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Good morning, Mr. Chairman and Members of the Committee. I am Benjamin Grumbles, Acting Assistant Administrator for Water at the United States Environmental Protection Agency (EPA). I welcome this opportunity to discuss the issue of lead in drinking water, the specific situation related to elevated lead levels in the District of Columbia's (D.C.'s) drinking water, and actions that EPA is taking at the local and national level to address the matter.

Lead as a Public Health Concern

Lead is a contaminant that EPA takes very seriously. This contaminant has been found to have serious health effects, particularly for children. Health effects may include delays in normal physical and mental development in infants and young children; slight deficits in the attention span hearing, and learning abilities of children; and, high blood pressure in some adults (which may lead to kidney disease and increased chance of stroke). But pregnant women and children are our primary concern. The Centers for Disease Control and Prevention (CDC) has identified a blood lead level of 10 micrograms per deciliter as the level of concern for lead in children.

Lead exposure in young children has been dramatically reduced over the last two decades. According to a 2003 CDC report [Surveillance for Elevated Blood Lead Levels Among Children – United States, 1997–2001. Centers for Disease Control and Prevention. *Surveillance Summaries*, September 12, 2003. MMWR 2003:52 (No. SS-10)], 88% of children between the ages of 1 to 5 were estimated to have blood lead levels that exceeded 10 ug/dl for the period between 1976-1980. By 1999-2000, this estimate had decreased to approximately 2%. This decrease is largely due to the 1973 EPA regulation to phase out lead in gasoline between 1973 and 1995, and to the reduction in the number of homes with lead-based paint from 64 million in 1990 to 38 million in 2000. Some decline was also a result of EPA regulations reducing lead levels in drinking water and banning lead from paint. Other reasons include bans on lead in food and beverage containers and reductions in lead in industrial emissions, consumer goods, hazardous waste, and other sources. There are several EPA programs that continue to be successful in reducing the public's exposure to lead in the environment.

The most common source of lead exposure for children today is lead in paint in older housing and the contaminated dust and soil it generates. [see Risk Analysis to Support Standards for Lead in Paint, Dust and Soil (EPA 747-R-97-006, June 1998] This is primarily from housing built in the 1950s and homes with pre-1978 paint. Several Federal programs and surveillance and prevention programs at the State and local level continue to work towards reducing exposure to lead. In addition, EPA works with Federal agencies – mainly the Departments of Housing and Urban Development, Health and Human Services, and Justice through the President's Task Force on

Environmental Health Risks and Safety Risks to Children – on implementing a federal strategy to virtually eliminate childhood lead poisoning.

Lead in Drinking Water

Although the greatest risks are related to paint, lead in drinking water can also pose a risk to human health. As indicated in EPA's public education language for the Lead and Copper Rule, approximately 20% of a person's exposure to lead can come from drinking water. The level of exposure can be greater for children and infants, particularly when tap water is used to mix juices and formula. EPA has set a maximum contaminant level goal of zero for lead in drinking water and has taken several actions over the last 20 years to reduce lead in drinking water. The 1986 Amendments to the Safe Drinking Water Act (SDWA) effectively banned the new use of lead solder, and leaded pipes from public water supply systems and plumbing, and limited faucets and other brass plumbing components to no more than 8% lead. To address lead in schools, the Lead Contamination Control Act (LCCA) of 1988 recalled drinking water coolers with lead-lined water reservoir tanks, and banned new drinking water coolers with lead parts. The 1986 SDWA Amendments also directed EPA to revise its regulations for lead and copper in drinking water.

An interim standard for lead in drinking water of 50 micrograms per liter, or parts per billion (ppb), had been established in 1975. Sampling of customer taps was not required to demonstrate compliance with this standard. In 1988, the Agency proposed revisions to the standard and eventually issued a final standard in 1991. The revised standard significantly changed the regulatory framework. Unlike most contaminants,

lead is not generally introduced to drinking water supplies from the source water. The primary sources of lead in drinking water are from lead pipe, lead-based solder used to connect pipe in plumbing systems, and brass plumbing fixtures that contain lead. Setting a standard for water leaving the treatment plant fails to capture the extent of lead leaching in the distribution system and household plumbing.

EPA requires public water suppliers to meet the regulations governing treated water quality distributed via the public water system. The regulations do not require homeowners to replace their plumbing systems if they contain lead. To reduce consumers' lead exposure from tap water, EPA used its available authorities to require public water suppliers to treat their water to make it as non-corrosive as possible to metals in their customers' plumbing systems. These treatment requirements were issued in EPA's Lead and Copper Rule (LCR) on June 7, 1991.

