



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806



Edmund G. Brown Jr.
Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL'S 2018 REPORT ON RESULTS OF TESTING FOR LEAD IN CALIFORNIA DRINKING WATER PLUMBING PRODUCTS

This Report is prepared pursuant to Health and Safety Code Section 25214.4.3 on results obtained from DTSC's sampling activities conducted between May 14 and May 29, 2018.

June 18, 2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
SECTION 1. INTRODUCTION	4
SECTION 2. PLUMBING FITTING SELECTION AND SAMPLING	5
SECTION 3. SAMPLE ANALYSIS & RESULTS.....	7
SECTION 4. DISCUSSION	9
SECTION 5. CONCLUSION	10
REFERENCES.....	11
Appendix: Plumbing Fitting Descriptions.....	12

EXECUTIVE SUMMARY

California Health and Safety Code Section 116875 prohibits the introduction into commerce of any pipe, plumbing fitting, or plumbing fixture intended to convey or dispense water for human consumption that is not “lead-free”. To monitor and test for compliance, Health and Safety Code Section 25214.4.3 requires the Department of Toxic Substances Control (DTSC), based on its available resources and staffing, to annually test potable water faucets, pipes, or other plumbing fittings or fixtures, which are readily accessible to the public, and issue a report to summarize results of the testing program. This Report is prepared pursuant to Health and Safety Code Section 25214.4.3, and summarizes results of DTSC’s testing conducted in 2018.

BACKGROUND

Exposure to lead in potable water is considered a contemporary public health issue. There is a long history of lead use in plumbing materials, some of which continue to serve as sources of potable water contamination. It is now well established that lead is toxic at low levels and exposure is associated with adverse health effects that include impaired cognitive function, neurotoxicity, and high blood pressure. In particular, infants and children are considered to be highly-susceptible populations, for which no safe blood lead level has been determined [1]. California recognizes the public health hazards of environmental lead exposure, and Health and Safety Code Section 116875 serves as a measure to prevent the introduction of lead-contaminated faucets, pipes, fittings, and fixtures into commerce. This law requires that all products introduced into commerce that are intended to convey, or dispense water for human consumption are “lead-free”. For purposes of Health and Safety Code Section 116875, the law defines “lead-free” to mean the following:

- For pipes, pipe or plumbing fittings, and fixtures: “lead-free” means the lead content shall not to exceed a weighted average of 0.25 percent (%) when used with respect to the wetted surfaces.
- For solder and flux: “lead-free” means the lead content shall not to exceed more than 0.2% lead.

In addition, Health and Safety Code Section 116875 requires all potable water pipes, fittings, fixtures, solder, and flux to be certified for compliance with the above standards by an independent, American National Standards Institute (ANSI)-approved third party. To monitor for compliance with Health and Safety Code Section 116875, Health and Safety Code Section 25214.4.3 requires DTSC, based on its available resources and staffing, to:

- 1) Annually select no more than 75 potable water faucets, pipes, or other potable water fittings, or fixtures for testing and evaluation;
- 2) Acquire samples of faucets, pipes, fittings or fixtures from locations that are readily accessible to the public at either retail or wholesale sources;
- 3) Use test methods, protocols, and sample preparation procedures that are adequate to determine the total lead concentration in a faucet, pipe, fitting, or fixture to determine compliance with the standards for maximum allowable total lead content in Health and Safety Code Section 116875;

- 4) Post test results on DTSC's Internet Web site and transmit results in an annual report to the Division of Drinking Water of the State Water Resources Control Board, successor to the California Department of Public Health for the purpose of receiving this report.

This report presents sampling results from monitoring and compliance testing that DTSC conducted during the calendar year of 2018.

SAMPLING & ANALYSIS METHODS

In 2018, DTSC collected plumbing fittings from a variety of sources who also operate both stores and internet websites that sell these items to the general public in California. DTSC focused the 2018 analyses on brass fittings and fixtures, following the 2017 testing, which evaluated the lead content in a 59 different pipe tees, elbows, and couplings that were manufactured out of copper, brass, bronze, and galvanized steel. Although the "lead-free" compliance rate for these fittings exceeded 98% in 2017, it was observed that the brass fittings carried the highest lead content, on average. Thus, in 2018, DTSC only purchased brass fittings, with emphasis on procuring samples from an array of manufacturers. These items represent relatively low-cost plumbing components, which contain no moving parts, and are sourced from suppliers around the World. They are also used to connect potable water pipes in residential and commercial buildings and are in use for many years, or decades, after installation.

