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GETTING THE LEAD OUT: THE ONGOING QUEST FOR SAFE DRINKING WATER IN THE NATION'S CAPITAL

HEARING

BEFORE THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

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GETTING THE LEAD OUT: THE ONGOING QUEST FOR SAFE DRINKING WATER IN THE NATION'S CAPITAL

FRIDAY, MARCH 11, 2005

HOUSE OF REPRESENTATIVES,
COMMITTEE ON GOVERNMENT REFORM,
Washington, DC.

The committee met, pursuant to notice, at 10:20 a.m., in room 2154, Rayburn House Office Building, Hon. Tom Davis (chairman of the committee) presiding.

Present: Representatives Davis and Norton.

Staff present: David Marin, deputy staff director/communications director; Keith Ausbrook, chief counsel; Amy Laudeman, special assistant; John Hunter, counsel; Rob White, press secretary; Drew Crockett, deputy director of communications; Teresa Austin, chief clerk; Sarah D'Orsie, deputy clerk; Corinne Zaccagnini, chief information officer; Rosalind Parker and Alexandria Teitz, minority counsels; Earley Green, minority chief clerk; and Jean Gosa, minority assistant clerk.

Chairman Tom DAVIS. The committee will come to order. I apologize, we were a couple minutes late.

If you step outside of this hearing room and you try to get a drink of water from the drinking fountain, you can't. Every drinking fountain in the Capitol complex has been shut off. Go into any bathroom in this building and you will be confronted with a big red sign that reads, "Do not drink water from restrooms." Why? Because of the elevated lead levels in the drinking water supply.

I have here the January, 7, 2005 message from the Architect of the Capitol that warns of the elevated lead levels which, without objection, I ask to be inserted in the record.

In the Capital of the most advanced and powerful Nation in the world, the water supply is not safe for drinking. This discovery came on the heels of elevated levels of lead found in the District of Columbia's water supply. What exactly is going on?

Today marks the third investigative hearing that the Government Reform Committee has conducted into the causes of the elevated lead levels in the District of Columbia's water supply. This is a situation that affects every individual of the District, including the Congress and the rest of the Federal Government.

In our hearings on March 5 and May 21, 2004, the committee assessed the progress being made by EPA, the Washington Aqueduct, and the WASA, in combating the lead problem in the District, and the sufficiency of steps being taken to address the problem; the re-

mediation process, lead replacement and changes to water treatment. We also explored potential measures designed to assure that the regulations governing lead content in the water supply and requirements for coordination among the responsible governmental agencies were effective in ensuring the safety of the drinking water in the District of Columbia and throughout the Nation.

Since those hearings, several developments have occurred that are central to the critical issues raised by the level of safety in the District water supply. One is the Administrative Order for Compliance on Consent and the Supplemental Order between EPA Region III and WASA, where WASA agreed to comply with the corrective actions specified by EPA, which extended beyond the minimum compliance requirements of the Safe Drinking Water Act and EPA regulations. Actions required by WASA included development and implementation of, one, accelerated lead service line replacement; two, a public education plan with education materials approved by the EPA; three, a plan and schedule for enhanced monitoring and reporting of lead levels and data base management; and four, a plan to distribute water filters to all households that have lead service lines.

Another significant development is EPA's announcement earlier this week of preliminary results in its nationwide review of the effectiveness of the lead and copper rule in monitoring and evaluating the lead levels in the water systems throughout the country.

Overall, EPA found that lead levels were not elevated nationwide as they were in the District of Columbia. EPA determined that the framework for the current rule was reasonably effective in achieving its purpose. Therefore, EPA did not recommend any wholesale changes in the lead and copper rule, but did identify a number of clarifications and improvements to the rule and accompanying guideline documents which it believes will facilitate compliance by the water systems across the country. The specific recommended changes are included in the EPA's plan of action, which I am sure will be outlined by EPA in its testimony.

I am generally pleased that EPA has taken these actions. Based on my initial review of the EPA's findings, I believe that this is a step in the right direction for assuring that the lead and copper rule is effective in protecting the Nation's water supply from excessive lead levels.

I look forward to hearing more about the recommendations from EPA, the water systems across the country, and other interested parties. Also, I am encouraged that EPA will continue to evaluate the situation, and will await its further recommendations.

We have a distinguished panel of witnesses before us. I look forward to hearing their testimony on Federal regulations concerning the monitoring of lead levels in drinking water, the status of the District of Columbia's drinking water lead levels, the remediation efforts, and EPA's recently announced plan for actions that includes changes to the lead and copper rule.

We will hear from the EPA, the U.S. Army Corps of Engineers, Washington Aqueduct, the District of Columbia Water and Sewer Authority, the American Water Works Authority, the National Resources Defense Council, and an independent consultant.

[The prepared statement of Chairman Tom Davis follows:]

Opening Statement
Chairman Tom Davis
Committee on Government Reform
"Getting the Lead Out:
The Ongoing Quest for Safe Drinking Water in the Nation's Capital"
March 11, 2005

If you step outside of this hearing room and try to get a drink of water from the drinking fountain — you can't! Every drinking fountain in the Capitol complex has been shut off. Go into any bathroom in this building and you will be confronted with a big red sign that reads "DO NOT DRINK WATER FROM RESTROOMS." Why? Because of elevated lead levels in the drinking water supply.

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In our hearings on March 5 and May 21, 2004, the Committee assessed the progress being made by EPA, the Washington Aqueduct, and WASA in combating the lead problem in the District and the sufficiency of steps being taken to address the problem: the remediation process, lead replacement, and changes to water treatment. We also explored potential measures designed to assure that regulations governing lead content in the water supply and requirements for coordination among responsible governmental agencies were effective in ensuring the safety of drinking water in the District of Columbia and throughout the nation.

Since those hearings, several developments have occurred that are central to the critical issues raised by the level of safety of the District water supply. One is the Administrative Order for Compliance on Consent and the Supplemental Order between EPA Region III and WASA, where WASA greed to comply with the corrective actions specified by EPA, which extended beyond the minimum compliance requirements of the Safe Drinking Water Act and EPA regulations. Actions required by WASA included development and implementation of: (1) accelerated lead service line replacement; (2) a public education plan with education materials approved by EPA; (3) a plan and schedule for enhanced monitoring and reporting of lead levels and data base management; and (4) a plan to distribute water filters to all households that have lead service lines.

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We have a distinguished panel of witnesses before us. I look forward to hearing their testimony on federal regulations concerning the monitoring of lead levels in drinking water, the status of the District of Columbia's drinking water lead levels and remediation efforts, and EPA's recently-announced plan for actions that includes changes to the Lead and Copper Rule. We will hear from the Environmental Protection Agency, the U.S. Army Corps of Engineers Washington Aqueduct, the District of Columbia Water and Sewer Authority, the American Water Works Authority, the National Resources Defense Council, and an independent consultant.

January 7, 2005

A MESSAGE FROM THE ARCHITECT OF THE CAPITOL

This week, the Environmental Protection Agency (EPA) verbally advised the Office of the Architect of the Capitol (AOC) that obtaining drinking water from any **restroom sink** should be discouraged. Please be aware that some office kitchenette sinks may be of restroom-type construction. The reason for this advisory is that standards restricting the amount of lead that can leach from plumbing components have only been in place since 1996 and the standards exempt some types of bathroom faucets. Many restroom sinks installed throughout the Capitol complex pre-date that standard.

To fully understand the actual conditions on Capitol Hill, the AOC is in the process of comprehensively sampling drinking fountains and kitchen, kitchenette, and restroom faucets. Capitol Hill-wide sampling is being conducted in accordance with established EPA protocols under the direction of the Federal Occupational Health; Public Health Services. The AOC will take appropriate actions as results arrive and will communicate building specific results with occupants in the coming weeks.

In the interim, please find the attached fact sheet about safe drinking water that was prepared by the Office of the Attending Physician (OAP).

Background

Upon the discovery of elevated levels of lead in the Washington, D.C., water supply in spring 2004, the AOC sampled the water supply on Capitol Hill as a precaution. Initially, the AOC sampled 246 locations across Capitol Hill starting with the child care facility and the page dorms. All readings from comprehensive testing done at the child care and dorm facilities were well below EPA established guidelines. This testing confirmed that service lines leading into our buildings were not creating elevated drinking water lead levels and indicated that isolated sinks or water fountains in office building locations had slightly elevated levels of lead. These locations were immediately taken out of service and/or maintenance actions were identified and taken. The OAP reviewed the procedures and test results taken and continues to provide medical advice regarding this situation.

Last summer, the Washington Aqueduct began adding orthophosphate to the drinking water system-wide to prevent lead from leaching into drinking water. According to the EPA, it will take "six months to a year to be sure that a protective film is building up in the pipes to block further lead corrosion."

Please contact my office at 228-1793 or Ms. Susan Adams, Director of Safety, Fire, and Environmental Programs at 226-0630 if you have any questions or require further information.

Chairman TOM DAVIS. I now recognize the distinguished ranking member, Ms. Norton, for her opening statement.

Ms. NORTON. Thank you very much, Mr. Chairman.

The sad story of lead in the drinking water supply of the Nation's Capital ultimately became a case study in the country's undiscovered drinking water problems. As a result of the revelations reported here, many water systems throughout the country were found to have excessive lead levels, with little oversight or public notification and exposure. The discovery here did not originate where Congress intended, with the assigned regulator, the Environmental Protection Agency, D.C. residents and this committee have reason to be grateful that we live in a society and in a city where there is a free and inquiring press, and in this case, a series of Washington Post articles.

Of course children, under 6, many vulnerable residents and a woman who had been pregnant who testified at our last hearing were not alerted in time and live with whatever the consequences may be.

Hearings by the D.C. City Council and this committee uncovered what appeared to be at first unseemly collusion among EPA, the District of Columbia Water and Sewer Authority and the Washington Aqueduct. How else to explain lead levels sometimes frighteningly above the 15 parts per billion threshold, fine print notification not designed to alert residents, and a change in water chemical purification without a corrosion control study?

However, I believe it is now clear that the shocking lead water crisis here was not a case of cynical collusion by the agencies involved. To recoin a phrase, "it was the rule, stupid," and of course it was not enforcement of the rule such as it was. EPA's response with a so-called Drinking Water Lead Reduction Plan announced on Monday, along with the belated administrative orders to WASA, seem to bear out this conclusion. However, since last year EPA, WASA and the Washington Aqueduct have had an additional incentive to add provided by the Lead Free Drinking Water Act of 2004 introduced in the last Congress by ranking member Henry Waxman, Senator Jim Jeffords and me.

We wrote our bill not because the parties at fault were bad boys, we wrote our bill because the EPA's rule and regulations were riddled with major flaws. Because, for example, the rule that purported to assure safe drinking water all but invited utilities to cheat in evaluating lead levels, and that is exactly what WASA deliberately did, allowed some residents whose tests indicated high lead levels to continue to drink unsafe water without ever being informed, failed to assure scientifically valid and enforceable maximum levels of lead and copper in drinking water, and allowed changes in chemicals for water purification without testing their safety. The question before us today is whether these problems have been corrected.

Lead in D.C.'s drinking water was revealed more than a year ago, yet it took until 4 days ago for EPA to hurriedly issue a six-page document, not the required change in the rule or regulations, and only after this hearing was announced. Unfortunately, looking for the moment at the major problems that cause the District's crisis, the brief outline that EPA has provided appears to show that

the Agency's initial plan largely ignores the rule's key flaws, including lack of enforceability, inadequate notice requirements and insufficient monitoring requirements.

If EPA believes that what it is proposing today would have prevented the tragedy that occurred here in the District, the Agency will need, this morning, to explain how.

As these opening remarks indicate, I have not yet fully recovered from living in the most visible city on Earth while my constituents, Federal employees and millions of visitors unknowingly drank lead contaminated water with the full knowledge of the three responsible agencies. Public confidence in the delivery of the most basic of life-sustaining substances was shattered. The obligation of this committee is to help rebuild public trust. We can meet this obligation only by requiring that the appropriate burden of delivery, regulation and enforcement be placed on the assigned agencies. This hearing is designed to assure that the three agencies are meeting the full burden of their responsibilities to the public. We welcome all of today's witnesses and appreciate their testimony.

Thank you very much, Mr. Chairman.

Chairman Tom DAVIS. Thank you, Ms. Norton.

[The prepared statement of Hon. Eleanor Holmes Norton follows:]

Statement of Congresswoman Eleanor Holmes Norton
Committee on Government Reform
"Getting the Lead Out: The Ongoing Quest for Safe Drinking Water in the Nation's Capital"

March 11, 2005

The sad story of lead in the drinking water of the nation's capital ultimately became a case study in the country's undiscovered drinking water problems. As a result of the revelations reported here, many water systems throughout the country were found to have excessive lead levels with little oversight or public notification and exposure. The discovery here did not originate where Congress intended with the assigned regulator, the Environmental Protection Agency. D.C. residents and this committee have reason to be grateful that we live in a society and in a city where there is a free and inquiring press, and in this case, a series of Washington Post articles. Of course, children under 6, many vulnerable residents, and a woman who had been pregnant who testified at our last hearing were not alerted in time and live with whatever the consequences may be.

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Chairman TOM DAVIS. We are going to now recognize our first panel. We have the Honorable Benjamin Grumbles, the Assistant Administrator of the EPA Office of Water. We have Donald Welsh, the Regional Administrator, Environmental Protection Agency Region III; Thomas Jacobus, general manager Washington Aqueduct U.S. Army Corps of Engineers, and Jerry Johnson, who is the general manager of the District of Columbia Water and Sewer Authority.

You know it is our policy that we swear you in before you testify, so if you would rise with me and raise your right hands.

[Witnesses sworn]

Chairman Tom DAVIS. Thank you very much. Please be seated.

Mr. Grumbles, we will start with you. You are administrator of this committee; we appreciate your fine work, and thanks for being with us.

STATEMENTS OF BENJAMIN GRUMBLES, ASSISTANT ADMINISTRATOR, EPA OFFICE OF WATER; DONALD WELSH, REGIONAL ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY REGION III; THOMAS JACOBUS, GENERAL MANAGER, WASHINGTON AQUEDUCT, U.S. ARMY CORPS OF ENGINEERS; AND JERRY JOHNSON, GENERAL MANAGER, DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

STATEMENT OF BENJAMIN H. GRUMBLES

Mr. GRUMBLES. Thank you, Mr. Chairman and Congresswoman Norton.

I am Ben Grumbles, Assistant Administrator for the Office of Water at the EPA, and I am joined by Don Welsh, who is the Regional Administrator for Region III Mid-Atlantic region.

I want to take a few minutes to describe what has happened over the last year in terms of our response and our review, and since the last hearing, and also describe our response.

Congresswoman, I would like to say at the outset that the response that was described on Monday is something that we have been working on for quite a long time, it wasn't hastily prepared; it is something that is also a living document in the terms of—we want it to be made very clear that it's not the end of the story, it is the beginning, a chapter where we are saying yes, regulatory changes are required, they're needed, and we are going to continue to review some of the other more comprehensive issues that we don't yet have enough data to make a regulatory determination on.

So the first thing I would like to do, Mr. Chairman, is just very briefly describe our response since your hearings, and since the incident involving the drinking water problems in the District.

The first thing we did was have a comprehensive data call. The last time we had the hearing in your committee we had only 25 percent of the utilities in the country that had the data that had been submitted to the States. Since then, we have made a major call to get the information in to be able to assess how the rule has been working, and we have 95 percent of that data in. We have also conducted audits of the State data verification plans, and we are currently working on revising and reviewing those and providing a report on the States.

Congresswoman, we have had site inspections of 484 facilities working with those 10 States; a major amount of work has gone into it. We have the conclusion that the rule, basically 96 percent of the utilities across the country that are subject to the rule, are staying below the 15 part per billion 90th percentile action level. So 96 percent. But that doesn't mean we're here to defend the status quo, what it means is that we're here to change the status quo, and that means targeted revisions to the rule, coupled with important guidance and other measures.

On Monday, we described the initial list of items, regulatory changes that we plan to propose. I would describe these as becoming part of a significant upgrade—not a major overhaul of the rule because we think that the fundamental framework of it works, but we do recognize there is some areas that need to be improved, and that's what the focus is of the regulatory changes. And the major themes of these changes, of the ones we are identifying right now, saying we are moving forward with and plan to propose in regulation by the end of the year or shortly thereafter, focus on improved monitoring, awareness, proactive management, and schools. And on the monitoring your committee has made very clear, and we agree, that there are some areas that need to be tightened in terms of the time, place and manner of how samples are collected and how the 90th percentile is calculated.

The awareness issue is a focal point for us, and we are proposing to change the rules to require—we recognize that homeowners and parents and teachers at public water systems have a right to know about the results when their tap water is tested. So we plan to require, in regulation, that customers be notified of the results.

We also are planning to revise the public education language. Learning from the District, we believe that it's important to get the wording right to convey the proper degree of awareness and motivation to help reduce risk.

Mr. Chairman, we also have some specific elements related to lead service lines and to simultaneous compliance, focusing on the areas that you raised in your letters to us.

The last thing I want to mention is the importance of schools. Schools should be safe havens for learning, and it is incumbent upon all of us to put more attention and focus on drinking water in schools. So we are planning to have a significant revision to the 1994 guidance, focusing on testing and telling and training to improve the protection and awareness for lead in drinking water in schools.

Mr. Chairman, I appreciate your patience, and the Congresswoman; I would be happy to respond to any questions you have.

Chairman Tom DAVIS. Thank you very much.

[The prepared statement of Mr. Grumbles follows:]

STATEMENT OF
BENJAMIN H. GRUMBLES
ASSISTANT ADMINISTRATOR FOR WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
GOVERNMENT REFORM COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES
March 11, 2005

Good morning, Mr. Chairman and Members of the Committee. I am Benjamin Grumbles, Assistant Administrator for Water at the United States Environmental Protection Agency (EPA). I welcome this opportunity to return to the Committee to update members on activities that EPA has been taking at the national level to address the issue of lead in drinking water. Regional Administrator Welsh will update you on efforts to address the specific situation related to elevated lead levels in the District of Columbia's (D.C.'s) drinking water.

Background on the Lead and Copper Rule

First I want to review the purpose of the Lead and Copper Rule (LCR). As you may remember, 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 actions they can take to reduce their exposure to lead, through public notices and public education programs. If a water

utility, 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 until such time that the utility's 90th percentile results demonstrate that it is below the action level for two consecutive monitoring periods.

The action level for the rule is 15 parts per billion as calculated by the 90th percentile of tap monitoring results. If lead concentrations exceed the action level in more than 10% of the taps sampled, the utility must undertake a number of additional actions to control corrosion and to inform the public about steps they should take to protect their health. It is important to note that exceeding the action level does not constitute a violation. A utility incurs a violation if it fails to carry out actions required by the regulations.

Some utilities may be able to achieve 90th percentile levels that are below the action level without corrosion control treatment because they either do not have significant sources of lead in their system (e.g., lead service lines) or because the water is naturally non-corrosive. However, as a precautionary measure, the rule required large utilities serving more than 50,000 people to conduct studies of corrosion control and install state-approved optimal corrosion control treatment by January 1, 1997. Small and medium sized utilities are required to optimize corrosion control when monitoring at the consumer taps shows action is necessary.

National Activities to Evaluate Lead in Drinking Water

Since I last appeared before this committee on May 21, 2004, my staff have been carrying out a number of activities to address the specific issue of lead in drinking water

from a national perspective. We have also continued to work with the Region to provide technical assistance in identifying a treatment solution for D.C.

Our national review placed a focus on determining if the existing rule is being effectively implemented by states and local communities and on identifying where additional guidance or changes to the regulation might be needed to improve implementation. Earlier this week we announced our decision to move forward on implementing a number of actions to respond to findings from our review. As part of our plan, we are going to initiate an effort to make several targeted changes to the regulations and significantly revise two guidance documents. We expect to complete the process needed to propose regulatory revisions and complete the guidance documents in late 2005 or early 2006.

We will continue to review implementation of the regulations and maintain oversight efforts to ensure that the rule is being carried out effectively at the state and local level. We will continue to work with partners to promote research in key areas, and on efforts to protect children from lead (including partnerships between utilities and schools to test for lead). We will also convene an additional expert workshop in mid-2005 to discuss issues associated with the lead content of plumbing fittings and fixtures and performance standards to control leaching of lead.

We will also continue to work on a number of other issues that require additional data collection, research, analysis and/or full stakeholder involvement to support decisions. Our intent is to add elements and actions to this plan as needed to respond to the results of any further research, analysis and evaluation.

Before going into the details of our plan, I want to review the activities we carried out to help us make decisions. During the year we: (1) collected and analyzed lead concentration data and other information required by the regulations; (2) carried out a review of implementation in states; (3) held four expert workshops to further discuss elements of the regulations; and (4) worked to better understand local and state efforts to monitor for lead in school drinking water, which included a national meeting to discuss challenges and needs.

Analysis of Monitoring Results

When I first testified before you last year, I was unable to give you a complete picture of the degree to which water utilities were exceeding the action level. This was because we had data for fewer than 25% of the utilities for which states are required to report to EPA's Safe Drinking Water Information System (SDWIS). Clearly this was unacceptable. Our focus for much of last year was to ensure that we had complete information in our data system. States responded to our request to update the database, and we now have data for more than 95% of the utilities serving more than 3,300 which are required to report all 90th percentile results.

Our review of the data suggests that the rule's focus on minimizing lead exposure by controlling corrosion in treated water has been successful. Data provided by states indicates that 90th percentile levels for approximately 96% of the utilities subject to the rule are below the 15 ppb action level - due, in part, to efforts taken by utilities to control corrosion. This is not meant to diminish the clear challenges that DC and some other cities have experienced and continue to experience. Utilities must remain vigilant to ensure that treatment continues to control corrosion. A summary of

the data that we posted on our website in late June 2004 showed that 88 of 2,758 (3.2%) utilities serving more than 3,300 people had exceeded the action level for monitoring periods ending after January 2003. We are working to update that summary to reflect data received as of late January 2005 which includes data from additional water utilities and for additional monitoring periods. A preliminary review of that data indicates that 111 of 3,552 utilities (3.1%) exceeded the action level for monitoring periods ending after January 2003, a percentage consistent with our June 2004 value.

Review of Implementation at the State and Utility Level

Early in our review of implementation we identified several areas where states or utilities were misinterpreting the rule, in particular in how states were managing samples. In November 2004, I issued a memorandum to Regional Administrators to remind states and utilities of specific requirements in order to ensure that utilities would promptly begin implementing the required sampling protocols.