The rule requires systems to optimize corrosion control to prevent lead and copper from leaching into drinking water. Large systems serving more than 50,000 people were required to conduct studies of corrosion control and to install the State-approved optimal corrosion control treatment by January 1, 1997. Small and medium sized systems are required to optimize corrosion control when monitoring at the consumer taps shows action is necessary.

To assure corrosion control treatment technique requirements are effective in protecting public health, the rule also established an Action Level (AL) of 15 ppb for lead in drinking water. Systems are required to monitor a specific number of customer taps, according to the size of the system. If lead concentrations exceed 15 ppb in more than 10% of the taps sampled, the system must undertake a number of additional

actions to control corrosion and to inform the public about steps they should take to protect their health. The rule was subsequently revised in 2000 to modify monitoring, reporting and public education requirements, but the basic framework, including the action level, was not changed.

The LCR has four main functions: (1) require water suppliers to optimize their treatment system to control corrosion in customers' plumbing; (2) determine tap water levels of lead and copper for customers who have lead service lines or lead-based solder in their plumbing system; (3) rule out the source water as a source of significant lead levels; and, (4) if action levels are exceeded, require the suppliers to educate their customers about lead and suggest actions they can take to reduce their exposure to lead through public notices and public education programs. If a water system, after installing and optimizing corrosion control treatment, continues to fail to meet the lead action level, it must begin replacing the lead service lines under its ownership.

Although we are currently seeing problems in the District, the LCR has proven to be successful in reducing levels of lead in drinking water. Following issuance of the rule in 1991, EPA required medium and large systems to conduct initial rounds of monitoring by December 1992. The results showed that 819 of 7,500 systems serving more than 3,300 people exceeded the action level of 15 ppb, 100 of which served more than 50,000 people. These 100 large systems, which completed two rounds of monitoring by December 1992, served more than 25 million people across the nation. Information reported by States to EPA's Safe Drinking Water Information System indicate that only 4 large systems (one of which is D.C.), serving a total population of 1.1 million, had exceeded the action level within the past 3 years. The actions taken by systems to

reduce corrosion through appropriate treatment have significantly reduced the public's exposure to lead in drinking water. However, even though we have had success in reducing exposure, we must remain vigilant to ensure that treatment continues to control corrosion and that information on potential risks is communicated to the public.

The Current Situation in D.C.

In the District of Columbia, the regulatory framework that EPA established and with which the D.C. Water and Sewer Authority (WASA) sought to comply did not achieve its intended objectives. Within the last few years lead concentrations have increased significantly. Public education efforts were not effective in reaching the people who needed to know about the problem or in conveying the risks posed to some customers by elevated levels of lead in the water.

The provision of safe drinking water is not an easy task. Treatment processes must be balanced to address multiple risks. EPA has developed guidance to assist systems in achieving simultaneous compliance with different standards to, for example, balance treatment processes between the need to control corrosion within a system and also avoid harmful byproducts that can result from disinfection processes. As Regional Administrator Welsh will describe, EPA is working with WASA and the Washington Aqueduct, managed by the U.S. Army Corps of Engineers , which supplies water to WASA, to determine if changes in treatment processes to reduce disinfection byproducts resulted in elevated lead levels. The situation in D.C. appears to be unique. In surveying States and regions, we have not identified a systemic problem of

increasing lead concentrations in tap monitoring conducted by public water systems. However, we will continue to investigate this matter in the weeks ahead.

Actions Undertaken by EPA Headquarters

This event is a reminder of what we take for granted – that we can turn on our faucets, whenever we want, to draw a glass of clean, safe water. I also see it as indicative of the challenges in managing the nation's water infrastructure. We face the possibility of interruptions in service quality and public health protection as a result of deterioration of aging infrastructure or outdated components, such as the lead service lines serving older homes in the District. This will require significant levels of coordination on the part of local, State and Federal governments, and an understanding of the true investment needs on the part of customers. With respect to the specific issue of lead in drinking water, as the head of the national water program I am committed to taking a number of actions to address the matter from a national perspective.

I will be working with our enforcement and regional drinking water program managers to embark on a thorough review of compliance with the Lead and Copper Rule, with a particular focus on the systems serving populations greater than 3,300 people. States were required to report specific results of monitoring (i.e., 90th percentile lead levels) to EPA for these systems beginning in 2002. I want to make sure that the information EPA has in its Safe Drinking Water Information System is both complete and accurate and will be working with the States to achieve this end.