Eighteen different fitting and component types were selected for testing in 2018. These items were purchased in triplicate to assess the variability in lead content within select fitting types from individual manufacturers. A total of 54 fittings were purchased from the websites of seven different retailers between May 14 and May 29, 2018. All sample processing and chemical analysis was conducted by DTSC chemists and scientists at DTSC's Environmental Chemistry Lab (ECL), in Berkeley, California, using validated analytical methods.

RESULTS

For fittings tested in 2018, DTSC found that all 54 of the fittings tested contained less than 0.25% lead. The average lead content was 0.09%, with a range of 0.01% - 0.17%. Within individual fitting types from the same manufacturer, minimal variability in the lead content was observed (average coefficient of variation = 8.44%). Due to limitations of sampling size and requirements under the law, the products selected are not representative of all products offered for sale in California. However, DTSC's sampling and testing data provide some monitoring and compliance baselines. Such information may be useful to identify any trends in products that show a pattern of exceeding "lead-free" standards; provide consumers independent information on product compliance with the lead-free standards; or help identify points of non-compliance in the manufacturing and supply chains. Additionally, this data can assist DTSC in developing future sampling strategies.

DISCLAIMER

As required by Health and Safety Code Section 25214.4.3, this Report presents sampling and testing conducted by DTSC to determine the lead content contained in a selection of plumbing products. DTSC provides this information to meet the legal requirements and inform the general public. Any discussion of commercially available products, or compliance with the lead standards, does not constitute an actual or implied endorsement or a regulatory opinion of these products by DTSC.

SECTION 1. INTRODUCTION

Pursuant to the California Health and Safety Code Section 25214.4.3, DTSC has prepared this Report for the calendar year of 2018, to summarize the results of DTSC's lead-in-plumbing product monitoring and compliance testing, which was performed to evaluate the lead content of plumbing fittings that are accessible to the public at retail or wholesale sources in California. This lead-in-plumbing product monitoring and compliance testing was completed as part of DTSC's ongoing programs to monitor for, and promote reductions of toxic substances in consumer products and the environment.

It is now well established that lead is toxic at low levels and exposure to lead carries a variety of adverse health effects that include neurotoxicity, impaired cognitive function, high blood pressure, and bioaccumulation in soft tissue and bone, over time. In particular, infants and children are considered to be highly-susceptible populations, for which no safe blood lead level has been determined [1]. This is a contemporary public health issue due to the historical use of lead as a common additive in plumbing materials such as solder, brass, bronze, and other metal alloys. The contamination of potable water with lead often results from corrosion of these lead-containing plumbing materials, which may leach lead into water at increased rates when their surfaces are exposed to water with sufficiently corrosive chemical properties. This promises to persist as a public health issue, due in part to the potential for lead-contaminated plumbing products to continue to enter commerce, and become integrated into new building construction or remodeling projects.

To mitigate against the further use of lead-contaminated faucets and plumbing piping, fittings, and fixtures, California has enacted laws to restrict the allowable content of lead in products that are intended to convey or dispense water for human consumption. Section 116875 of the Health and Safety Code serves as an important measure to protect public health in California, and is aimed at preventing the introduction of lead-contaminated plumbing products into commerce. This law requires that all faucets, pipes, and plumbing fittings or fixtures introduced into commerce that are intended to convey, or dispense water for human consumption are "lead-free." For purposes of Health and Safety Code Section 116875, the law defines "lead-free" to mean the following:

- For pipes, pipe or plumbing fittings, and fixtures: "lead-free" means the lead content shall not to exceed a weighted average of 0.25% when used with respect to the wetted surfaces.
- For solder and flux: "lead-free" means the lead content shall not to exceed more than 0.2% lead.

