REPSG
React Environmental
Professional Services Group, Inc.

December 2, 2019

Independence Charter School
1600 Lombard Street
Philadelphia, PA 19146
Attn: Ms. Tanya Ruley-Mayo, CEO

RE: Lead in Drinking Water Testing Services
Independence Charter School
1600 Lombard Street
Philadelphia, PA 19146
REPSG Project No.: 007514.240.01

Ms. Mayo:

React Environmental Professional Services Group, Inc. (REPSG) has completed the testing of drinking water for total lead concentration at "Independence Charter School" located at 1600 Lombard Street in Philadelphia, Pennsylvania (the "subject property"). All testing was performed in accordance with the United States Environmental Protection Agency (USEPA) protocols and methods. These services are described in detail below.

1.0 SUBJECT PROPERTY INFORMATION

The subject property is a four-story, school building. The structure has a full basement, with concrete floor slabs, concrete masonry unit (CMU) and brick bearing walls, a flat roof. Interior building materials observed at the subject property structure included: 12"x12" floor tiles, carpeting, hardwood floors, and sheetrock walls and ceilings.

REPSG understands that usage of the subject property will remain the same.

2.0 LEAD BACKGROUND INFORMATION

2.1 Lead Exposure Hazards

The Centers for Disease Control and Prevention (CDC) has estimated approximately 900,000 children, or about 4.4% of children under the age of 6, may have unacceptable high levels of lead in their blood. Lead exposure in pregnant adults, infants, and young children is of particular concern, because children absorb lead more readily than adults and their nervous systems are particularly vulnerable to the effects of lead.

Children with high levels of lead in their body can suffer from learning disabilities, behavioral and learning problems, and mental retardation. The effects of long-term lead exposure or poisoning in

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children are well documented: higher school failure rates and reductions in lifetime earnings due to permanent loss of intelligence and increased social pathologies. Fetuses are also at risk, as lead can pass from a pregnant woman's bloodstream to the developing child. There is also some indication that lead exposure contributes to high blood pressure, reproductive and memory problems in adults. Lead has no known use in the body and is difficult to remove from blood and bones in cases where medical intervention is necessary.

2.2 Regulations Governing Lead in Drinking Water

The Safe Drinking Water Act (SDWA), passed in 1974, requires that the USEPA determine the level of contaminants in drinking water at which no adverse health effects are likely to occur with an adequate margin of safety. These health goals, which are non-enforceable, are based on potential health risks called "maximum contaminant level goals" (MCLGs). For lead, the MCLG has been set at zero.

The USEPA sets an enforceable regulation called a "maximum contaminant level" (MCL) based on the MCLG. MCLs are set as close to the MCLGs as possible. However, as corrosion of water system plumbing materials may result in lead contamination of drinking water, the EPA has instead established a "treatment technique" rather than an MCL for lead. Treatment techniques are an enforceable procedure that water systems must follow in order to ensure control of a contaminant.

The USEPA treatment technique regulation for lead, the "Lead and Copper Rule," has established an Action Level for lead in drinking water at 15 micrograms per liter (ug/L), or parts per billion (ppb)[1]. Drinking water systems found to contain levels of lead above the Action Level may be required to take additional actions, such as water monitoring and/or corrosion control treatment.

In addition, on January 6, 1991, Pennsylvania's "Plumbing System Lead Ban and Notification Act (PA Lead Ban)" became effective. The Lead Ban applies to all plumbing construction and/or repairs completed after that date. The Lead Ban, which is similar to amendments made to SDWA in 1986, requires the use of "lead-free" materials in the construction and/or repair of any public water system (PWS), any facility connected to a PWS, or any plumbing that provides water for human consumption.

The Lead Ban was further strengthened by amendments made in 1996 to the SDWA. Effective after August 6, 1998, the amended law banned plumbing suppliers from selling leaded solder or flux as well as pipe, fittings, or fixtures that are not "lead-free" and do not meet acceptable lead leaching standards. Further amendments to the federal SDWA, which took effect in 2011, revised the definition for "lead-free" to include any pipes or pipe fittings that contain less than or equal to 0.25% lead, and any solders or flux that contain less than or equal to 0.2% lead. The law deems that pipes,

[1] https://www.epa.gov/dwreginfo/lead-and-copper-rule

fittings, or fixtures that meet the lead leaching standards in the American National Standards Institute/NSF International (ANSI/NSF) Standard 61: Drinking Water System Components – Health Effects are acceptable.

Most recently, the Pennsylvania Department of Education amended the Public School Code in June 2018 via Act 39 Section 742 to address lead in drinking water concerns at schools. This amendment requires Pennsylvania-based schools to either test for lead in drinking water or, if they choose not to conduct testing, to hold an annual public meeting (such as a school board meeting) discussing lead issues. In addition, the amendment requires that Pennsylvania-based schools implement a plan to ensure that no child or adult is exposed to lead contaminated drinking water if the results of testing indicate that school drinking water contains concentrations of lead above the exceed the USEPA's action level of 15 ppb.

2.3 Sources of Lead in Water

The USEPA and Pennsylvania Department of Environmental Protection (PADEP) estimate that approximately 10-20%, and as much as 40%, of human exposure to lead may be from drinking water. Although lead is not typically found in public water supply systems, drinking water pipes, solder, faucets, valves, and other plumbing materials may contain lead.

While residential homes built prior to 1986 are more likely to have lead pipes, fixtures and solder, newer homes may also be at risk. Even legally "lead-free" plumbing systems may contain up to 8% lead, with brass or chrome-plated brass faucets and fixtures the most common source of lead leaching into the water.