All of us want to ensure that the nation's school children are not exposed to elevated lead levels in their drinking water. To that end, I have directed my staff to communicate with State drinking water program directors to determine the status of State and local efforts in monitoring lead in schools. While States and schools may have acted immediately to remove harmful lead lined coolers in accordance with the 1988 Lead Contamination Control Act, lead solder and plumbing fixtures can still contain low levels of lead. I want to ensure that States and schools continue to monitor their water outlets to ensure that children are protected using EPA's recommended protocol for testing water in schools for lead.

With respect to the situation here in D.C., I fully understand the concerns that City Leaders and members of Congress have with respect to the timeliness and effectiveness of notification for the public. Members of my own staff who reside in the District share your concerns and have made them known to me. There will be a accounting of the actions taken by all parties – WASA, the Army Corps of Engineers, and EPA 's regional office (in its role as primacy agency for the District). I want to ensure that we use the lessons learned to prevent such an event from taking place in the future – here in D.C. and in other communities across the nation. I sense we will find that each party will be able to point to a moment in time when a question that went unasked would have shed full light on the extent of the problem. Staff from my program and EPA's Office of Research and Development are currently working closely with the Region to provide technical assistance. I have asked the program to identify a group of experts to conduct an independent review of the work underway by the group evaluating potential technical solutions to elevated lead levels. I have also asked my staff to work

in consultation with enforcement and regional staff to review the existing requirements of the rule and associated guidance to determine whether it is appropriate to make changes as part of our review of existing regulations.

I want to stress that I believe that this whole event serves as an object lesson in the importance of communication – both within and between organizations and especially with the public. While I understand the importance of ensuring that information communicated to the public is accurate, we provide a disservice to the community by failing to communicate information in a timely manner. I believe the action taken by the District's Department of Health to recommend that pregnant women and children not consume unfiltered tap water or use it to prepare infant formula or concentrated juice until otherwise advised is a prudent cautionary move to take at this time. We are completing a thorough review of WASA's and the Aqueduct's activities to determine if any violations of environmental law have occurred and to ensure public health is protected. EPA will take the appropriate steps to ensure that these agencies meet their responsibility to protect public health, both by enforcing existing regulations and by using its additional authorities to address imminent and substantial threats to public health, as appropriate.

I will now turn over the balance of my time to Donald Welsh, Administrator for our Region III office in Philadelphia. EPA's Region III office has primary enforcement responsibility for the District's drinking water program and oversight responsibility for WASA and the Aqueduct. He will provide you with a specific recounting of what has

happened to date and will provide information on the actions underway to identify both the cause of elevated lead levels and potential solutions.

Region III Introduction

Mr. Chairman and Members of the Committee, my name is Don Welsh and I am the Regional Administrator for EPA's Region III. Thank you for the opportunity to testify this morning on the circumstances and events regarding the lead levels in the District of Columbia residents' tap water.

As noted, lead in the environment, whether in lead paint, in drinking water or any other avenue of exposure, poses significant risks to health– particularly to pregnant women and young children. Reducing all sources of exposure to lead is vital to protecting the health of our citizens.

It is unacceptable to us that many families in the District, particularly those with young children and pregnant women, continue to live with fear and uncertainty over the quality of the water they drink. The citizens of Washington, D.C. demand and deserve much better.

It is clear that the D.C. Water and Sewer Authority, or WASA, was ineffective at informing the public about the magnitude of the problem of lead in drinking water or in conveying the steps families and individuals should take to protect themselves. Both the Regional and Headquarters offices of EPA are taking a critical look back at how the Region could have done a better job in its oversight of WASA. There will be lessons learned from our reviews which will benefit the Agency in the future. We are completing a thorough assessment of WASA's and the Aqueduct's activities to determine if any

violations of environmental law may have occurred and to ensure public health is protected. If warranted, EPA will take an appropriate compliance and enforcement response to safeguard public health.

Our primary focus is on taking strong action with other agencies to help bring about solutions as quickly as possible to the current situation – both short term, in ensuring a safe water supply for families and improving outreach efforts, and longer term in finding and fixing the root cause of the problem.

The first priority is to ensure that citizens have safe water to drink. We have published consumer guidelines that should be followed by all residents to reduce their risk of exposure. These guidelines, which are attached to this testimony, prescribe longer tap water flushing periods for those with lead service lines. Additionally, as an extra level of safety, the District's Department of Health (D.C.DOH) recently recommended that pregnant women and children under six, those most susceptible to health effects from lead, not consume unfiltered tap water. We believe that this is a prudent and cautionary step to take at this time.

I met this week with City officials to discuss the City's plans for providing safe water to residents. We will closely monitor the steps being taken in this area. If affected residents are not promptly supplied with safe drinking water, we stand ready to exercise our authorities to compel action.

I would like briefly to address several issues raised by members and describe the specific actions we have underway to address them. I have also included a longer summary of LCR compliance in D.C. over the past several years as an attachment to this testimony.