Between August and December 2004, we carried out detailed reviews of implementation in 10 states, one in each region. We reviewed individual files for more than 450 utilities with a focus towards determining if 90th percentiles are properly calculated, reviewing responses to action level exceedances and identifying potential sampling issues related to site selection, changes in sampling sites, repeat sampling, and invalidation. Our goal was to identify common issues associated with implementation that may need to be addressed by training, guidance, or regulatory changes.

Currently we are working to complete an analysis of the information collected as part of the on-site reviews. This will help us to further identify areas on which to target

oversight and compliance assistance efforts. We will also work with the individual states reviewed to address and correct problems identified during the reviews.

Expert Workshops

When I last appeared before you in May 2004, I informed you about two of our expert workshops that had been held earlier that month. Those two workshops focused on monitoring programs and simultaneous compliance (which is related to the considerations utilities must take into account to balance treatment processes in addressing multiple risks).

We convened two additional expert workshops in the latter half of 2004. The first focused on public education requirements of the rule and risk communication practices. Participants discussed specific concerns with the existing public education language in the rule and suggested potential approaches to improve and refine the message content. Participants also discussed methods to improve risk communication to the public - by establishing partnerships with health departments and other groups, improving message delivery, and spending more time planning and evaluating the effectiveness of risk communication.

The final workshop held in 2004 was focused on lead service line replacement. Participants discussed four general topics related to lead service line replacement: inventory management, replacement methods, testing (before and after replacement), and communication. Participants discussed the problems they have encountered in these topic areas, particularly in motivating customers to take action with respect to replacing lines or taking protective measures, and provided suggestions for guidance, and training that the Agency could provide to help states and utilities.

Our experience with the workshops was very positive. We received more than 200 suggestions from participants which included rule changes to improve implementation, additional guidance to help utilities make decisions, and research needs to help better understand specific issues related to achieving corrosion control. We provided summaries of each workshop on our website and considered all of the suggestions as we moved forward to make decisions on next steps.

Lead in Schools

In July of last year, we released a report that summarized the responses we received from state public health and environmental programs on program efforts they had undertaken to address lead in school drinking water. States agreed that minimizing lead in drinking water consumed by children is important and many are conducting surveys, expanding outreach efforts and taking advantage of partnerships to help them reach schools. They responded that they had implemented the requirements associated with the Lead Contamination Control Act of 1988 and continue to focus on ensuring that schools with their own water system are in compliance with the LCR. While several states have developed specific programs that are focused on improving drinking water quality and environmental health at schools, others indicated that it could be difficult to expand programs beyond existing efforts.

In December, 2004, we hosted a meeting, in partnership with the Department of Education, to discuss school and child care facility drinking water issues. Participants included representatives from the CDC, state associations representing schools and child care facilities, state public health program staff, water utilities, and environmental and educational advocate organizations. Panelists discussed the differences between

regulated schools and child care facilities with their own water supplies and those that are served by other community water systems. Panelists also discussed issues associated with testing, remediation and communication strategies. They expressed a clear need for an update to EPA's existing guidance and additional guidance to help water utilities and school districts address this important issue.

Drinking Water Lead Reduction Plan

Based on the information derived from our review we have identified several opportunities to improve and clarify specific areas of the existing rule and our guidance materials. Earlier this week I announced efforts we are undertaking as part of our Drinking Water Lead Reduction Plan. In addition to continuing our oversight responsibilities and identifying opportunities for strategic partnerships, we are proposing nine targeted changes to the regulations and updating and expanding two guidance documents. Our focus is strengthening protection in five major areas: monitoring, treatment processes, customer awareness, lead service line management, and lead in school drinking water.

Monitoring

As previously noted, the Agency released guidance in November 2004 to clarify some existing requirements of the regulations. To address confusion about sample collection we will propose revision to the regulations to clarify language in the regulation that speaks to the number of samples required and the number of sites from which they should be collected. We will also propose modifying definitions for a monitoring period and compliance period and clarifying that all samples must be taken within the same

calendar year. Finally, we will propose to revisit provisions relating to criteria for reduced monitoring to reconsider allowing large utilities above the action level to reduce tap monitoring based solely on the results of their water quality parameter monitoring.

Treatment Processes

At our expert workshop on simultaneous compliance, we clearly heard the message that utilities and states could use additional guidance on how to consider the potential effects on corrosion control when a utility makes treatment changes to address other drinking water regulations. In 1999, EPA released a guidance on simultaneous compliance to accompany the Stage 1 Disinfection Byproducts Rule. The Agency is currently working to finalize its Stage 2 Disinfection Byproducts Rule and will provide an updated and expanded simultaneous compliance guidance to accompany that rule-making. The American Water Works Research Foundation is also working to develop materials to assist utilities in this area. To further address concerns that utilities may not adequately consider the effects of treatment changes on corrosion control, we will propose a rule change to require that a utility notify the state 60 days prior to a treatment change, rather than 60 days after such a change. This will allow the state an opportunity to provide input on the utility's decision to make treatment changes and to require additional monitoring, if the state determines that additional monitoring is needed.

Customer Awareness

As you know, one of the significant concerns in D.C. was that homeowners were not notified of the results of tap monitoring that took place in their homes. While many

utilities indicate that they provide the results of monitoring to customers, there is no requirement in the regulations. To address this issue, we will propose changes to the regulation to require that utilities provide occupant notification of the results of monitoring to detect lead in drinking water. This would include homeowners who participate in tap monitoring programs and parents, students, and staff at schools that are required to monitor for lead in drinking water because they are also a regulated water utility. We will also seek changes to the regulations to permit states to allow utilities to modify the tap flushing directions to address local circumstances (e.g., 10 minute flushing recommendation for D.C.) and provide information to states and utilities to help them determine an appropriate flushing time to recommend to customers.

Lead Service Line Replacement

The regulations allow a utility to consider a lead service line that tests below the action level as "replaced" for the purposes of compliance. Many have been concerned that this is allowed and have requested that the Agency disallow the practice. At this time the Agency does not believe that the practice should be disallowed. If sampling shows that the levels of lead corroding from an individual household's service line and other plumbing are not elevated, then there is little benefit to incurring the cost and disruption of replacing the service line. However, we do not believe that a line that tests out should be permanently removed from the utility's inventory of lead service lines. Therefore, we are proposing to revise the rule to indicate that a line that tests out cannot be considered permanently replaced, such that if a subsequent treatment change

caused the utility to exceed the action level, the line would have to be reevaluated to ensure that it is not leaching elevated levels of lead.

Lead in School Drinking Water

As I mentioned, many participants at our public meeting on lead in school drinking water commented that our 1994 guidance, which was focused on lead in school drinking water and non-residential buildings, could use updating. We have begun to revise that document to focus on schools and child care facilities. It will include information on methods for testing, remediation, and communicating results to the public. EPA will also develop additional implementation guidance for schools and child care facilities that are regulated public water systems. My goal for schools is to emphasize prevention by focusing on the three "T"s - training, testing, and telling. We want to encourage schools and child care facilities to test drinking water outlets for lead. To this end, we are discussing developing partnerships with utility associations such as the American Water Works Association and other federal agencies to facilitate and encourage testing.

Oversight

We all know that a rule cannot be effective if it is not carried out. The Agency will continue its oversight efforts to ensure that the requirements of the rule are being met at the state and utility level. We will continue to provide assistance to improve implementation and coordinate with our counterparts at the federal and state levels as they pursue potential enforcement or compliance assistance actions.

Additional activities

We also have a number of additional activities underway to support our plan. One thing we heard time and again at our expert workshops was a frustration on the part of utilities that the Safe Drinking Water Act allows new plumbing fixtures and fittings to contain and leach lead. Their feeling was that materials that are in contact with water used for consumption should not contain lead. To help further that dialogue, we are planning to hold an expert workshop on lead content in plumbing materials in mid-2005. This workshop will consider the ability of manufacturers to develop products with much lower lead content and the ability of voluntary performance standards to control lead leaching from products.

We will work within EPA and with external research partners, such as the American Water Works Research Foundation, to promote research in key areas, which include gaining a better understanding of the effects of disinfectant treatment on corrosion, new and innovative methods to monitor for lead and copper corrosion and effective techniques in replacing lead service lines.

I want to be clear that we are not limiting our efforts to the specific items I have discussed today. We have also identified a number of issues that we will continue to review as part of potential, more comprehensive revisions to the rule or guidance. The issues require additional data collection, research, analysis and/or full stakeholder involvement to support decisions. The issues include, but are not limited to, revision of mandatory public education language to make sure it is relevant and understandable, requirements for consecutive systems, and broader revisions to monitoring and lead service line replacement requirements. We will provide additional information on these issues and others in the future as additional analyses are completed.

Conclusion

Mr. Chairman, our review of compliance and implementation, expert workshops and other efforts, have helped the Agency to determine how to move forward at this time. We believe the approach we are taking represents an appropriate response to the issues that have been identified. We will continue our efforts to review implementation and will work with members to respond to any questions or concerns you may have.

Our goal has been and will continue to be that the nation's citizens receive safe water and that utilities and States have the information they need to fully and effectively implement the rule and minimize risks to public health. EPA wants to ensure that citizens across the country are 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.

* * *

Chairman TOM DAVIS. Mr. Welsh.

STATEMENT OF DONALD WELSH

Mr. WELSH. Good morning, Mr. Chairman, and Congresswoman Norton. Thank you for the opportunity to provide an update on activities to resolve the problem of lead in drinking water in the District of Columbia.

EPA has maintained a priority focus on working with local officials and corrosion experts to reduce lead levels in the tap water. We have approved water treatment changes and are closely monitoring sampling results. We have issued administrative orders under the Safe Drinking Water Act to help ensure that people are protected and informed, and we have revised procedures and taken additional steps to achieve more effective oversight. We are committed to working with the city and other partners to meet the challenges involved in safeguarding residents and restoring full confidence in the drinking water in the Nation's Capital.

Since my last appearance before this committee, EPA Region III approved the application of orthophosphate to the drinking water supplied to the District of Columbia. Orthophosphate was recommended by the Technical Expert Working Group convened by EPA, and is used by many water systems nationwide to control corrosion.

Orthophosphate was added to the water in a small section of Northwest Washington, DC, in June 2004, and after evaluation and EPA approval, has been applied since August 23rd to the entire D.C. distribution system.

On January 10, 2005 the D.C. Water and Sewer Authority submitted to EPA its tap water sampling results for the second half of 2004. Those results indicated a 90th percentile lead level of 54 parts per billion. The data showed that 31 percent of the homes tested had lead levels above the EPA action level of 15 parts per billion. EPA's lead and copper rule requires that this percentage be reduced to 10 percent or below. Residents have been advised to continue to follow the advisory for flushing and filtering water before use for drinking or cooking.

Sampling results provided by WASA also show that lead levels toward the latter half of the 6-month monitoring period were lower than those from before or during early stages of the treatment. Until further rounds of monitoring are done and lead levels are consistently below the action level, it's too early to declare this treatment fully effective.

Experts in the field have indicated that it can take 6 months or more to begin seeing a drop in lead levels, and a year or more for the treatment to reduce lead levels below the EPA action level. We have not seen anything in the data or in WASA pipe loop simulations that leads us to believe that we're on the wrong track. The work is being reviewed at key points by an independent peer review panel formed by EPA.

In June 2004, Region III issued an administrative order on consent to D.C. WASA to address past violations, and to order public health protections on multiple levels, including water filters, lead service line replacement, notifications to customers, lead testing and enhanced public education.

The consent order with WASA was the result of a 4-month compliance audit that included onsite review of records, and detailed evaluation of thousands of pages of documents that were formally requested by EPA. We have instituted monthly compliance calls with WASA to ensure a full understanding of the obligations of the orders, and that the required corrective actions are being taken. Under this order, WASA is required to notify customers of the results of tap water sampling in writing within 3 days of obtaining the laboratory results, and to exercise its best efforts to provide customers with results within 30 days of taking the sample.

As a result of the order WASA submitted and EPA approved a plan to supply replacement water filters to those customers that have known or suspected lead service lines. WASA last spring distributed approximately 37,000 water filters certified for lead removal to those customers. In January, WASA reported that the manufacturer of one of the replacement cartridges would not be able to meet the delivery needs; as a result, a new filter pitcher system was delivered to approximately 7,500 affected homes.

In addition, the order compelled WASA to improve its efforts to communicate with the public on continuing developments regarding elevated lead levels in the water. Required public notifications have been made on time and with input from EPA. WASA has taken other communications initiatives and has hired George Washington University's School of Public Health to provide ongoing risk communication consulting. We have encouraged WASA to take full advantage of public education steps contained in EPA guidance and review documents.

On January 14, 2005 EPA issued a supplement to the order, which it cited WASA's failure to replace the required 7 percent of lead service lines in 2003, after determining that approximately 400 lead service lines were tested through an improper sampling technique. The supplemental order required WASA to notify customers who received inaccurate information and directed WASA to physically replace service lines equal to the number improperly sampled in 2003 in addition to those previously required.

The June 2004 consent order requires WASA to update its baseline inventory of lead service lines each year to recalculate the 7 percent of lines that must be replaced, to work with the D.C. Department of Health to establish criteria for health-based priority replacement of lines, and to implement a strategy to determine the makeup of service lines listed as unknown content.

In 2004, WASA exceeded the requirements for replacing the public portion of 7 percent of all lead service lines in their system. All of the approximately 1,700 replacements were actual physical replacements as prescribed in our administrative order. WASA has committed to replacing the public portion of all lead service lines by 2010. EPA Region III has revised its internal operating procedures. We've had more regular contact with D.C. officials, and we have taken a number of other steps to improve our oversight. I want to assure you of EPA's continued dedication to finding the best solutions to challenges that led to the public health concern in the District. We will continue to build on the progress that has been made, and we will keep the committee and the general public informed of developments in our work.

Thank you very much for the opportunity, Mr. Chairman.
Chairman Tom DAVIS. Thank you very much, Mr. Welsh.
[The prepared statement of Mr. Welsh follows:]

Written Testimony of
Donald S. Welsh
Administrator, Region III
U.S. Environmental Protection Agency
Before the
Committee on Government Reform
U.S. House of Representatives
March 11, 2005

Good morning, Mr. Chairman and Members of the Committee. I am Donald Welsh, Regional Administrator for Region III of the United States Environmental Protection Agency (EPA). Thank you for the opportunity to provide an update on activities to resolve the problem of lead in drinking water in the District of Columbia.

EPA has maintained a priority focus on working with local officials and corrosion experts to reduce lead levels in the tap water. We have approved water treatment changes and are closely monitoring sampling results. We have issued administrative orders under the Safe Drinking Water Act to help ensure that people are protected and informed. And we have revised procedures and taken additional steps to achieve more effective oversight.

We are committed to working with the city and other partners to meet the challenges involved in safeguarding residents and restoring full confidence in the drinking water in the nation's capital.

Water Treatment Changes and Lead Monitoring Results

Since my last appearance before this committee, EPA Region III approved the application of orthophosphate to the drinking water supplied to the District of Columbia. Orthophosphate was recommended by the Technical Expert Working Group convened by EPA, and is used by many water systems nationwide to control corrosion. The orthophosphate is intended to form a protective coating inside the pipes and fixtures to decrease the amount of lead leaching from lead service lines and customers' plumbing systems.

Orthophosphate was added to the water in a small section of northwest Washington, D.C., in June 2004, and, after evaluation and EPA approval, has been applied since August 23 to the entire D.C. distribution system.

On January 10, 2005, the D.C. Water and Sewer Authority (WASA) submitted to EPA its tap water sampling results for the second half of 2004 which indicated a 90th percentile lead level of 54 parts per billion (ppb). The data showed that 31 percent of the homes tested had lead levels above the EPA action level of 15 ppb. EPA's Lead and Copper Rule requires that this percentage be reduced to 10 percent or below. Residents have been advised to continue to follow the consumer advisory for flushing and filtering water before use for drinking or cooking.

Sampling results provided by WASA also show that lead levels toward the latter half of the six-month monitoring period were lower than those from before or during early stages of the treatment.

Until further rounds of monitoring are done and lead levels are consistently below the action level, it is too early to declare this treatment fully effective. The preliminary data is supported by laboratory experiments using actual WASA lead service lines and simulating the conditions in the distribution system, known as pipe loop studies.

Experts in the field have indicated that it can take six months or more to begin seeing a drop in lead levels and a year or more for the treatment to reduce lead levels below the EPA action level. We have not seen anything in the data or in WASA pipe loop simulations that leads us to believe we are on the wrong track. The work is being reviewed at key points by an Independent Peer Review Panel formed by EPA. The Peer Review Panel helps ensure that the changes being made are informed by the best available science. We will continue to use outside expert peer review to provide feedback on important matters. We are proceeding with studies, for example, on the potential effectiveness of zinc orthophosphate, an alternate form of orthophosphate, and whether it could be introduced without adverse effects on wastewater treatment systems.

We anticipated red- or rusty-colored water and an increase in detection of coliform bacteria as temporary side effects of the orthophosphate treatment. Some instances of red water were reported, and in September 2004, WASA exceeded the maximum contaminant level for coliform bacteria. All bacteria concentrations and red water complaints began to subside in October 2004. EPA Region III assisted WASA and the D.C. Department of Health with public communication regarding the levels of coliform bacteria.

The City of Falls Church and Arlington County, which also receive treated water from the Washington Aqueduct, have experienced no adverse side effects from orthophosphate treatment, and lead levels, which were already below the EPA action level, appear to have decreased even further.

The Technical Expert Working Group, consisting of EPA, WASA, the Washington Aqueduct, the D.C. Department of Health, the U.S. Centers for Disease Control and Prevention, Arlington County, the City of Falls Church and outside corrosion control experts, will continue to evaluate the latest information, conduct necessary research, and update the public on a regular basis.

Compliance with Administrative Order

On June 17, 2004, Region III issued an administrative order on consent to D.C. WASA to address past violations and to order public health protections on multiple levels, including water

filters, lead service line replacement, notifications to customers, lead testing and enhanced public education.

The consent order was the result of a four-month compliance audit that included on-site review of records and detailed evaluation of thousands of pages of documents that were formally requested by EPA.

We have instituted monthly compliance calls with WASA to ensure a full understanding of the obligations of the orders and that the required corrective actions are being taken.

Under this order, WASA is required to notify customers of the results of tap water sampling in writing within three days of obtaining the laboratory results, and to exercise its best efforts to provide customers with results within 30 days of taking the sample.

As a result of the order, WASA submitted and EPA approved a plan to supply replacement water filters to those customers that have known or suspected lead service lines. WASA last spring distributed approximately 37,000 water filters certified for lead removal to those customers. In January, WASA reported that the manufacturer of one of the replacement cartridges would not be able to meet the delivery needs. As a result, a new filter-pitcher system was delivered to approximately 7,500 affected homes.

In addition, the order compelled WASA to improve its efforts to communicate with the public on continuing developments regarding elevated lead levels in the water. Required public notifications have been made on time and with input from EPA. WASA has taken other communications initiatives and has hired George Washington University's School of Public Health to provide ongoing risk communication consulting. We have encouraged WASA to take full advantage of public education steps contained in EPA guidance and review documents.

The order prescribed a schedule for monitoring and reporting requirements. WASA has met those time frames in the reporting of monthly results and submission of plans and progress reports.

On January 14, 2005, EPA issued a supplement to the order. It cited WASA's failure to replace the required seven percent of lead service lines in 2003, determining that approximately 400 lead service lines were tested through an improper sampling technique. The supplemental order required WASA to notify customers who received inaccurate information and directed WASA to physically replace service lines equal to the number improperly sampled in 2003 in addition to the seven percent required under the rule and the replacements required by the initial order.

Lead Service Line Replacement

The June 2004 consent order requires WASA to update its baseline inventory of lead service lines each year to recalculate the seven percent of lines that must be replaced, to work with the D.C. Department of Health to establish criteria for health-based priority replacement of lines, and to implement a strategy to determine the makeup of service lines listed as "unknown" content.

In 2004, WASA exceeded the requirement for replacing the public portion of seven percent of all lead service lines in their system. All of the approximately 1,700 replacements were actual physical replacements, as prescribed in our administrative order. WASA has committed to replacing the public portion of all lead service lines by 2010.

In compliance with the June 2004 consent order, EPA has received and approved a plan by WASA to encourage property owners to participate in full replacement of lead service lines. Homeowners own the portion of the service line that runs from the property line to the home. The plan, which was recently implemented, includes a low-interest loan program, grants of up to $5,000 for low-income residents, and a fixed fee structure for line replacement.

Improvements to Process

EPA Region III revised its internal operating procedures in handling and reviewing data from the District to ensure multiple staff and managers review the compliance data. The procedures ensure that compliance and enforcement reviews are done separately from programmatic oversight. Data is now being tracked electronically so that trends will be more easily identifiable, and EPA is working with WASA and the Aqueduct to develop an electronic transfer protocol to fully automate data reporting and logging.

EPA has had more frequent contact with the D.C. Department of Health regarding drinking water matters in the district, and the health department is involved on a regular basis in discussions regarding the progress of treatment and water monitoring results as a member of the Technical Expert Working Group. We have also held more face-to-face meetings with the District's utilities to cover lead and other important topics. EPA has arranged for WASA and the Aqueduct to share monitoring results directly with the D.C. Department of Health.

Region III has participated in regular conference calls with L.E.A.D. (Lead Emergency Action for the District) Coalition members as one means to keep the community updated on actions taken, research and sampling results and the status of WASA's compliance with the administrative order. EPA has encouraged the coalition representatives to share the information with their members in the community.

With the assistance of a contractor, we are providing information to the public on the work of the Technical Expert Working Group. Outreach material is addressing lead levels, treatment status, data interpretation and other issues. We held four public meetings when the orthophosphate was about to be introduced to alert residents to the action and the potential

temporary side effects. We also issued a mailing in two languages and coordinated with WASA in its mailing to every customer in the District about the new treatment.

We have built and continue to update a comprehensive Web site, www.epa.gov/dclead, containing public health advisory information, key communications between EPA and other parties, research plans and updates, data from the monitoring programs, and links to other helpful Web sites. The Web site was one of the early steps the region took to respond to the need for more information. We also dispatched community outreach specialists to the District, provided radio outreach in English and Spanish, and participated in a series of public meetings.

EPA is preparing to increase funding for the Lead Safe D.C. program we established last year with the National Nursing Centers Consortium to educate residents at risk from elevated lead exposures from environmental sources, including lead-based paint and dust, as well as drinking water. The program assists residents through education, home visits and blood lead level testing in District neighborhoods.