The potential for lead to leach into water can increase the longer the water remains in contact with lead in plumbing. Plumbing systems with intermittent water use may have elevated lead concentrations. Debris containing lead can also build up on faucet aerators and screens. In addition, elevated lead concentrations can also result from corrosive water.

2.4 Routine Practices to Reduce Exposure to Lead in Drinking Water

The USEPA[2] and PADEP[3] recommend that the following actions be taken on a routine basis to reduce exposure potential to lead in drinking water:

- If water in a particular faucet is not used for a period of several hours, fully flush out the faucet and pipes by running cold water through the faucet for two minutes or more before use for consumption or cooking.

[2] https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water
[3] https://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Lead-in-Drinking-Water.aspx

- Only use cold water for drinking, cooking, or making baby formula as hot water may contain higher levels of lead.
- Clean screens and aerators in the faucets regularly.

In addition, if warranted based upon testing results, use exclusively bottled water for all consumption and cooking, or install a water filter which is National Sanitation Foundation (NSF) certified for lead removal at faucets used for consumption or cooking.

Copies of the USEPA "Lead in Drinking Water" fact sheet and the PADEP's "Lead Ban" fact sheet have been included in **Attachment 2** of this letter.

3.0 LEAD IN DRINKING WATER ASSESSMENT

3.1 Scope of Work and Survey Activities

RESPG personnel collected drinking water samples from five (5) locations at the water fountains and kitchen at the subject property. No water samples were collected from the plumbing system inlet at the basement of the subject property structure as no water spickets were observed at the time of the inspection. Sampling activities at the subject property were conducted on November 22, 2019.

At each sample location, two (2) samples were collected. The first sample was a "first" or "initial" draw sample, which consisted of the first water drawn from the tap after a period of inactivity. The second sample was a "flush" sample, collected after water had been allowed to run for a period of five minutes.

3.2 Laboratory Analytical Methodology

Drinking water samples were submitted to EMSL Analytical Inc., an analytical testing laboratory located in Cinnaminson, New Jersey, for analysis. EMSL is an American Industrial Hygiene Association (AIHA) and National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. The analytical method utilized for these samples was EPA Method 200.8 (Lead in Water by Inductively Coupled Plasma-Mass Spectrometry (ICP)).

4.0 LABORATORY ANALYTICAL RESULTS

The results of the primary lead analysis of the drinking water samples collected at the subject property are summarized in **Table 1**, below.

Table 1: Summary Table of Sample Results

Sample	Location	Sample Type	Result (ppb)
Kitchen -001	Kitchen Sink, Ground Floor	Initial Draw	ND
Kitchen -002	Kitchen Sink, Ground Floor	5-Min Flush	ND
WF1-001	Water fountain, Ground Floor	Initial Draw	ND
WF1-002	Water fountain, Ground Floor	5-Min Flush	ND
WF2-001	Water fountain, 1st Floor	Initial Draw	ND
WF2 -002	Water fountain, 1st Floor	5-Min Flush	ND
WF3 -001	Water fountain, 2nd Floor	Initial Draw	ND
WF3 -002	Water fountain, 2nd Floor	5-Min Flush	ND
WF4 -001	Water fountain, 3RD Floor	Initial Draw	ND
WF4 -002	Water fountain, 3RD Floor	5-Min Flush	ND

ND: Indicates sample did not have detectable concentrations above the laboratory reporting limits of 1 ppb

Complete analytical reports and chain of custody documentation are included as **Attachment 1**.

5.0 CONCLUSIONS AND RECOMMENDATIONS

REPSG's testing of lead in drinking water at the subject property did not identify any detectable levels of lead in drinking water above the laboratory reporting limits. These limits were sufficiently below the USEPA Action Level to be considered valid regulatory data.

Based on these results, REPSG does not recommend any further testing at this time.

Should you have any questions or need any further information, please do not hesitate to contact our office.

Sincerely,
REPSG Environmental Professional Services Group, Inc.

Quanda Beck
Environmental Scientist

Suzanne Shourds
Senior Project Manager

ATTACHMENT 1: ANALYTICAL REPORTS AND CHAINS OF CUSTODY

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Suzanne Shourds**
REACT Environmental Prof Svcs Grp, Inc.
6901 Kingsessing Avenue
Suite 201
Philadelphia, PA 19142
Phone: (215) 729-3220
Fax:

11/24/2019

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 11/22/2019. The results are tabulated on the attached data pages for the following client designated project:

0P7514.240.01

The reference number for these samples is EMSL Order #011914999. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Phillip Worby, Environmental Chemistry
Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, CA ELAP 1877

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011914999
CustomerID:	REAC59A
CustomerPO:	
ProjectID:	

Attn: **Suzanne Shourds**
REACT Environmental Prof Svcs Grp, Inc.
6901 Kingsessing Avenue
Suite 201
Philadelphia, PA 19142

Phone: (215) 729-3220
Fax:
Received: 11/22/19 4:25 PM

Project: **0P7514.240.01**

Analytical Results

Client Sample Description KITCHEN 001
KITCHEN SINK FAUCET ON GROUND FLOOR- INITIAL
Collected: 11/22/2019 5:45:00 AM
Lab ID: *011914999-0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
METALS								
200.8	Lead	ND	1.00	µg/L	11/22/2019	SK	11/22/19 17:55	SK

Client Sample Description KITCHEN 002
KITCHEN SINK FAUCET ON GROUND FLOOR- FLUSH
Collected: 11/22/2019 5:50:00 AM
Lab ID: *011914999-0002*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
METALS								
200.8	Lead	ND	1.00	µg/L	11/22/2019	SK	11/22/19 18:00	SK

