

THE FEDERAL LEAD AND COPPER RULE

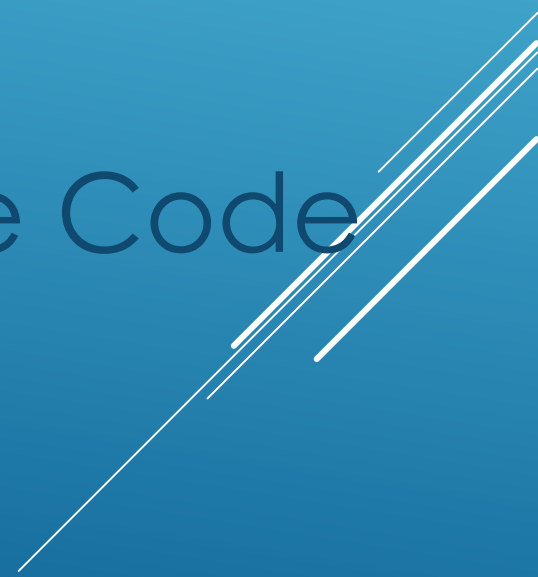


- ▶ Product of the 1986 amendments to the Safe Drinking Water Act.
- ▶ Goal of this Rule is to reduce the amount of lead and copper in drinking water.

THE LEAD AND COPPER RULE




THE FEDERAL LEAD AND COPPER RULE

- ▶ Code of Federal Regulations (CFR) 141.80 to 141.91 (I)
 - ▶ Nevada Administrative Code (NAC) 445A.4525
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THE LEAD AND COPPER RULE


FOUR BASIC REQUIREMENTS:

1. Require water suppliers to optimize their treatment system to control corrosion in customer's plumbing;

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FOUR BASIC REQUIREMENTS:

2. Determine tap water levels of Lead and Copper for all customers, especially those who have lead service lines or lead-based solder in their plumbing system;


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FOUR BASIC REQUIREMENTS:

3. Rule out source water as a source of significant lead levels; and,



4. If lead action levels are exceeded, require suppliers to educate their customers about lead and suggest actions they can take to reduce their exposure to lead through public notices and public education programs.

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- ▶ sample taken at consumer's cold-water kitchen or bathroom tap *rather than the source*;
- ▶ sample may be taken by consumer rather than a certified operator or owner;
- ▶ look at 90th percentile of sample pool to determine regulatory compliance.

THIS RULE IS UNIQUE!



SOURCES OF LEAD

Rarely found in source water



- ▶ Once common in household plumbing and water service lines
- ▶ Bronze or chrome-plated brass faucets/fixtures



COMMON SOURCES
OF LEAD

Homes built before 1986 are more likely to have lead pipes, fixtures and solder.



Enters tap water through corrosion of plumbing materials (i.e. lead service lines, brass/bronze fixtures, lead solder, faucets, and meters)



SOURCES OF COPPER

Copper is primarily a result of corrosion of interior plumbing





- ▶ Sampling sites (residences) are characterized by risk of Lead and Copper exposure on a 3-tiered scale
- ▶ Systems are obligated to select sampling sites from highest practical risk tiers

MONITORING OF DISTRIBUTION SYSTEM

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Tap water samples must be taken at high-risk locations (Tier 1 sites):

- ▶ Single family homes with Copper pipes with lead solder installed between 1982 – 1989, or contain Lead pipes
- ▶ homes having lead service lines

Can result in

- ▶ kidney problems
- ▶ high blood pressure
- ▶ interference with heme synthesis (anemia)

HEALTH EFFECTS FOR ADULTS

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- ▶ Lead is persistent and can bio-accumulate in the body over time.
- ▶ Exposure to high levels of lead can cause
 - ▶ delays in physical or mental development
 - ▶ deficits in attention span and IQ
 - ▶ lowered birth weight

HEALTH EFFECTS FOR
INFANTS AND CHILDREN

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- ▶ The health effects of lead are more severe for infants, children and pregnant women.



