LEAD AND COPPER REGULATIONS

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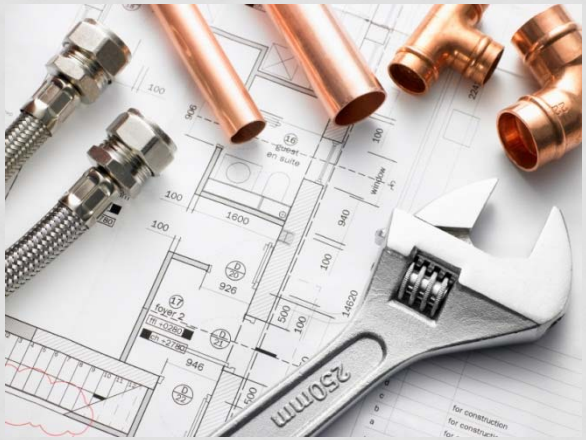
HEALTH EFFECTS

- Lead Toxicity
  - Permanent damage to the brain and nervous system
    - Behavior and learning problems
    - Lower IQ
  - Slowed growth
  - Anemia
- Copper (Cu)
  - Stomach and Intestinal Distress
  - Liver and/or Kidney damage

SOURCE OF LEAD AND COPPER

- Lead and Copper can enter drinking water through the corrosion of plumbing materials
- The most common problem is with brass or chrome plated brass faucets and fixtures with lead solder.
- Extent of Lead and Copper
  - Chemistry of the water
  - The amount of lead and copper
  - How long the water remains in contact with a fixture
  - Presence of protective scales or coatings
- Source Contamination
  - Soil contaminated with lead seeping into ground water



CORROSION

- Corrosive water
  - Low pH
  - Low alkalinity
  - "Soft" water
- Corrosion of household plumbing
  - Lead pipe
  - Copper pipe with lead solder
  - Lead Service Lines
- Customer Complaints
  - Bitter taste
  - Stained Laundry
  - Greenish-blue stains around basins and drains

CORROSIVITY

Langelier Saturation Index

- Variables
  - pH
  - Conductivity in Total Dissolved Solids
  - Calcium (Ca^{2+})
  - Bicarbonate (HCO^{3-})
  - Water Temperature

Corrosion Control

- Increase pH
- Alkalinity Adjustment
- Corrosion Inhibitor
  - Phosphate
  - Silicate

KEY REGULATIONS

- 1988 – Louisiana Lead Ban
- 1991 – Lead and Copper Rule (LCR)
- 2000 – Minor Revisions to the LCR
- 2007 – Short-Term Revisions to the LCR
- 2012 – Louisiana Lead Reduction Act
- 2014 – Federal Lead Reduction Act
- ???? – EPA's Long-Term Revisions to the LCR

SHORT-TERM REVISIONS

- Lead Consumer Notice
  - Notice of Individual results to participants
  - Language Required
    - An explanation of the health effects of lead.
    - Steps that consumers can take to reduce exposure to lead in drinking water.
    - Contact information for your water utility.
    - The maximum contaminant level goals and action levels for lead, and the definitions of these two terms from §141.153(c).
- Public Education (Only required for exceeding lead action level)
  - Mandatory language rewritten (shortened)
  - Distribution process restructured
- Clarifications and Corrections
  - Water system must collect every three years
  - Removal of dates

LEAD AND COPPER RULE

Compliance Levels

- 90th Percentile – the value that indicates 90% of the values are below
- Action Level (AL) – the level which determines the actions needed to be taken by the water system

Lead AL = 0.015 ppm (15 ppb)

Copper AL = 1.3 ppm

MINIMUM NUMBER OF SAMPLES

Initial/Routine

Population	Number of Samples
>100,000	100
10,001 – 100,000	60
3,301 – 10,000	40
501 – 3,300	20
101 – 500	10
< 100	5

Reduced

Population	Number of Samples
> 100,000	50
10,001 – 100,000	30
3,301 – 10,000	20
501 – 3,300	10
< 500	5

SAMPLE SITE SELECTION

Collect samples from the interior of **"High Risk"** homes served by the water system

- Tier 1 – single family structures that contain copper pipes with lead solder installed after 1982 or contain lead pipes and/or are served by a lead service line

If the water system is unable to complete the sampling pool with Tier 1 sites, the water system must then selected sites meeting Tier 2 requirements

- Tier 2 – buildings, including multi-family structures that contain copper pipes with lead solder installed after 1982 or contain lead pipes and/or are served by a lead service line

If the water system is unable to complete the sampling pool with Tier 2 sites, the water system must then selected sites meeting Tier 3 requirements

- Tier 3 – single family structures that contain copper pipes with lead solder installed before 1983.