EPA's Role in the District of Columbia

Two public water systems are responsible for complying with provisions of the LCR in the District. The Washington Aqueduct Division (Aqueduct) of the U.S. Army Corps of Engineers owns and operates two water treatment plants which provide finished drinking water to the D.C. Water and Sewer Authority (WASA), as well as to Arlington County and the City of Falls Church in Virginia. The Aqueduct is responsible for all corrosion control treatment for its three customer systems. WASA, which distributes water from the Aqueduct to customers, is responsible for monitoring lead and copper at its retail customers' taps.

EPA's Region III office in Philadelphia has primary oversight and enforcement responsibility for public water systems in the District. The Region ensures that D.C.'s water suppliers know and understand Federal regulations, provides advice and technical assistance on how to comply with the Federal regulations, requires monitoring of the water and treatment processes according to the Federal regulations, and ensures that required results are reported. The region can also take an appropriate administrative or judicial enforcement action, including issuing notices of violation or administrative orders and seeking administrative and/or civil penalties.

As noted by Acting Assistant Administrator Grumbles, the goal of the LCR is to provide maximum human health protection by reducing lead levels at consumers' taps to as close to the maximum contaminant level goal of zero as is feasible. WASA and the Aqueduct are required to periodically report monitoring results and other process information to EPA on a regular basis. WASA is required to report: (1) results of routine tap monitoring within ten days after each monitoring period ends (i.e., every six months

or annually, depending on whether the system is on standard or reduced monitoring); (2) lead service line replacement program information annually; and, (3) documents that demonstrate that it complied with public education requirements within ten days after the period in which it is to complete those steps (i.e., every six months and annually, depending on the specific public education program element).

Effectiveness of Treatment

The results of D.C.'s required tap monitoring exceeded the 15 ppb action level at the 90th percentile for taps monitored during 6 out of 15 reporting periods since January 1992 – three times prior to 1994 and three times since 2002.

Because of the difficulties in removing all sources of lead from plumbing, the goal of the LCR is to minimize corrosion through appropriate treatment so that lead is not released into drinking water. During the 1990's several studies were conducted by WASA, the Aqueduct, and EPA to support identification of an optimal corrosion control treatment (OCCT) for the drinking water supplied by the Aqueduct. The studies investigated the potential of several different mechanisms by which to control pH and corrosion. Several of the studies initially recommended using a phosphate-based corrosion inhibitor, but reconsidered based on information that suggested that such a change could cause other water quality problems. EPA gave the Aqueduct conditional OCCT approval in 1997 and the Aqueduct began implementing the new corrosion control regime. EPA gave final approval of the OCCT in 2000, after reviewing results from several reports required by the 1997 conditional approval. Later that year, the Aqueduct replaced its secondary disinfection treatment by converting from free chlorine

to chloramines. The primary purpose of this change was to ensure compliance with EPA's updated and more stringent requirements for disinfection byproducts.

The OCCT implemented by the Aqueduct appeared to be effective in minimizing lead levels until the reporting period between July 1, 2001 and June 30, 2002. EPA received a final report from WASA on August 27, 2002 indicating that the 90th percentile value had increased to 75 ppb during that period. The high level required that WASA conduct more frequent monitoring every six months. The lead action level was also exceeded for subsequent monitoring periods in 2003, with 90th percentile values of 40 ppb (January 1 to June 30, 2003) and 63 ppb (July 1 to December 31, 2003).

A problem with the treatment process is now suspected, and technical issues regarding the corrosivity of the water need to be resolved. As noted, in November 2000 the Aqueduct replaced its secondary disinfection treatment by converting from free chlorine to chloramines. Also, during 2001 and 2002, WASA initiated an extensive water meter replacement program with approximately 18,000 water meters replaced with new remote read capability units. Since the elevated lead levels returned during this general time frame, there is a belief that these changes or others may have been related to increased corrosivity in the lead service lines. In 2003, EPA Region III worked through a Headquarters' contractor to hire Professor Marc Edwards of Virginia Tech to help analyze the situation and make recommendations to assist the region in working with WASA. Professor Edwards' draft report delivered in October 2003 provided key input to the evaluation of the problem during the fall of 2003 and continues to aid the expert technical team convened by EPA to identify the underlying causes for elevated lead levels.

We are working with WASA, the Washington Aqueduct, and other outside technical experts to help determine the correct balance of treatment needed to both reduce corrosivity and maintain the optimum protection against other harmful contaminants that can be found in drinking water. The expert technical team has been researching these issues and will report preliminary recommendations to me by March 10. Under their current schedule, the working group is expecting to arrive at a preliminary water chemistry change decision by May 1 with a partial system test in an isolated section of D.C.'s distribution system to begin about June 1 followed by full system implementation about September 1.