- ▶ A dose of Lead that would have little effect on an adult can have a significant effect on children, infants, and fetuses.



Copper:

- stomach and intestinal distress
- complications of Wilson's Disease
- chronic exposure may cause liver disease

HEALTH EFFECTS

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MCLG (mg/L)

Action Level

Lead

Zero

0.015

Copper

1.3

1.3

AL exceedance *is not* a violation

MCLG'S


- ▶ EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water (~1% of all systems comes from Source water for both Pb and Cu)
- ▶ Infants who consume mostly mixed formula can receive 40 to 60 percent of their exposure to lead from drinking water

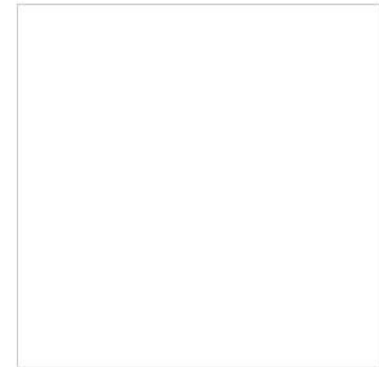
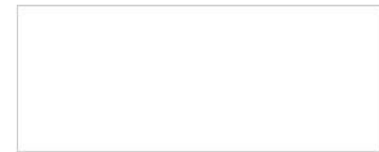
Study: Lead Exposure Linked to 10 Times More Deaths Than Reported

A new study found lead exposure is responsible for more deaths in the U.S. than previously thought.

By **Alexa Lardieri**, Staff Writer March 13, 2018, at 12:00 p.m.



People can become exposed to lead through some industrial jobs.  (BUSÀ PHOTOGRAPHY/GETTY IMAGES)



MORE HEALTH CARE NEWS

NEWS
Healthcare of Tomorrow




NATIONAL NEWS



SOURCES OF LEAD

- ▶ Homes built between 1982 and 1988 are more likely to have faucets, fixtures and solder containing Lead
- ▶ Newer homes also at risk: legally “lead-free” solder may have contained up to 0.2% lead; and pipes, plumbing materials, and chrome and brass facets up to 8% lead, until 2014.

CWS TIER 2 SAMPLING SITES CONSIST OF BUILDINGS, INCLUDING MFRS:

- ▶ with copper pipes with lead solder installed between 1982 and 1989 (*the effective date of State's lead ban*) or contain lead pipes; and/or
 - ▶ that are served by a lead service line.
- 
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REVIEW OF MONITORING REQUIREMENTS - NTNC

Two sampling site tiers: Tier 1 and Tier 2.

Tier 1 sampling pool consists of sample sites that:

- ▶ Contain copper pipes with lead solder installed between 1982-89 or contain lead pipes; and/or,
- ▶ Are served by lead service line.

Tier 2 sampling pool consists of sample sites that:

- ▶ Contain copper pipes with lead solder installed before 1983.


TIER 3 SAMPLING SITES

- ▶ are single family structures with copper pipes having lead solder installed before 1983.




REPRESENTATIVE SAMPLE:

If a CWS or NTNCWS cannot collect enough samples from tiered sites, it must collect them from sites where the plumbing is similar to that used at other sites served by the water system.




Once monitoring begins,
you must use the same sites,
unless a site is no longer
accessible to you or no
longer fits the requirements
of a priority site



SOURCES OF INFORMATION TO REVIEW

Survey records documenting the materials used to construct and repair your distribution system and connected buildings


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SOURCES OF INFORMATION

Plumbing Codes and Permits;
Distribution Maps and Drawings;
Inspection and Maintenance Records;
Meter Installation Records;
Capital Improvement and Master Plans;
Standard Operating Procedures;
Operation and Maintenance Manuals;
Permit Files;
Existing Water Quality Data;
Interviews with Senior Personnel, Building Inspectors, and Retirees; and
Community Survey.