If the water system is unable to complete the sampling pool with Tier 3 sites, the water system must then select representative sites throughout the distribution system

MONITORING PERIODS

Initial/Routine

- Samples collected every six months
- Samples collected between
  - January – June
  - July – December

Reduced

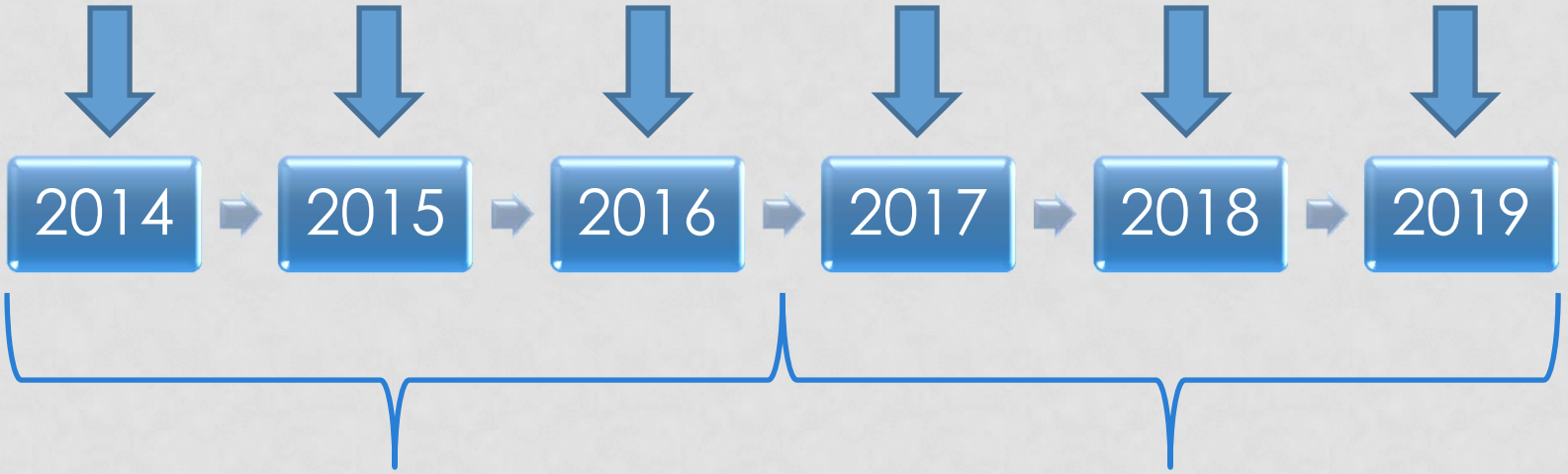
- Samples collected annually (every year) or triennially (every 3 years)
- Samples Collected in the warmest temperature months (June-September)

MONITORING TIMEFRAME

ACCELERATED TIMEFRAME

If system meets ≤ 0.65 ppm for Cu and ≤ 5 ppb for Pb for both routine monitoring sets can go to accelerated reduced monitoring

MONITORING EVERY 3 YEARS



Samples coul[illegible] year period

Samples must be collected every 3 years
If sampling in 2014, the water system must monitor again in 2017
If sampling in 2015, the water system must monitor again in 2018
If sampling in 2016, the water system must monitor again in 2019

MONITORING EVERY 3 YEARS

Samples must be collected every 3 years
If sampling in 2013, the water system must monitor again in 2016
If sampling in 2014, the water system must monitor again in 2017
If sampling in 2015, the water system must monitor again in 2018

FAILURE TO MONITOR

- A notice of violation will be sent to the water system
  - If samples are not collected within the appropriate months required.
  - If an insufficient number of samples are collected to meet the minimum number of samples required (90th Percentile still calculated and compliance is still determined)
- Public Notification Required (Tier 3)
  - 45 days to distribute notice by newspaper
  - 90 days to distribute notice by mail and/or hand delivery
  - Certification to the State