Effectiveness of Lead Service Line Replacement Program

When WASA exceeded the action level, they were also required to develop and undertake a lead service line replacement (LSLR) program. The LCR requires that a system replace 7 percent of the lead service lines which the system owns each year until all of the lines have been replaced, or until tap water monitoring indicates that its 90th percentile lead level is equal to or less than 15 ppb. If the sample for a service line shows a concentration below the action level, the line serving that house is considered to be replaced for the purposes of meeting the 7 percent requirement. WASA has estimated that they have 23,000 lead service lines.

Starting in March 2003, WASA began an expanded lead service line sampling program to evaluate the lead concentrations leached into water from lead service lines using a protocol that differs from that used for required tap monitoring. The Region received detailed sampling results from this program on October 27, 2003. The information was reviewed by our technical staff with an eye towards determining how to address the underlying cause of the corrosion problem. The WASA LSLR report indicated that 385 lead service lines had been physically replaced and that an additional 1,241 lines were considered replaced because they had monitoring results below the 15 ppb action level. The report also indicated that 3,372 of 4,613 lead services lines tested through September 30, 2003 had lead levels that exceeded the lead action level. In many cases, lead levels from customer taps served by lead service lines were very high, with nearly 3% of the samples above 300 ppb and 18.5% above 100 ppb. While homeowners who participated in the expanded sampling program were notified of the results, in many cases several months passed between when a sample was collected

and information provided to a homeowner. This is a particular concern for homeowners with high lead levels in their water and EPA has notified WASA that it expects more timely notification of results to customers in the future.

We understand that, as of December 31, 2003, WASA has collected a cumulative total of about 6,000 lead service line water samples. Region III has requested that WASA report further lead service line testing results on a monthly basis rather than on an annual basis as specified in the regulations. The first report will provide all the lead service line replacement information going back to the beginning of the current compliance period that began October 1, 2003. For homes where WASA conducts a partial lead service line replacement, Region III has requested that WASA provide detailed flushing instructions to the resident so that they can take steps to minimize their exposure to very small lead particles dislodged during the replacement.

EPA completed its review of the WASA LSLR for 2002-2003 and will request WASA to submit a modified LSLR plan for 2003-2004 that will continue the expanded monitoring program and accelerate lead service line replacement. Region III has stressed to WASA that the lead service lines, which are the major source of the high lead levels, need to be replaced. We expect to award funding in April, in the form of $8 million in FY 2004 grant funds and $3.7 million in prior year funds, to accelerate the replacement of these lines. EPA is also strongly encouraging WASA to physically replace lead service lines that test over 15 ppb rather than considering those lines that have results less than 15 ppb as replaced for the purposes of meeting the 7% replacement requirement.

Currently WASA only replaces that part of the lead service line under their control. However, partial replacement of lead service lines will not completely eliminate the high lead levels coming from the service line. EPA highly recommends that homeowners have their portion of the service line replaced when WASA replaces their portion. We understand the cost may be prohibitive for some homeowners and are exploring other, potentially cost-effective, options for assisting homeowners in dealing with this expense.

Effectiveness of Public Education

When the action level for lead in drinking water is exceeded, the goals of federal requirements are to ensure that the public is informed about potential risks and the steps they can take to minimize exposure. While WASA may have met requirements of the regulations, it did not meet the spirit -- which is focused on public right to know and robust communication. In its outreach efforts, WASA did not fulfill its responsibility to effectively inform all impacted parties about a problem with their water. Notifications to individual residents were often not timely and did not achieve the goal of getting information to those who needed to know. Mass media tools were not used as effectively as they could have been. There should have been more widespread and urgent communication of the problem District-wide. Additional measures could have been taken by WASA and EPA to ensure that customers were quickly informed, and that public education and outreach materials reflected an appropriate level of concern.

In hindsight, it appears that EPA could have more quickly assessed the timeliness, effectiveness and impact of WASA's public notification program and

promptly directed WASA to correct its deficiencies. We are auditing WASA's public information efforts to identify specific elements that failed and we have revised our oversight procedures to assure that shortcomings in public outreach are identified earlier and corrected. We are more closely monitoring WASA's activities to ensure that system-wide notices effectively inform customers about the lead risk and we will ensure that information provided in WASA's next Consumer Confidence Report to customers is clear with respect to information about lead levels in drinking water.

We are moving ahead with plans to work with citizens to get a better understanding of how WASA's outreach was received and how to improve it for the future. We are also taking our own actions to provide information to the public. EPA continues to provide information on our Regional and National Web sites, through our National Safe Drinking Water Hotline, and through the media to help guide consumers.