Technical Assistance from EPA

EPA continues to provide technical assistance on lead and copper testing in non-residential buildings in the D.C. area. EPA has provided guidance on sample site selection and sampling protocol to federal facilities, schools and day care centers.

During the past year, we have provided technical assistance to WASA in designing sampling protocols for the sampling of day care facilities, apartments and other buildings. A total of 77 facilities completed sampling under our protocol. All results were reported to facilities managers and all outlets over the action level were to be remediated. We provided additional support to the sampling efforts by the Navy, the General Services Administration and the Architect of the Capitol, all of which are currently conducting sampling of buildings in the District.

Continuing Research

With the assistance of EPA headquarters, we have helped arrange for an engineering firm to conduct an historical analysis of water system data to help further our understanding of what may have caused the increase in lead.

We have developed a Facility Planning Research Outline that focuses on the broader issues of optimizing drinking water treatment in D.C. and overall public health protection through simultaneous compliance with all applicable regulations. Research topics include corrosion control, microbial control, disinfectants and disinfection by-products, and sampling plans.

We also have increased funding to EPA contractors to develop several new corrosion-related studies and to assist utilities, through the Technical Expert Working Group, in research and treatment communications.

The Technical Expert Working Group has been active in all phases of this issue as we work toward the elimination of elevated lead levels.

Conclusion

I want to assure you of EPA's continued dedication to finding the best solutions to the challenges that led to the public health concern in the District. We will continue to build on the progress that has been made. And we will keep this committee and the general public informed of developments in our work.

Thank you for the opportunity to present this information this morning. I will be pleased to answer any questions you may have.

Chairman TOM DAVIS. Mr. Jacobus, thanks for being with us.

STATEMENT OF THOMAS P. JACOBUS

Mr. JACOBUS. Good morning, Mr. Chairman. Good morning Ms. Norton. Thank you very much for inviting me to be here and tell you a little bit of what the water treatment plants have been doing as part of the effort to change the corrosion control situation in the District of Columbia.

As both Mr. Grumbles and Mr. Welsh said, the treatment for the entire distribution system served by Washington Aqueduct, which is not only the D.C. Water and Sewer Authority area, but the Arlington County and the city of Falls Church service area, all of those service areas began receiving orthophosphate as an additional corrosion inhibitor in the water on August 23rd. So far, all aspects of that treatment from the point of view of the system receiving the orthophosphate have been working very well.

The important thing right now, I think, to note is that we have assembled a series of pipe loops using lead pipe that was harvested from the lead service line replacement program in the District of Columbia, have set those up, and we have seven racks running with seven different chemistries in the basement of a water treatment plant.

The purpose of those loops is to see how water flowing through pipes, which replicates the situation that would be in a home or anyplace that water would be delivered to, are affected by the chemistry of the water. Obviously one of those loops is representing the ongoing conditions of the water being delivered. However, we have other chemistries running to see if there could be some slight improvement to the current situation; all of those will be evaluated over the next year, we will actually do sampling, we will take little pieces of lead out of these loops, analyze it chemically and physically and—to get a very good idea of the efficacy of the current system and the ability to maybe change to even a more refined system. So that's something that is very important and really ties into the rules that EPA was changing in terms of a water system having to notify and do some analysis 60 days before any treatment change in the future. So we will be having these lines running, and any adjustments we make to the water in the future will be done as a basis of that analysis.

As others have mentioned, we said it would be a year before we could really know for sure if the chemistry was working as we expected, early indications are that it has. I know that Mr. Johnson will be reporting on that from the District of Columbia in just a moment.

For the Arlington and Falls Church customers, their systems were never out of compliance with the lead and copper rule because they really don't have any lead service lines, they just have the plumbing and the copper—the solder in the copper joints and the potential lead in any fixtures. But they, in their testing cycle from July through December 2004, continue to remain under the action level. So that's really good news.

The coordination that has occurred over the last year among the water utilities and the regulators has been excellent, and we are now in a much more elaborate and deliberate way sharing water

quality information amongst the senior managers, and understanding completely all aspects of our water chemistry from the producer at the Washington Aqueduct through the customers what the conditions are at all times.

Looking to the future, we have acquired the services of three important consulting firms to conduct studies for us on a range of alternatives and improvements to our current processes. We want to be looking to see what kind of long-term water treatment possibilities there are for our customers. Clearly, all of that will be done in cooperation with our customers and the appropriate oversight from EPA State and local agencies.

Thank you again for the opportunity to appear here this morning, and that concludes my testimony.

[The prepared statement of Mr. Jacobus follows:]

Testimony of

Thomas P. Jacobus

General Manager, Washington Aqueduct

Baltimore District, U.S. Army Corps of Engineers

Before the

Committee on Government Reform

U.S. House of Representatives

March 11, 2005

Good Morning, Chairman Davis and Members of the Committee. I am Tom Jacobus, the General Manager of Washington Aqueduct.

Thank you for inviting us to once again appear before this committee to discuss matters relating to the elevated concentrations of lead in the drinking water found in some homes in the District of Columbia. I am pleased to be able to be here to report the results we have achieved since the last time I testified before your committee on May 21, 2004.

In February 2004, we formed a Technical Expert Working Group, consisting of Region 3 of the Environmental Protection Agency and scientists from within the Environmental Protection Agency, the District of Columbia

Water and Sewer Authority and its consultants, Washington Aqueduct and its other wholesale customers Arlington County and the City of Falls Church and their consultants, along with the District of Columbia Department of Health and the Virginia Department of Health. This group studied the corrosion problem and then recommended a revised corrosion control strategy. The recommendation was to add orthophosphate to the water leaving the Washington Aqueduct's water treatment plants. On August 3, 2004, EPA Region 3 approved a new Optimal Corrosion Control Treatment plan, and on August 23, 2004 treatment began in the entire system.

So far, all aspects of the change in the treatment chemistry have worked as expected at the treatment plants. The cost of the equipment necessary to make this treatment change was approximately $820,000.

In addition to new process equipment installed at the two water treatment plants, Washington Aqueduct, in consultation with the Technical Expert Working Group, designed and constructed a set of pipe loops that will be used over the next year to evaluate the effectiveness of and possible improvements to the current corrosion control treatment. We used lead pipe obtained from the lead service line replacement project in the District of Columbia for the construction of our pipe loops. There are seven individual pipe loop racks running simultaneously, each with different water chemistry.

Daily readings of water chemistry and residual lead concentrations are taken. This will allow us to further optimize treatment.

This system will allow us to replicate what is actually happening as water flows through a pipe as it would in a residence. It has been constructed in such a way that pieces of lead pipe will be periodically removed for analysis to confirm the efficacy of the corrosion inhibitor.

We told the public that it would likely be a year after the corrosion inhibitor was applied to the system as a whole before it was having the desired effect and that the District of Columbia Water and Sewer Authority system would regain compliance with the Lead and Copper Rule. The new corrosion control chemistry has been operating for seven months, and it does appear that the treatment is positively affecting lead in the distribution system though compliance with the Lead and Copper rule has not yet been achieved. I will defer to the general manager of the District of Columbia Water and Sewer Authority to report on those specifics.

Our Virginia customers in Arlington County and in the City of Falls Church service area were never out of compliance with the Lead and Copper Rule, and in the round of compliance sampling between July and December 2004, they remained in compliance.

The coordination and cooperation among Washington Aqueduct, its customers and EPA Region 3 throughout this period of re-optimizing the corrosion control chemistry have been excellent. Senior water utility managers at Washington Aqueduct, the District of Columbia Water and Sewer Authority, Arlington County, and the City of Falls Church are directly involved in reviewing and discussing water quality data..

We have acquired services from major consulting firms with outstanding expertise in water treatment to help us evaluate a range of alternatives and improvements to our current processes. These steps will be taken via consultation with our wholesale customer technical committee, the EPA, and local and state regulatory agencies.

Thank you again for the opportunity to appear here this morning. I look forward to answering your questions.

Chairman Tom DAVIS. Thank you very much.

Mr. Johnson, thanks for being with us.

STATEMENT OF JERRY JOHNSON

Mr. JOHNSON. Good morning, Mr. Chairman, Congresswoman Norton.

I am Jerry Johnson, general manager of the District of Columbia Water and Sewer Authority, and I am pleased to represent the Authority before the committee this morning.

As you may know, the District of Columbia Water and Sewer Authority has undertaken an intense effort to improve how we address our obligations under the Safe Drinking Water Act and the lead and copper rule.

Experience has taught us that fulfilling our obligations under the law by ensuring complete compliance with the provisions of the lead and copper rule is important, but not sufficient. WASA is doing more to address not only the administrative agreements with the U.S. EPA, which is also important, but we are addressing the public's concerns and expectations. WASA has issued a community pledge and promise that we will continually improve our services and the product, and also made a commitment to keep our stakeholders better informed. We released a progress report on that just a few weeks ago, which is included in your briefing material.

WASA has learned from the reviews and suggestions of Federal and local policymakers, regulators, residents, health officials and other experts, however, it is the Board of Directors that continues to lead our effort. First, the Board has commissioned an independent review of WASA'S compliance with the lead and copper rule, and it is important to note that the Holder Report is the first such independent review completed. Its findings and recommendations have been, for the most part, reflected in the recommendations offered by those that followed, including the Inspector General and the U.S. EPA enforcement order.

The Board took specific policy actions last year that resulted in, for example, establishing a flat rate for public service line replacement, establishing an extended payment plan for private line replacement, worked with Wachovia Bank to establish low-interest rate equity loans, created a grant program through DCHCD, and established a goal of eliminating all service lines in public space by 2010, at a cost of approximately $340 million. It is unprecedented nationally, in size and scope, and goes well beyond the letter and perhaps even the spirit of the lead and copper rule.

I understand the committee's interest in specific steps taken by WASA, or WASA in conjunction with other agencies over the past year. First, WASA is fully addressing the requirements of the law, and we embrace the need to take extra steps and go well beyond the requirements of the law to inform and reassure the public.

Examples of some of the steps taken to include the addition of orthophosphate, which was discussed earlier, re-evaluating and restructuring and fully staffing the water quality program, creating a position of an Environmental Compliance Officer to coordinate and monitor compliance, creating a senior management position to manage the lead service program. WASA's Lead Service Hotline has responded to over 76,000 customer calls and re-mails, distrib-

uted more than 38,000 sample test kits and 35,000 water filter and replacement cartridges.

WASA works with the Department of Health to fund over 7,000 blood lead level tests and environmental assessments throughout the city and maintain real time data in collecting that information so that we can provide it to health care providers. And we've established several innovative automated systems for monitoring and tracking a variety of functions and activities.

Public communications have mushroomed. You will have examples of that in the testimony that's been provided to you today. WASA has hosted over 45 community meetings to help address public concerns about this issue. A list of other activities too numerous to mention in the time allotted may be found in the written testimony.

I would also like to note that we have cooperated with a number of reviews that have looked at the Authority's management of this issue, and the Authority concurs with a great majority of those recommendations, and in most cases the initiatives that were mentioned were things that had been planned and implemented prior to even receiving the suggestions.

There is a long list of reviews that have been undertaken, to include the EPA audit, the Covington and Burling report, the Federal GAO review to House Committee on Government Reform hearings, a Senate Energy Commerce subcommittee hearing, a U.S. Senate Environment Public Works hearing, 12 District of Columbia Council Public Works hearings chaired by Mrs. Schwartz, a City Council Investigative report, an inter-agency task force that was convened by the mayor and the Committee on Public Works.

The administrative and supplemental orders for compliance and consent notes several finding and remedies. WASA, as I believe EPA has already testified, is in full compliance with the provisions of those orders. In general, WASA's agreement with EPA codifies activities that the Authority already had planned or underway, and it is important that these agreements encourage, and in some respects, require more attention to a healthy evolution of the relationship with our regulator.

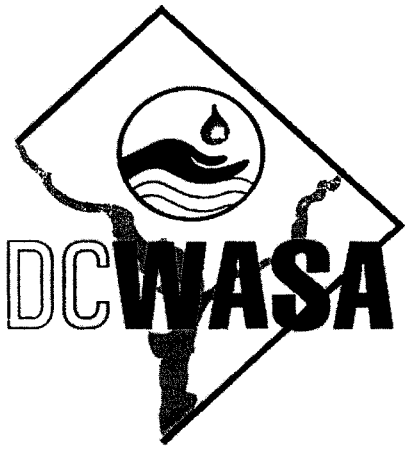
WASA has a number of broad-base responsibilities in the water and sewer industry. In one way or another, most of our employees participate in ensuring that compliance with the Safe Drinking Water Act and Clean Water Act standards are met on a daily basis.

Historically communications between the two agencies was on frequently often productive but often very casual. I believe that the informal undocumented communications exasperated some of the problems that this community experienced. Communications between the two agencies on compliance issues and other matters is formal and carefully documented today, and I believe that better serves the public.

Mr. Chairman and Ms. Norton, I am pleased to present my testimony, and I will be glad to answer any questions you might have.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. Johnson follows:]



Jerry N. Johnson, General Manager

The District of Columbia Water and Sewer Authority

Before the

House of Representatives Committee on Government Reform

March 11, 2005

Good morning, Mr. Chairman, Congresswoman Norton and other members of the Committee. I am Jerry N. Johnson, General Manager of the District of Columbia Water and Sewer Authority, and I am pleased to represent the Authority before the Committee this morning.

As you may know, the District of Columbia Water and Sewer Authority has undertaken an intensive effort to improve how we address our obligations under the Safe Drinking Water Act and the Lead and Copper Rule.

Experience has taught us that fulfilling our obligations under the law by ensuring complete compliance with the provisions of the Lead and Copper Rule is critically important, and we are doing so. Fulfilling this obligation, however, is not sufficient.

And, despite our continuing efforts, we continue to exceed the lead action level under the LCR.

WASA is doing more to address not only the administrative agreements we have reached with the Environmental Protection Agency but also — and as important—to address the public's concerns and expectations.

Last June, WASA issued a "Community Water Pledge" - a promise to continuously improve our services and product, and a renewed commitment to keep our stakeholders better informed. We released a progress report just a few weeks ago, which has been provided to the Committee.

Some evidence that this seed we have planted is bearing fruit is the response to our effort to encourage private participation in the lead services replacement program --

> Late last year, we implemented an outreach program to encourage private side replacements, and as a result the number of residents who are working with WASA to replace the service line in private space has increased from two (2) percent in FY 2003 to approximately 20 percent so far this year.

Mr. Chairman, I appreciate this opportunity to continue this discussion, and to talk about what it is we are learning as we respond to your questions. Specifically the Committee notes three items of interest:

- The Administrative Orders agreed to by WASA and the EPA
- The January 5, 2005 Office of the District of Columbia Inspector General Audit of Elevated Levels of Lead in the District's Drinking Water, and

- The July 16, 2004 Summary of Investigation Reported to the Board of Directors of the District of Columbia Water and Sewer Authority prepared by Covington and Burling

The WASA Board of Directors

WASA has learned from the reviews and suggestions of federal and local policymakers, regulators, health officials and other experts. Residents participated in this process as well – we received tens of thousands of communications over the last year from the public!

However, it is the Board of Directors that continues to lead our effort. First, the Board commissioned an independent review of WASA's compliance with the LCR. The Board has also diligently held management to account for providing a full and detailed response to the Covington and Burling ("Holder") Report recommendations.

It is important to note that the Holder Report was the first such independent review to be completed. Its findings and recommendations have been, for the most part, reflected in the recommendations offered by those that followed, including the Inspector General and EPA through its Administrative Order.

As important, our Board reflects the interests of the community we serve. Board members have traditionally participated in some of the community meetings that take place. In response to public concerns and fulfilling their charge as WASA's governing body, the Board took specific policy action last year that resulted in, for example:

1) Establishing a flat rate ($100/foot and $500/entry) for private line replacement
2) Establishing an extended payment plan for private line replacement,
3) Encouraging management to work with Wachovia Bank to establish low-interest rate equity loans for private service line replacement
4) Establishing a grant program through the District for line replacement
5) Establishing a goal to eliminate all lead service lines in public space by 2010.

This last goal will result in a projected $300-370,000,000 investment. It is unprecedented in size and scope, and goes well beyond the letter and perhaps even the spirit of the LCR.

Lead Services Program Update

I understand the Committee's interest in the specific steps taken by WASA (or WASA in conjunction with other agencies) over the past year, and in many respects these activities are mirrored in the recommendations contained in the Covington and Burling, OIG recommendations, and the Administrative Order.

WASA is fully addressing the requirements of the law and we also embrace the need to take extra steps that go well beyond the requirements of the law to inform and reassure the public. Examples include but are not limited to:

- Washington Aqueduct implementation of a new optimal corrosion control treatment plan (orthophosphate)
- Evaluating, restructuring and fully staffing the WASA Water Quality Program
- Creating the position of Environmental Compliance Officer in the Office of the general Counsel to coordinate and monitor compliance
- Creating a senior management position to manage the lead program
- WASA's Lead Services Hotline responses to 75,966 customer calls/e-mails - A snapshot of the Hotline traffic indicates that between February 5 and February 19, 2005, we received 608 calls – 38 were for lead test kits.
- WASA distribution of 38,499 water sample test kits (20,668 test kits have been returned by customers for analysis since January)
- WASA distribution of 34,786 water filters and replacement cartridges
- WASA's work with the Department of Health to fund over 7,000 lead blood level tests, many environmental assessments conducted at target households, and a real-time data system for collecting blood lead level information from private health care providers
- Exerting very strong efforts to coordinate service line replacement construction with the District Department of Transportation and other utilities
- Establishing several innovative automated systems for monitoring and tracking a variety of functions and activities.

Public Outreach Update

Our public communications efforts have also mushroomed. You have examples of some of the work included with the testimony. Since February of last year, WASA has hosted or participated in 45 community meetings to help address public concern about the lead issue. We also:

- continue to schedule these meetings, focusing on areas of the city where we expect to undertake physical service line replacements
- so far this year, provided about 2,500 colorful, attention-grabbing brochures to residents who are part of the lead service replacement program so far this
- present periodic media briefings
- published many customer newsletters (125,000 recipients) on the topic
- distributed multiple customer and "all address" mailings to update them on the lead issue, including health information
- engage a team of experts from the George Washington University School of Occupational and Environmental Health to advise us on health matters, and to help improve communications and community outreach

- have begun to participate in the Lead Task Force, a coalition of community groups that includes health professionals, community and environmental advocates who have provided advice and more effective community outreach
- hosted a national symposium to discuss the LCR, risk communication and begin the process of developing a case study of our experience
- added additional staff to the public affairs department
- engaged consulting expertise to advise and support community outreach generally and to special populations (Edelman, Equals 3, Maya, Silverberg, as well as GWU)
- updated our website to include a video on the replacement program
- provide password protected customer access to lead sample test results and pipe material information through the WASA web page.

Committee's Interest in Responses to Certain Audit Recommendations

I would like to note that we have cooperated with a number of reviews of the Authority's management of this issue. Although not all have concluded, several have been completed. The Authority concurs with the great majority of the recommendations. In most cases these initiatives were planned or implemented before we received these suggestions.

Although WASA *does not necessarily agree with all of the findings* that have been produced from these reviews, our position on compliance with the LCR has frequently been set forth in public statements, sworn hearing testimony and in filings submitted in ongoing legal proceedings.

Specifically, the Authority has participated in a number of audits and reviews, including:

- An Environmental Protection Agency LCR compliance audit going back several years - complete.

- A Covington and Burling investigation, conducted at the request of the Board of Directors - complete.

- A federal Government Accountability Office review - underway.

- Two United States House Committee on Government Reform hearings.

- A United States House Energy and Commerce Subcommittee on Environmental and Hazardous Materials Subcommittee hearing.

- A United States Senate Environment and Public Works, Fisheries, Wildlife and Water Subcommittee hearing.

- About twelve District Council Public Works and the Environment hearings

- A report by the Chair of the Council Committee on Public Works and the Environment, Carol Schwartz - complete.

- An Interagency Task Force on Lead in Drinking Water (convened by Mayor Anthony Williams and the Council Committee on Public Works - complete.

Administrative Order and Supplemental Administrative Order

The Administrative and Supplemental Administrative Orders for Compliance on Consent (Docket No. SDWA-03-2004-0259DS and SDWA-03-2005-0025DS) note several findings and remedies.

> These findings involved: the required follow-up monitoring of partially replaced lead service lines; required public service announcements; use of required language in written materials; acknowledgement of and appropriate steps following an exceedance of the lead action level in 2000 –2001 monitoring period, and the finding by Covington and Burling that WASA sampling instructions for a certain number of residents in 2003 was not consistent with the LCR, and other provisions.

WASA, as I believe the EPA has already testified, is fully in compliance with the provisions of the Administrative Order agreements.

> The agreements include: a commitment by WASA to undertake additional lead service replacements through 2007 than are annually required under the LCR in order to make-up for replacements that should have been completed in 2003, an additional 1,615 service lines that should have been addressed in 2001; a prioritization plan for 1,000 specific addresses for replacement by September 2006; implement additional measures to obtain samples following a partial replacement; to improve reporting to the EPA under the LCR we are also updating materials evaluation, and the lead service line inventory; delivery of water filters to designated addresses, and other provisions

I will be happy to address any specific questions from the Committee on those matters.

Improving Appropriate Communications with EPA

In general, WASA's agreements with the EPA codify activities that the Authority already had planned or were underway. As important, these agreements encourage, and in some respects require more attention to and a healthy evolution in our relationship with our regulator.

Remember that WASA is responsible for: 1) delivering drinking water to 570,000 residents in the District; 2) wastewater treatment services for well over 2.1 million residences across the region; 3) 1,300 miles of water lines; 4) 1,800 miles of sewer lines, and 4) the up to 370 mgd of wastewater treatment capacity provided by the operation of the world's largest advanced wastewater treatment plant.

One way or another most of our employees participate in assuring that we comply with federal Safe Drinking Water Act and Clean Water Act standards and regulations. Our mission is very broad and the depth of our relationship with the federal EPA which regulates wastewater treatment, air pollution and drinking water is necessarily deep.

Historically, communications between the two agencies was frequent, often productive, but too often casual – I believe that informal undocumented communications exacerbated some of the problems this community experienced. Communications between the two agencies on compliance issues and other matters is formal and carefully documented, today. I believe the public's interests are much better served.

OIG

As you know, the District of Columbia Office of the Inspector General report issued on January 5, 2005 includes WASA's specific responses to each of the recommendations made by the Inspector General.