Client Sample Description WF1-001
GROUND FLOOR WATER FOUNTAIN- INITIAL
Collected: 11/22/2019 5:46:00 AM
Lab ID: *011914999-0003*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
METALS								
200.8	Lead	ND	1.00	µg/L	11/22/2019	SK	11/22/19 18:01	SK

Client Sample Description WF1-002
GROUND FLOOR WATER FOUNTAIN- FLUSH
Collected: 11/22/2019 5:52:00 AM
Lab ID: *011914999-0004*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
METALS								
200.8	Lead	ND	1.00	µg/L	11/22/2019	SK	11/22/19 18:03	SK

Client Sample Description WF2-001
1ST FLOOR WATER FOUNTAIN- INITIAL
Collected: 11/22/2019 5:53:00 AM
Lab ID: *011914999-0005*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
METALS								
200.8	Lead	ND	1.00	µg/L	11/22/2019	SK	11/22/19 18:04	SK

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	011914999
CustomerID:	REAC59A
CustomerPO:	
ProjectID:	

Attn: **Suzanne Shourds**
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Suite 201
Philadelphia, PA 19142

Phone: (215) 729-3220
Fax:
Received: 11/22/19 4:25 PM

Project: **0P7514.240.01**

Analytical Results

Client Sample Description WF2-002 1ST FLOOR WATER FOUNTAIN- FLUSH — ***Collected:*** 11/22/2019 5:59:00 AM — ***Lab ID:*** *011914999-0006*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*	*Analysis Date & Analyst*
METALS						
200.8	Lead	ND	1.00	µg/L	11/22/2019 SK	11/22/19 18:23 SK

Client Sample Description WF3-001 2ND FLOOR WATER FOUNTAIN- INITIAL — ***Collected:*** 11/22/2019 5:55:00 AM — ***Lab ID:*** *011914999-0007*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*	*Analysis Date & Analyst*
METALS						
200.8	Lead	ND	1.00	µg/L	11/22/2019 SK	11/22/19 18:25 SK

Client Sample Description WF3-002 2ND FLOOR WATER FOUNTAIN- FLUSH — ***Collected:*** 11/22/2019 6:01:00 AM — ***Lab ID:*** *011914999-0008*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*	*Analysis Date & Analyst*
METALS						
200.8	Lead	ND	1.00	µg/L	11/22/2019 SK	11/22/19 18:26 SK

Client Sample Description WF4-001 3RD FLOOR WATER FOUNTAIN-INITIAL — ***Collected:*** 11/22/2019 6:01:00 AM — ***Lab ID:*** *011914999-0009*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*	*Analysis Date & Analyst*
METALS						
200.8	Lead	ND	1.00	µg/L	11/22/2019 SK	11/22/19 18:28 SK

Client Sample Description WF4-002 3RD FLOOR WATER FOUNTAIN-FLUSH — ***Collected:*** 11/22/2019 6:08:00 AM — ***Lab ID:*** *011914999-0010*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*	*Analysis Date & Analyst*
METALS						
200.8	Lead	ND	1.00	µg/L	11/22/2019 SK	11/22/19 18:29 SK

Definitions:
MDL - method detection limit
J - Result was below the reporting limit, but at or above the MDL
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit (Analytical)
D - Dilution

OrderID: 011914999

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*: 0119 14999

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Company : REPSG, Inc.	**EMSL-Bill to:** ☐ Different ☑ Same If Bill to is Different note instructions in Comments**
Street: 6901 Kingsessing Avenue	*Third Party Billing requires written authorization from third party*
City: Philadelphia **State/Province:** PA	**Zip/Postal Code:** 19142 **Country:** US
Report To (Name): Suzanne Shourds	**Telephone #:** 215-729-3220 x309
Email Address: sshourds@repsg.com	**Fax #:** 215-729-1557 **Purchase Order:** 18886
Project Name/Number: 0P7514.240.01	**Please Provide Results:** ☐ FAX ☑ E-mail ☐ Mail
U.S. State Samples Taken: PA	**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☒ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ☐ ppm	SW846-7000B	Flame Atomic Absorption	0.01%	☐
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	☐
Wipe* ASTM ☐ non ASTM ☐ *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	☐
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	☐
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	☐
Wastewater Unpreserved ☐	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
Preserved with HNO_3 pH < 2 ☐	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	☐
Drinking Water Unpreserved ☐	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
Preserved with HNO_3 pH < 2 ☒	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	☒
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	☐
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	☐
Other:				☐

Name of Sampler: Quanda Beck and Brenda Kellogg **Signature of Sampler:** Quanda Beck

	Sample #	Location	Volume/Area	Date/Time Sampled
1	Kitchen 001	Kitchen Sink Faucet on Ground Floor-Initial	250 ml	11/22/19 5:45 AM
2	Kitchen 002	Kitchen Sink Faucet on Ground Floor - Flush	250 ml	11/22/19 5:50 AM
3	WF1-001	Ground Floor Water Fountain-Initial	250 ml	11/22/19 5:46 AM
4	WF1-002	Ground Floor Water Fountain-Flush	250 ml	11/22/19 5:52 AM
5	WF2-001	1st Floor Water Fountain-Initial	250 ml	11/22/19 5:53 AM

Client Sample #'s - **Total # of Samples:** 10 SAMPLES

Relinquished (Client):	[illegible]	**Date:**	11-22-19	**Time:**	1500
Received (Lab):	CP WI	**Date:**	11/22/19	**Time:**	16:25p

Comments:

EMSL ANALYTICAL, INC.
LABORATORY•PRODUCTS•TRAINING

LEAD (Pb) CHAIN OF CUSTODY

EMSL ORDER ID *(Lab Use Only):* 011914999

EMSL Analytical, Inc.
200 Route 130 North

Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

	Sample #	Location	Volume/Area	Date/Time Sampled
6	WF2-002	1st Floor Water Fountain-Flush	250 ML	11/22/19 5:59 AM
7	WF3-001	2nd Floor Water Fountain-Initial	250 ML	11/22/19 5:55 AM
8	WF3-002	2nd Floor Water Fountain-Flush	250 ML	11/22/19 6:01 AM
9	WF4-001	3rd Floor Water Fountain-Initial	250 ML	11/22/19 6:01 AM
10	WF4-002	3rd Floor Water Fountain-Flush	250 ml	11/22/19 6:08 AM

Comments/Special Instructions:

Page 2 of 2 pages

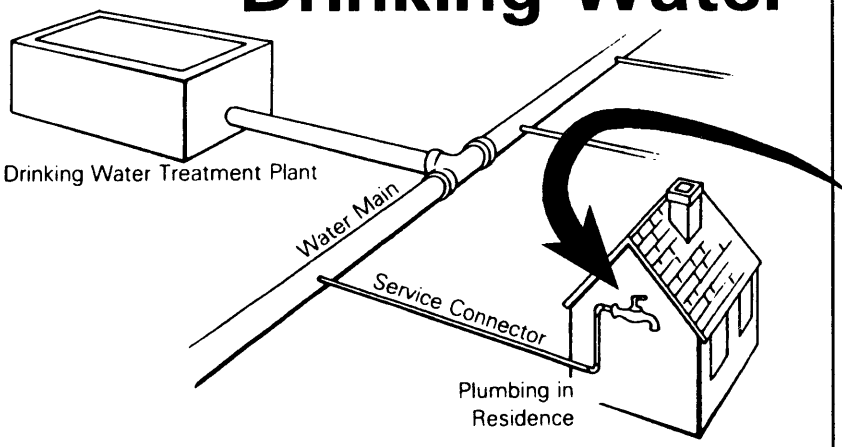
ATTACHMENT 2: LEAD IN WATER FACT SHEETS

United States Environmental Protection Agency

Office of Water (WH-550)

EPA/810-F-93-001
June 1993

LEAD In Your Drinking Water



Health Threats From Lead

Too much lead in the human body can cause serious damage to the brain, kidneys, nervous system, and red blood cells.

You have the greatest risk, even with short-term exposure, if:

- you are a young child, or
- you are pregnant.

Sources of Lead in Drinking Water

Lead levels in your drinking water are likely to be highest if:

- your home has faucets or fittings made of brass which contains some lead, **or**
- your home or water system has lead pipes, **or**
- your home has copper pipes with lead solder, **and**
  - the home is less than five years old, or
  - you have natually soft water, or
  - water often sits in the pipes for several hours.

Actions You Can Take To Reduce Lead In Drinking Water

♦ Flush Your Pipes Before Drinking

Anytime the water in a particular faucet has not been used for six hours or longer, "flush" your cold-water pipes by running the water until it becomes as cold as it will get. (This could take as little as five to thirty seconds if there has been recent heavy water use such as showering or toilet flushing. Otherwise, it could take two minutes or longer.) The more time water has been sitting in your home's pipes, the more lead it may contain.

♦ Only Use Cold Water for Consumption

Use *only* water from the cold-water tap for drinking, cooking, and **especially for making baby formula.** Hot water is likely to contain higher levels of lead.

The two actions recommended above are very important to the health of your family. They will probably be effective in reducing lead levels because most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

♦ Have Your Water Tested

After you have taken the two precautions above for reducing the lead in water used for drinking or cooking, **have your water tested.** The only way to be sure of the amount of lead in your household water is to have it tested by a competent laboratory. Your water supplier may be able to offer information or assistance with testing. Testing is especially important for apartment dwellers, because flushing may not be effective in high-rise buildings with lead-soldered central piping.

For more details on the problem of lead in drinking water and what you can do about it, read the questions and answers in the remainder of this booklet. *Your local or state department of health or environment might be able to provide additional information.*

Q Why is lead a problem?

A Although it has been used in numerous consumer products, lead is a toxic metal now known to be harmful to human health if inhaled or ingested. Important sources of lead exposure include: ambient air, soil and dust (both inside and outside the home), food (which can be contaminated by lead in the air or in food containers), and water (from the corrosion of plumbing). On average, it is estimated that lead in drinking water contributes between 10 and 20 percent of total lead exposure in young children. In the last few years, federal controls on lead in gasoline have significantly reduced people's exposure to lead.

The degree of harm depends upon the level of exposure (from all sources). Known effects of exposure to lead range from subtle biochemical changes at low levels of exposure, to severe neurological and toxic effects or even death at extremely high levels.

Q Does lead affect everyone equally?

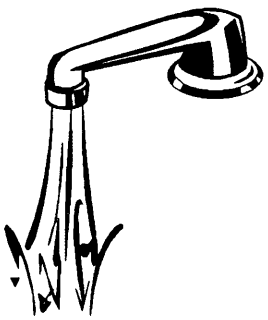
A Young children, infants and fetuses appear to be particularly vulnerable to lead poisoning. A dose of lead that would have little effect on an adult can have a big effect on a small body. Also, growing children will more rapidly adsorb any lead they consume. A child's mental and physical development can be irreversibly stunted by over-exposure to lead. In infants, whose diet consists of liquids made with water - such as baby formula - lead in drinking water makes up an even greater proportion of total lead exposure (40 to 60 percent).