The Federal Safe Drinking Water Act (SDWA) has also been amended (under the 2011 Reduction of Lead in Drinking Water Act) to reflect similar requirements for "lead-free" plumbing products. Additionally, under the US Environmental Protection Agency's (EPA's) Lead and Copper Rule, the SDWA places limits on the allowable concentration of lead (and copper) in potable water at the consumer tap. The US EPA's action level for lead in potable water at customer taps is 0.015 mg/L, above which, action must be taken to treat corrosion in upstream distribution piping.

In California, Health and Safety Code Section 116875 also requires all potable water pipes, pipe or plumbing fittings or fixtures, solder, or flux to be certified for these “lead-free” compliance standards by independent, American National Standards Institute (ANSI)-approved third party.

To monitor for compliance with Health and Safety Code Section 116875, Health and Safety Code Section 25214.4.3 requires DTSC, based on its available resources and staffing, to:

- 1) Annually select no more than 75 potable water faucets, or other potable water pipes or plumbing fittings, or fixtures for testing and evaluation;
- 2) Acquire samples of the selected faucets, pipes, fittings, and fixtures from locations that are readily accessible to the public at either retail or wholesale sources;
- 3) Use test methods, protocols, and sample preparation procedures that are adequate to determine the total lead concentration in a potable water plumbing fitting or fixture to determine compliance with the standards for maximum allowable total lead content in Health and Safety Code Section 116875;
- 4) Post test results on DTSC’s Internet Web site and transmit results in an annual report to the Division of Drinking Water of the State Water Resources Control Board, successor to the California Department of Public Health for the purpose of receiving this report.

As mentioned above, the scope of this testing is contingent upon the availability of DTSC staff and resources, per Health and Safety Code Section 25214.4.3, subsection (b). For further information, please refer to the specific sections of the Health and Safety Code.

SECTION 2. PLUMBING FITTING SELECTION AND SAMPLING

DTSC focused the 2018 testing on plumbing fittings and fixture components (e.g. – pipe tees, elbows, couplings, faucets balls) which were manufactured out of brass. These fittings types are relatively low-cost, ubiquitous components, which contain no moving parts and are sourced from suppliers around the World. DTSC also focused on these items because they may be in use for many years, or decades, after installation in residential and commercial water systems.

As required in Health and Safety Code Section 25214.4.3, DTSC collected fittings from retail sources that are readily accessible to the public. DTSC staff obtained a total of 54 fittings for testing between April 29 and May 23, 2018, and these fittings were procured from the internet websites of seven different retailers who also operate stores in the State of California.

Figure 1 – Potable Water Plumbing Fixtures to Test for FY 2017/18

Threaded Brass Fittings		Cross-linked Polyethylene (PEX) Pipe Brass Fittings		Faucet Components
				

DTSC collected product information associated with categories listed below, in Table 1 and Appendix, based upon product packaging and information provided on the respective retailer’s internet website, or the website of an item’s distributor or manufacturer. The results of the lead analyses are summarized in Section 3, and a further-detailed summary of information for each fitting or fixture component is presented in the Appendix.

SECTION 3. SAMPLE ANALYSIS & RESULTS

All fitting and fixture components were submitted to DTSC’s Environmental Chemistry Laboratory (ECL), via the Lab’s chain-of-custody process. At ECL, these items were further processed to develop samples suitable for analysis via inductively coupled plasma atomic emission spectroscopy (ICP-AES). Since each item was a single component, and had only one surface that would be exposed to potable water during use (i.e. – a single “wetted surface”), no calculations were necessary to evaluate the weighted average lead content across the entire wetted surface of the respective fitting or fixture component.

In previous years of testing, multi-component plumbing products (e.g. - faucets) were included in DTSC’s testing. The wetted surface of products such as faucets often contain multiple components manufactured from different materials, each of which require lead analysis. As a result, Health and Safety Code Section 116875 requires that a weighted average calculation is completed to assess lead content across the total wetted surface of the product. For further detail on calculations for the weighted-average lead content for multi-component plumbing products, DTSC refers readers to the Health and Safety Code Section 116875.