The District of Columbia Water and Sewer Authority Response to the OIG Special Review commented on specific OIG recommendations. Specifically, WASA agreed with 11 of 12 OIG recommendations.

WASA's response also offered clarifications on selected issues of fact given the complexity or technical nature of the subject matter (Lead Service Line Replacement Efforts in 2003; Customer Information System; Corrosion Control); Availability of Federal Funds; Written Material Provided to Customers; Potential Causes and Effects of Lead Exposure).

Covington & Burling (Holder) Report to the Board of Directors

On March 4, 2004, Covington and Burling began, at the request of the Board of Directors an investigation of lead monitoring activities beginning with the 2000-2001 monitoring period. The investigation was to provide an independent, thorough review of the facts, evaluate the Authority's compliance with the applicable regulations and the appropriateness of the Authority's handling of lead monitoring.

Covington reviewed tens of thousands of documents from the Authority, the United States Environmental Protection Agency ("EPA"), the District of

Columbia's Office of the Inspector General and Department of Health (DOH"), as well as the Washington Aqueduct Division of the United States Army Corps of Engineers. Covington also conducted more than 20 interviews, including Authority employees and Board members.

The "Summary of Investigation" concludes that a confluence of factors contributed to the Authority's difficulties, including but not limited to weaknesses in the Lead and Copper Rule ("LCR") public awareness requirements and muted and inadequate responses from the EPA and DOH despite having been informed of the LCR exceedance by the Authority. Covington's investigation led to preliminary conclusions, given limited time and access, "....regarding past shortcomings in the Authority's lead monitoring activities and its compliance with EPA regulations." The Report concludes that two central shortcomings at the Authority played an important role:

- The Authority did not have sufficient controls in place to govern the EPA compliance process;

- The Authority failed to communicate effectively about lead-related issues both internally and externally.

The Board received the Report on July 16, 2004, and Mr. Holder provided a summary briefing of the Report at the September 2, 2004, regular meeting of the Board. The Report included 20 recommendations. As part of its review of the Report findings and recommendations the Board assigned to Authority management the task of providing a management response to the Report's specific recommendations. The Management Response concurs with 18 of the 20 recommendations, and has implemented or is in the process of implementing them. The Management response has been provided to the Committee.

WASA through its Board of Directors, management and employees maintain a renewed commitment to providing the very highest quality of services and product to our customers, and we will be constantly seeking opportunities to improve.

Thank you for the opportunity to address the Committee on this important matter. I would be pleased to respond to any questions.

Chairman TOM DAVIS. Let me start the questioning here.

Mr. Grumbles, as a basis for your conclusion that the lead and copper rule has been successful and doesn't require wholesale revision, you cited some statistics that 88 of 2,758 utilities have exceeded the action levels for lead as of June 2004, and that 111 of 3,114 utilities have exceeded the level as of January 2005. How does this rate of exceedance compare to compliance with other water requirements?

Mr. GRUMBLES. Mr. Chairman, I would say that the 96 percent compliance is comparable to other standards and requirements under the Safe Drinking Water Act, that they, as well, are over 90 percent, somewhere between 90 and 94 percent.

Chairman Tom DAVIS. Are there any specifics or anything of a comparative nature about the municipalities where the lead level action has been exceeded, do you find that they had things in common?

Mr. GRUMBLES. Well, as you know, and as Congresswoman Norton knows, it is partly a function of the lead service lines and the lead that's in the pipes and the plumbing in homes, but a key component that's common with all of them is the corrosivity of the water. So where we find exceedances of the action level, it's really—the primary focus is on getting the corrosion control to be more effective. And that's the fundamental approach——

Chairman Tom DAVIS. That's kind of the thread that runs throughout, basically.

Mr. GRUMBLES. Yes, sir.

Chairman Tom DAVIS. There was an October 5, 2004 Washington Post article that said municipalities across the Nation were manipulating test results of lead levels in the water supply to avoid being in violation of the lead and copper rule.

What is your assessment of the charges contained in that article? Are you familiar with the article?

Mr. GRUMBLES. I am familiar with the article. We've spent a lot of time reviewing the allegations made in that article.

We have not found any conscious effort or pernicious approach where utilities are deliberately manipulating, but that is still a matter for review, and our enforcement offices and regional offices will continue to look at that.

I think the focal point is there is some legitimate ambiguity and a lack of clarity in some of the existing regulation as to how to take the samples and to correct them. So what we've done, in November, we issued guidance that was meant to be helpful guidance, but fair warning to utilities that you can't improperly invalidate samples, that there is a certain time, place and manner for taking them. And that's what we're committed to do so that data that's inappropriate or if there is a gaming of the system, we want to try to prevent that from happening by having clearer monitoring and sampling requirements.

Chairman Tom DAVIS. OK. Thanks.

Mr. Welsh, you outlined the elements that WASA was required to comply within the administrative order and the supplement, and stated that it has met those requirements. But you also report that WASA's January 2005 sampling results reveal that 31 percent of the homes tested exceeded the lead action level of 15 parts per bil-

lion. That seems a little disturbing. I know that alternative treatment measures such as the orthophosphates take time to achieve results, but the lead levels have been elevated for several years. Aren't there other measures that can be taken to turn the situation around more quickly?

Mr. WELSH. We are encouraged by the data that we've seen, that it does seem to be the response that we anticipated from the orthophosphate, it seems to be showing up in the numbers. We continue to be concerned about the fact that those levels are above the action levels, so we want to make sure that neither we nor the citizens of D.C. become complacent on the issue. We still want to reinforce that people need to continue to do the flushing, continue to use the filters until the lead is completely below the action level.

But the numbers that you cite there do seem to indicate the first response to the orthophosphate change in treatment. So we want to continue to remain vigilant, continue to work to improve the communication with the public to make certain that folks understand that they need to continue to use the filters and continue to flush, and we are keeping a very close eye on the technical data that is received from the tap sampling.

We still have the Technical Expert Working Group reviewing that data, so if we see anything in that data that indicates we need to take other steps or different measures to reduce the level of lead in the tap water, we would certainly recommend that, but for now we haven't seen any data that makes us think that the solution that's been implemented is on the wrong track, and we think things are turning in the correct direction.

Chairman Tom DAVIS. Thank you.

Mr. Johnson, what is your reaction to the continued elevated lead levels? Similar?

Mr. JOHNSON. My reaction would certainly be similar, I think we're going in the right direction. However, Mr. Davis, I would like to update the data that you have with information that we received as recently as last evening and analyzed very early this morning.

We are required to do 100 sample sets, compliance samples in each of 6 month periods, one beginning in January and another beginning in June of this year. We have received the first 51 of those samples back for compliance purposes and have found that all but four of those are at or below 15 parts per billion action level. So certainly I think that is a clear indication that we are moving in the right direction. I am not really to stand up and declare victory at this point, obviously we have to go through the balance of the testing period for this first 6 months, and then again during the summer and fall, but it is a very clear indication that the numbers are moving dramatically down, so it appears that the chemical addition is working and doing what it is supposed to.

Chairman Tom DAVIS. Mr. Welsh, do you think that would be consistent with what you predict on this?

Mr. WELSH. Yes. So far the response that we expected to see we are seeing. But we want to make sure that we bear in mind that there is a long predicted response time for this. So we want to keep our eyes on the numbers and make sure they continue to go in the right direction. And I would echo what Jerry said, that we don't want to prematurely declare that we have solved the problem, we

want to keep our eyes on it and make sure that we get under the action levels before we determine that we've achieved what we need to achieve for the safety of drinking water.

Chairman Tom DAVIS. Did EPA consider imposing penalties or taking civil or criminal action against WASA for violations of the lead and copper rule?

Mr. WELSH. We did an extensive compliance review and we learned information that said that there were elements of the rule that hadn't been completely complied with. We did consider what the appropriate response should be to that. It was our judgment that working with WASA, negotiating for measures that not only brought them back into compliance with the rule, but went beyond the compliance that would be required by the rule was the fastest and best way to get us on track to making the water safe for the citizens of D.C. So we did not assess a dollar penalty of WASA, and it was my judgment that the consent order route was the fastest and best way to get the most relief possible to the situation.

Chairman Tom DAVIS. All right. Thank you.

Mr. Jacobus, EPA's proposed plan of action calls for changes in procedures for corrosion control treatment, particularly requiring notification 60 days prior to making any changes in corrosion control. Do you agree with that proposal?

Mr. JACOBUS. Yes, sir, I do.

Chairman Tom DAVIS. Do you think it would be effective in avoiding potential problems such as those that occurred in the District with elevated lead levels?

Mr. JACOBUS. Certainly. In retrospect, had we run pipe loop studies before we made the change to chloramine we would have discovered the events that unfolded in 2001, 2002. So that additional surveillance on lead and copper in any kind of study to determine what the actual effects of your change would be, I think, are warranted and important.

Chairman Tom DAVIS. And you stated, I think, that Virginia customers were never out of compliance with the lead and copper rule.

Mr. JACOBUS. That is correct.

Chairman Tom DAVIS. Thank you.

Mr. Johnson, do you think the additional requirement imposed on WASA by the administrative order or on consent and the supplemental are reasonable?

Mr. JACOBUS. Absolutely, Mr. Chairman. And we have, in fact, gone beyond the requirements of the administrative order with all the actions that we have taken in respect to dealing with this particular issue.

Chairman Tom DAVIS. And finally, you have had now several months experience in the lead service line replacement program. How effective is that program in reducing the cause of lead in the District water system?

Mr. JOHNSON. We are getting mixed kinds of test results back with the replacement program. In cases where we've done total service line replacement where there is a requirement to go in and do the testing after the replacement is done, we are getting lower results than in cases where we have gone in and done partial service line replacement where the product portion has not been done. We're going back now and doing some re-testing in those areas to

determine what occurs after some period of time has passed. And we offer to those residents the same precautions for flushing and filtering utilization until we have gone back and done that second test.

Chairman Tom DAVIS. I guess my last question for the panel is, how have the public meetings been going that you've been holding?

Mr. JOHNSON. The public meetings I think have gone well. I think that there was an understandably nervous reaction from the public in some of the initial meetings that we had. I think after a time when there was a plan in place for some of the actions that were to be taken, public concerns began to subside somewhat. In the most recent meetings that we have had, there obviously continues to be concern, and we continue to make the public aware that they should still be taking precautions until such time as we have come under the action level and can give them the appropriate notification for that.

Chairman Tom DAVIS. Thank you very much. Ms. Norton, for 10 minutes.

Ms. NORTON. Thank you very much, Mr. Chairman.

First of all, I don't want to imply by my opening remarks or any of the questions I ask that you have done nothing; I didn't mean, for example, Mr. Grumbles, that your document issued just before you were to come here meant that you sat down and quickly scribbled something together. What I meant, of course, was after a year, it seemed to me that something more significant was required rather than a plan, particularly if you contemplate changes in the rule or in the regulations.

Now, I want to begin with you, Mr. Johnson, because quite apart from the rules and regulations, you are under direct pressure from everybody who lives in the District. And I don't have any way of knowing except by what EPA tells me and by what you tell me exactly how it's going, but I do have anecdotal evidence that there is still dissatisfaction. So before I even get to Mr. Grumbles, Mr. Welsh, Mr. Jacobus, I would like to ask you about particularly the testing that has been done where we know or we knew we were dealing in some neighborhoods with high lead content. And there have been complaints that my office has received, for example, from one southwest neighborhood where some tested as much as 500 above the required level—the allowed level, that WASA had been slow to respond with filters in a timely manner or with immediate pipe replacement, and the complaints have been—and again, this is anecdotal, but you need to know it, that unless WASA is monitored and you stay on WASA every minute, it's hard to get things done.

How do you respond to that, that people call the Congresswoman—actually, you might have expected them to call the council or you—that these complaints are still coming forward?

Mr. JOHNSON. I am not actually aware of any recent complaints, Ms. Norton——

Ms. NORTON. Who accepts complaints there and how do you deal with complaints? Or how many complaints have you gotten? And is there an office or a place that accepts complaints from the public?

Mr. JOHNSON. Yes.

Ms. NORTON. So that they don't have to go to their Congresswoman?

Mr. JOHNSON. Yes, ma'am, there is. We have a Lead Services Hotline that receives calls on a continuous basis, those calls have dropped off. We were at a high of several thousand calls a day, we are now receiving a couple hundred a month on that particular service line, but we maintain it as an active line.

We have computerized and automated the filter distribution system so that any resident who has been listed as having a lead service line should have received a filter at this point and replacement cartridges. If there is someone who has a lead service line and has not received that, then we would certainly want to know about it and be prepared to——

Ms. NORTON. Well, I think people are at least entitled to, as we're fixing the system, is fast service, particularly if they haven't received their filters. If they were among the neighborhoods where there may be replacements on an emergency basis, and the rest of it, just so that you know.

Mr. JOHNSON. Well, the service line replacement will actually be taking place on a block-by-block basis, and we are doing about 2,800 of those this year. We obviously can't get to everyone at the same time, but if it's a priority situation which has been worked out between us and the Health Department and this person has—a pregnant woman or a child that is under 6 or a nursing mother in a home, then they are placed on a priority list. And we will get to those sooner than we will on the block-by-block arrangement. And we currently have about five contracts now that we're working around the entire city for those replacements.

Ms. NORTON. Mr. Grumbles, in this morning's paper, I thought that I was waking up to a surprise from EPA on this issue, "EPA Enacts Long-awaited Rule to Improve Air Quality, Health," and I said look again, Eleanor, read carefully. It's not a new rule about lead in the water, it's the long-awaited and long-discussed problem of air quality. And my questions really go to the effect of the rule on utilities.

I think what you've already done indicates that EPA does understand that the rule does need some fixing, and that you are trying to learn from the experience here.

What I was looking for was some indication that the changes that we had outlined in our letter, the letter from Mr. Waxman, from the chairman and from me would at least have been considered. We understand floridly that WASA violated the regulations, for example, on public disclosure, there is no question that in any—anybody looking at anything but an admission, all the circumstantial evidence is clear that they were trying to avoid public disclosure. You don't have any direct responsibility for that, but your regulations on public disclosure are the only way to alleviate that. And I looked at what you have presented and recognize that, for example, you have not set even yet an enforceable limit on lead levels in public disclosure.

Particularly in light of that, whatever you know, it seems to me, the public has a right to know in ways the public can understand. So I looked at what at least your plan says, and I saw no indication that your educational requirements, shall we call them, would go

to the kind of language that would give the WASAs of this world guidance of how to, in fact, speak to the ordinary citizen so he understands. It sounds to me like they were left the way they were when, in fact, we had the greatest scandal here, which is that there was no public disclosure.

I see nothing in your plan that would indicate that the hundreds of thousands of people who live in apartments would ever know anything unless the owner chose to tell them because water bills apparently still can be the way to find out whether there is lead in the water. And I don't care if you're a nursing mother, somebody with AIDS who lives in an apartment, I do not see anything in this rule that helps you. And heaven help you if you are non-English speaking. We would assume—and here I am speaking for, I think, water systems across the country, that if there was a part of the jurisdiction where people needed to have notification in other than English, that they might be sensitive enough to do it, but it is certainly not because you tell them to do it. That's the kind of thing we're looking for to indicate that you have understood what happened in the District. And I don't see anything in the plan to indicate that you're going in that direction.

Mr. GRUMBLES. If I could, and Congresswoman, I really appreciate your constructive criticisms and also comments. And I would say that it's very important to understand that those initial items that we've identified, those are not the end of the story. In fact, those are some items that we know we can move forward with quickly; we have the data, the information, and they will help cure part of the problem, but I can assure you——

Ms. NORTON. Wait a minute, Mr. Grumbles, how about, for example, let's just take non-English. When you tell folks in a country where, what is it, the fastest growing group is Hispanics, wouldn't you tell them at least something about if a certain percentage—I don't care what you use, I'm not here to prescribe, that you would want to make sure that you don't have whole sections of L.A. or D.C. or Fairfax County who don't have any idea what you're talking about because they are recent immigrants. I mean, what kind of additional time and evidence do you need to at least get that out?

Mr. GRUMBLES. The point to be made is that I agree with you, and that is part of the plan.

Ms. NORTON. But it's not in the plan.

Mr. GRUMBLES. It is in the plan in the sense that the plan has some items—one of the priority items is to develop the right language for public education. I can't say that we'll work that specific language over the next couple of months. We need some more time to have all of the right players involved, but we are committed to improving upon that language. You have made it very clear, and we agree—I'm just saying as a timing matter we don't have that language yet, but we're committed to developing it, and I agree with you.

We do have, Congresswoman, in the guidance on schools, we're committed to making that clearer and more communicative of the risks involved, and that guidance we can complete by the end of the year. But on the all-important public education language, right now we don't have—we're not comfortable with the exact wording,

we feel we need more input to make sure that it communicates the proper tone and awareness so that it not only informs, but motivates people. And Congresswoman, we're committed to getting that done, I just don't know what month we'll have that, but——

Ms. NORTON. I didn't even ask about the month. See, you're not answering my question. Are you committed to non-English language notification, yes or no?

Mr. GRUMBLES. To me, that seems right, and the right thing to do so——

Ms. NORTON. Are you committed to notifying people who live in apartment buildings who would have no notice whatsoever, including, of course, people with babies, people nursing? Are you committed to some form of notification for people who live in those apartment buildings?

Mr. GRUMBLES. I will say this, I am committed to the broadest, most effective form of communication. And I know that I myself, here, am not able to identify the particulars, that it needs to be risk communication experts. And Congresswoman, we are committed to having the right people deciding upon and recommending to us what is the best possible language to improve the current language. So——

Ms. NORTON. Does that mean you're going to take public comments so that the millions of people who are living in building can tell you what apparently you're not willing to——

Mr. GRUMBLES. I don't know how we can——

Ms. NORTON. If I lived in New York I would be coming across this table at you because almost everybody there lives in an apartment building. You're not even willing to say to those folks—remember, we're speaking for the entire country there—would have notification, and this is the kind of thing that we are after——

Mr. GRUMBLES. I am just letting you—it makes sense to me, Congresswoman, I just know that the most important thing is to have risk communication professionals working to agree upon the language and to have the public involved and comment on that. And it's that type of process which led us to conclude we need some more time to do it; but it is a priority, Congresswoman, to get that language right.

Ms. NORTON. Should utilities like WASA be required to—again, I'm going to what's not in your action plan, now, and what, in fact, caused the crisis in the District of Columbia where babies, where children under six, where people with AIDS were not identify notified, what is it, 3 years? So my questions go to what's not in your plan, and if you want to tell me it's going to be in your plan, that's all I need to hear.

WASA took months to provide the results. Do you believe that the rule or the regulations should require the utility to notify in a timely manner, for example, in 2 weeks or some other time, that you would consider to be timely, some kind of deadline, some kind of deadline?

Mr. GRUMBLES. I completely agree, it has to be timely and targeted to the relevant audience; it has to be consistent and accurate, so——

Ms. NORTON. Go ahead. I'm sorry.

Mr. GRUMBLES. No, I am saying that our top priority is to ensure that it's timely and targeted and consistent and accurate to motivate.

Ms. NORTON. You know, you have taken a lot of our time, Mr. Grumbles, with really very vague answers. So you understand that I have asked you specific questions, and I expect you to respond specifically.

Here is a question that I would like a—because the chairman wants to move on, this is a critical question for the people who live in the District of Columbia. You talk about 96 percent of the water systems that are not exceeding the action level. Thank you for that.

Suppose you are among the homes that are 4 percent. We were dealing with 9 percent before. You may even happen to live in a neighborhood full of children. You may even happen to be a nursing mother. How will you be informed that under the rule and under the plan that, in fact, your water has tested above the 15 parts per billion?

Mr. GRUMBLES. Well, the first thing is that 96 percent is relevant only in the sense that there is not a need for a systemic, major overhaul of the rule—is that it works in many ways. But the 4 percent, that's what we are all focused on, how to better address that.

Ms. NORTON. I am focused on the 4 percent. What is the answer for the mother who is pregnant and among the 4 percent?

Please answer my question. You are taking up my time, and now the chairman is forcing me to move on and not even ask all my questions. Please go ahead.

Mr. GRUMBLES. Part of the consumer confidence reports is one way. We are committed to working with the utilities and the States that oversee the utilities to get more effective information to those other people.

Ms. NORTON. You then are committed to, in the rule or in the regulations, finding ways to inform the 4 percent—last time it was 9 percent here—that their water, that they are drinking lead-contaminated water? You are prepared to inform those people?

Mr. GRUMBLES. We are prepared to inform them, or working through the States who have the statutory responsibilities.

Ms. NORTON. Right. I don't mean you necessarily. Here would be you and the utility. I just want to know, will those people know; and whether the rule will say, one, they will know, and two, you will give guidance—you and the State, you and whoever—so that those people don't continue to drink lead-contaminated water and never know the difference.

Mr. GRUMBLES. As we begin this regulatory process, which will involve public comment and further discussion and bringing into the discussion the other issues that aren't specifically identified in those first nine, we are, Congresswoman, committed to broader communication; and continued customer communication is a key component of that.

I want to work with you and the committee and the Energy and Commerce Committee as we move forward with the rulemaking process.

Ms. NORTON. Thank you, Mr. Chairman. I have only one more question I will ask these witnesses.

Ms. NORTON. One of the most shocking things that came forward in our hearings was the so-called notion of "lead-free fixtures" that contain up to 8 percent lead.

Now, that was—frankly, Congress left that there. I am concerned about that not only because it is a lie, but because there are probably hundreds of thousands of people that are wasting their money—consumers, in fact, buying so-called or allowing the use of so-called lead-free "fixtures," which contain—actually contain 8 percent lead. Every day these people are just buying it off the market with no sense.

It's the same thing, you know, as drinking water if you want the 4 percent, and you didn't even know you are drinking lead-contaminated water. Would you recommend to Congress that that 8 percent rule be changed to some other percentage in keeping with what we now know?

Mr. GRUMBLES. Congresswoman, I would recommend that Congress seriously revisit that 8 percent. I don't know what the right percentage is. EPA is committed and this is part of our——

Ms. NORTON. That's all I need to know. If you think we need to revisit it, you are the expert agency and I appreciate that.

Thank you, Mr. Chairman.

Chairman TOM DAVIS. Thank you very much. I want to thank this first panel. Is there anything else anybody wants to add before I dismiss you?

OK. Well, thank you very much for being with us.

We will take about a 3-minute recess as we move to our second panel. Thank you.

[Recess.]

Chairman TOM DAVIS. Thank you. We have our second panel. Mr. Smargiassi, the director of planning of the Massachusetts Water Authority. Representing the American Water Works Association. Thank you very much.