90TH PERCENTILE

- The 90th percentile is calculated using the total number of samples collected
- Example if collection 30 samples
  - 30 samples x 0.9 = 27
    - 27th Highest Sample
  - 27 samples x 0.9 = 24.3
    - Calculate 90th percentile between the 24th and 25th Highest samples

90th Percentiles	
5	Average of the 4th and 5th Highest Samples
10	9th Highest Sample
20	18th Highest Sample
30	27th Highest sample
40	36th Highest sample
50	45th Highest Sample
60	54th Highest Sample
100	90th Highest Sample

90TH PERCENTILE DETERMINATION

1. Separate Lead Values from Copper Values
2. Order Samples in order of lowest value to highest value
3. Take the number of samples and multiply by 0.90 (In this case 20 samples x 0.90 = 18)
4. The number derived from step 3 is the 90th percentile value
5. Is Lead ≤ 15 ppb and Copper ≤ 1.3 ppm?

Sample Location	Lead Level (PPB)
1. 2265 Walker Rd	0
2. 5464 Charles St	0
3. 7564 Pine Haven	0
4. 9876 7th Avenue	0
5. 1400 Mississippi Ave	1
6. 4656 Alabama Ave	1
7. 1647 Louisiana Ave	1
8. 8532 Harrison St	1
9. 1582 Arkansas Ave	2
10. 5646 Pine St	2
11. 123 Main St	2
12. 2156 Texas Ave	3
13. 1582 Mississippi Ave	5
14. 3918 Alabama Ave	6
15. 1295 Florida Ave	6
16. 4655 Georgia Ave	8
17. 1599 Saw Mill Loop	10
18. 1568 Saw Mill Loop	10
19. 1550 Davis St	10
20. 1440 Hill Loop	32

Sample Location	Copper Level (PPM)
1. 123 Main Street	0.1
2. 1647 Louisiana Ave	0.2
3. 2265 Walker Rd	0.2
4. 4656 Alabama Ave	0.2
5. 5464 Charles St	0.2
6. 2156 Texas Ave	0.4
7. 9876 7th Ave	0.4
8. 4655 Georgia Ave	0.6
9. 7564 Pine Haven	0.8
10. 1568 Saw Mill Loop	0.9
11. 1400 Mississippi Ave	0.9
12. 1295 Florida Ave	1.0
13. 5646 Pine St	1.0
14. 1582 Arkansas Ave	1.2
15. 1440 Hill Loop	1.1
16. 8532 Harrison St	1.1
17. 1582 Mississippi Ave	1.1
18. 3918 Alabama Ave	1.2
19. 1599 Saw Mill Loop	1.7
20. 1550 Davis St	1.8

STANDARD PROCEDURE

- State maintains schedules and sends sample kits to water system
  - Make sure you know when you are required to sample (Schedules are online)
  - If you do not receive a samples kit, it is your responsibility to contact the State for another (Sample kits are generally sent out in May for reduced systems)
- Water system coordinates with customer on the collection of samples at the appropriates sites
- Water system sends samples to State Lab
- Lab will preserve samples (14 day hold time)
- Lab sends results to Compliance Engineer

****NEW ADDRESS FOR THE LABORATORY****

Attn: David Boucher
Lead and Copper Water Samples
OPH Central Laboratory
1209 Leesville Avenue
Baton Rouge, LA 70802-4336

- State (Compliance Engineer) sends results to water system
- **NEW** Water System sends Lead Consumer Notice and certifies to State

SAMPLE COLLECTION

- Can be done by the resident or employee of the water system
- First-draw sample (No flushing 6 hours prior to sample collection)
- Frequently used tap (used daily)
- Interior source (Kitchen or Lavatory)
- Collect samples after the water has rested for at least 6 hours
  - Morning
  - Evening

SAMPLE INSTRUCTIONS

- An instruction sheet must be given to each resident who collects a sample on behalf of the water system (Sheet provided by the State)
- Information Needed
  - Name of the person collecting the sample
  - Address where the sample was collected (unique)
    - Apartments, trailer parks, ***etc.*** need individual number identifiers (Apt 4, Lot 6, ***etc.***)
    - Businesses must identify sample points (***i.e.*** men's lavatory)
  - Date and time sample was collected
  - Whether the sample was collected from the Kitchen or a Lavatory Tap
  - When the water was last used

Note: Samples can not be invalidated because of improper sample collection after a result has been obtained.