Q How could lead get into my drinking water?

A Typically, lead gets into your water after the water leaves your local treatment plant or your well. That is, the source of lead in your home's water is most likely pipe or solder in your home's own plumbing.

The most common cause is corrosion, a reaction between the water and the lead pipes or solder. Dissolved oxygen, low pH (acidity) and low mineral content in water are common causes of corrosion. All kinds of water, however, may have high levels of lead.

One factor that increases corrosion is the practice of grounding electrical equipment (such as telephones) to water pipes. Any electric current traveling through the ground wire will accelerate the corrosion of lead in the pipes. (Nevertheless, wires **should not be removed** from pipes unless a qualified electrician installs an adequate alternative grounding system.)



Q Does my home's age make a difference?

A Lead-contaminated drinking water is most often a problem in houses that are either very old or very new.

Up through the early 1900's, it was common practice, in some areas of the country, to use lead pipes for interior plumbing. Also, lead piping was often used for the service connections that join residences to public water supplies. (This practice ended only recently in some localities.) Plumbing installed before 1930 is most likely to contain lead. Copper pipes have replaced lead pipes in most residential plumbing. However, the use of lead solder with copper pipes is widespread. Experts regard this lead solder as the major cause of lead contamination of household water in U.S. homes today. New brass faucets and fittings can also leach lead, even though they are "lead-free."

Scientific data indicate that the newer the home, the greater the risk of lead contamination. Lead levels decrease as a building ages. This is because, as time passes, mineral deposits form a coating on the inside of the pipes (if the water is not corrosive). This coating insulates the water from the solder. But, during the first five years (before the coating forms) water is in direct contact with the lead. More likely than not, **water in buildings less than five years old has high levels of lead contamination.**

Q How can I tell if my water contains too much lead?

A You should have your water tested for lead. Testing costs between $20 and $100. Since you cannot see, taste, or smell lead dissolved in water, testing is the only sure way of telling whether or not there are harmful quantities of lead in your drinking water.

You should be particularly suspicious if your home has lead pipes (lead is a dull gray metal that is soft enough to be easily scratched with a house key), if you see signs of corrosion (frequent leaks, rust-colored water, stained dishes or laundry, or if your non-plastic plumbing is less than five years old. Your water supplier may have useful information, including whether or not the service connector used in your home or area is made of lead.

Testing is especially important in high-rise buildings where flushing might not work.

Q How do I have my water tested?

A Water samples from the tap will have to be collected and sent to a qualified laboratory for analysis. Contact your local water utility or your local health department for information and assistance. In some instances, these authorities will test your tap water for you, or they can refer you to a qualified laboratory. You may find a qualified testing company under 'Laboratories" in the yellow pages of your telephone directory.

You should be sure that the lab you use has been approved by your state or by EPA as being able to analyze drinking water samples for lead contamination. To find out which labs are qualified, contact your state or local department of the environment or health.

Q What are the testing procedures?

A Arrangements for sample collection will vary. A few laboratories will send a trained technician to take the samples; but in most cases, the lab will provide sample containers along with instructions as to how you should draw your own tap-water samples. If you collect the samples yourself, make sure you follow the lab's instructions exactly. Otherwise, the results might not be reliable.

Make sure that the laboratory is following EPA's water sampling and analysis procedures. Be certain to take a "first draw" and a "fully flushed" sample. (The first-draw sample - taken after at least six hours of no water use from the tap tested - will have the highest level of lead, while the fully

flushed sample will indicate the effectiveness of flushing the tap before using the water.)

Q How much lead is too much?

A Federal standards initially limited the amount of lead in water to 50 parts per billion (ppb). In light of new health and exposure data, EPA has set an action level of 15 ppb. If tests show that the level of lead in your household water is in the area of 15 ppb or higher, it is advisable - especially if there are young children in the home - to reduce the lead level in your tap water as much as possible. (EPA estimates that more than 40 million U.S. residents use water that can contain lead in excess of 15 ppb.)

Note: One ppb is equal to 1.0 microgram per liter (μg/l) or 0.001 milligram per liter (mg/l).

Q How can I reduce my exposure?

A If your drinking water is contaminated with lead-or until you find out for sure-there are several things you can do to minimize your exposure. Two of these actions should be taken right away by everyone who has, or suspects, a problem. The advisability of other actions listed here will depend upon your particular circumstances.

Immediate Steps

♦ The first step is to refrain from consuming water that has been in contact with your home's plumbing for more than six hours, such as overnight or during your work day. Before using water for drinking or cooking, "flush" the cold water faucet by allowing the water to run until you can feel that the water has become as cold as it will get. You must do this for each drinking water faucet-taking a shower will not flush your kitchen tap. Buildings built prior to about 1930 may have service connectors made of lead. Letting the water run for an extra 15 seconds after it cools should also flush this service connector. Flushing is important because the longer water is exposed to lead pipes or lead solder, the greater the possible lead contamination. (The water that comes out after flushing will not have been in extended contact with lead pipes or solder.)

Once you have flushed a tap, you might fill one or more bottles with water and put them in the refrigerator for later use that day. (The water that was flushed - usually one to two gallons-can be used for non-consumption purposes such as washing dishes or clothes; it needn't be wasted.)

Note: Flushing may prove ineffective in high-rise buildings that have large-diameter supply pipes joined with lead solder.