Where are you from in Massachusetts?

Mr. ESTES-SMARGIASSI. I live right in downtown Boston Jamaica Plain.

Chairman TOM DAVIS. Thank you.

Erik Olson, senior attorney, Natural Resources Defense Council. Thanks for being back.

And James R. Elder, who is an independent consultant.

It is our policy that we swear our witnesses before you testify. So if you would just raise your hands.

[Witnesses sworn.]

Chairman TOM DAVIS. Mr. Smargiassi, we will start with you. Again, your entire statement is in the record. We appreciate you being here as kind of a check on everything, outsiders able to look in and offer a perspective on this. We always find that this is very, very helpful to us.

We appreciate each of you taking the time to be with us and your patience.

We will start with you, Mr. Smargiassi, and then move to Mr. Olson and then Mr. Elder.

STATEMENTS OF STEPHEN ESTES-SMARGIASSI, DIRECTOR OF PLANNING, MASSACHUSETTS WATER RESOURCES AUTHORITY, REPRESENTING THE AMERICAN WATER WORKS ASSOCIATION; ERIK D. OLSON, SENIOR ATTORNEY, NATIONAL RESOURCES DEFENSE COUNCIL; AND JAMES R. ELDER, INDEPENDENT CONSULTANT

STATEMENT OF STEPHEN ESTES-SMARGIASSI

Mr. ESTES-SMARGIASSI. Thank you, Mr. Chairman.

The MWRA is the wholesale water and sewer provider to 61 cities and towns in the Boston area, serving about 2½ million people and 5,000 businesses. I am particularly pleased to be here today because the MWRA has made the lead in drinking water issue a priority. Over the last decade we have reduced levels in our system by about 80 percent. We are still working hard to see further reductions.

With our partners in the public health community, we have been aggressive in communicating all the risks of lead to our customers and offered them simple, understandable, practical advice on how to reduce those risks.

As you have mentioned. I am here today on behalf of the American Water Works Association. AWWA and its members commend you for holding this hearing and we do appreciate the opportunity to present our views. This morning, I would like to just summarize a few of the points in our written testimony.

AWWA and its members emphatically support all lead reduction measures that promote public health. AWWA has no information that would suggest that the problems experienced in Washington, DC, are occurring elsewhere in the country. In our testimony before this committee last May, we outlined four recommended measures to address lead contamination in drinking water.

First, we did advocate a national approach with research and public education focused on reducing lead contamination from all sources. It's important that the program not be limited simply to drinking water, since all agree that drinking water is not the major source of lead exposure.

Second, we advocated the use of corrosion control techniques by all utilities to reduce exposure in every home.

Third, we supported the replacement of lead service lines that significantly contribute to high lead levels in the home.

And last, we advocated a holistic approach to the development and implementation of drinking water regulations to minimize the extent to which regulations can interfere with each other, potentially increase rather than decrease health risks.

Over the past year, we have worked to educate water utilities on ways to manage lead exposure, organizing workshops, Web-casts and sessions at national and regional conferences. Our peer review journal has published new research on the topic, and we have mailed information about lead and drinking water in homes and in schools to all our member utilities, and we have incorporated practical advice in all of our routine publications.

AWWA continues to advocate the treatment technique of optimizing corrosion control, as I have said, as the best way of reducing exposure in drinking water in every home, because that exposure

is primarily the result of the interaction of the water with home plumbing and fixtures. Because managing corrosion control in drinking water is complex and might sometimes be in conflict with efforts to meet other important water quality objectives, AWWA undertook the development of a management framework to help drinking water utilities proactively evaluate changes in treatment, or operations that might impact corrosivity or other key parameters before they make those changes.

The framework is now completing peer review. We expect distribution to begin this spring to all of our member utilities, and it represents a big step forward in avoiding unexpected consequences.

The importance of corrosion control and a holistic approach to water quality is emphasized by the challenges posed in managing lead services. All agree that partial replacement of lead service lines increases lead levels in water, at least in the short term and should be avoided.

Lead service line replacements are complicated throughout the country by the ownership of the service lines. In most cases, part of the service lines are owned by the utility and part are owned by the property owner. Getting property owners to change their position—change the position, rather, of lead service lines, can be challenging.

AWWA is preparing a guide for drinking water engineers. This guide will encourage public water systems to aggressively work toward full lead service line replacement and provide them helpful guidance on how to develop that program and how to gain acceptance for that program in their community. We anticipate distribution of that document also this spring.

AWWA strongly advocates public education about all sources of lead exposure and effective, protective measures as a key component of any risk reduction effort. Back in the 1980's, AWWA launched a national "Get the Lead Out" campaign. In 2004, we renewed our efforts to create informational material for utilities to provide to their customers and to provide information directly to the public through our consumer-oriented Web site. Water suppliers, working in cooperation with public health officials and others, can help deliver the needed messages on lead and all the parts that we can play.

Plumbing materials are also important. AWWA standards for the type of materials used are now being reviewed and with the explicit goal of identifying any remaining lead products and eliminating them if we can.

We remain concerned that consumer products may leach lead. The NSFF has initiated a review of its testing protocol to ensure that plumbing products do not contribute excessive lead to drinking water. We will be active in that.

As to school and child care facilities, the existing regulatory legal structure provides for a voluntary program at schools in contrast to the program for the lead and copper rule, which is mandatory. We are preparing a guide for our water utility managers to encourage them to go out and work with the school and child care administrators in addressing this issue, giving them the tools they need to do that.

In conclusion, we pledge to continue to work with you and with EPA and with our State and local partners in public health and education to address this important issue.

We thank you are for your consideration of our views.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. Estes-Smargiassi follows:]

American Water Works Association
The Authoritative Resource for Safe Drinking Water SM

AMERICAN WATER WORKS ASSOCIATION
BEFORE THE
COMMITTEE ON GOVERNMENT REFORM
U. S. HOUSE OF REPRESENTATIVES

STATEMENT ON

LEAD CONTAMINATION IN THE DISTRICT OF COLUMBIA'S WATER SUPPLY

MARCH 11, 2005

PRESENTED BY
STEPHEN ESTES-SMARGIASSI
DIRECTOR OF PLANNING
MASSACHUSETTS WATER RESOURCES AUTHORITY
BOSTON, MASSACHUSETTS

INTRODUCTION

Good morning Mr. Chairman. I am Stephen Estes-Smargiassi, Director of Planning, Massachusetts Water Resources Authority (MWRA), in Boston, Massachusetts. MWRA is the wholesale provider of water and wastewater services to 61 cities and towns in eastern and central Massachusetts, serving a total of about 2.5 million people and over 5,000 businesses. Our supplies come from two very large and well protected reservoirs in central Massachusetts, and we provide all water treatment and water quality analysis for our customer communities. I am here today on behalf of the American Water Works Association (AWWA). AWWA and its members commend you for holding this hearing and appreciate the opportunity to present its views on lead contamination of drinking water.

Founded in 1881, AWWA is the world's largest and oldest scientific and educational association representing drinking water supply professionals. The association's 57,000 members are comprised of administrators, utility operators, professional engineers, contractors, manufacturers, scientists, professors and health professionals. The association's membership includes almost 4,800 utilities that provide over 80 percent of the nation's drinking water. AWWA and its members are dedicated to providing safe, reliable drinking water to the American people.

AWWA utility members are regulated under the Safe Drinking Water Act (SDWA) and other statutes. AWWA believes few environmental activities are more important to the health of this country than assuring the protection of water supply sources, and the treatment, distribution and consumption of a safe, healthful and adequate supply of drinking water.

BACKGROUND

In the past year, there has been much interest in Congress about the elevated levels of lead found in drinking water in Washington, DC. Much of the discussion has centered on the lead service lines between the distribution system and the home plumbing, and whether or not they are a significant source of lead in drinking water. We cannot speak to the specifics of the situation in Washington, DC. The matter is under investigation and AWWA has no direct knowledge of the cause of the elevated lead levels found in tests of drinking water in Washington, DC, or any remedial action that has been taken or should be taken in that instance. Nor does AWWA have any information that would suggest that the problem experienced in Washington, DC, is occurring in other public water systems across the country. In testimony before this Committee on May 21, 2004, we provided general information concerning the sources of lead in drinking water and what has been done and can be done to reduce exposure to lead in drinking water.

AWWA and its members emphatically support lead exposure reduction measures that promote public health. In our testimony last year, we outlined the following recommended measures to address lead contamination of drinking water.

1. First and most importantly, we advocate a comprehensive national approach to reducing lead contamination in drinking water from all sources. This should involve a program of research and public education concerning the sources of, dangers of, and protection against lead contamination from all sources such as paint, dust, drinking water, and others. It is important that the program not be limited to drinking water, since drinking water is not the major source of lead exposure.
2. We advocate the use of corrosion control treatment techniques by all utilities to reduce exposure to lead in drinking water.
3. We support replacement of lead service lines that significantly contribute to high lead levels in the home.
4. We advocate a "holistic" approach to the development and implementation of drinking water regulations to minimize the extent to which regulations can interfere with each other and potentially increase health risks.

Since AWWA testified to this Committee in May last year, we have organized workshops, webcasts, and sessions at national and regional conferences on managing lead exposure. Our peer-reviewed journal has published new research. We direct mailed information to raise member utility awareness about lead in drinking water at homes and in schools, as well as incorporated practical advise on addressing lead into our routine publications. We have also taken a number of steps beyond raising awareness about the lead in drinking water issue. In today's testimony, we will highlight several key activities that have occurred since our last testimony.

HOLISTIC APPROACH TO WATER QUALITY MANAGEMENT

Lead contamination of drinking water is primarily the result of lead in home plumbing and fixtures, which is beyond the control of a drinking water utility. The means available to drinking water systems to mitigate the degradation of water passing through pipes and fixtures in home plumbing involves controlling the water's corrosivity. With this in mind, in our testimony to this committee last year AWWA advocated the treatment technique of optimizing corrosion control as the best way of reducing exposure from lead in drinking water. AWWA continues to believe that this recommendation is sound. Recognizing that managing the corrosivity of drinking water is complex and sometimes in conflict with utility efforts to meet other important water quality objectives, AWWA undertook development of a management framework to help drinking water utilities pro-actively evaluate changes in treatment or operations which might impact corrosivity and other related water quality parameters. The framework is now completing peer review, a process that has included the participation of recognized academic and engineering experts as well as state and federal drinking water regulators. We anticipate distribution to member utilities early this spring.

LEAD SERVICE LINES

The importance of corrosion control and holistic approach to water quality is emphasized by the challenges posed in managing lead service lines. Lead service lines represent one source of lead that must be considered when attempting to control lead in tap water at an individual home, child care facility, or school. AWWA advocates lead service line removal as a means of reducing lead contamination in drinking water when the lead service line is significantly contributing to lead contamination. However, lead service line replacement is complicated by the ownership of the lead service lines. In some instances, the water utility owns the entire line. In others, the property owner owns the entire service line. And in the majority of other cases, part of the lead service line is owned by the utility and part by the property owner. A public water system can only be held legally liable for replacing that part of the service line owned by the utility. A public water system has no legal means to compel a property owner to replace a lead service line or portion of a lead service line. Requiring a water utility to remove privately owned lead service lines raises constitutional and legal issues with regard to private property and eminent domain. All agree that partial replacement of lead service lines increases lead levels in water and should be avoided. Further, removing a lead service line may not reduce lead contamination of drinking water. Tests have revealed high lead levels in homes that have no lead service line and low or no measurable lead contamination in homes with lead service lines.

Recognizing that engaging property owners in changing their portion of a lead service line in conjunction with their public drinking water utility can be challenging, AWWA is preparing a guide for drinking water utility managers. This guide both encourages public water systems to undertake full lead service line replacement and provides helpful guidance on how to develop such a program. We anticipate distribution of this guide to member utilities early this spring.

PLUMBING MATERIALS

In the mid-1980's AWWA launched the "Get the Lead Out" campaign to raise the level of lead contamination awareness among consumers. In 2004 AWWA renewed its efforts to create informational material for utilities to give their customers and

provide information directly to the public on lead contamination. We now have consumer information about lead contamination in drinking water on the AWWA website (www.drinktap.org).

AWWA is a multi-faceted organization and one of its roles in the drinking water community is as a consensus standards organization. In this capacity AWWA's standards are now being reviewed and revised with the explicit goal of identifying any remaining lead containing components in products encompassed by AWWA standards. When lead containing components are identified, if there is a technically sound low-lead material for that component, the standards will be modified to ensure that alternative low-lead materials may be specified by utilities, engineers, and manufacturers that rely on those standards. Significant reductions in lead content in distribution system components were achieved in the 1980s and 1990s but we will continue to facilitate further reductions where they are possible.

Assuring that current "lead-free" expectations are met by plumbing product manufacturers relies in large part on testing under NSF/ANSI Standard 61 for whether contaminants, including lead, leach or migrate from the product/material into the drinking water are above acceptable levels. AWWA will be an active stakeholder in NSF's recently initiated review of its toxics leaching protocol. NSF has initiated a review of its procedures to ensure that the testing protocol is sufficient to ensure that plumbing products do not contribute an excessive amount of lead to drinking water.

LEAD IN DRINKING WATER AT SCHOOLS AND CHILD CARE FACILITIES

Recognizing the importance of minimizing lead exposure in schools and child care facilities, the U.S. Congress passed the Lead Contamination Control Act (LCCA) of 1988. The LCCA provided for repairing or replacing lead-lined water coolers and guidance to schools and child care facilities on methods to test and reduce lead exposure in drinking water. Compliance with the LCCA on the part of schools is voluntary, in sharp contrast to the mandated provisions of the Lead and Copper Rule, which applies to public water systems.

Differences between the LCCA guidance and the LCR requirements are a source of confusion. It is essential that utility personnel have a thorough understanding of the differences between the two rules and an awareness of lead in drinking water issues in schools and child care facilities in their communities. Toward that end, AWWA is preparing a guide that summarizes the LCCA guidance and the LCR requirements and highlights the distinguishing differences; describes the steps school systems and day-child care facilities may take to effectively manage lead levels in the water supplies in their facilities; and provides drinking water suppliers with information and tools they may use to assist school and child care administrators in addressing lead in drinking water. We think of the drinking water utility as the best source of local information about the drinking water supply. We hope that by preparing our members we will set the stage for schools and child care facility administrators to engage in monitoring to identify facilities with unacceptable lead levels and invest in necessary changes to reduce that exposure. AWWA is looking forward to working with EPA and other partners in a coordinated effort to assist in ensuring appropriate monitoring for lead and lead reduction measures in schools and child care facilities are being implemented.

RESEARCH

The recent events in Washington D.C. illustrated that additional drinking water research is critical to ensuring that water systems have the information they need about materials science, water treatment chemistry, and other facets of monitoring and managing the corrosivity of distributed water. AWWA and its members have a long history of promoting research to eliminate or reduce exposure to lead through drinking water. The American Water Works Association Research Foundation (AwwaRF) maintains an active research program. Through AwwaRF, public water supplies have spent approximately $3.4 million dollars on ongoing and past research projects related to lead and copper corrosion and plan to spend over $900,000 on new planned research for a total of $4.3 million. An overview of AwwaRF projects related to the Lead and Copper Rule is attached to this statement.

CONCLUSION

AWWA and its members thank you for holding this hearing concerning lead contamination of drinking water. AWWA pledges to continue to work with the Congress and the US Environmental Protection Agency to address this important issue. We thank you for your consideration of our views.

This concludes the AWWA statement on lead contamination in drinking water. I would be pleased to answer any questions or provide additional material for the committee.

Awwa Research Foundation
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January 2005

Distribution System Corrosion and the Lead and Copper Rule: An Overview of AwwaRF Research

By Traci Case, AwwaRF Project Manager

This summary of relevant completed and ongoing AwwaRF research projects is meant to help with a basic understanding of the issues surrounding distribution system corrosion and the lead and copper rule. Additionally, several new projects are described.

Background

Drinking water lead and copper levels at the tap are regulated by the 1991 Lead and Copper Rule (LCR). This regulation requires utilities to apply certain treatment techniques and to meet action levels in order to control lead and copper release from distribution systems into drinking water at the tap. The LCR established an action level of 1.3 milligrams per liter (mg/L) for copper. If the action level is exceeded in 10 percent ore more of selected tap water samples, corrosion control treatment and source water treatment strategies are required. The LCR also established an action level of 0.015 mg/L of lead at the 90th percentile. If the action level is exceeded, utilities are required to respond with corrosion control and source water treatment strategies as well. Lead and copper release is of concern whether it is in the soluble or particulate form. With these regulatory requirements, the LCR presents a complex operational, treatment, and management challenge for U.S. drinking water utilities.

In the early 1990's, prior to the pending promulgation of the LCR, AwwaRF funded a number of research projects that investigated issues associated with meeting the requirements of the regulation. These projects focused on determining how treatment changes affect distribution water quality and how those water quality changes affect corrosion and metal release in the distribution system.

The following section summarizes the objectives, general research approach, and major findings of fifteen AwwaRF projects that have examined various aspects of the lead and copper corrosion issue. The project report summaries are organized under the following general topic areas:

- general overview
- corrosion-control effects on water quality and corrosion
- treatment process effects on lead and copper corrosion
- specific water chemistry effects on lead and copper corrosion
- tools to help utilities manage lead and copper corrosion issues

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- ongoing AwwaRF research projects
- new request for proposals (RFPs)

The final section of this paper summarizes common themes and lessons learned from the results of this body of research.

A full listing of AwwaRF projects can be found by visiting the Project Center located on the AwwaRF website at www.awwarf.org.

AwwaRF Project Summaries

General Overview

Internal Corrosion of Water Distribution Systems, Second Edition (AwwaRF 90508, 1996) is a hard-bound comprehensive guidance manual on corrosion control for drinking water systems. It is a reference text and does not report specific research results. The second edition consists of ten chapters that cover corrosion principles, corrosion of materials, mitigation of corrosion impacts, assessment technologies, and approaches to corrosion control studies.

Three chapters directly address lead and copper corrosion issues. Chapter 4 focuses on the corrosion and solubility of lead, chapter 5 focuses on the corrosion of copper, and chapter 6 covers corrosion of copper alloys and solders.

Two chapters address the management of corrosion control strategies. Chapter 8 outlines mitigation strategies for corrosion effects and Chapter 10 helps water utilities organize and implement corrosion control studies and strategies.

Corrosion Control Effects On Water Quality And Corrosion

Distribution System Water Quality Changes Following Corrosion Control Strategies (AwwaRF 90764, 2000) documented distribution system secondary water quality impacts of implementing lead and copper corrosion control strategies. The researchers also developed mitigation strategies to preclude, minimize, or eliminate problem areas that resulted from LCR treatment.

The researchers found that the interplay of the water quality of the distributed water, types of materials present in the distribution system, and the hydraulic conditions in the distribution system all lead to secondary water quality impacts. Most impacts occurred when the distribution system water quality was unstable, either because of multiple finished water quality changes over short periods of time or because of wide fluctuations in pH levels. Wide fluctuations in pH largely occurred because of inadequate buffering in the distribution system or because large changes occurred in finished water quality conditions. For systems controlling pH and/or alkalinity, few adverse secondary impacts occurred when consistent distribution pH levels and adequate buffering intensity were maintained.

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The researchers recommended that utilities establish and implement procedures for corrosion control treatment, including:

- Design corrosion control facilities with appropriate pH adjustment controls. Low buffer intensity can result in pH fluctuations that can produce scales on pipe surfaces that are less adherent. Large pH fluctuations can also cause solubilization and precipitation of scales.
- Ensure that distributed water quality remains stable by maintaining adequate buffering and consistency of treatment.
- Avoid other treatment changes during the period of time when corrosion control is initiated (such as changing disinfectants, changing coagulants, or adding new treatment processes).
- Make incremental changes to finished water quality during start up to avoid exposing the distribution system to large finished water quality changes over a short period of time.
- Respond to localized water quality problem areas with a flushing program.
- Evaluate the potential for secondary impact based on water quality data evaluations, assessments of piping conditions and hydraulic information, and review of historical treatment information.
- For systems using orthophosphate inhibitors, maintain adequate residuals in the distribution system and apply the inhibitors at the pH range that is optimal for lead and copper control (7.3 to 7.8).
- Implement a distribution system monitoring program to provide information to assess and respond to secondary impacts that might occur. Monitoring programs should include:
    - Standing lead and copper levels (more frequently than required by the LCR)
    - Water quality parameter measurements to assess the secondary impacts of corrosion treatment and to evaluate the amount of time needed for lead, iron, copper and other materials to re-equilibrate to new water quality conditions
    - Orthophosphate and/or silicate levels
    - pH and alkalinity levels

A General Framework for Corrosion Control Based on Utility Experience (AwwaRF 90712, 1997) and ***Control of Pb and Cu Corrosion By-products Using CORRODE Software*** is a compilation of utility experiences with mitigation of lead and copper corrosion by-product release under provisions of the LCR. Corrosion by-products include aqueous, dissolved, and solid species associated with lead and copper ions. This project report provides a list of publications that synthesize utility experiences with corrosion control, information on how to conduct desktop corrosion control studies, corrosion control case studies, and a software program that simplifies predictions of lead and copper solubility. This manual is meant to be used at two different levels. Utility managers, staff, and regulators could review the report to gain insights into corrosion control approaches and strategies. On another level, the report provides more specific utility experiences under the LCR, providing insight for mitigation of corrosion by-products.

The software product provided with this report is a tool to simplify predictions of maximum soluble lead and copper corrosion by-product release in pipes under different water quality conditions. It also addresses the impacts of aeration on pH and lead and copper solubility as well

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as the effects of mixing on water quality. It should be noted that due to gaps in knowledge regarding the fundamental science of corrosion by-product release and the fact that many corrosion by-products are particulates and not soluble, the software is somewhat limited. Despite those limitations, solubility predictions are an important component of corrosion desktop studies and were considered one of the best predictive tools for utilities at the time this report was published.

