American Water Works Association

The Authoritative Resource on Safe Water SM

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June 2, 2011

Aaron Yeow
Science Advisory Board (1400R)
U.S. Environmental Protection Agency
1300 Pennsylvania Avenue N.W.
Washington, DC 20004

RE: Questions Arising on May 16 Science Advisory Board, Drinking Water Committee Conference Call

Dear Mr. Yeow,

The American Water Works Association (AWWA) would like to offer several clarifications regarding data AWWA submitted on May 13 to assist the Science Advisory Board (SAB) Drinking Water Committee as it develops its *Review of Technical Studies Examining the Effectiveness of Partial Lead Service Line Replacements.* On March 16, 2011, the committee met via conference call to discuss its work to-date and receive additional oral comment from the public. During that call several observations regarding AWWA's May 13 submittal were drawn that warrant the following clarification.

1. AWWA's citation of Sandvig et al. (2008) was a reference to Appendix B, specifically pages B-20 – B-29. Upon review you will find that this citation is for an individual case study submitted to the researchers by Louisville Water. There is no information in the case study to indicate that sample flow rates were atypically low compared to normal residential use.
2. Data reflected in the tables AWWA submitted to the SAB were collected in a manner consistent with Lead and Copper Rule (LCR) and EPA guidance. See Appendix A for several relevant excerpts for past and current EPA monitoring guidance with respect to flow rates during routine compliance and lead service line sampling, as well as relevant extracts from DC Water's instructions to samplers.

EPA's 1991 guidance did deliberately target a calculated flow rate of roughly 1.3 L/minute for routine compliance samples, however a particular flow rate was not specified in EPA model instructions to homeowners for such samples. Subsequent EPA guidance in 2002 and 2010 has been silent on flow rates for such monitoring. Normal water flow rates are specified in all EPA LCR guidance for sampling of lead service lines. Sampling protocol is important and should be addressed in more detail by the agency and independent researchers. It is critical that the sampling protocol be consistent with the purpose of the sampling. With this point in mind, LCR sampling is not intended to assess exposure; it is intended to maximize the likelihood that if lead is being released, it will be observed. At this time there is insufficient data to illustrate that a person following current sampling instructions filling a sample bottle uses a flow rate that fails to achieve this goal. A quick illustratory example of this point follows. Six monitoring technicians were asked to fill 1-liter, small-mouthed LCR sample bottles as though taking a sample, and did so with an average flow rate of 5.7 L/minute (range 4.0 – 8.5 L/minute); these observations are well within the desirable flow regime for sampling discussed by the committee on its conference call.

Also, the committee should be aware that EPA guidance was changed in 2006 such that individuals taking samples are instructed to leave aerators on the faucet being sampled. Water and energy conservation programs recommend the use of water conserving faucet aerators. Based on information available through Flex Your Power, California's energy efficiency marketing and outreach campaign, new kitchen faucets typically have an aerator that allows a maximum flow of 8.33 L/ minute at 80 psi. Water faucet aerators with much lower maximum flows (e.g., 1.89, 3.79, 4.54, and 5.68 L/minute) are available and encouraged by conservation programs. While actual household pressure varies with location in the distribution system typically water systems seek to keep water pressure levels above 35 psi and less than 80 psi. EPA has recently released guidance on control of water loss that similarly recommends pressure management. It may also be useful to note that water lines, particularly older metal lines such as those at issue in this discussion can be occluded by the build-up of scale deposits. As the interior diameter of the pipe decreases, there is loss of water flow for any given pressure.

Hopefully, this additional information assists the committee in evaluating the data AWWA submitted on May 13.

As the committee finalizes its report, AWWA requests that the committee carefully weigh its recommendations regarding lead service line replacement against the challenge of removing lead from contact with drinking water to the greatest extent possible and at every opportunity. Both the potential health consequences of lead and the economic burden of complete lead service line replacement fall directly on individual households. Consequently, it is important that where the available science is inadequate to make a well-justified decision, the committee provide the agency guidance on critical information gaps and how those gaps might be effectively addressed in a timely manner.

If you have any questions regarding this correspondence or if AWWA can be of assistance in some other way please contact me or Steve Via at (202) 326-6130 or svia@awwa.org.

Best regards,

Thomas W. Curtis
Deputy Executive Director

cc: Jeffrey Griffiths, Chair Drinking Water Committee
Cynthia Dougherty, Director, OW/OGWDW

Appendix A
Instructions for Sampling and Flow Rates

EPA Guidance for Flow Rate When Sampling for Lead

The 1991 LCR monitoring guidance read as follows for routine compliance samples (e.g., first draw tap samples):

> "…
> The cold water tap ***should be turned on gently to maintain low flow conditions during sample collection*** such that the one liter bottle is filled in approximately 45 seconds. …"[1] **(*emphasis added*)**

While the text of the 1991 guidance deliberately targeted a calculated flow rate of roughly 1.3 L/minute, the model instructions to homeowners did not include language that specifies a particular flow rate.

> "… Place the sample bottle (open) below the faucet and ***gently open*** the cold water tap. ***Fill the sample bottle*** to the line marked "1000-mL" and turn off the water. …"[2] **(*emphasis added*)**

The instructions provided in EPA guidance in 2002 and 2010 are silent as to flow rate for routine compliance tap samples. Also, the 2010 guidance notes that the agency model instruction for homeowner tap sample collection procedure was changed in September, 2006.