CONTAMINATION OF DOMESTIC TAP WATER OCCURS AT FIVE KINDS OF POINTS

- ▶ 1. Lead connectors (i.e. pigtails or goosenecks),
 - ▶ 2. Lead service lines
- 

SOURCES OF LEAD

3. Lead-soldered joints in copper plumbing,

▶ 4. Lead-containing drinking fountains and water coolers


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SOURCES OF LEAD

- ▶ 5. Lead-containing brass faucets and other fixtures.



TIME FRAME


- ▶ Samples taken during the summer months **June – September**
 - ▶ Take 90th percentile of sample pool to determine regulatory compliance.
- 

- prepare site by previously flushing tap
- tap must stand unused for at least 6 hours
(no longer is there any maximum time)
- one liter sample taken from tap at first draw

SAMPLE COLLECTION METHODS
UPDATED

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Although regular removal and cleaning of aerators is advisable, EPA guidance advises aerators to remain in place during initial sampling for lead from taps.

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RESULTS OF MONITORING

Sample number depends on the population of the system.

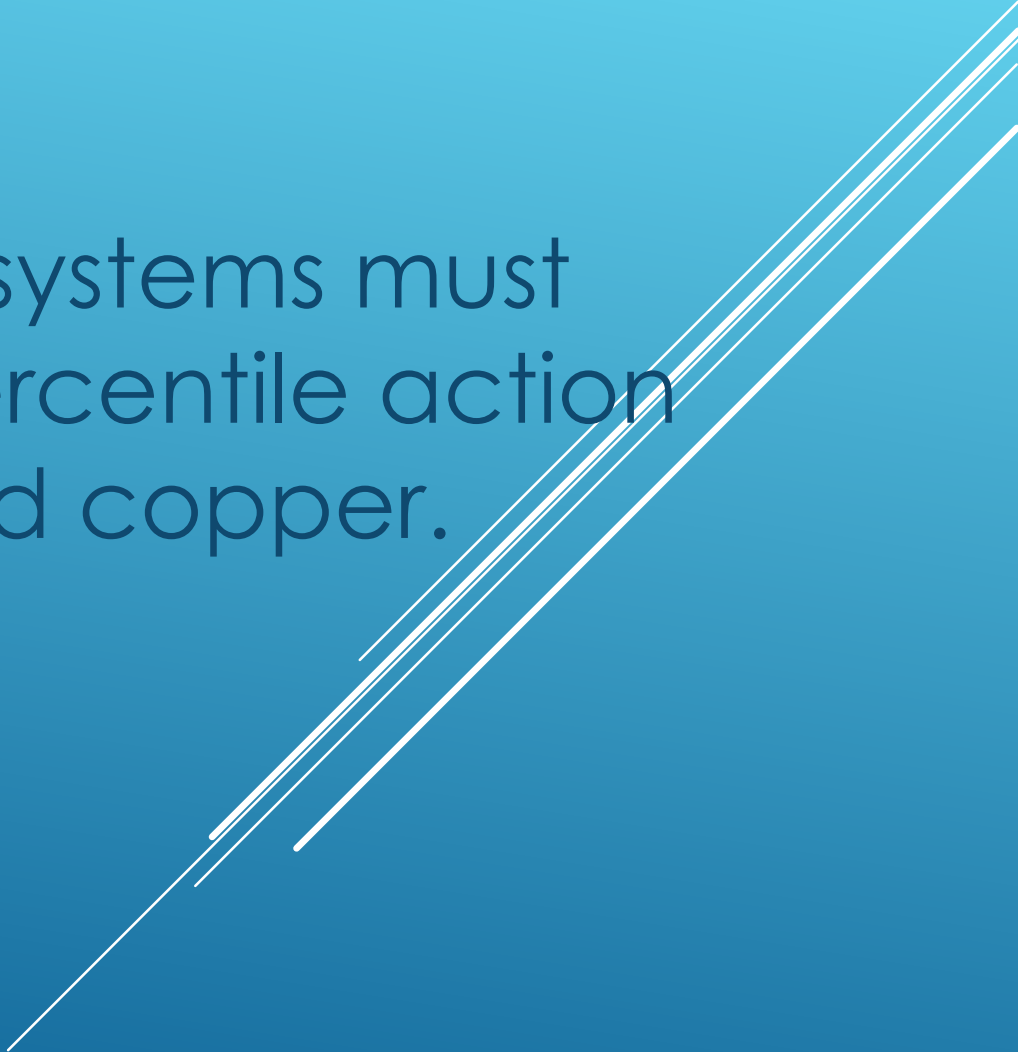
Large: > 50,000 people

Medium: 3,301 to 50,000 people

Small: 3,300 or fewer people

RESULTS OF MONITORING

All public water systems must meet the 90th percentile action level for lead and copper.

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SAMPLE INVALIDATION

States may invalidate tap sample if:

- **Improper sample analysis**
- **Site selection criteria not met**
- **Sample container damaged**
- **Sample subjected to tampering**



SAMPLE INVALIDATION

Is not permitted simply to discard a high reading

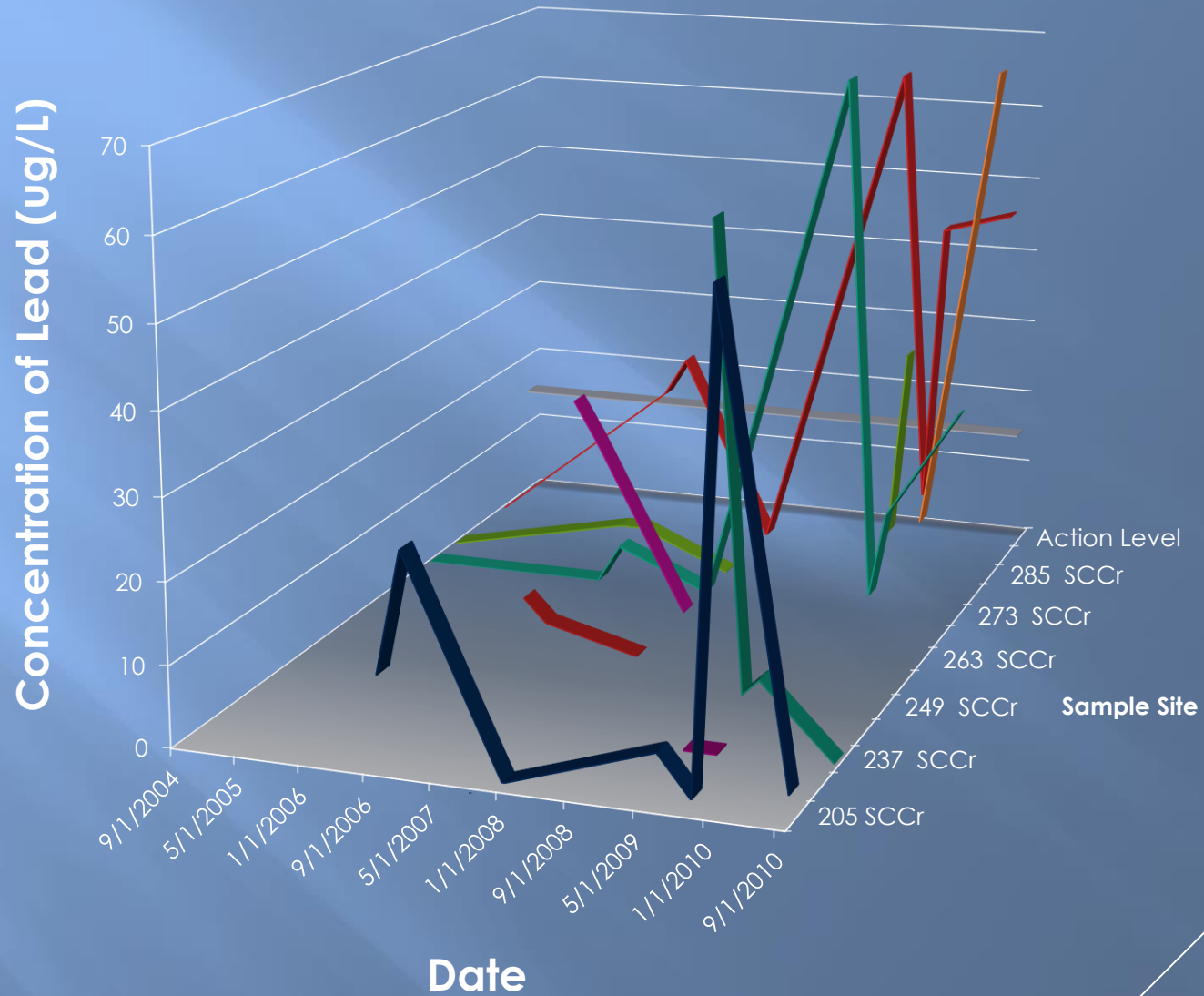
Does require documentation as to why the operator believes the sample did not meet testing requirements