Some key points presented in this manual are:

- The 1995 Water Industry Technical Action Fund (WITAF) database referenced in this report provides a comprehensive compilation of utility experiences that allows utilities to compare their own experiences with those of other water utilities with similar water qualities.
- Differences in sampling rigor can cause substantial differences in the outcome of a tap sampling program. Monitoring programs should stress that samples be acquired following the minimum standing water period and using low flow rates during the sample draw.
- Before proceeding with the implementation of a corrosion control program, it is critical to establish representative metal release rates in the distribution system.
- Pipe loop protocols are proven to provide useful information in several corrosion control assessment programs; however, they required a substantial investment of resources and time. Additionally, the data they yield are often difficult to analyze and not always predictive of distribution system performance.
- The secondary impacts of corrosion control are usually relatively minor:
    - Utilities that attempted to define whether corrosion control treatments produced noticeable change in the taste and odor profile of the distributed water were unable to demonstrate any difference relative to the unmodified baseline water.
    - The pH shifts associated with most corrosion control strategies produced only minor changes in the concentration of disinfection by-products.
- Solubility models have value in terms of predicting metal release trends and for examining mechanisms of passivation and corrosion scale accumulation. However, while the models accurately reflect equilibrium conditions, they do not take into account solubility kinetics, the heterogeneity of plumbing surfaces, or the issue of particulate shedding versus soluble metal release.
- Some electrochemical screening techniques can accurately determine the underlying rate of corrosion on lead and copper surfaces, as well as on the surfaces of their alloys.
- Copper corrosion control is easier to achieve than lead release control. Copper corrosion is almost exclusively chemical, while lead release is governed by a combination of chemical, hydraulic, and other mechanical factors.
- Stability of pH is necessary for controlling the release of lead. Distribution system pH changes that drop the pH by greater than 0.5 units - even for brief periods - appear to disrupt the effective passivation of corrosion surfaces, especially on brass and lead/tin solder surfaces.
- There is evidence that opportunistic organisms can exploit corrosion scales as colonization sites. By doing so they create a microenvironment that may influence the rate and morphology of corrosion on the underlying metal.

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Role of Phosphate Inhibitors in Mitigating Lead and Copper Corrosion (AwwaRF 90823, 2001) summarizes the effects of phosphate-based corrosion inhibitor chemicals on lead and copper corrosion. Experiments were conducted to examine the complexation of copper and lead, solid dissolution rates, and solid precipitation in the presence of polyphosphate.

Fundamental chemistry experiments: For the polyphosphate tested in this study, every 1 mg/L of phosphate inhibitor dosed (as P) had the potential to hold 2 mg/L of lead in solution. This could be considered a maximum capacity for lead dissolution, as this high of a value would rarely be achieved in practice due to the effects of calcium, magnesium, kinetic limitations, and other factors. Lead complexation is not as strong in the presence of calcium (40 mg/L) but is still relatively important. These experiments also indicated that hexametaphosphate increases the rate of dissolution from lead scales [including $PbCO_3$ and $Pb_3(CO_3)_2(OH)_2$]. Precipitation of lead from solutions containing $NaHCO_3$ was inhibited by sodium metaphosphate. The final dissolved lead concentration was roughly equal to the metaphosphate complexing capacity. Higher metaphosphate concentrations resulted in higher dissolved lead concentrations. This led to the conclusion that polyphosphate can influence the kinetics of scale formation in pipes.

Copper corrosion: With a few exceptions, dosing of orthophosphate and hexametaphosphate inhibitors had beneficial effects on copper release. The exceptions are for very new pipes at pH 7.2, in which hexametaphosphate had very significant adverse short-term effects, and for well-aged pipes at pH 7.2 and alkalinity 300 mg/L as $CaCO_3$. In the latter case, although the orthophosphate had dramatic short-term benefits, a few years of aging caused marked decreases in release when inhibitors were absent.

Lead corrosion: Orthophosphate dosing often produced significant benefits for lead. This was true for every stagnation time and water quality tested at 6 months' pipe age. The project also examined the role of phosphate inhibitors in controlling soluble lead release, as opposed to total lead. In every instance, soluble lead concentrations were lower in the presence of orthophosphate than in an equivalent system without inhibitor. Conversely, with few exceptions, soluble lead concentrations were higher in systems dosed with hexametaphosphate than without inhibitor. Orthophosphate has an enormous advantage over hexametaphophate when comparing soluble lead release. Hexametaphosphate demonstrated an increase in soluble lead in every instance when compared to an equivalent dose of orthophosphate. This lead to the conclusion that hexametaphosphate substantially increases problems with soluble lead.

Lead and copper corrosion by-products: Significant fractions of particulate and colloidal lead and copper were found in participating utilities' tap water samples. Copper was mostly soluble when total copper levels were high. In contrast, most of the lead found in the tap samples was in the particulate form.

Zinc orthophosphate: The addition of zinc did not enhance the performance of orthophosphate. In all cases zinc tended to detract from the benefits of orthophosphate. This lead the researchers to conclude that zinc orthophosphate cannot be recommended for copper or lead corrosion control when compared to orthophosphate alone.

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Treatment Process Effects On Lead And Copper Corrosion

Chloramine Effects on Distribution System Materials (AwwaRF 90624, 1993). The purpose of this project was to investigate corrosion and degradation of elastomers and some metals with chlorine and chloramine disinfection.

For elastomers, the results pointed to accelerated elastomer failure after changeover to chloramination. Accelerated life-cycle testing of tension mounted thermoplastic coupons showed that with few exceptions solutions of chloramines produced greater material swelling, deeper and dense surface cracking, a rapid loss of elasticity, and loss of tensile strength than equivalent concentrations of free chlorine. Elastomers more susceptible to degradation are those formulated with natural or synthetic isoprenes. Newly engineered synthetic polymers performed well in the chloramines exposure tests.

For metals, the researchers exposed seven metals (copper, brass, bronze, three types of solders, and mild steel) to varying levels of pH (6-8), chlorine (0.5 and 5.0 mg/L), chloramines (0.5 and 5.0 mg/L) and ammonia (<10 mg/L). Corrosivity was measured using weight methods, electrochemical analysis, and galvanic current on coupons or pipe segments exposed to disinfectants. The researchers made the following conclusions:

- Both chlorine and chloramines accelerate the corrosion of copper and its alloys at pH 6 but cause minimal corrosion at pH 8.
- An increase in disinfectant concentration can increase corrosion of copper and its alloys at pH 6.
- Corrosion of copper and copper alloys by free or combined chlorine was greatest for brass, followed by copper, and then bronze.
- The presence of free or combined chlorine did not lead to pitting type corrosion on copper or copper alloy surfaces under the conditions tested in this project.
- The presence of ammonium ions produced no discernible increase in corrosion on copper or copper alloy surfaces.
- Neither leaded nor lead-free solders are substantially influenced by the presence of free or combined chlorine at pH levels common to distribution systems.
- In equal concentrations, free chlorine is slightly more corrosive than chloramines on copper and its alloys. However, residual concentrations are higher in systems that disinfect with combined chlorine, compared to free chlorine. As a result, systems that convert to chloramine disinfection may experience higher rates of corrosion depending on pH levels.

Optimizing Chloramine Treatment, Second Edition (AwwaRF 90993, 2004). In 1993 AwwaRF funded the first edition of this report, which is a manual on the use of chloramines and the role they play in water quality improvements for drinking water utilities. This second edition of the report provides updated information gathered from 68 utilities by documenting their experience with chloramination use. Using the information from the utility survey, the researchers identified critical parameters for controlling chloramination and formulated a chloramination optimization strategy.

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The report provides key evaluation criteria when evaluating a switch to chloramines, a process for determining if chloramines are the right choice for a utility, a process and operating procedures for optimizing chloramines treatment, ammonia storage and feed facility considerations, chloramination start up considerations, distribution system issues, parameters to monitor, and customer relations issues to consider.

The researchers did not find that the utilities surveyed had experienced any general trends of lead and copper corrosion issues with chloramine use. Through the literature review for this project, the researchers found that many corrosion studies conducted on chlorinated and chloraminated water systems included evaluations of copper; however, very few rigorous studies exist that make a direct comparison of the corrosive effects of chlorine and chloramines.

One case-study utility conducted a comprehensive corrosion study on their soft, slightly buffered water sources. The utility evaluated the corrosivity of chlorine and chloramines using flow through pipe loops for a 12 month period. According to the results, copper thinning rates decreased as the pH was increased. At each of the different levels, chloramines caused more copper thinning than chlorine, with the exception of three control loops. It is important to note that the utility did not compare equivalent levels of chlorine and chloramines. As such, the utility results, which indicate that chloramine was more corrosive to copper than chlorine, are not direct comparisons of corrosivity between the two disinfectants.

Impacts of Enhanced Coagulation on Corrosion of Water Treatment Plant Infrastructure (AwwaRF 90997, 2004) examined the effects of enhanced coagulation (lower coagulation pH and higher coagulant doses) on water treatment plant infrastructure. This project focused specifically on corrosion of treatment plant infrastructure to include concrete, internal plant piping, pumps, and valves.

The research team conducted a utility survey and case studies to determine the effects of enhanced coagulation on water treatment plant infrastructure. Additionally, the team conducted experiments on inhibitor compatibility with enhanced coagulation and a comparison of alum, ferric, and PACl coagulants in the degradation of concrete.

Some key findings of this research are:

- Free chlorine is highly corrosive to plant infrastructure. However, few utilities anticipate increased problems from free chlorine when coagulation pH is lowered, even though such changes are known to enhance release of Cl_2 gas from water. Painting plant infrastructure provides a simple means of slowing the rate of attack.
- Metallic plant infrastructure, such as pumps and pipes, bear close monitoring for pinhole or pitting-type corrosion.
- Coagulation at the treatment plant can cause discoloration and change corrosion of materials in the distribution system. Whenever a change in coagulant type or pH is implemented, the corrosivity of the water is fundamentally changed. Even small changes in the pH of distributed water can have noticeable impacts on corrosion of distribution system materials.

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- If inhibitors are used to protect components in the treatment plant, they need to be compatible with coagulation goals. Since phosphate or polyphosphate inhibitors are removed by, and likely interfere with, coagulation, they do not appear to be a good option for protecting plant infrastructure.

Role of Inorganic Anions, NOM, and Water Treatment Processes in Copper Corrosion (AwwaRF 90687, 1996) studied the effects of water quality on copper corrosion using both conventional and electrochemical aging methods. In addition to natural organic matter (NOM), the researchers focused on the effects of five common anions: sulfate, chloride, bicarbonate, perchlorate, and nitrate.

Some general implications for water treatment practices were discovered. Utilities delivering high-alkalinity (> 100 mg/L as $CaCO_3$) and low pH (<7.7) waters can expect a high likelihood of problems with copper corrosion. A small pH increase to about 8.0 may alleviate or eliminate copper corrosion problems. The research team recommends on-site corrosion studies to accurately define the pH increase necessary to gain the desired benefits.

In waters with NOM in the range of 1 – 4 mg/L (typical for surface source waters), NOM removal by coagulation or adsorption, or both, cause little change in copper corrosion and release.

With enhanced coagulation, waters treated with alum were more aggressive towards copper than those treated with ferric chloride. Alum also caused longer term corrosion rates. The choice between using aluminum sulfate and ferric chloride as coagulants is very important for copper corrosion control. Although chloride has beneficial effects and sulfate has adverse effects, it is not known whether these effects are magnified at increased concentrations, nor are the combined interactions understood. Once again, corrosion studies are imperative to determine whether the benefits, if any, would be worth the cost of changing coagulants.

Adsorption with GAC had a negative impact on copper corrosion while ozonation had no significant effects on copper corrosion.

Disinfectant Decay and Corrosion: Laboratory and Field Studies (AwwaRF 90992, 2004) examined the secondary water quality effects of the decay of free chlorine and chloramines in the distribution system. The research team developed and tested a pipe section reactor to measure the decay rate of disinfectant at the pipe wall. They also collected field data from two utility distribution systems to measure the decay of free chlorine by two alternative methods and to explore a relationship with corrosion rates.

The results of this research work are fundamental in nature and are meant to achieve a better understanding of disinfectant decay at pipe walls such that a set of default values for decay rate coefficients could be specified for free chlorination and chloramination, the two most common secondary disinfectants. These coefficients could be available within modeling software to be assigned to pipe sections based on information about pipe materials, corrosion rates, water velocities, and key water quality parameters (e.g., pH, alkalinity, and dissolved oxygen). This would ensure that the wall reaction has been accounted for within the model. Ultimately, an

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accelerated model calibration process and greater utility confidence in model predictions would be valuable when evaluating the impact of different strategies such as pipe replacement, alternative storage tank management, and changes in water treatment to meet regulations.

Specific Water Chemistry Effects on Lead and Copper Corrosion

Corrosion and Metal Release for Lead Containing Plumbing Materials: Influence of NOM (AwwaRF 90759, 1999) investigated the effects of natural organic matter (NOM) on the corrosion of lead-containing materials (i.e., leaded brass, lead-tin solder, and lead pipe) in drinking water. The researchers found that the effects of NOM were dependent on the properties of the corroding material. The primary conclusion of this research confirmed the suspicion that the presence of NOM may be a major factor affecting lead release from lead pipe, lead-tin solder, and leaded brass or bronze. The adverse effects of NOM were exacerbated in low-pH, low-alkalinity waters. Increasing pH and alkalinity can alleviate the adverse effects of NOM. Chlorination and ozonation did not diminish the lead leaching associated with NOM on the short term, but may alleviate NOM effects associated with lead release in the long run. NOM did exhibit some corrosion-inhibiting action for brass and decelerate the dezincification of the brass, but it did not stop or inhibit selective lead oxidation and leaching caused by the galvanic coupling of the lead microphase with the copper-based matrix. The researchers concluded their report with a recommendation that all lead-containing copper-based alloys be eliminated in potable water applications.

Tools to Help Utilities Manage Lead and Copper Corrosion Issues

Development of a Pipe Loop Protocol for Lead Control (AwwaRF 90650, 1994) provides drinking water utilities with a standard protocol for use of the AwwaRF pipe rack to evaluate the effectiveness of various treatment options in controlling lead and copper levels at the tap. The protocol provided is a practical, hands-on approach with construction, operation, and data evaluation recommendations based on results from several utilities that tested the AwwaRF pipe rack in their plants.

The AwwaRF pipe rack is designed to evaluate lead and copper leaching characteristics in a flow-through system that simulates household plumbing. Each rack is designed to contain several individual pipe loops for which various metal levels could be evaluated for specific water qualities. The pipe rack is designed to help utilities perform corrosion rate studies and metals leaching determinations for compliance with the LCR.

The LCR requires that all utilities serving over 50,000 customers conduct corrosion control optimization studies and demonstrate optimal treatment for lead and copper. The 1992 USEPA guidance manual for the LCR specifies a framework for conducting corrosion studies. The AwwaRF pipe rack can be used as a demonstration testing device for comparing the effect of corrosion treatments on metals levels and for testing secondary impacts of treatment changes on water quality and regulatory compliance.

Proper planning and operation of pipe rack studies are crucial for a successful pipe rack study: proper fabrication, adequate mixing of chemical feed solutions, adequate preconditioning, proper

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disinfection of sample ports (to prevent high heterotrophic bacteria counts), and monitoring of pipe rack operations. The operation can be divided into three phases: startup, preconditioning, and corrosion testing operations. With startup, a standard protocol for flushing is recommended in the manual. The manual also recommends a four-week preconditioning phase before chemical treatments are started. This allows verification that the pipe loops are constructed in a similar fashion and yield similar results with a common starting point for evaluating treatment effects on leaching. For the actual corrosion testing, the manual recommends a daily on-off cycle to simulate flow in a typical home, collection of standing samples for measuring corrosion-related parameters, and collection of running samples for determining influent water quality characteristics and operational consistency. At a minimum, lead, copper, temperature, alkalinity, total and free chlorine, and pH are recommended for analysis on first flush, standing water quality samples. The manual recommends frequency of collection of standing samples based on the expected variability of the results and the length of time over which samples will be collected.

The manual recommends that utilities run pipe rack studies for three distinct periods: a conditioning period, a transition period, and a stability period. The conditioning period consists of a rapid drop in metals levels, followed by a transition period where metals levels decrease at a slower rate. In the stability period, metals levels stabilize. Utilities must run the pipe rack studies long enough to ensure data represent the stabilization period. The utilities that tested the pipe rack for this study found that it took six to nine months for lead to stabilize in lead loops; three to eight months for lead to stabilized in lead-soldered copper loops. Copper levels stabilized in two to eight months. The manual recommends utilities operate the pipe rack long enough for the metals levels to stabilize. Longer periods may be required if data collected are highly variable or a greater degree of statistical confidence is required.

In 1994, when this study was published, an AwwaRF pipe rack cost $10,000 to $13,000 in materials in labor to build. For several water quality conditions to be tested, one rack would be needed for each treated water condition. Operation costs may require up to one full-time operator for a two to four week period, with routine operations up to 20 hours/week.

Noted drawbacks with the AwwaRF pipe rack study include:

- For statistically meaningful and valid results, the study may have to be run for as long as 18 months to obtain adequate data.
- Metals levels measured are impacted by the nature and consistency of source water quality.
- The stability of metals may not be observed if seasonal source water quality changes happen during the course of a pipe rack study.
- The cost of building a pipe rack system may be cost prohibitive for small utilities.
- Variability measured in the lead and copper data from the pipe racks used in the study was high. However, nonparametric methods are available with which to evaluate the variable data in a statistically valid manner.

Although the results from the AwwaRF pipe rack must be considered a relative evaluation of treatment impacts on metal levels, the data can be used for demonstrating optimization.

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Optimizing Corrosion Control in Water Distribution Systems (AwwaRF 90983, 2004) developed and tested an online, real-time electrochemical sensor to screen corrosion inhibitors for drinking water treatment. It also demonstrated the use of electrochemical noise (EN) in development for corrosion control applications.

The results of this study were successful in demonstrating the use of a multi-element sensor, electrochemical technique for instantaneously monitoring corrosion and optimizing corrosion in water distribution systems. Additional findings from the study include:

- The EN technique was shown to be a sensitive tool for identifying electrochemical corrosion phenomena and allowed low rates of pitting to be accurately detected and monitored.
- EN corrosion rate calculations appeared to follow changes in process parameters such as use of inhibitors, water flow past electrodes, and water temperatures.
- Electrochemical noise measurements in the field detected corrosion rates over a wide range, and characterized the degree of localization.
- EN monitoring can be implemented with informed but minimal effort. New monitoring techniques can be effective if process is kept fairly simple.
- Although EN signals could not be directly correlated to water quality concentrations, the value of using EN is having the ability to monitor changes in corrosion environments and having the ability to identify pitting and crevice corrosion regimes.

Post-Optimization Lead and Copper Monitoring Strategies (AwwaRF 90996F, 2004) developed a monitoring program for drinking water utilities that have already achieved optimized corrosion control. Alternative monitoring methods were developed to demonstrate to regulatory primacy agencies that corrosion control is being maintained when treatment techniques and/or source waters are altered.

Utilities have been struggling with variability in monitoring data, shrinking sample pools (due to home remodeling or lack of customer interest), increasing costs associated with monitoring programs, and the differing needs of utilities verifying optimization and corrosion control versus those trying to achieve optimization in the first place. The monitoring protocol recommended in this report simultaneously addresses the control of data variability and attrition of sample pools by recommending the sampling of fewer sites more often. It also provides utilities and regulators with tools to continue to collect statistically sound data in the face of fewer qualified sample locations.

The research team conducted regulator and utility surveys to develop both an in-home tap and an on-line corrosion monitoring protocol that were then field tested by four participating utilities. From this research the team developed a proposed alternative lead and copper corrosion control monitoring strategies. Included are proposed in-home tap sampling protocol and statistical evaluation methodologies and an evaluation of the applicability of on-line corrosion cell predictive technologies.

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Alternative in-home tap monitoring protocol: A detailed summary of the alternative tap monitoring protocol can be found in the published report. It outlines, for both lead and copper, the number of sites recommended for sampling, the number of samples per site, a quarterly evaluation period, site selection criteria, and data collection and analysis criteria.

On-line corrosion monitoring protocol: The development of the on-line corrosion cell (OLCC) addressed many of the challenges associated with the initial design of a functioning corrosion cell. After several attempts the Narrow Rectangular Cell (NRC) design showed that the Corrosion Potential-Stagnation/Flow (CPSF) theory could be verified in the laboratory and in the field. In its current level of development the NRC OLCC is not widely applicable to utility use and data interpretation can be difficult for a typical utility operator. However, the OLCC design and findings reported are a significant first step to future investigation into this type of corrosion cell.

An automated sampling device was developed to a prototype stage and tested in the field. Data collected using the devices was comparable to manually collected samples. Future investigation will require design revision and more extensive field testing.

Finally, the investigation of lead and copper pipe loops as a tool for tracking corrosion control changes demonstrated that the potential for their use did exist. However, due to the time required for pipe loops to stabilize, the feasibility of their use is limited to utilities that have an operable pipe loop rack in inventory or under operation. The data provided by the pipe loop racks evaluated did not justify the time and associated financial commitment required for the development of such a tool for an already optimized utility.

Lead Pipe Rehabilitation and Replacement Techniques (AwwaRF 90789, 2000) tested and evaluated existing and emerging technologies for rehabilitation or replacement of lead pipes distribution systems. The LCR requires that a water system that exceeds the 90th percentile action level for lead after installing optional corrosion control and source water treatment is required to replace lead service lines that contribute more than 0.015 mg/L to total standing tap water lead levels. Although replacement or rehabilitation is an efficient method to remove lead sources in the distribution system, it is usually the most costly alternative for reducing lead levels at the tap (as opposed to corrosion control and source water treatment). This manual provides utilities with a tool for assessing and selecting lead pipe rehabilitation and replacement technologies. It provides descriptions of the various techniques, where those techniques can be applied, and factors that should be considered for successful application of each technique. The manual includes cost estimates (estimated in 1998) for comparison between the various techniques.

The research team used a utility survey, case studies, and field testing to document utility experience with several lead pipe rehabilitation and replacement techniques. Technology categories tested included:

- Open-trench replacement
- Replacement along existing route (discarded pipe is left in the ground and new pipe is installed along a different route using a trenchless method)

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- Replacement along a new route (existing lead pipe is removed or displaced while simultaneously replacing it with a new pipe)
- Slip lining (existing pipe is lined with a loose or tight fitting liner made of plastic material)
- Pipe coating (existing pipe interior is coated with epoxy or other polymer material)

For each technology category, the manual describes various techniques needed to apply the technology. Twenty-eight techniques were addressed in this manual. Technology profiles are detailed in the manual and facilitate a direct comparison between the various techniques.

Comparison of technologies:

- In general, the open-trench replacement technology is the most versatile and adaptable but the costs can be very high compared to other technologies (due to the typically high costs associated with site restoration).

- Replacement-along-existing-route technology is commonly applied in the U.S., but not in Canada or Europe. The technology is straightforward to apply and costs are generally lower than open trench technology - provided conditions are favorable below grade. It does tend to cause longer interruptions in water service because the water must be disconnected during replacement of the existing lead pipe.