♦ The second step is to never cook with or consume water from the hot-water tap. Hot water dissolves more lead more quickly than cold water. So, do not use water taken from the hot tap for cooking or drinking, and **especially not for making baby formula.** (If you need hot water, draw water from the cold tap and heat it on the stove.) Use only thoroughly flushed water from the cold tap for any consumption.

Definitions

Corrosion: A dissolving and wearing away of metal caused by a chemical reaction (in this case, between water and metal pipes, or between two different metals).

First Draw: The water that immediately comes out when a tap is first opened.

Flush: To open a cold-water tap to clear out all the water which may have been sitting for a long time in the pipes. In new homes, to flush a system means to send large volumes of water gushing through the unused pipes to remove loose particles of solder and flux. (Sometimes this is not done correctly or at all.)

Flux: A substance applied during soldering to facilitate the flow of solder. Flux often contains lead and can, itself, be a source of contamination.

Naturally soft water: Any water with low mineral content, lacking the hardness minerals calcium and magnesium.

Public Water System: Any system that supplies water to 25 or more people or has 15 or more service connections (buildings or customers).

Service Connector: The pipe that carries tap water from the public water main to a building. In the past these were often made of lead.

Soft water: Any water that is not "hard." Water is considered to be hard when it contains a large amount of dissolved minerals, such as salts containing calcium or magnesium. You may be familiar with hard water that interferes with the lathering action of soap.

Solder: A metallic compound used to seal joints in plumbing. Until recently, most solder contained about 50 percent lead.

Other Actions

♦ If you are served by a public water system (more than 219 million people are) contact your supplier and ask whether or not the supply system contains lead piping, and whether your water is corrosive. If either answer is yes, ask what steps the supplier is taking to deal with the problem of lead contamination.

Drinking water can be treated at the plant to make it less corrosive. Cities such as Boston and Seattle have successfully done this for an annual cost of less than one dollar per person. (Treatment to reduce corrosion will also save you and the water supplier money by reducing damage to plumbing.)

Water mains containing lead pipes can be replaced, as well as those portions of lead service connections that are under the jurisdiction of the supplier.

♦ If you own a well or another water source, you can treat the water to make it less corrosive. Corrosion control devices for individual households include calcite filters and other devices. Calcite filters should be installed in the line between the water source and any lead service connections or lead-soldered pipe. You might ask your health or water department for assistance in finding these commercially, available products.

♦ Recently a number of cartridge type filtering devices became available on the market. These devices use various types of filtering media, including carbon, ion exchange resins, activated alumina and other privately marketed products. Unless they have been certified as described below, the effectiveness of these devices to reduce lead exposure at the tap can vary greatly.

It is highly recommended that before purchasing a filter, you verify the claims made by the vendor. If you have bought a filter, you should replace the filter periodically as specified by the manufacturer. Failure to do so may result in exposure to high lead levels.

Two organizations can help you decide which type of filter is best for you. The National Sanitation Foundation, International (NSF), and independent testing agency, evaluates and certifies the performance of filtering devices to remove lead from drinking water. Generally, their seal of approval appears on the device and product packaging. The Water Quality Association (WQA) is an independent, not-for-profit organization that represents firms and individuals who produce and sell equipment and services which improves the quality of drinking water. WQA's water quality specialists can provide advice on treatment units for specific uses at home or business.

For additional information regarding the certification program, contact NSF at (313) 769-8010, or WQA at (708) 505-0161, ext. 270.

- You can purchase bottled water for home and office consumption. (Bottled water sold in interstate commerce is regulated by the Food and Drug Administration. Water that is bottled and sold within a state is under state regulation. EPA does not regulate bottled water.)

- When repairing or installing new plumbing in old homes, instruct, in writing, any plumber you hire to use only lead-free materials.

- When building a new home, be sure lead-free materials are used. Before you move into a newly built home, remove all strainers from faucets and flush the water for at least 15 minutes to remove loose solder or flux debris from the plumbing. Occasionally, check the strainers and remove any later accumulation of loose material.

Q What about lead in sources other that drinking water?

A As mentioned above, drinking water is estimated to contribute only 10 to 20 percent of the total lead exposure in young children. Ask your local health department or call EPA for more information on other sources of exposure to lead. A few general precautions can help prevent contact with lead in and around your home:

- Avoid removing paint in the home unless you are sure it contains no lead. Lead paint should only be removed by someone who knows how to protect you from lead paint dust. However, by washing floors, window sills, carpets, upholstery and any objects children put in their mouths, you can get rid of this source of lead.

- Make sure children wash their hands after playing outside in the dirt or snow.

- Never store food in open cans. Keep it in glass plastic or stainless steel containers. Use glazed pottery only for display if you don't know whether it contains lead.

- If you work around lead, don't bring it home. Shower and change clothes at work and wash your work clothes separately.

Q Aren't there a lot of types of treatment devices that would work?

A There are many devices which are certified for effective lead reduction, but devices that are not designed to remove lead will not work.

It is suggested that you follow the recommendations below before purchasing any device:

- Avoid being misled by false claims and scare tactics. Be wary of "free" water testing that is provided by the salesperson to determine your water quality; many tests are inaccurate or misleading. Research the reputation and legitimacy of the company or sales representative.

- Avoid signing contracts or binding agreements for "one-time offers or for those that place a lien on your home. Be very careful about giving credit card information over the phone. Check into any offers that involve prizes or sweepstakes winnings.

- As suggested above, verify the claims of manufacturers by contacting the National Sanitation Foundation International or the Water Quality Association.

Q What is the government doing about the problem of lead in household water?

A There are two major governmental actions to reduce your exposure to lead:

- Under the authority of the Safe Drinking Water Act, EPA set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled. If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Utilities must also notify citizens of all violations of the standard.