On another front, we have initiated contact with the National Nursing Centers Consortium with the goal of establishing a new EPA-sponsored lead prevention program for the district. In addition, EPA and the Agency for Toxic Substances and Disease Registry have provided funding for the Pediatric Environmental Health Specialty Unit, which is offering important health information on lead in the D.C. community.

Conclusion

In closing, let me reiterate EPA's commitment to protect public health by identifying solutions to the lead problem in D.C. drinking water and ensuring that they are implemented quickly. We must learn from the past, but I am focused on working on

strategies that will help us move forward in a positive way. To that end, I am directing WASA to:

- test all lead service lines in 2004;
- expedite notification to customers of the results of water sampling at their residences;
- convey the necessary sense of urgency in all of its communications with the public, and;
- accelerate physical replacement of lead service lines to the maximum extent possible

Working closely with our public service partners and concerned citizens, we will continue to aggressively investigate this matter in the weeks ahead to provide needed assistance, determine the exact nature of the problem we are facing, and implement an appropriate balanced solution. EPA will not be satisfied until all aspects of this problem are resolved and the citizens of D.C. can once again be confident in the safety of their drinking water.

Thank you for the opportunity to testify this morning. I am pleased to answer any questions you may have.

* * *

Attachment 1

Flushing Guidelines for D.C. Residents

Because the source of lead found in drinking water is from lead service lines or household plumbing, levels are highest after water has been sitting in the pipes for a period of 6 hours or more.

All District of Columbia consumers should:

- Use cold water for drinking or cooking, as hot water will contain higher levels of lead. Cold water should be heated on the stove for drinking or cooking.
- For homes with non-lead service lines, flush water lines that have not been used for 6 hours or more by running the cold water (flush) for 60 seconds prior to using the water from a faucet for drinking or cooking.
- Periodically remove and clean the strainer/aerator device on your faucet to remove debris.

In addition, if consumers believe they have a lead service line, the following actions should be taken:

- Draw water for drinking or cooking after another high water use activity such as bathing or washing your clothes so that a total of at least 10 minutes of flushing has occurred. (The large amount of water used will flush significant amounts of water from your home's pipes.)
- Flush the faucet from which drinking water will be drawn by running the cold water tap for 60 seconds prior to use.
- Collect drinking water in a clean container and store in the refrigerator for use during the day.

Children and pregnant women are most at risk of adverse health effects from lead in drinking water. In an abundance of caution at this time, the D.C. Department of Health is recommending that pregnant women, nursing mothers, and children under 6 years old who live in homes with lead service lines should not drink unfiltered tap water.

Residents should not use tap water to mix baby formula and concentrated juices if the level of lead in their water exceeds 15 ppb or if they suspect they have a lead service line.

In homes where water tests have indicated elevated lead levels or which are suspected of having a lead service line, children or pregnant women should have their blood lead level screened to be sure they do not have elevated blood lead levels. The Department of Health provides information on how to have children screened for blood lead levels. The D.C. DOH can be reached by calling (202) 535-2626 or by visiting its web site (http://www.dchealth.dc.gov.). If a parent has additional concerns about a child's health, he or she should contact the child's pediatrician.

If consumers who are flushing water lines still have concerns about lead, they may want to consider switching to bottled water or purchasing a treatment device. Be sure to purchase a treatment device certified by an independent testing organization, such as NSF International. EPA does not certify or endorse home drinking water treatment devices. The NSF International website has information about certified drinking water treatment units at http://www.nsf.org/Certified/DWTU.

A point-of-use (POU) device should be selected that will be used after potentially lead-leaching plumbing components. POU devices must be installed and operated according to manufacturers instructions.

Attachment 2

LCR Compliance History in D.C.

The results of D.C.'s required tap monitoring exceeded the 15 ppb action level during 6 out of 15 monitoring reporting periods since January 1992 - three times prior to 1994 and three times since 2002 (see Table 1). WASA's predecessor, the Water and Sewer Utility Administration (WASUA) was responsible for LCR monitoring prior to October 1, 1996.