For the 2018 testing, samples were processed at ECL. A drill press was used to drill through each fitting with a clean 5/16” diameter black carbide drill bit, after which, approximately one gram of drilling shavings was collected. The samples were dissolved via an acid digestion, in accordance with US EPA Method 3050B (SW-846) [2], and lead analysis was then completed via ICP-AES, following US EPA Method 6010C (SW-846) [3]. The protocol for the pre-processing and drilling of fittings is summarized in previous reports for DTSC’s 2010 and 2011 lead-in-plumbing product monitoring and compliance testing [4, 5, 6].

Table 1 – 2018 Test Results for Lead Content in Plumbing Fittings

Number	Description	Material Type	Brand or Manufacturer	Lead Content ¹	“Lead-free” Compliant?
1	½” PEX Barb Tee	Brass	Apollo	0.17%	Yes
2	½” PEX Barb Tee	Brass	Apollo	0.17%	Yes
3	½” PEX Barb Tee	Brass	Apollo	0.13%	Yes
4	Pipe Nipple ¾” MIP x Close	Brass	Everbilt	0.03%	Yes
5	Pipe Nipple ¾” MIP x Close	Brass	Everbilt	0.03%	Yes
6	Pipe Nipple ¾” MIP x Close	Brass	Everbilt	0.03%	Yes
7	½” PEX Barb Tee	Brass	Sharkbite	0.07%	Yes
8	½” PEX Barb Tee	Brass	Sharkbite	0.05%	Yes
9	½” PEX Barb Tee	Brass	Sharkbite	0.08%	Yes

Table 1 (continued) – 2018 Test Results for Lead Content in Plumbing Fittings

Number	Description	Material Type	Brand or Manufacturer	Lead Content ¹	"Lead-free" Compliant?
10	½" x ½" Threaded Elbow Fitting	Brass	Streamline (Mueller Ind.)	0.12%	Yes
11	½" x ½" Threaded Elbow Fitting	Brass	Streamline (Mueller Ind.)	0.11%	Yes
12	½" x ½" Threaded Elbow Fitting	Brass	Streamline (Mueller Ind.)	0.12%	Yes
13	45° Elbow	Brass	AMC	0.10%	Yes
14	45° Elbow	Brass	AMC	0.08%	Yes
15	45° Elbow	Brass	AMC	0.08%	Yes
16	½" Insert Coupling	Brass	Merrill	0.10%	Yes
17	½" Insert Coupling	Brass	Merrill	0.10%	Yes
18	½" Insert Coupling	Brass	Merrill	0.09%	Yes
19	Faucet Barrel for Kohler Renu	Brass	Danco	0.15%	Yes
20	Faucet Barrel for Kohler Renu	Brass	Danco	0.15%	Yes
21	Faucet Barrel for Kohler Renu	Brass	Danco	0.17%	Yes
22	Pipe Nipple, ½" x 3"	Brass	Anderson Metals Corp	0.01%	Yes
23	Pipe Nipple, ½" x 3"	Brass	Anderson Metals Corp	0.02%	Yes
24	Pipe Nipple, ½" x 3"	Brass	Anderson Metals Corp	0.02%	Yes
25	Ball for Lever Kitchen Faucets	Brass	Brass Craft Service Parts	0.08%	Yes
26	Ball for Lever Kitchen Faucets	Brass	Brass Craft Service Parts	0.08%	Yes
27	Ball for Lever Kitchen Faucets	Brass	Brass Craft Service Parts	0.08%	Yes
28	90° Elbow, ½" MPT x ½" FPT	Brass	B&K ProLine Series	0.16%	Yes
29	90° Elbow, ½" MPT x ½" FPT	Brass	B&K ProLine Series	0.16%	Yes
30	90° Elbow, ½" MPT x ½" FPT	Brass	B&K ProLine Series	0.16%	Yes
31	½" 90° Elbow	Brass	LDR Industries	0.07%	Yes
32	½" 90° Elbow	Brass	LDR Industries	0.06%	Yes
33	½" 90° Elbow	Brass	LDR Industries	0.07%	Yes
34	½" PEX Crimp Tee	Brass	Viega	0.10%	Yes
35	½" PEX Crimp Tee	Brass	Viega	0.10%	Yes
36	½" PEX Crimp Tee	Brass	Viega	0.10%	Yes
37	½" OD Tube Brass Insert	Brass	ProFlo	0.02%	Yes
38	½" OD Tube Brass Insert	Brass	ProFlo	0.12%	Yes
39	½" OD Tube Brass Insert	Brass	ProFlo	0.11%	Yes
40	½" FNPT Coupling	Brass	Merit Brass	0.09%	Yes
41	½" FNPT Coupling	Brass	Merit Brass	0.09%	Yes
42	½" FNPT Coupling	Brass	Merit Brass	0.10%	Yes
43	½" PEX Tee	Brass	Uponor North America	0.07%	Yes
44	½" PEX Tee	Brass	Uponor North America	0.08%	Yes
45	½" PEX Tee	Brass	Uponor North America	0.07%	Yes
46	PEX Tee, ½" x ½" x ½"	Brass	Sioux Chief PowerPEX	0.09%	Yes
47	PEX Tee, ½" x ½" x ½"	Brass	Sioux Chief PowerPEX	0.10%	Yes