- In June 1986, President Reagan signed amendments to the Safe Drinking Water Act. These amendments require the use of "lead-free" pipe, solder, and flux in the installation or repair of any public water system, or any plumbing in a residential or non-residential facility connected to a public water system.

Under the provisions of these amendments, solders and flux will be considered "lead-free" when they contain not more than 0.2 percent lead. (In the past, solder normally contained about 50 percent lead.) Pipes and fittings will be considered "lead-free" when they contain not more than 8.0 percent lead.

These requirements went into effect in June 1986. The law gave state governments until June 1988 to implement and enforce these new limitations. Although the states have banned all use of lead materials in drinking water systems, such bans do not eliminate lead contamination within existing plumbing. Also, in enforcing the ban, some states have continued to find illegally used lead solder in new plumbing installations. While responsible plumbers always observe the ban, this suggests that some plumbing installations or repairs using lead solder may be escaping detection by the limited number of enforcement personnel.

Where can I get more information?

First contact your county or state department of health or environment for information on local water quality.

For more general information on lead, there are now two toll-free telephone services:

EPA Safe Drinking Water Hotline

1-800-426-4791

National Lead Information Center

1-800-LEAD-FYI

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PENNSYLVANIA LEAD BAN

Pennsylvania's *Plumbing System Lead Ban and Notification Act* (PA Lead Ban) became effective on January 6, 1991, and applies to all plumbing construction or repairs done after that date. Pennsylvania's law is similar to the 1986 amendments to the federal Safe Drinking Water Act (SDWA) and requires the use of lead-free materials in construction or repair of any public water system (PWS), any facility connected to a PWS, or any plumbing that provides water for human consumption.

The law was strengthened by the 1996 amendments to the federal SDWA. The amended law bans plumbing suppliers from selling after August 6, 1998, leaded solder or flux as well as pipe, fittings, or fixtures that are not lead-free and do not meet acceptable lead leaching standards. Further amendments to the federal SDWA, which took effect in 2011, revised the definition for lead-free to be any pipes or pipe fittings that contain less than or equal to 0.25 percent lead, and any solders or flux that contain less than or equal to 0.2 percent lead. Pipes, fittings, or fixtures that meet the lead leaching standards in the American National Standards Institute/NSF International (ANSI/NSF) Standard 61: *Drinking Water System Components – Health Effects* are deemed to be acceptable.

Why Ban Lead?

Although lead may be found in many places in our modern society, water is probably the easiest to control. Our drinking water can contain a significant amount of lead (up to 40 percent of a person's total lead exposure) as a result of corrosion of pipes, solder, and fixtures found in buildings or in the mains or service connection of a PWS. Solder containing lead is a major target under the PA Lead Ban since it is more likely to exceed allowable lead-content levels.

Pregnant women, their unborn children, young children (especially under the age of six), and middle-aged men and women are especially vulnerable to the health effects of lead. Exposure to lead above recommended levels may lead to delays in normal physical and mental development in babies and young children, cause slight defects in attention span, hearing and learning abilities in children, and may slightly increase blood pressure in some adults. Long-term exposure to lead above recommended levels may result in stroke, kidney disease, or cancer.

Summary of the PA Lead Ban

- PA's Lead Ban applies to all plumbing, not just plumbing used for drinking water.
- The Lead Ban forbids the sale and use of leaded solder, flux, pipe, and pipe-fittings for plumbing purposes. These products were to have been removed from sale by January 6, 1991.
- Solders banned for sale in Pennsylvania include 50/50 and 85/15 tin-lead acid and solid core solders, leaded solders labeled for plumbing use, or leaded solders not labeled as to content.
- Other leaded solders may be sold only if the package bears a prominent label stating that it is illegal to use the solder or flux in the installation or repair of any plumbing. Also, leaded solder is not allowed to be located in the plumbing section of the retail facility, nor in the proximity of plumbing materials in any establishment.
- The Lead Ban applies to all water users including private homes or facilities that obtain drinking water from private wells.
- A builder must certify that materials used in the construction of a new plumbing system which is to be connected to a PWS are lead-free. A PWS must refuse connection to any person who fails to provide that certification unless the local municipality has a plumbing code that prohibits the use of leaded materials.

Further Information:

Plumbers

You may only use lead-free materials in any construction or repair work you do in Pennsylvania. Specific materials that may not be sold or used include:

- Lead Pipes.
- Copper or brass fixtures, pipe, or fittings not meeting the lead-free definition of 2011 and not meeting the lead leaching limits set in ANSI/NSF Standard 61 after August 6, 1998.
- Solid and acid core solders or flux containing more than 0.2 percent lead.
- Solders not labeled lead-free or not labeled for lead content.
- Lead-containing solders labeled for plumbing use.

The Lead Ban does not apply to:

- Bulk lead normally used to repair cast iron pipe joints.
- Bar lead solder normally used in construction and repair of sheet metal, such as ductwork, roofing, etc.
- Any other lead solder not used in the plumbing industry (except 50/50 and 85/15 tin-lead solder or not labeled with material content). Solders that have automotive, electronic, industrial, or other applications not related to plumbing are not banned. These solders have specifications distinct from solders commonly used for plumbing applications.

Private Wells

Although certification is not required for hook up to a private well, the PA Lead Ban applies to all plumbing applications. Home buyers, home owners, real estate agents, and contractors should be sure that only lead-free materials are used in all new plumbing construction and repairs.