SAMPLE LABELS

Sample labels will be included in the sample kit
Included with the labels is a label for the State Lab

LEAD & COPPER FIRST DRAW COLD DRINKING WATER TAP SAMPLE

***PWS ID*:** LA1234567

***SUPPLY*:** ABC WATER SYSTEM

L1234567

SAMPLE COLLECTION AND COLLECTOR INFORMATION:

9 / 10 / 10 14:30 Doe, John

Date (mo/day/yr) ***Time*** (24 hrs) ***R*** (Resident) ***or E*** (Employee)

TAP CODE (Circle One): **KT** (Kitchen) **LT** (Lavatory)

Street Address: **9999 Eastside Lane**

FORM A – LOG SHEET

A log sheet must be sent with each set of samples to the OPH Central Laboratory (Address Below)

Form A – LEAD AND COPPER SAMPLE LOG SHEET

PWS ID: «PWSID» WATER SYSTEM NAME: «PWSNAME»

	LAB NUMBER (LAB USE ONLY)	TIER (I, II, III, or "R")	ADDRESS (site address where sample was collected)	COLLECTOR Last Name, First Initial of person collecting sample	(R)esident or (E)mployee	(KT)Kitchen or (LT)Bathroom	DATE sample collected	TIME sample collected
Ex:	Leave this section blank	I	1234 Main St	Doe, John	R	KT	01/04/2012	14:03 or 2:03 PM

Transfer information from sample labels to log sheet

Please print legibly

See Instruction on back of this page

Mail water samples with log sheet to:

Attn: David Boucher
Lead and Copper Water Samples
OPH Central Laboratory
1209 Leesville Avenue
Baton Rouge, LA 70802-4336

FORM B – CHANGE OF SITE

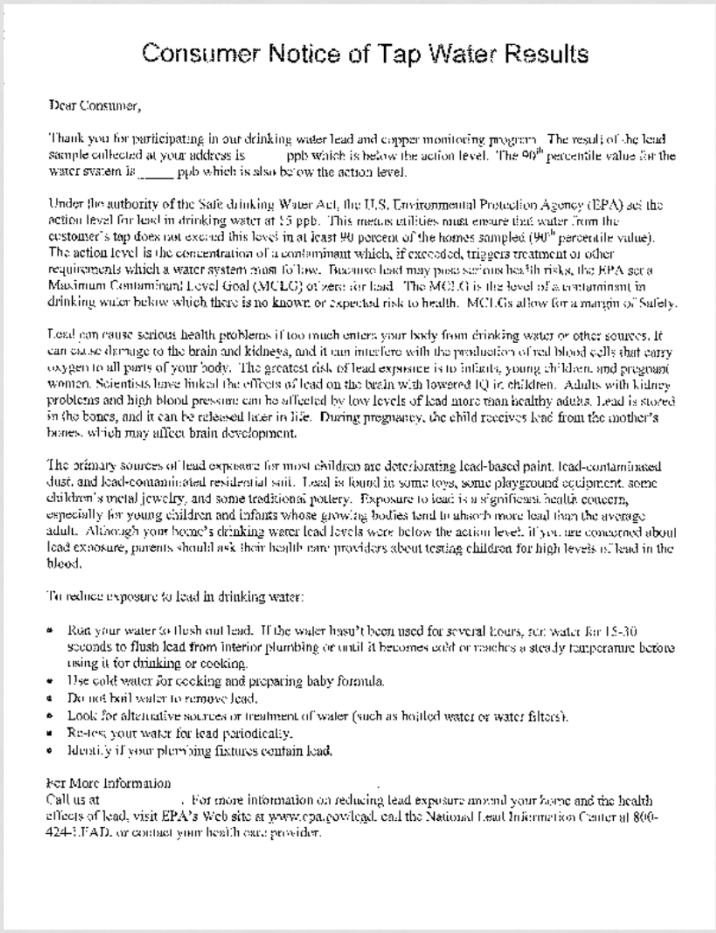
- Original Site address with Tier Level
- New Site address with Tier Level
- Approximate distance between sites
- Reason for change
  - House no longer occupied
  - Resident is unwilling or uncooperative