Number	Description	Material Type	Brand or Manufacturer	Lead Content¹	“Lead-free” Compliant?
48	PEX Tee, ½" x ½" x ½"	Brass	Sioux Chief PowerPEX	0.09%	Yes
49	PEX Tee ¾" x ½" x ¾"	Brass	Apollo	0.12%	Yes
50	PEX Tee ¾" x ½" x ¾"	Brass	Apollo	0.14%	Yes
51	PEX Tee ¾" x ½" x ¾"	Brass	Apollo	0.13%	Yes
52	Hex Nipple ½" x ¼" MPT	Brass	JMF	0.13%	Yes
53	Hex Nipple ½" x ¼" MPT	Brass	JMF	0.13%	Yes
54	Hex Nipple ½" x ¼" MPT	Brass	JMF	0.13%	Yes

(1) Limit of quantitation (LQ) for ICP-AES lead testing = 0.012% (125 mg/kg).

SECTION 4. DISCUSSION

As indicated in Table 1, above, all 54 of the fittings tested were compliant with the “lead-free” requirements for maximum allowable lead content set forth in Health and Safety Code Section 116875. None of the fittings were comprised of more than a single component. The average lead content was 0.09%, with a range of 0.01% - 0.17%. Minimal variability in the lead content was observed within individual fitting types of the same brand, or from the same manufacturer, (average coefficient of variation = 8.44%). The limit of quantitation for this testing was 125 mg/kg or 0.012%.

DTSC structured the 2018 testing to focus on brass fittings from a variety of manufacturers. These items were identified to be relatively low cost, commonly used in potable water pipes in residential or commercial buildings. Due to limitations of sampling size and requirements under the law, the products selected are not representative of all products offered for sale in California. However, DTSC’s sampling and testing data provide some monitoring and compliance baselines. Such information may be useful to identify any trends in products that show a pattern of exceeding “lead-free” standards; provide consumers independent information on product compliance with the lead-free standards; or help identify points of non-compliance in the manufacturing and supply chains.

SECTION 5. CONCLUSION

For fittings and components tested in 2018, DTSC reports a 100% rate of compliance with the “lead-free” limits imposed under Health and Safety Code Section 116875. This information provides consumers with independent information on plumbing product compliance with the “lead-free” standards. When multi-component products are tested (as in previous years), the report also helps identify points of non-compliance in the manufacturing and supply chains, by determining which individual components carry the highest lead content. However, DTSC cautions that this testing represents a limited cross-section of fittings offered for sale in California, and therefore, it is not statistically representative of all similar plumbing products in commerce.