Monitoring Period Start	Monitoring Period End	Lead (ppb) 90th percentile
January 1, 1992	June 30, 1992	**18**
July 1, 1992	December 31, 1992	**15**
January 1, 1993	June 30, 1993	11
July 1, 1993	December 31, 1993	**37**
January 1, 1994	June 30, 1994	14
July 1, 1994	December 31, 1994	12
January 1, 1997	June 30, 1997	6
July 1, 1997	December 31, 1997	8
July 1, 1998	December 31, 1998	7
January 1, 1999	June 30, 1999	5
July 1, 1999	June 30, 2000	12
July 1, 2000	June 30, 2001	8
July 1, 2001	June 30, 2002	**75**
January 1, 2003	June 30, 2003	**40**
July 1, 2003	December 31, 2003	**63**

Corrosion Control Investigations

During the mid-1990's several studies were conducted to support identification of an optimal corrosion control treatment (OCCT) for the drinking water supplied to the Aqueduct's three customer systems. As these studies were being conducted, D.C. underwent several periods of elevated total trihalomethane (disinfection byproducts) levels, and total coliform levels, the latter of which resulted in violations of the Total Coliform Rule. These persistent events, which occurred between 1994-1996, delayed a

final OCCT designation to allow for a consideration of impacts from these contaminants and appropriate treatment changes.

In 1993-1994, the Washington Aqueduct conducted and prepared a corrosion control study as required by the LCR. The study, conducted by ECG, Inc., recommended that pH control be utilized for OCCT and was submitted to Region III by the Aqueduct in June 1994 for review and designation of OCCT.

In 1995, at Region III's request, an EPA contractor (Wade Miller Associates) conducted a sanitary survey of the District's drinking water distribution system. The survey included an evaluation of the OCCT recommendation with regard to overall water quality. The contractor recommended that additional consideration be given to the use of a phosphate-based corrosion inhibitor to control corrosion, increase the effectiveness of the chlorine disinfectant, and reduce TTHM levels in the system. The contractor recommended that EPA not designate OCCT until more information was obtained about issues raised during the survey.

An administrative order (AO) issued against WASUA in July 1996 for repeated violations of the Total Coliform Rule included requirements for corrosion control treatment actions. When WASA began operation on October 1, 1996, it assumed the responsibility for compliance with the AO.

In 1996, Region III engaged Black and Veatch, Inc. to further study the effect of OCCT on the overall quality of the District's drinking water. While Black and Veatch initially believed that a phosphate-based corrosion inhibitor might be effective in D.C., the recommendation was revised because evidence had become available that the use of a phosphate-based corrosion inhibitor in a distribution system with predominately

unlined cast iron pipes, such as the District's, might result in other water quality problems. Therefore, the contractor recommended that pH adjustment continue to be used to control corrosion but that efforts be made to maintain a high pH of the treated water .

On July 15, 1997, the EPA Region III Water Protection Division issued a conditional OCCT designation to the Aqueduct and WASA which directed that pH adjustment continue to be used for corrosion control. The OCCT designation was conditioned to require that the Aqueduct and WASA conduct additional studies to determine if alternative treatments could be made. During 1997-1998, the Aqueduct contracted with Malcolm Pirnie to evaluate potential treatment changes for pH adjustment and corrosion control. WASA conducted a study evaluating the impact of potential drinking water treatment changes on wastewater.

After reviewing additional information provided by the Aqueduct and WASA studies required by the conditional OCCT designation and AO, EPA designated pH adjustment as the OCCT for the D.C. water system on February 29, 2000.

In November 2000, the Aqueduct replaced its secondary disinfection treatment by converting from free chlorine to chloramines. The primary purpose of this change was to ensure compliance with EPA's updated and more stringent requirements for disinfection byproducts.

WASA was not required to conduct lead monitoring in 1995 and 1996 because it was conducting its OCCT study. Lead levels in tap samples during three years worth of monitoring between 1997-1999 ranged from 8 - 12 ppb at the 90th percentile. The low

levels allowed WASA to reduce its lead and copper tap monitoring from 100 to 50 samples per year.

The OCCT implemented by the Aqueduct appeared to be effective in minimizing lead levels until the period between July 1, 2001 - June 30, 2002. WASA was required to submit a report on results within 10 days of the end of the monitoring period. EPA received a final report from WASA on August 27, 2002 indicated that the 90th percentile value had increased to 75 ppb during that period.

Chronology of Recent Events

The action level exceedance for the period ending in June 2002 triggered provisions in the LCR that required WASA to complete the following actions:

- Resume full monitoring for lead and copper at the customers' taps by sampling a minimum of 100 customers taps during subsequent 6-month monitoring periods.
- Prepare and implement a public education program to advise consumers on how to protect themselves from exposure to lead in drinking water and inform them of steps that will be taken to reduce the lead level.
- Develop and undertake a lead service line replacement (LSLR) program. The Lead and Copper Rule requires that a system replace 7 percent of the lead service lines which the system owns each year until all of the lines have been replaced, or until tap water monitoring indicates that its 90th percentile lead level is equal or less than 15 ppb. If the sample for a service line shows a concentration below the action level, the line serving that house is considered to be replaced for the purposes of meeting the 7 percent requirement.