MAIL OR HAND DELIVER SAMPLES

- Samples go to the OPH Central Laboratory
  - Must reach Laboratory within 14 days of sample collection
  - Form A – Log Sheet must be sent with each set of samples
- Copies of Form A – Log Sheets and Form B – Change of Site should be sent to the Compliance Engineer
- Laboratory will analyze samples (1-3 months)
- Results to the State Compliance Engineer
- Compliance Engineer sends letter to the water system informing them of results
  - Results below both action levels and next monitoring period (reduced if applicable)
  - Results indicating an exceedance of an action level, instructions on increased and additional monitoring required
- Water system distributes Lead Consumer Notice to participants (Must be done regardless of whether the system meets both action levels)

LEAD CONSUMER NOTICE (LCN)

- Notice to be distributed within ***30 days*** of the water system receiving the results
- Notice shall be distributed to all persons participating in the sampling event (even if result is 0)
- Must contain mandatory language (example notice sent with results)
- Must add the individual's lead result, the water system's 90th percentile and the water system's phone number (all values must be in ppb)



Consumer Notice of Tap Water Results

Dear Consumer,

Thank you for participating in our drinking water lead and copper monitoring program. The result of the lead sample collected at your address is ppb which is below the action level. The 90th percentile value for the water system is ____ ppb which is also below the action level.

Under the authority of the Safe drinking Water Act, the U.S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile value). The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

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

The primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated residential soil. Lead is found in some toys, some playground equipment, some children's metal jewelry, and some traditional pottery. Exposure to lead is a significant health concern, especially for young children and infants whose growing bodies tend to absorb more lead than the average adult. Although your home's drinking water lead levels were below the action level, if you are concerned about lead exposure, parents should ask their health care providers about testing children for high levels of lead in the blood.

To reduce exposure to lead in drinking water:

- Run your water to flush out lead. If the water hasn't been used for several hours, run water for 15-30 seconds to flush lead from interior plumbing or until it becomes cold or reaches a steady temperature before using it for drinking or cooking.
- Use cold water for cooking and preparing baby formula.
- Do not boil water to remove lead.
- Look for alternative sources or treatment of water (such as bottled water or water filters).
- Re-test your water for lead periodically.
- Identify if your plumbing fixtures contain lead.

For More Information

Call us at . For more information on reducing lead exposure around your home and the health effects of lead, visit EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Note: Results must be given in ppb (e.g. 0.003 ppm * 1000 is equal to 3 ppb)

LEAD CONSUMER NOTICE CONT'D

- Type of Notice
  - If the water system's 90th percentile is below 15 ppb
    - Notice for customer's whose tap result is below 15 ppb
    - Notice for customer's whose tap result is above 15 ppb
  - If the water system's 90th percentile is above 15 ppb
    - Notice for customer's whose tap result is below 15 ppb
    - Notice for customer's whose tap result is above 15 ppb
- Certification of Distribution for the Lead Consumer Notice
  - Certification Form included with results letter
  - A copy of one of the notices sent must be attached to the Certification Form when submitting to the State.

Notices can now be viewed at *http://new.dhh.louisiana.gov/index.cfm/page/1124*

FAILURE TO DELIVER LCN

- 30 Days to deliver lead results to homeowners at sites that were tested.
- Certification is due 3 months after the end of the monitoring period
- Failure to do so will result in a violation and require public notice to all customers.
  - 45 days by newspaper
  - 90 days by mail/hand delivery

EXCEEDANCE OF LEAD AND/OR COPPER

- Not a violation. Not doing follow-up response to exceeding either or both action levels is a violation
- If on reduced monitoring, the water system will be placed on routine monitoring (every six months) and increased to the routine number of samples
- Collect lead and copper at each entry point to the distribution system (Source Evaluation)
- Water Quality Parameters (WQPs)
  - Collected at sites in the distribution system, and
  - At each entry point to the distribution system
- Based on WQPs and source samples, water system sends treatment recommendation to the State
- Treatment installation varies by system size (1-1/2 to 3 years)
  - Small to Medium Water Systems (0 to 3,300)
  - Large Water Systems

SOURCE WATER MONITORING

- Collect samples at the source to eliminate it as the cause of high lead and/or copper
- Samples must be analyzed at a certified lab
- The water system must add treatment if source exhibits high levels of lead and/or copper

DISTRIBUTION AND ENTRY POINT MONITORING

- WQPs collected twice every six months (every 90 days)
  - In the Distribution system (i.e. Bactii sample locations)
  - Entry Point to the distribution system (or at each well)