REFERENCES

1. Centers for Disease Control and Prevention (CDC) (2012, August 10). "Lead in Drinking Water and Human Blood Lead Levels in the United States. MMWR. Morbidity and Mortality Weekly Report." Retrieved from:
<https://www.cdc.gov/mmwr/preview/mmwrhtml/su6104a1.htm>
2. U.S. EPA (1996). "Method 3050B: Acid Digestion of Sediments, Sludges, and Soils," Revision 2. Retrieved from: <https://www.epa.gov/sites/production/files/2015-06/documents/epa-3050b.pdf>
3. U.S. EPA (2007). "Method 6010C (SW-846): Inductively Coupled Plasma-Atomic Emission Spectrometry," Revision 3. Retrieved from:
<https://www.epa.gov/sites/production/files/2015-07/documents/epa-6010c.pdf>
4. DTSC (2011). "DTSC Sampling for Lead Concentration in California Plumbing Products: 2010 Report of Lead in Plumbing Sampling." Retrieved from:
<http://www.dtsc.ca.gov/PollutionPrevention/upload/Annual-Report-final-13-July-2011.pdf>
5. DTSC (2013). "2011 Report of Lead in Plumbing Sampling". Retrieved from:
<https://www.dtsc.ca.gov/PollutionPrevention/upload/LIP-FEB2013.pdf>
6. DTSC (2017). "Department of Toxic Substances Control's 2017 Report on Results of Testing for Lead in California Drinking Water Plumbing Products. Retrieved from:
http://www.dtsc.ca.gov/PollutionPrevention/upload/2017-Report-on-Testing-Lead-in-Drinking-Water-Plumbing-Products_7-26-2017.pdf

Appendix: Plumbing Fitting Descriptions

(Starting on next page.)

Sample Number	Material Type	Fitting Type	Product ID / Model Number	Brand / Manufacturer	Unit Cost	Lead Content, % (mg/kg) ¹
1	Brass	½" PEX Barb Tee	APXT12	Apollo	\$2.97	0.17% (1,690)
2	Brass	½" PEX Barb Tee	APXT12	Apollo	\$2.97	0.17% (1,680)
3	Brass	½" PEX Barb Tee	APXT12	Apollo	\$2.97	0.13% (1,340)
4	Brass	Pipe Nipple ¾" MIP x Close	802089	Everbilt	\$6.73	0.03% (272)
5	Brass	Pipe Nipple ¾" MIP x Close	802089	Everbilt	\$6.73	0.03% (282)
6	Brass	Pipe Nipple ¾" MIP x Close	802089	Everbilt	\$6.73	0.03% (250)
7	Brass	½" PEX Barb Tee	UC362LFA	Sharkbite	\$1.96	0.07% (687)
8	Brass	½" PEX Barb Tee	UC362LFA	Sharkbite	\$1.96	0.05% (538)
9	Brass	½" PEX Barb Tee	UC362LFA	Sharkbite	\$1.96	0.08% (846)
10	Brass	½" x ½" Threaded Elbow Fitting	707-3-LF	Streamline (Mueller Ind.)	\$7.98	0.12% (1,220)
11	Brass	½" x ½" Threaded Elbow Fitting	707-3-LF	Streamline (Mueller Ind.)	\$7.98	0.11% (1,090)
12	Brass	½" x ½" Threaded Elbow Fitting	707-3-LF	Streamline (Mueller Ind.)	\$7.98	0.12% (1,220)
13	Brass	45° Elbow	738107-08	AMC	\$4.99	0.10% (998)
14	Brass	45° Elbow	738107-08	AMC	\$4.99	0.08% (771)
15	Brass	45° Elbow	738107-08	AMC	\$4.99	0.08% (788)
16	Brass	½" Insert Coupling	RBCPNL50	Merrill	\$7.49	0.10% (980)
17	Brass	½" Insert Coupling	RBCPNL50	Merrill	\$7.49	0.10% (986)
18	Brass	½" Insert Coupling	RBCPNL50	Merrill	\$7.49	0.09% (931)
19	Brass	Faucet Barrel for Kohler Renu	15145E	Danco	\$6.79	0.15% (1,530)
20	Brass	Faucet Barrel for Kohler Renu	15145E	Danco	\$6.79	0.15% (1,510)
21	Brass	Faucet Barrel for Kohler Renu	15145E	Danco	\$6.79	0.17% (1,660)
22	Brass	Pipe Nipple, ½" x 3"	38300-0830	Anderson Metals Corp	\$4.99	0.01% (144)
23	Brass	Pipe Nipple, ½" x 3"	38300-0830	Anderson Metals Corp	\$4.99	0.02% (156)
24	Brass	Pipe Nipple, ½" x 3"	38300-0830	Anderson Metals Corp	\$4.99	0.02% (184)
25	Brass	Ball for Lever Kitchen Faucets	SL0123X	Brass Craft Service Parts	\$13.99	0.08% (835)
26	Brass	Ball for Lever Kitchen Faucets	SL0123X	Brass Craft Service Parts	\$13.99	0.08% (777)
27	Brass	Ball for Lever Kitchen Faucets	SL0123X	Brass Craft Service Parts	\$13.99	0.08% (768)
28	Brass	90° street elbow, ½" MPT x ½" FPT	BF-832NL	B&K ProLine Series	\$6.99	0.16% (1,590)
29	Brass	90° street elbow, ½" MPT x ½" FPT	BF-832NL	B&K ProLine Series	\$6.99	0.16% (1,570)
30	Brass	90° street elbow, ½" MPT x ½" FPT	BF-832NL	B&K ProLine Series	\$6.99	0.16% (1,570)
31	Brass	½" 90° Elbow	323-E90-12	LDR Industries	\$7.49	0.07% (672)
32	Brass	½" 90° Elbow	323-E90-12	LDR Industries	\$7.49	0.06% (630)
33	Brass	½" 90° Elbow	323-E90-12	LDR Industries	\$7.49	0.07% (711)
34	Brass	½" PEX Crimp Tee	V4654	Viega	\$2.28	0.10% (1,010)
35	Brass	½" PEX Crimp Tee	V4654	Viega	\$2.28	0.10% (957)
36	Brass	½" PEX Crimp Tee	V4654	Viega	\$2.28	0.10% (990)
37	Brass	½" OD Tube Brass Insert	PFXBRIDN	ProFlo	\$1.23	0.02% (239)
38	Brass	½" OD Tube Brass Insert	PFXBRIDN	ProFlo	\$1.23	0.12% (1,210)