Violation of the Lead Ban

If plumbing materials containing lead are used in Pennsylvania after January 6, 1991:

- The plumber may be required to replace the banned materials with lead-free materials at the plumber's own expense. In addition, a supply of an alternate, approved drinking water (bottled water) may be required until the plumbing is replaced.
- Monetary penalties may be assessed.

Federal law forbids the U.S. Department of Housing and Urban Development (HUD) and the Veterans Administration (VA) from insuring or guaranteeing a mortgage, or from furnishing assistance, for a newly constructed residence if the new residence's potable water system is not lead-free.

For Additional Information:

Contact your local municipality if you suspect a local plumbing code violation.

If there is not a local plumbing code or if you suspect a violation of the ban of sale, please contact:

PA Department of Environmental Protection
Bureau of Safe Drinking Water
P.O. Box 8467
Harrisburg, PA 17105-8467
717-772-4018

For more information, visit www.dep.pa.gov, search: Lead in Drinking Water.

IMPORTANT HEALTH INFORMATION FOR:

HOMEOWNERS WITH LEAD PLUMBING

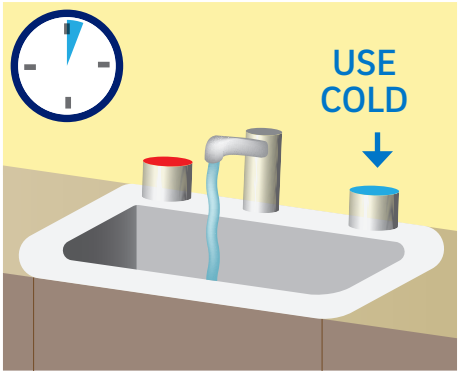
PHILADELPHIA WATER

Daily cleaning tips

to clean lead from your home's drinking water pipes

CAUTION

If your home is connected to the City water main by a water service line that has sections made from lead, a toxic metal, it can impact your health. Follow the steps below to clean out your home plumbing until lead plumbing is replaced. **Lead is harmful to everyone. Pregnant women, infants, children under the age of six and adults with high blood pressure and kidney problems are at the most risk.**



Instructions for daily cleaning

Run cold water from your tap for at least three minutes. This will give you fresh water from the City water main that is safe for drinking, cooking, making baby formula, feeding your pets, making ice, or watering vegetable gardens.

TIP: You can also bring in fresh water from the City water main by taking a shower, washing dishes, using the clothes washer, or flushing the toilets first.

Best time of day?	How often?	For how long?	When to stop?
• First thing in the morning • After you come home from work, if no one has used the water all day	• Before using water for any cooking or drinking • If no one has used the water for 6 hours or more	At least 3 – 5 minutes	This ongoing maintenance is good to do regularly, but especially important in any homes that still have lead pipes

8/30/16

Cleaning faucet aerators

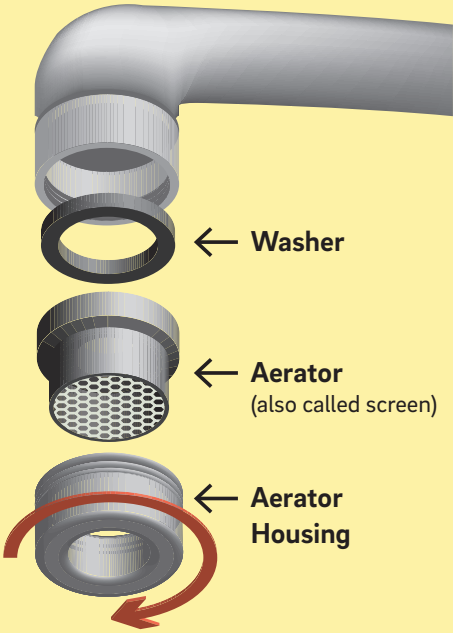
Don't let poorly maintained home plumbing prevent you from getting the best water available!

As water stands in your home's plumbing, lead from the soldered joints and old lead pipes can get into your water. Other debris can build up on the aerator, too. It's important to clean faucet aerators and screens to remove any debris from them.

How often should I clean aerators?

It's recommended you replace the aerator annually, and then clean the aerator twice a year. If the aerator appears to need frequent cleaning or becomes worn, the aerator may need to be replaced more often.

What is a faucet aerator?



It's a device attached to the tip of a faucet. It saves water, filters out debris, and prevents water from splashing. As water flows through the screen, it mixes with air and flows more evenly.

Instructions for cleaning aerators

You will need:

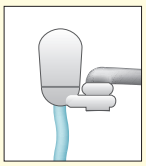
- Rag
- Masking tape
- Wrench or Pliers
- Old toothbrush
- White vinegar
- Small plastic tub
- Extra aerators
- Extra washers

If your faucet has an aerator that you can take off, follow these easy steps:

- ❑ Place a rag in the sink drain in case you drop any pieces.
- ❑ If you need to use a wrench or pliers, wrap masking tape around the tips of the wrench or pliers, or on the aerator. Using tape will keep you from scratching the aerator.
- ❑ Unscrew the aerator.
- ❑ Separate each part—aerator housing, aerator and rubber washer.
- ❑ Remove small bits on the screen and other parts.
- ❑ Soak the parts in white vinegar for a few minutes.
- ❑ Scrub them with a brush.
- ❑ If the aerator and rubber washer are in poor condition, replace them.
- ❑ Put the aerator parts back together.
- ❑ Screw the aerator back onto the faucet.
- ❑ Repeat these steps for all faucets.

Troubleshooting

Can't find the aerator?
Some faucets have hidden aerators. If you have a hidden aerator, follow the manufacturer's instructions.



If you have a water filter attached to a faucet, the faucet will not have an aerator.

8/18/16