In light of new information, EPA is seeking input on identifying how the sample site selection criteria for Lead and Copper could be modified to capture the current sources of high risk sites in a simple and cost effective way.

GOAL OF LONG TERM
REVISIONS

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History of Lead Concentrations for County Water System



- ▶ Do not take samples from vacant homes, buildings, or those only seasonally occupied

$$[\text{Pb}] = 130 \text{ ppb}$$

$$[\text{Cu}] = 2.8 \text{ ppm}$$

- ▶ Do not let inmates take your samples

$$[\text{Pb}] = 45 \text{ ppb}$$

SAMPLE INVALIDATION



- ▶ Do not take samples from abandoned volunteer fire station sinks with brass faucets

$$[\text{Pb}] = 240 \text{ ppb}$$

- ▶ Do not take samples from the tap of a hot water heater

$$[\text{Pb}] = 780 \text{ ppb}$$

SAMPLE INVALIDATION



SITE S



EPA
standard

15

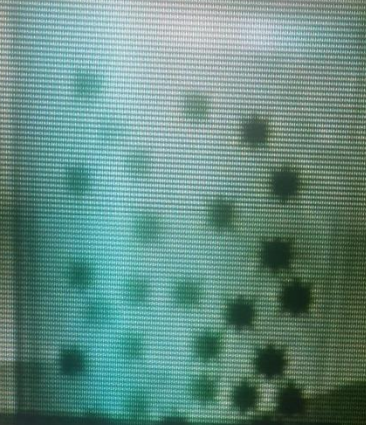
parts per billion



FLINT
50% sampled

1,000

parts per billion



FOA
Highest Reading

13,200

parts per billion



LEAD IN DRINKING WATER

SOURCES: EPA, Virginia Tech Study



Lead and Copper Rule

Requirements to Inform the Public before an ALE

- Consumer Notification of Lead Tap Water Results.
- Consumer Confidence Report Lead Informational Statement.



Requirements to Inform the Public

Lead Consumer Notice

Systems Affected

- All CWSs and NTNCWSs

Rule Requirements

- Provide notice of lead tap water monitoring results
- Provide irrespective of whether sample exceeds lead AL
- Provide to all served by sampling site -- not just ones with water bills
- Provide as soon as practical but within 30 days after receives results
- Provide by mail or other State-approved methods



Requirements to Inform the Public

Lead Consumer Notice

Notice must include:

- ✓ Results of lead tap water monitoring
- ✓ Explanation of lead health effects
- ✓ Steps consumers can take to reduce exposure
- ✓ Facility contact information
- ✓ MCLG and AL for lead and their definitions*