> "…
> Place the opened sample bottle below the faucet and ***gently open*** the cold water tap. ***Fill the sample bottle*** to the line marked "1000-mL" and turn off the water. …"[3] **(*emphasis added*)**

> "…**Do not remove the aerator prior to sampling.** Place the opened sample bottle below the faucet and ***gently open the cold water tap***. ***Fill the sample bottle*** to the line marked "1000-mL" and turn off the water. …"[4] **(*emphasis added*)**

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[1] EPA (1991), *Lead and Copper Rule Guidance Manual, Volume 1 Monitoring*, Excerpt from "Sample Collection Methods," Page 4-14.
[2] EPA (1991), *Lead and Copper Rule Guidance Manual, Volume 1 Monitoring*, Excerpt from "Suggested Directions for Homeowner Tap Sample Collection Procedures," Page A-104.
[3] EPA (2002), *Lead and Copper Monitoring Guidance*, Excerpt from "Suggested Directions for Homeowner Tap Sample Collection Procedures," Page E-6.
[4] EPA (2010), *Revised LCR Monitoring and Reporting Guidance*. Excerpt from "Suggested Directions for Homeowner Tap Sample Collection Procedures (Revised 9/2006)," Page 85.

The EPA guidance in 1991, 2002, and 2010 contain similar instructions to the sampler, to run the water at a normal flow rate when sampling lead service lines.

> "…
> Temperature Variation: …For the temperature variation type of sampling, the sample collector should by ***gently opening the kitchen tap*** and ***run the water at a normal flow rate***, keeping a hand/finger under the flowing water. …"[5] **(*emphasis added*)**

> "…
> *Temperature Variation* - This method is recommended if the temperatures of lead service line and interior piping are easily distinguishable (for example in a single-family home). A tap sample should be collected by ***gently opening the tap*** *and* ***running the water at a normal flow rate***, keeping a hand/finger under the flowing water. When a change in water temperature is detected, a 1-liter sample should be collected by filling the sample bottle to the appropriate level and capping. …"[6] **(*emphasis added*)**

> "…
> *Temperature Variation:* This method is recommended if the temperatures of lead service line and interior piping are easily distinguishable (for example in a single-family home). A tap sample should be collected by ***gently opening the tap*** and ***running the water at a normal flow rate***, keeping a hand/finger under the flowing water. When a change in water temperature is detected, a 1-liter sample should be collected by filling the sample bottle to the appropriate level and capping. …" [7] **(*emphasis added*)**

Instructions Provided by DC Water

The instructions with respect to flow rate of water provided to individuals conducting sampling underlying data included in AWWA's May 16 letter are provided below. The following excerpts were provided by DC Water.

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[5] EPA (1991), *Lead and Copper Rule Guidance Manual, Volume 1 Monitoring*, Excerpt from "Sample Collection Methods," Page 4-15.
[6] EPA (2002), *Lead and Copper Monitoring Guidance*, Excerpt from "How Do I Collect Lead Service Line Samples? (See §141.86(b)(3))" Page 68.
[7] EPA (2010), *Revised LCR Monitoring and Reporting Guidance*. Excerpt from "How Do I Collect Lead Service Line Samples? (40 CFR 141.86(b)(3))" Page 85.

2005-2007 - First and Second Draw Sample Collection Instructions

"**1.** Use a kitchen cold-water faucet for sampling. The 1st and 2nd draw samples must be collected from the same cold water faucet.

Notes:

***PLEASE DO NOT REMOVE AERATOR FROM FAUCETS BEFORE SAMPLING.**
***If you have a water treatment unit or filter attached to your plumbing system or faucet, please bypass the unit or remove the filter before sampling.**

2. Uncap a sample bottle. Place the sample bottle under the faucet. ***Gently open*** the cold water faucet and ***fill the sample*** bottle to within an inch of the top of the sample bottle.

3. When the bottle is full, tightly cap the sample bottle. On the bottle label, fill out **Collect Date**, **Collect Time**, **Collector** (your name), **Address,** and circle **1st Draw**. Leave **Sample #** blank.

4. Note the Date and Time of the sampling on this form in the designated area on the next page.

5. Once 1st draw sample is taken, uncap the unused plastic bottle to take the 2nd draw sample. ***Run the cold water faucet at a slow to moderate pace until the water turns cold. Then fill the bottle to within an inch of the top of the bottle***.

6. When the bottle is full, tightly cap the sample bottle. On the bottle label, fill out **Collect Date**, **Collect Time**, **Collector** (your name), **Address,** and circle **2nd Draw**. Leave **Sample #** blank. Note the Date and Time of the sampling on this form in the designated area on the next page**."** ***[emphasis added]***

2008-2010 - First and Second Draw Sample Collection Instructions

"1. Use the kitchen cold-water faucet for all sampling. If you have a water treatment unit or filter attached to your plumbing system or faucet, please bypass the unit or remove the filter before sampling.

2. ***Gently open*** the cold water faucet and ***immediately fill the first bottle*** to the top. Close the faucet and tightly cap the sample bottle once the bottle is full.

3. On the bottle label, fill out **Collect Date**, **Collect Time**, **Collector** (your name), **Address,** and Circle **1st Draw**. Leave **Sample #** blank.

4. ***Open the cold-water faucet and run the water***, keeping a hand/finger under the flowing water until the water changes temperature. ***Fill the second bottle*** to the top and tightly cap the bottle." ***[emphasis added]***