- The replacement-on-new-route technology enables new service pipes to be installed at lower costs compared to open-trench and with minimum disruption to the environment and customers. It is commonly used in North America and Europe and is considered the most preferable technology choice for installation of replacement service pipes by many utilities surveyed for this project.

- The slip-lining technology is applied mostly in Holland and the U.K. Limited testing of this technology has been conducted in North America, but it is not applied routinely. This technology can be used to rehabilitate lead pipes where replacement-along-existing-route and replacement-on-new-route technologies are not suitable. This technology would not be suitable for lead pipes that follow a convoluted route or have significant breaks or restrictions. Costs are relatively high compared to other technologies due to the cost of the lining material and high capital cost of the equipment.

- The pipe-coating technology is not used routinely in North America or Europe to rehabilitate lead pipes. It is used in the U.S. to coat small diameter potable water pipes within buildings and ships. It can also be used to coat the inside of pipes around bends and through pipe restrictions. The major advantage of this technology is its ability to complete multiple installations at a reduced cost. The major disadvantage is the extended interruption in water service due to the long time required for the resin to cure.

Lead Control Strategies (AwwaRF 90559, 1990) was published during the time that the LCR was being first introduced in the U.S. At the time, USEPA guidance on LCR treatment plans (i.e., pipe loop studies, analysis of data, start-up, and monitoring of treatment) had not yet been

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developed or published. Despite the premature timing of this study with respect to the LCR, the manual does provide a body of knowledge to help utilities develop lead control strategies.

This project identified potential sources of lead coming from customer plumbing as being goosenecks, lead service lines, lead plumbing, lead lined iron piping, lead tin solder, and brass faucets. Many variables control the rate of leaching and lead in water samples, including the age and type of material, workmanship, size of pipe, water quality, size of the water sample, standing time, and whether a water sample has been running or standing.

As a part of this project, the research team contacted utilities that had conducted lead studies to improve water quality for their customers. The studies included water quality tap sampling, pipe loop studies, lead materials investigations and replacement programs, and lead treatment programs. The case studies provided a good basis for developing viable lead control strategies at the time.

The manual also provided the theory and practical considerations for controlling lead leaching from chemical treatment processes. The researchers determined the most important water quality parameters for lead solubility to be pH, alkalinity, dissolved inorganic carbonate, and orthophosphate levels. The manual recommended controlling lead with pH adjustment, carbonate adjustment, orthophosphate addition, silicate addition, and calcium carbonate deposition.

Ongoing AwwaRF Projects

Two LCR-related projects are currently ongoing. Research on both projects commenced in December of 2004 and both should be completed by late 2007.

Contribution of Service Line and Plumbing Fixtures to LCR Issues (AwwaRF Project 3018) (Gregg Kirmeyer and Anne Sandvig, EES/HDR) The research team is investigating and quantifying the contribution of lead service lines, utility-owned plumbing fixtures, and customer-owned plumbing fixtures to lead and copper rule compliance issues. This project stems from a need in the drinking water industry to know if lead service line replacement is helpful for LCR compliance. Utilities also want to know if customer plumbing and utility installed in-line plumbing devices contribute to LCR compliance issues. The researchers are conducting testing to determine what sources could contribute to elevated lead concentrations at the tap, and the operational/compliance significance of that contribution. This will be done by conducting a utility survey as well as conducting water sampling from utilities that have done sampling both before and after full- and partial-lead service line replacement. The researchers are evaluating a representative sample of customer piping, fittings, and solder material that are in contact with water for scaling characterization. An evaluation of the impact of hydraulic flow factors in plumbing systems will be done to determine how faucet-related physical characteristics affect LCR compliance. The final product of this research will provide guidance to water utilities on when to either fully or partially replace lead service lines versus applying corrosion control treatment strategies.

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Nonuniform Corrosion in Copper Piping – Assessment (AwwaRF Project 3015) (Marc Edwards, Virginia Tech) The research team is assessing the prevalence of non-uniform corrosion in copper piping within the North American drinking water industry. This project stems from anecdotal evidence that certain water quality factors and water utility actions may lead to this type of corrosion in copper household plumbing. Factors to be investigated include elevated pH levels, use of NOM removal methods, increase in chlorine dosages, use of chloramines for disinfection, high aluminum levels, interactions of aluminum with silicate, and the presence of aluminosilicate particulates in finished water. The research approach includes an industry wide survey assessment as well as collection of water quality data from utilities where copper pinhole failures have occurred. Additionally, the researchers will characterize water chemistry from the surveyed utilities and will conduct physical examinations on representative pipe specimens. From this information, the researchers will evaluate and find trends or correlations in water quality data from surveyed utilities and their distribution systems. The final product will be an assessment of the extent of the problem of pinhole leaks across North America, as well as potential causes that might lead to the problem in customer plumbing.

New AwwaRF Request for Proposals (RFPs)

Three LCR-related RFPs are to be released in March 2005. Proposals are due in summer of 2005 and if adequate proposals are received, work should commence by early 2006.

Impact of the Change in Disinfectants on Lead, Brass, and Copper Components in the Distribution System (RFP 3107) This project will determine the effect of changing disinfectants (from free chlorine to chloramines and vice versa) on metals leaching rates and leaching levels from lead, brass, and copper distribution system components. This project will also study the effects of galvanic coupling on metals release.

Non-Uniform Internal Corrosion in Copper Piping – Monitoring Techniques (RFP 3109) This project will evaluate techniques for identifying and monitoring non-uniform internal corrosion (pinhole leaks) in copper premise and service line piping. This project will provide drinking water utilities and researchers a tool for evaluating the consequences of changing treatment processes or water sources for the purpose of regulatory compliance, and will also provide methods to evaluate corrosion control strategies to mitigate pinhole leak problems. This project is not intended to study external corrosion of copper service line piping or copper corrosion from stray currents.

Performance and Metals Release of Non-Leaded Brass Meters and Fixtures (RFP 3112) This project will define issues, determine the current state of knowledge, and identify research gaps and needs with the increased and widespread use of "non-leaded" brass (or "enviro" brass) meters and fixtures by the drinking water industry. This project will build the framework for researching how these new non-leaded fixtures perform in the short and long term as well as what water quality impacts they may have on finished drinking water at the tap after installation. It will also help to develop a research plan to investigate specification and operations and maintenance (O&M) issues associated with the use of these new non-leaded brass fixtures.

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Summary of results/common themes

One of the most important lessons learned from the AwwaRF research conducted on lead and copper corrosion is that every utility's lead and copper corrosion challenges are unique to that utility's source water quality, treatment train, and distribution system configuration and materials. There is no standard "recipe" for lead and copper corrosion control that every utility can apply regarding treatment strategies, corrosion control strategies, or distribution system management.

That being said, there are some general lessons learned from this body of research that do apply to most or all drinking water utilities that can be helpful in addressing lead and copper corrosion issues.

Corrosion-control effects on water quality and corrosion:

- Most negative water quality impacts occur when the distribution system water quality is unstable, either because of multiple finished water quality changes over short periods of time or because of wide fluctuations in pH levels in the distribution system.
- To minimize adverse water quality impacts, maintain a consistent distribution system pH with adequate buffering intensity. Distribution system pH changes that drop the pH by greater than 0.5 units - even for brief periods - can disrupt the effective passivation of corrosion surfaces, especially on brass and lead/tin solder surfaces.
- Utilities should make incremental changes to finished water quality during start up to avoid exposing the distribution system to abrupt changes over a short period of time. It is also advisable to avoid making other treatment changes during start up (i.e., changing disinfectants, changing coagulants, or adding new treatment processes).
- When using orthophosphate inhibitors, maintain adequate residuals in the distribution system and apply those inhibitors at the pH range that is optimal for lead and copper control (7.3 to 7.8).
- Look to other similar utilities' experiences concerning corrosion control. The 1995 WITAF database referenced in the report, *A General Framework for Corrosion Control Based on Utility Experience* (AwwaRF 90712, 1997), provides a compilation of utility experiences that allows utilities to compare their own experiences with those of other water utilities with similar water qualities. The report also provides a compilation of utility experiences with mitigation of lead and copper corrosion by-product release under the LCR.
- In general, copper corrosion control is easier to achieve than lead release control. Copper corrosion is almost exclusively chemical, while lead release is governed by a combination of chemical, hydraulic, and other mechanical factors.

Treatment process effects on lead and copper corrosion:

- While the AwwaRF body of research did not specifically investigate the effect on lead release when changing from chlorine to chloramines, it did look preliminarily at copper release. It was determined that residual concentrations of free chlorine are higher in

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systems that disinfect with combined chlorine (chloramines), as opposed to systems that disinfect with free chlorine alone. As a result, systems that convert to chloramines may experience higher rates of copper corrosion, depending on pH levels.

- Both chlorine and chloramines accelerate the corrosion of copper and its alloys at pH 6 but cause minimal corrosion at pH 8. In equal concentrations, free chlorine is slightly more corrosive than chloramines on copper and its alloys.
- In *Optimizing Chloramine Treatment, Second Edition* (AwwaRF 90993, 2004), the researchers did not find that the utilities surveyed had experienced any general trends of lead and copper corrosion issues with chloramine use. Through the literature review they found many corrosion studies conducted on chlorinated and chloraminated water systems included evaluations of copper. However, very few rigorous studies exist that make a direct comparison of the corrosive effects of chlorine and chloramines.
- With enhanced coagulation, waters treated with alum are generally more aggressive towards copper than those treated with ferric chloride. The choice between using aluminum sulfate versus ferric chloride as coagulants is very important for corrosion control. Corrosion studies are imperative to determine whether the benefits, if any, would be worth the cost of changing coagulants.
- In waters with NOM in the typical range for surface source waters (1 - 4 mg/L), NOM removal by coagulation and/or adsorption, or both, cause little change in copper corrosion and release.

Specific water chemistry effects on lead and copper corrosion:

- Utilities delivering water that is high alkalinity (>100 mg/L as $CaCO_3$) and low pH (<7.7) can expect a high likelihood of problems with copper corrosion. A small pH increase to about 8.0 may alleviate or eliminate copper corrosion problems. On-site corrosion studies can help to accurately define the pH increase necessary to gain the desired benefits of a pH change.
- The presence of NOM may be a major factor affecting the release of lead from lead pipe, lead-tin solder, and leaded brass or bronze. The adverse effects of NOM are exacerbated in low-pH, low-alkalinity waters.

Tools to help utilities manage lead and copper corrosion issues:

- The AwwaRF pipe loop protocol (*Development of a Pipe Loop Protocol for Lead Control,* AwwaRF 90650, 1994) offers a practical, hands-on approach to evaluate lead and copper leaching characteristics in a flow-through system that simulates household plumbing. It is a useful tool for corrosion-rate studies and determinations of metals leaching for compliance with the LCR, but is expensive and time-consuming to use.
- *Post Optimization Lead and Copper Monitoring Strategies* (AwwaRF 90996F, 2004) provides a monitoring program for drinking water utilities that have already achieved optimized corrosion control. The program includes a proposed in-home tap sampling protocol (number of sites to sample, number of samples per site, a quarterly evaluation period, site selection criteria, and data collection/analysis criteria) and statistical evaluation methodologies.

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- The LCR requires that a water system that exceeds the 90th percentile action level for lead after installing optional corrosion control and source water treatment is required to replace lead service lines that contribute more than 0.105 mg/L to total standing tap water lead levels. *Lead Pipe Rehabilitation and Replacement Technologies* (AwwaRF 90789, 2000) is a tool for assessing and selecting lead pipe rehabilitation and replacement techniques to meet this requirement.

Future work

In addition to the three requests for proposals (RFPs) outlined above, AwwaRF continually strives to help utilities prepare for the future through new drinking water research.

Over the summer of 2005 the four workgroups of the AwwaRF Research Advisory Council (RAC) will be considering new research ideas and will develop a solicited research agenda for 2006. The RAC workgroup members are volunteer drinking water industry professionals – utility representatives, consultants, regulators, AWWA committee members, and academicians. They evaluate and consider research ideas collected from the drinking water community in order to develop next year's solicited research agenda. The four workgroups that make up the body of the RAC – High Quality Water, Infrastructure Reliability, Environmental Leadership, and Efficient and Customer Responsive Organization – will carefully consider any lead and copper corrosion related issues and, if they see a research need of high priority, will develop projects to release for RFP in 2006.

To submit specific research ideas related to the topic of lead and copper corrosion and the LCR, please contact Traci Case, AwwaRF Project Manager, at (303) 347-6120 or tcase@awwarf.com as soon as possible, but no later than August 1, 2005.

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Report Title	Year Published	Order #	Principal Investigator
Contribution of Service Line and Plumbing Fixtures to LCR Issues	research ongoing		Kirmeyer (Economic and Engineering Services, Inc./HDR)
Nonuniform Corrosion in Copper Piping – Assessment	research ongoing		Edwards (Virginia Tech)
Disinfectant Decay and Corrosion: Laboratory and Field Studies	2004	90992	DiGiano (University of North Carolina)
Impacts of Enhanced Coagulation on Corrosion of Water Treatment Plant Infrastructure	2004	90997	Edwards (Virginia Tech)
Optimizing Chloramine Treatment (2nd Edition)	2004	90993	Kirmeyer (Economic and Engineering Services, Inc.)
Optimizing Corrosion Control in Water Distribution Systems	2004	90983	Duranceau (Boyle Engineering Corp.)
Post-Optimization Lead and Copper Monitoring Strategies	2004	90996F	Kirmeyer (Economic and Engineering Services, Inc.)
Role of Phosphate Inhibitors in Mitigating Lead and Copper Corrosion	2001	90823	Edwards (Virginia Tech)
Distribution System Water Quality Changes Following Corrosion Control Strategies	2000	90764	Kirmeyer (Economic and Engineering Services, Inc.)
Lead Pipe Rehabilitation and Replacement Techniques	2000	90789	Kirmeyer (Economic and Engineering Services, Inc.)
Corrosion and Metal Release for Lead Containing Plumbing Materials: Influence of NOM	1999	90759	Korshin (University of Washington)
A General Framework for Corrosion Control Based on Utility Experience (includes *Control of Pb and Cu Corrosion By-products Using CORRODE Software*)	1997	90712	Reiber (HDR Engineering)
Internal Corrosion of Water Distribution Systems	1996	90508	N/A
Role of Inorganic Anions, NOM, and Water Treatment Processes in Copper Corrosion	1996	90687	Edwards (University of Colorado – Boulder)
Development of a Pipe Loop Protocol for Lead Control	1994	90650	Kirmeyer (Economic and Engineering Services, Inc.)
Chloramine Effects on Distribution System Materials	1993	90624	Reiber (HDR Engineering)
Lead Control Strategies	1990	90559	Economic and Engineering Services, Inc.

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Chairman TOM DAVIS. Mr. Olson, thank you for being with us.

STATEMENT OF ERIK D. OLSON

Mr. OLSON. Good morning, and thank you for asking us to testify this morning.

I wanted to briefly say that we do think that there has been some progress in this area, certainly since the 1991 rule was issued. And in Washington, it was good news this morning to hear Mr. Johnson say that the levels of lead may be dropping in D.C.

But there is a lot left to be done here. Specifically, although you heard this morning about 96 percent of the water system supposedly being in compliance, the same data show a different story, if you look at it. For example, that number is based on less than half of the water—of the large water supplies, 316 out of 744 water—of the large water supplies. Our concern is that there may be another story to tell.

In addition, over 10 million people's water is supplied by systems that exceeded the action level. That's not a trivial number, and we are concerned that some of the problems identified by the Washington Post in October of last year, that Congresswoman Norton alluded to, specifically gaming the system on how monitoring is done, may cover up the extent of the problem.

In addition, EPA has done 10 verifications of data in 10 States, and those have not been integrated into this review. So we are concerned that the problem may be larger than suggested by the proposed 96 percent compliance.

In addition, the enforcement record is problematic. In recent years the numbers have plummeted of enforcement actions. I put them in the testimony, but you can see that there's a huge decrease in the last several years in enforcement, and we are concerned that's sending a wrong signal.

There are, however, a series of fundamental changes that need to be made. The one that I think is important that we should all agree on is that the State revolving fund, the current Federal assistance to water supplies and to sewage treatment plants, should not be slashed. The administration is proposing an enormous cut in State revolving fund money for the Clean Water Act, and that can have a spillover effect in the drinking water arena, literally.

More important for this hearing, I know, is a discussion of what the rules themselves need to do. We are concerned that there are major changes that are necessary in the drinking water regulations that have not been recommended by the administration.

Specifically, as has already been addressed, the lead pipe and fixtures provision, allowing 8 percent lead, is inexcusable and not based on current science. We now know that some cities require, by contract, 0.1 to 0.25 percent lead, routinely—Los Angeles, Bangor, ME, elsewhere. We ought to have that here in D.C. We ought to have it nationally.

In addition, lead in schools—what hasn't been mentioned—this is not just a problem in Washington, DC. In Seattle and in Boston they are buying bottled water for students and staff in the schools.

There are serious lead problems here in this building, right here, and in many schools across the country. What hasn't been mentioned is that there is a court decision that overturned a section of

the Safe Drinking Water Act with respect to schools, so there is no longer a mandatory testing program. This needs to be fixed, and we believe that it could be fixed quickly.

In addition, with respect to the broader lead regulations, we urge a comprehensive review and overhaul of the rule. We would like to see a maximum contaminant level for lead with potentially an affirmative defense if there is no lead service line and the utility has done as much as it can for corrosion control. But absent that, there needs to be an overhaul of the rule. There shouldn't be a 10 percent exemption so that 10 percent of the households don't have to comply with the action level.

There also needs to be an overhaul of the public notice and right-to-know provisions. Specifically, for example, there needs to be immediate notice if a result comes back high, to the consumer. There need to be non-English-speaking notices. There needs to be an overhaul of the mandatory language that's used.

It obviously was completely ineffective in Washington and everywhere else.

There need to be better methods of delivering the information and the right-to-know reports have to be changed. We all remember the right-to-know report that came out the year this ongoing lead problem was ongoing in 2003, where it said, "Your drinking water is safe," across the cover. We can't allow that to continue anywhere in the United States, and Washington is not the only location where that has happened.

In addition, the monitoring system is broken. We are concerned that you can do just 50 samples in many cities across the country and demonstrate so-called compliance. As this committee recently found, I think, with the steroid investigation, you have to have a good monitoring system in order to pick this kind of thing up; and you have to have statistically valid comprehensive testing and site selection that can't be gamed. That's a big problem.

Partial lead service line replacement is not adequate, and I was glad to hear AWWA concede that it would be better to have full lead service line replacement.

In conclusion, there are several other changes that are laid out in our testimony, those are some of the bigger ones that need to be adopted. We would like to work with this committee, with the Energy and Commerce Committee and others to try to put together legislation like that we support, that Ms. Norton introduced last year.

Thank you.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. Olson follows:]

STATEMENT OF
ERIK D. OLSON
SENIOR ATTORNEY
NATURAL RESOURCES DEFENSE COUNCIL

BEFORE THE
COMMITTEE ON GOVERNMENT REFORM
SUBCOMMITTEE ON THE DISTRICT OF COLUMBIA

AT HEARING ENTITLED

"GETTING THE LEAD OUT:
THE ONGOING QUEST FOR SAFE DRINKING WATER
IN THE NATION'S CAPITAL"

MARCH 11, 2005

OVERVIEW & SUMMARY

Thank you for the opportunity to present testimony today. I am Erik D. Olson, a Senior Attorney with the Natural Resources Defense Council (NRDC), a national non-profit public interest organization dedicated to the protection of public health and the environment, with over 500,000 members. I also am chair of the Campaign for Safe & Affordable Drinking Water, an alliance of over 300 public health, consumer, medical, nursing, environmental, and other groups that works to ensure safe drinking water for all Americans. I appear today only on behalf of NRDC.

Although some progress has been made since EPA issued the Lead and Copper Rule (LCR) in 1991, lead contamination of tap water remains a significant health risk in many communities in the United States, threatening the health of millions of Americans, especially children. The experience in Washington D.C., where tens of thousands of residents still have tap water containing unsafe levels of lead 14 years after EPA adopted its rule, is but one serious example of this ongoing risk.

EPA did not fulfill its obligation to aggressively oversee the safety of Washington's water supply, to ensure that the public is fully apprised of the health threats posed by lead in drinking water, or to enforce the Safe Drinking Water Act (SDWA). The agency has issued two Administrative Orders (on consent) to the D.C. Water and Sewer Authority (WASA), but EPA has failed to impose a single penny in penalties, or to initiate a civil or criminal case, despite ample evidence of clear violations of federal law. This raises key questions about the adequacy of EPA's drinking water program in D.C. and across the country.

For some time, the U.S. Army Corps of Engineers' Washington Aqueduct Division failed to treat the water it delivers to D.C. and neighboring Northern Virginia communities sufficiently to ensure that the water was not corrosive, in order to reduce lead contamination. D.C. WASA failed to act promptly or adequately in response to the lead contamination crisis, and neglected to adequately and clearly inform the public about the lead problem. A report commissioned by the WASA Board of Directors released last July, the "Holder Report", concluded that WASA failed to act promptly after it detected high lead levels in D.C. drinking water, and subsequently downplayed the scope of the lead contamination and the health threats it posed in communications with the public. The D.C. Inspector General also found widespread problems with WASA's communications and implementation of the lead rules. The nation's capital's water supply should be the best in the world, an international model. Instead, it is among the worst big city supplies in the nation.

While we appreciate that EPA's proposal this week to respond to the national lead crisis is at least an acknowledgement that there is a lead problem, in substance EPA proposes to change very little. The agency says it will adopt non-binding guidance documents, make nine very small changes to the rule, and hold some workshops. None of the proposals grapple with the most fundamental problems with the lead program highlighted by the past year's experience (see Table 1 for a summary of the changes needed to the lead in drinking water program, and EPA's response to these needs in its proposal this week).

EPA publicly asserted earlier this week that the LCR has effectively dealt with the lead problem in "more than 96 percent" of medium and large water systems, concluding that "there does not appear to be a widespread problem with elevated lead levels across the country...."[1] However, when one scratches beneath the surface, there is reason to question the sweeping assertion of safety.