** Must use CCR Rule language in § 141.13(c).*



Requirements to Inform the Public

Lead Consumer Notice

Within 3 months after the monitoring period ends, the system sends the State:

- Sample of lead consumer notice, and
- Certification that notification meets delivery requirements.
- Sample certification available in revised M/R and State implementation guidances.*



* <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100DP2P.txt>

Requirements to Inform the Public

Consumer Confidence Report (CCR) Requirement

Systems Affected

- All CWSs

Rule Revision

- All CCRs must include:
 - ✓ Sources of lead in drinking water.
 - ✓ Health effects from lead exposure.
 - ✓ Ways to reduce lead in drinking water.
 - ✓ Recommended flushing times.
 - ✓ Places to go for more information including lead testing.
- Required regardless of lead sample levels.

- ▶ Although your water meets standards, if present at elevated levels, 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 from the Safe Drinking Water Hotline or at:
<http://www.epa.gov/safewater/lead>.



***Notification of Treatment
Changes and Source Additions***

Long-Term Treatment Changes and New Source Additions

Systems Affected

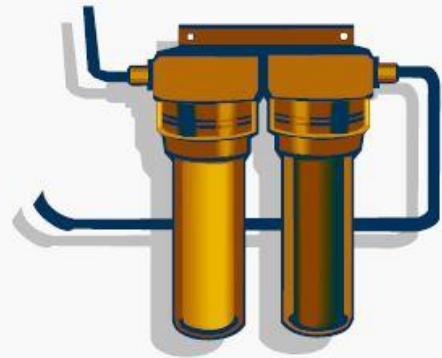
- Systems on reduced lead and copper tap monitoring

Rule Requirement

- Requires prior notification and approval of treatment change or source addition
- Limits notification of treatment changes to “long-term changes”
- Notification due as specified by State, or early as possible prior to change or addition

Long-Term Treatment Changes and New Source Additions

- Examples of long-term treatment changes:
 - ✓ Switching secondary disinfectants
 - ✓ Switching coagulants
 - ✓ Switching corrosion inhibitor products
 - ✓ Changing dosage of existing chemicals
 - ✓ Installation of membrane filters, ozonation, enhanced coagulation/softening
- Does NOT include chemical dose fluctuations associated with daily raw water quality changes



Long-Term Treatment Changes and New Source Additions

- Examples of source water additions include:
 - ✓ Switching source types
 - ✓ Adding treated surface water to ground water only system
 - ✓ Adding new well from different aquifer

- Seasonal or interannual source changes DO NOT require notification if:
 - ✓ Covered by previous OCCT studies and sampling, and
 - ✓ Covered within OCCT designation framework



Lead and Copper Rule

Resources

- EPA's lead and copper compliance help web site <https://www.epa.gov/dwreginfo/lead-and-copper-rule>
- Lead and Copper Rule: A Revised Quick Reference Guide (PDF) (2 pp, 125K) EPA816-F-08-018 June 2008 <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=60001N8P.txt>
- Lead and Copper Rule: A Quick Reference Guide for Schools and Child Care Facilities that Are Regulated Under the Safe Drinking Water Act (PDF) (5 pp, 546K) <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10058C5.txt>
- Simultaneous Compliance Guidance Manual for Stage 2 Rules (PDF) (462 pp, 3MB) EPA 815-R-07-017 May 2007 <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=60000E2Q.txt>
- Memo Addressing Lead and Copper Rule Requirements for Optimal Corrosion Control Treatment for Large Drinking Water Systems (PDF) (2 pp, 522K) https://www.epa.gov/sites/production/files/2015-11/documents/occt_req_memo_signed_pg_2015-11-03-155158_508.pdf
- Memo Addressing tap sampling instructions <https://www.epa.gov/dwreginfo/memo-clarifying-recommended-tap-sampling-procedures-lead-and-copper-rule>