- Water Quality Parameters (WQPs)
  - pH
  - Alkalinity
  - Calcium
  - Conductivity
  - Water Temperature
  - Orthophosphate*
  - Silicate*

*If the water system currently uses a product containing orthophosphate or silicate

- Used to determine corrosivity of the water and best treatment option

EPA Guidance Manual for Selecting Lead and Copper Control Strategies is available online at EPA website or contact us for a copy)

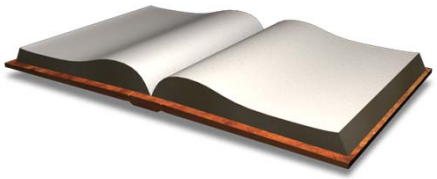
PUBLIC EDUCATION

- Required for all water systems that exceed the ***lead*** action level
  - Distributed notice to all customers
  - Distribute to sensitive populations
  - Quarterly water bill notice
  - All of the above must meet mandatory language requirements

PUBLIC EDUCATION ACTIVITIES

- Community Water
  - All water system must mail out/hand deliver
  - Serving greater than 3,300 persons – conduct 3 additional activities
  - Serving 3,300 or fewer – conduct 1 additional activity
- Non-transient Non-community water
  - Materials to every person served
  - Post material in conspicuous areas
- Additional Activities
  - Public Service Announcements (every six months)
  - Paid advertisements
  - Display information in public areas
  - Email to customers
  - Public Meetings
  - Provide materials directly to multi-family structures

RECORD KEEPING



- Any system subject to the requirements of the lead and copper rule shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, State determinations, any other information pertaining to the rule

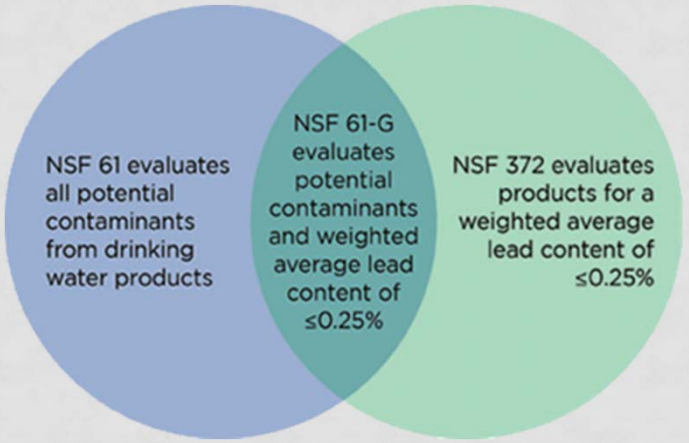
- The records shall be retained for no fewer than 12 years

REDUCTION OF LEAD IN DRINKING WATER ACT

- On January 4th, 2011 – President signed Senate Bill S.3874 known as the Reduction of Lead in Drinking Water Act
  - Federal Safe Drinking Water Act – Effective January 2014
- Louisiana Administrative Code – Act 362 (2012)
  - No person shall use any pipe, pipe or plumbing fitting or fixture, solder, or flux that is not lead free in the installation or repair of any public water system or any plumbing in a facility providing water for human consumption, except when necessary for the repair of leaded joints of cast iron pipes.
  - Effective since January 1, 2013
- Establishes new low lead requirements for plumbing fixtures
  - For drinking water used for human consumption (exemption for non potable use)
  - **Louisiana - Materials purchased or acquired by a public water system prior to January 1st, 2013 can continue to be utilized until January 2014.**

REDEFINING "LEAD FREE"

- Not containing more than 0.2 percent lead when used with respect to solder and flux; and
- Not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures
- NSF/ANSI 61-G



FORMULA CALCULATION

$$WLC = \sum_{c=1}^{n} \left(LC_c \times \left[WSA_c / WSA_t \right] \right)$$

WLC = weighted average lead content of product

LC_c = percentage lead content

WSA_c = wetted surface area of component

WSA_t = total wetted surface area of all components

n = number of wetted components in product

QUESTIONS

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DHH-OPH Engineering Services
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Baton Rouge, LA 70802

Safe Drinking Water Program Website
www.dhh.la.gov/safedrinkingwater

Contact Information:
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Fax: 225-342-7303