On January 1, 2003, WASA began a required tap sampling program with increased monitoring frequency and an increased number of sampling sites. The lead action level was exceeded for both monitoring periods in 2003, with 90th percentile

values of 40 ppb (January 1 to June 30, 2003) and 63 ppb (July 1 to December 31, 2003).

Starting in March 2003, WASA began an expanded sampling program to evaluate the lead concentrations leached into water from lead service lines using a protocol that differed from that used for required tap monitoring. The Region did not receive the detailed sampling results from the lead service line testing program until October 27, 2003. This information was reviewed by our technical staff with an eye towards determining how to address the underlying cause of the corrosion problem.

On November 19, 2003, EPA Region III technical staff completed the initial review of the WASA LSLR report, which reported that WASA had physically replaced 385 lead service lines and that an additional 1,241 lines were considered replaced because they had monitoring results below the 15 ppb action level.. The report indicated that 3,372 of 4,613 lead services lines tested through September 30, 2003 had lead levels exceeding the action level. In many cases, lead levels were very high, with nearly 3% of lines above 300 ppb and 18.5% above 100 ppb. The LCR has no provision to address extremely high lead levels other than to include them in the schedule for replacement. EPA has completed its review of the WASA LSLR for 2002-2003 and will be requesting WASA to submit a modified LSLR plan for 2003-2004 that will continue the expanded monitoring program and accelerate lead service line replacement.

We understand that, as of December 31, 2003, WASA has collected a cumulative total of about 6,000 lead service line water samples. Region III has requested that WASA report further lead service line testing results on a monthly basis

rather than on an annual basis as specified in the regulations. The first report will provide all the lead service line replacement information going back to the beginning of the current compliance period that began October 1, 2003. For homes where WASA conducts a partial lead service line replacement, Region III has requested that WASA provide detailed flushing instructions to the resident so that they can take steps to minimize their exposure to very small lead particles dislodged during the replacement.

Public Notification of Lead Concerns

Once the Action Level for lead (15 ppb) was exceeded, WASA was required to do all of the following activities. The Region is conducting a thorough compliance review and audit of WASA's files to determine if it met all requirements.

- Annually, insert informational notices containing mandatory written language in each customer's water utility bill, along with a special alert on the face of the bill or on the envelope. Systems that do not bill monthly, as was the case with WASA in 2002, may use an alternate method of delivering this information to its entire service area. WASA delivered a public education information guide, "Living Lead-Free in D.C.," to all residents through the Washington Post delivery service and separately to all other addresses in the District in October 2002. In August 2003, the information was included in the "What's On Tap" newsletter delivered with water utility bills.

- Annually, submit all mandatory written language to major daily and weekly newspapers. WASA submitted this information to the Washington Post and the Washington Times in October 2002. However, WASA has yet not demonstrated that it delivered this information to major newspapers in 2003.

- Annually, deliver pamphlets and/or brochures to facilities and organizations that serve high risk populations, containing the mandatory language on the health effects of lead and steps that can be taken to reduce exposure to lead in drinking water. WASA delivered brochures to facilities and organizations such as schools, libraries, and clinics in November and December in 2002 and September 2003.

- Every six months, deliver Public Service Announcements (PSAs) containing mandatory language to at least five radio and five television stations with the largest broadcast audiences. WASA delivered PSAs to seven television stations and 19 radio stations in October 2002; and to five television stations and 14 radio stations in September 2003. However, WASA has not demonstrated that it issued PSAs at intervening 6-month milestones.

- WASA was also required to include the lead sampling results in its Annual Consumer Confidence Report (Water Quality Report). This was done in WASA's 2002 Water Quality Report, advertised in the Washington Post and delivered to District residences in June 2003.

WASA completed many of the substantive elements of public education required by our regulations: development and distribution of educational information on lead, public service announcements, and offering free sampling in response to any customer's request. WASA initiated and advertised a Lead Service Hotline and had informational materials on its web site. WASA created an incentive program, offering customers who were suspected to have lead service lines an incentive of $25 to have their water tested.

As long as WASA continues to exceed the lead Action Level, they must continue to perform public education and outreach. Looking forward, by August 2004 they must deliver public education materials to all customers and major television and radio broadcast outlets; and deliver brochures and/or educational information to public and private organizations to reach high risk segments of the population (e.g., pregnant women and young children). WASA must report by March 10 whether it provided PSAs to radio and television stations in February and must provide PSAs again in August, and report by September 10, 2004. The sampling results for required tap monitoring from 2003 must be reported in the 2003 Water Quality Report, which must be delivered to consumers by July 1, 2004.

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