Appendix: Plumbing Fitting Descriptions (continued)						
Sample Number	Material Type	Fitting Type	Product ID / Model Number	Brand / Manufacturer	Unit Cost	Lead Content, % (mg/kg)
39	Brass	½" OD Tube Brass Insert	PFXBRIDN	ProFlo	\$1.23	0.11% (1,110)
40	Brass	½" FNPT Coupling	BRLFCD	Merit Brass	\$12.53	0.09% (860)
41	Brass	½" FNPT Coupling	BRLFCD	Merit Brass	\$12.53	0.09% (890)
42	Brass	½" FNPT Coupling	BRLFCD	Merit Brass	\$12.53	0.10% (989)
43	Brass	½" PEX Tee	ULF47	Uponor North America	\$9.09	0.07% (704)
44	Brass	½" PEX Tee	ULF47	Uponor North America	\$9.09	0.08% (750)
45	Brass	½" PEX Tee	ULF47	Uponor North America	\$9.09	0.07% (713)
46	Brass	PEX Tee, ½" x ½" x ½"	S641XG222	Sioux Chief PowerPEX	\$1.72	0.09% (871)
47	Brass	PEX Tee, ½" x ½" x ½"	S641XG222	Sioux Chief PowerPEX	\$1.72	0.10% (1,010)
48	Brass	PEX Tee, ½" x ½" x ½"	S641XG222	Sioux Chief PowerPEX	\$1.72	0.09% (863)
49	Brass	PEX Tee ¾" x ½" x ¾"	EPXT341234	Apollo	\$5.99	0.12% (1,210)
50	Brass	PEX Tee ¾" x ½" x ¾"	EPXT341234	Apollo	\$5.99	0.14% (1,410)
51	Brass	PEX Tee ¾" x ½" x ¾"	EPXT341234	Apollo	\$5.99	0.13% (1,340)
52	Brass	Hex Nipple ½" x ¼" MPT	4507307	JMF	\$5.99	0.13% (1,330)
53	Brass	Hex Nipple ½" x ¼" MPT	4507307	JMF	\$5.99	0.13% (1,250)
54	Brass	Hex Nipple ½" x ¼" MPT	4507307	JMF	\$5.99	0.13% (1,280)

(1) Limit of quantitation (LQ) for ICP-AES lead testing = 0.012% (125 mg/kg).