First, even if one accepts EPA's data as complete, the data show that since 2000, over 10.4 million Americans drank water from large or medium water systems that exceeded the EPA lead action level.[2] Second, EPA has acknowledged to us that its assertion that there is "more than 96 percent" compliance with the LCR does not take into account the extensive evidence that water systems and states undercount lead problems, as amply documented by the Washington Post in October 2004.[3] Third, EPA's assertion of widespread compliance also does not take account of the underreporting of lead problems apparently

confirmed by an as-yet undisclosed 10-state data verification audit of state LCR programs done by EPA contractors in 2004. EPA's use of the incorrect 96 percent compliance figure without caveat is similar to the agency's frequent use elsewhere of drinking water compliance figures that grossly understate the numbers of violations. This EPA practice of misleadingly understating violations has been criticized by EPA's Inspector General, who found in a 2004 report that "EPA incorrectly reported meeting its drinking water goal" and inflated actual compliance rates, even though it knew the data it was quoting was "flawed and incomplete" and overstated compliance.[4]

EPA's public statement this week also trumpeted that "from 1995-2004, states have concluded 1,753 enforcement actions to ensure compliance with the [LCR], and EPA has concluded 570." What EPA fails to disclose is that the vast majority of this enforcement (93% of EPA's actions, and 82% of States' actions) took place in 2001 and earlier. As Figures 1 and 2 show, enforcement of the LCR has dropped precipitously in recent years, with EPA issuing only 16 Administrative Orders (AOs) in 2003 and just 12 in 2004 to enforce the LCR, and not taking a single LCR enforcement case to court for over 5 years.

In apparent response to public and Congressional pressure and adverse media coverage, EPA undertook a review of the lead rule, and has now proposed to take several actions that it says are based upon this year of review. At the outset, we note that EPA's review suffered from several process problems; the workshops EPA held were generally one-sided affairs dominated by industry and state representatives—the groups who had often failed to respond adequately to the problem in the first place.*

We were deeply disappointed to find this week that essentially none of our comments have been reflected in EPA's proposed rule changes for the LCR or in any legislative proposals from EPA. Even changes that many members of the industry or their consultants indicated may be worthwhile were not included in the EPA lead proposal. For example, despite the clear failure in Washington and many other cities of the rule's public notification and education language (and the delivery mechanisms) to get information effectively to the public, EPA proposes no changes to the rule's inadequate mandatory language and delivery provisions.

Similarly, EPA proposes no changes to the lead plumbing and fixtures provisions of the Safe Drinking Water Act (SDWA), and fails to recommend any legislation to deal with the lack of testing of schools and day care centers. Moreover, EPA proposes no significant changes to the testing rules that the Washington Post has shown are widely evaded or manipulated, nor does EPA propose and significant changes in the lead service line replacement rules that allowed so much confusion and inaction in Washington. EPA also makes no commitments to improve its recently moribund enforcement of the SDWA. Thus, EPA has avoided any proposals to deal with the heart of the problem, offering instead a series of proposals for non-binding guidance documents, workshops, and minor rule changes that would not likely resolve the lead problem.

This testimony first discusses in Part I the lead in drinking water problem in Washington D.C., and Part II discusses the lead problem nationally. Part III discusses what needs to be done, and compares that to what EPA proposed to do this week.

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* For example, EPA convened four workshops to review a variety of issues regarding implementation of the LCR. After receiving notice of the first two workshops, I flew at NRDC expense to St. Louis to attend the first two (one on monitoring, the other on simultaneous compliance with the lead rule and other rules). I was shocked to learn that only water industry officials, their consultants, a few academics, and state officials were invited to participate in these meetings; I objected but was relegated to "observer" status and was told I could not participate in the plenary or breakout discussions, and could only speak during a brief public comment period. After complaining later to EPA management, I was invited to participate in the lead service line workshop, but was the only non-industry or state affiliated participant invited. We and a few other non-governmental organizations were invited to the final workshop (on public education).

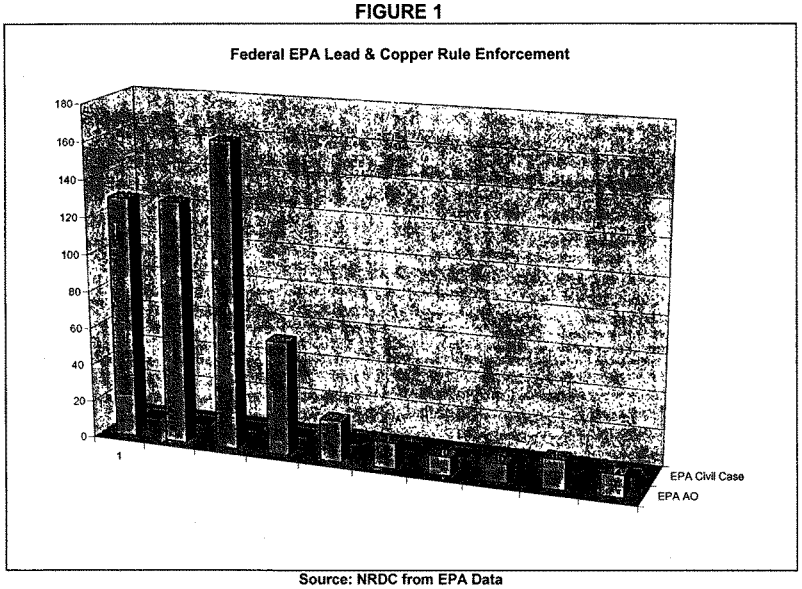
TABLE 1:
ACTIONS NEEDED TO REMEDY LEAD PROBLEM vs. EPA PROPOSAL

ACTION NEEDED	EPA's PROPOSAL (Revision # From EPA List)
Fix Lead Pipe & Fixtures provision in the SDWA	
Congress should redefine "lead free" in SDWA §1417(d) to mean really lead free (no more that 0.1 or 0.25% incidental lead – as required by Los Angeles, Bangor, Maine, etc.)	None **(EPA proposes a workshop)**
Congress should fix the public notice provisions in SDWA §1417(a)(2), which clearly have been inadequate (e.g, DC)	None
Lead in Schools and Daycare Centers	
Congress should clarify SDWA §§1461-63 to eliminate any doubts about constitutionality raised by the decision in Acorn v. Edwards, 81 F.3d 1387 (5th Cir. 1996), holding that states can't be forced to develop school/day care lead testing plans.	None
Congress should require ongoing retesting of all schools and day care centers in light of Acorn, resulting widespread non-compliance, and new info on lead in many schools' tap water.	None **(EPA proposes voluntary testing)**
Congress should require strong notification of parents & staff	None
Congress should redefine "lead free" in the Lead Contamination Control Act (LCCA), which added SDWA §1461, to mean really lead free (0.1% or 0.25%, see above)	None
Congress should order an EPA review of SDWA §1462 implementation and effectiveness of lead fountain recall provision in all states	None
Fix the EPA Lead Rule & Associated Regulations	
Adopt a 10 or 15 ppb MCL at the tap. There was an MCL (50 ppb) until 1991.	None
As a clearly second-best alternative, the EPA lead rule needs serious overhaul:	
Action Level	
EPA should fix Action Level to protect health of all homes, not exempt up to 10% from protection	None
Corrosion Control	
Require review and revision of corrosion control plan if system comes out of compliance with action level	None
Require immediate review and re-approval of corrosion control programs if systems make treatment changes, and require review periodically.	**Notify state 60 days in advance of treatment change, but no review/approval or periodic review required [Revision #6]**
Public Notification & Right to Know	
Strengthen/overhaul inadequate language required for public education, public notice, and warnings to vulnerable people	None
Require more effective delivery mechanisms to reach public	None
Require information to be given to the public on where in system lead contamination is problem	None
Fix consumer confidence report rules; for example, WASA's report declared on the cover "Your Drinking Water is Safe" and buried the facts. Similar problems documented across the country.	None
Require evaluation of effectiveness of system's public education program	None

ACTION NEEDED	EPA's PROPOSAL (Revision # From EPA List)
Require citizen participation in education efforts	None
Require immediate clear warning and alternative supply/filters if lead levels are far above safe level	None
Require utility to tell consumers immediately about their home's results and clearly notify them of risks	**Would require utility to notify customer of test results; no time limit or warning stated [Revision #7]**
Require more detailed info on filters, faucets	None
Require longer flushing time recommendation to consumers if needed	**Would allow more flexibility on flushing instructions [Revision #8]**
Monitoring	
Increase number of homes tested so sample is statistically valid (50-100 for major city is insufficient)	None
Change monitoring requirements so systems cannot go for years without testing	None
To avoid reporting problems, require labs to electronically report test results to EPA, state, utility	None
Strengthen/clarify how sample locations are selected to hit highest risks and reduce gaming of the system	None
Automatically require increased monitoring if treatment changes could affect lead levels	None
At a minimum, do not allow waivers based on testing water quality parameters other than lead	**Would no longer allow testing waivers based only on parameters other than lead [Revision #5]**
Prohibit systems from cherry picking test data or failing to report data contradicting reported info	None **(But 11/04 guidance says systems should report data collected from qualifying homes)**
Clarify that all samples must be taken during same calendar year, and clarify number of locations to be tested and number of samples per location	**Proposes to clarify these issues, but proposes no expansion of current testing requirements [Revisions #1, 2, and 4]**
Lead Service Line (LSL) Replacement	
Require full not partial LSL replacement, since partial does not fully reduce lead levels	None
Expedite service line replacement to 10 or fewer yrs.	None
Require actual replacement of LSL; end loophole counting LSL as replaced based on testing	None
Require replacement of high risk service lines first (e.g. homes with young children and high levels)	None
At a minimum, require water systems that approved or required use of LSLs to replace those entire lines if they are contributing to lead over the action level	None
Require homes with LSLs to be told of risks	None
At a minimum, don't allow LSLs to be counted as replaced permanently based on testing; require retests if treatment changes.	**Would require that any line previously deemed to be replaced through testing be re-evaluated in the event that a subsequent treatment change causes the system to exceed the action level. [Change #9]**
Enforcement	
Enforce the law: impose penalties and initiate court cases	None
Other Key Changes Needed	
Require an overhaul and upgrade of EPA's poor compliance & data tracking system.	None
Require in-home certified filters to be provided to high-risk people with high lead, with water system-supplied maintenance as in 40 C.F.R. 141.100	None

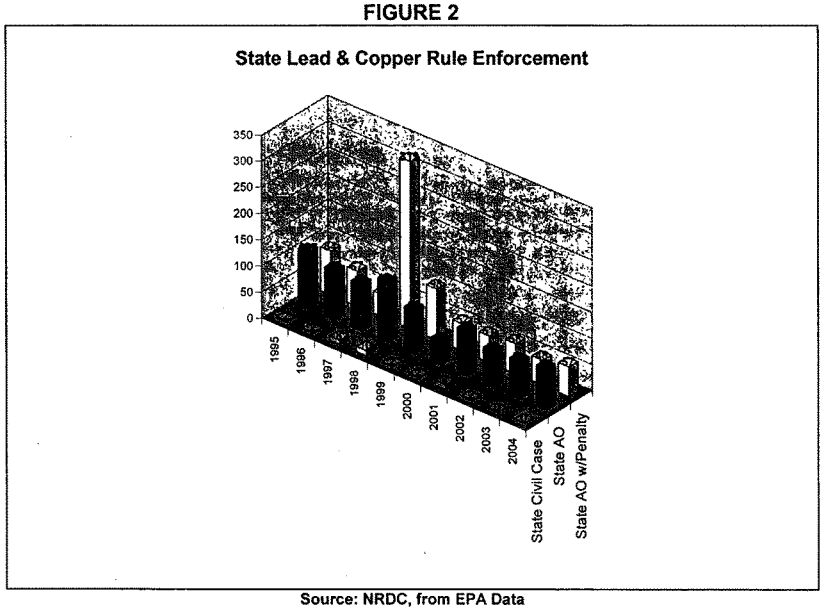
ACTION NEEDED	EPA's PROPOSAL (Revision # From EPA List)
Require federal buildings to be tested for lead levels, as has the Capitol complex	None

FIGURE 1



Source: NRDC from EPA Data

FIGURE 2



Source: NRDC, from EPA Data

I. D.C.'S LEAD IN DRINKING WATER PROBLEM

In June 2003, the Natural Resources Defense Council (NRDC) issued a report, "What's on Tap," that found that the drinking water in Washington, D.C., and several other cities was in precarious shape, and that lead, bacteria and certain other contaminants were of increasing concern in the District.[5] The tap water problems in D.C. received only modest local media attention at the time, but that was about to change.

On Saturday, January 31, 2004, Washingtonians collectively dropped their jaws at a banner Washington Post headline announcing that thousands of city homes' tap water contained unsafe levels of lead and the public had not been informed about it.[6] The local water utility, the D.C. Water and Sewer Authority (WASA), had done everything it could to keep the facts from city residents and city officials. This revelation triggered public outrage, investigations by the City Council, Congress and others, and led to embarrassing finger-pointing by city and federal officials. A new coalition of citizens formed, calling itself "Lead Emergency Action for the District," or LEAD. The LEAD coalition called upon WASA and other authorities to take a series of specific steps to remedy the lead crisis. This section provides a brief review of what we have learned over the past year, and what still needs to be done.

Systemic Problems at WASA, Health Department, Corps, and EPA

The D.C. tap water lead crisis spawned an array of investigations, including one by the Washington Post, which culminated in more than 100 articles[7], as well as published reports by: (1) former Deputy U.S. Attorney General Eric Holder and the law firm Covington & Burling, chartered by the WASA board of directors;[8] (2) the non-profit D.C. Appleseed Center, requested by City Councilwoman Carol Schwartz;[9] (3) the U.S. Environmental Protection Agency's (EPA) Region 3;[10] (4) the D.C. inspector general;[11] (5) the D.C. City Council's Public Works Committee and Councilwoman Schwartz;[12] (6) the federal Centers for Disease Control and Prevention (CDC)[13]; and the D.C. Government's Interagency Task Force on Lead in Drinking Water.[14] While we will not attempt to fully summarize all of the findings of these reports and our own investigations, several key findings, common themes, and recommendations are worth noting.

WASA consistently misled the public, often in violation of EPA rules. WASA has repeatedly failed to notify the public about its lead and other drinking water problems, or has affirmatively misled the public about these problems. WASA's refusal to play straight with the public has lead to virtually no public confidence in the utility. These omissions and outright misstatements continue to this day. Examples include WASA's:

- Decision in 2000-2001 to illegally "invalidate" test results showing high lead levels to avoid having to report that they exceeded EPA's action level and publicly report the problem.[15]
- Failure to follow EPA regulations and to use common sense to notify the public about the extent of the city's lead in tap water problem from 2002 to 2004, and its repeated statements that the water was safe, even when WASA admits it exceeded EPA's action level.[16]
- Misleading proclamation in February 2004 that its tests showed school lead levels were safe, when subsequent WASA tests completed in accordance with EPA protocols in April (after criticism that the first round was misleading) showed 28 schools had unsafe water fountains or taps.[17]
- Decisions to unjustifiably downplay risks. To quote the report to WASA's board of directors by its own internal investigator, Eric Holder, "WASA management made decisions to downplay some lead-monitoring issues in its public communications."[18]
- Continuing failures to honestly advise the public about tap water problems and their health implications throughout much of 2004, such as WASA head Jerry Johnson's statements at public forums that lead in city tap water presents no public health risk and that it is a crisis manufactured by the media.
- Failure to properly test for lead and correctly notify citizens with high lead levels of their results. On January 14, 2005, EPA issued a supplemental administrative order to WASA (to which WASA agreed).

The order stated that WASA had violated federal law by asserting that the water in more than 400 District homes had safe levels of lead and by failing to replace those lead service lines.[19]

WASA repeatedly violated the EPA rules on testing for lead. For example, WASA illegally "invalidated" lead samples in 2000 to 2001, used an unlawful testing protocol that flushed lead service lines for five minutes before testing them to avoid finding high lead levels and having to replace service lines (which triggered the EPA's January 2005 supplemental administrative order), and it used a testing protocol that flushed school taps before testing them, contrary to the established EPA protocol for school tests. These and other actions show a pattern of inadvertent or intentional behavior that violated EPA rules and misled EPA and the public.

WASA failed to aggressively complete full lead service line replacements. WASA apparently first violated EPA's rules requiring lead service line replacement in 2001 and 2002, and then in 2003 sought to use a loophole in EPA's rules that allows utilities to avoid replacing lead service lines if they were tested and found to supply water containing less lead than the EPA Lead Action Level (LAL). This problem was exacerbated by WASA's use of the unlawful protocol noted above. WASA's board of directors commendably has now directed WASA management to replace the WASA-owned portion of all lead service lines in the District. However, WASA is leaving it up to individual residents to replace the portion of the lead service line between the meters and their homes. Testing shows that elevated lead contamination in many homes will continue even after a partial lead service line replacement, prompting NRDC and LEAD Coalition members to urge full lead service line replacement for all lines.

WASA and the Army Corps of Engineers' Washington Aqueduct Division failed to promptly respond to the mounting lead problem. Despite clear indications as early as 2000 and 2001 showing alarming increases in lead levels in the District, WASA and the Corps (which collects and treats the water and then pumps it into WASA's distribution pipes) failed to aggressively step in and change their corrosion control treatment to reduce lead levels. Only after the news media blew the whistle in 2004 did WASA, the Corps, and EPA move with the necessary speed to address the problem.

WASA failed to effectively communicate with the District's Health Department and health-care providers, and Health Department fails to efficiently respond. WASA has repeatedly failed to effectively involve the D.C. Department of Health (DOH) in ongoing operations and when violations or other potentially health-threatening events occur. For example, the Holder report, the Appleseed report, Inspector General's report, and several other investigations found that there is an urgent need for better communications between WASA and DOH. Yet WASA's Jerry Johnson has rejected calls for a written agreement between WASA and DOH on how to handle crises and improve ongoing communications between the two agencies. In addition, even when WASA or EPA did notify DOH of the lead problem, DOH failed to act efficiently or effectively. Both DOH's director and environmental program head have left, creating an opportunity for improvement. WASA brought in a health advisor from George Washington University Medical Center, but has yet to establish an effective written outreach agreement with health care providers to inform them in the event of a serious water quality problem.

WASA has little or no health expertise on staff or its board, and responsibility for ensuring water quality and health protection is diffuse. Many of the independent investigations found that the lack of clear lines of accountability and responsibility within WASA for ensuring health protection and water quality is a serious problem. The lack of public health expertise on staff and on its board of directors only exacerbates the problem.

Serious shortcomings in EPA's lead rules and in the Safe Drinking Water Act cripple the lead in drinking water program. Several of the investigations, including the Holder report and the Appleseed report, hearings in Congress, and EPA's own workshops have identified significant deficiencies in EPA's lead in drinking water program and its regulations. The EPA lead in tap water rules and program establish a

complex scheme where up to 10 percent of tested households can exceed the agency's Lead Action Level (LAL) before additional action is required to reduce lead levels, and also requires certain notifications to be issued to the public about lead. The weaknesses of the program are legion, as the D.C. and many other examples illustrate. For example, the public notification provisions are clearly ineffective even if fully followed, and the structure of the rule and monitoring requirements need to be simplified and strengthened. This is discussed further below.

EPA's oversight of WASA and other cities has been poor. The Holder report, Appleseed report, and other independent reviews, as well as congressional hearing testimony from NRDC and others, have shown that before the Washington Post blew the lid off the lead problem in D.C., EPA took what can only be called a lackadaisical attitude about the District's lead problems. Moreover, the Post documented that widespread violations of the lead rule by dozens of other cities have gone unaddressed, finding: "Cities across the country are manipulating the results of tests used to detect lead in water, violating federal law and putting millions of Americans at risk of drinking more of the contaminant than their suppliers are reporting."[20]

EPA, the Centers for Disease Control, and D.C. Government commendably established a joint lead task force, with citizen participation, to evaluate the extent of lead poisoning from all sources in the District, and especially its impact on low-income African-American and Latino households. EPA also funded a lead outreach program in the city, which coordinates this task force. This is an important, positive development that should be commended.

WASA continues to resist meaningful integration of the public into its decision-making. Despite pressure from independent investigators and from the LEAD coalition, WASA has failed to meaningfully involve the public in its decision-making. While WASA's usual response to this criticism is to note that its board meetings are open to the public and that it held a series of public briefings on the lead crisis, such one-way communications in unbalanced forums do little to foster serious and meaningful dialogue.

Other Water Quality Problems in the District

The renewed focus on drinking water quality in D.C. has focused the spotlight on other problems with the District's water.

Bacterial contamination and the risk of pathogens. In NRDC's June 2003 report, it documented that there was a creeping increase in total coliform bacteria levels in the District's water supply. Total coliform is a group of bacteria that are used as an indicator of possible fecal contamination or possible regrowth of pathogenic bacteria in the system's pipes after disinfection. At that time, WASA admitted to no violations for several years, but data showed that peak coliform levels were gradually beginning to approach the EPA standard. EPA's standard requires that no more than 5 percent of total coliform bacteria can be detected in a city's water each month.

Many city residents remember past problems with bacteria and possible pathogens in the city's water supply that triggered violation notices and boil water alerts in 1993 and again in 1995 and 1996. In 2004, WASA violated the total coliform standard in September, triggering a mandatory public notification.[21] While EPA officials note that levels have since dropped, NRDC remains deeply concerned about potential bacteria and pathogen contamination of the D.C. water supply. This is in part because the Corps' monitoring for parasites such as *Cryptosporidium* is infrequent because it does not use advanced treatment such as ultraviolet light or ozone that is known to kill chlorine-resistant parasites like *Crypto*.

An NRDC employee whose immune system was compromised drank D.C. tap water and died in November 2004; *Crypto* was listed on his death certificate as a contributing factor in his death. While it is not possible to confirm the source of the *Crypto*, tap water must be a primary suspect. It is virtually impossible to determine the number of District residents who become ill from *Crypto* and other potentially waterborne

pathogens. The lack of public health infrastructure and D.C. Department of Health's inattention to this issue makes it impossible to ensure accurate and complete testing and reporting.

NRDC also is concerned about potential microbial pathogens because WASA has repeatedly failed to fully flush all of its pipes using unidirectional flushing (UDF), which is the most effective way to assure that the city's pipes are cleaned of bacteria and other pathogens that can regrow in the distribution system. Even after EPA ordered WASA to do a complete system UDF flush when it approved the city's new 2004 corrosion control plan,[22] WASA failed to comply with this order.[23] We are concerned that bacteria and potentially pathogen levels may again creep up as temperatures increase in 2005 (microbes often thrive in warmer water), particularly if WASA fails to properly complete UDF.

Rocket fuel perchlorate in D.C. tap water. It was recently revealed that perchlorate, the toxic component of rocket fuel and certain munitions, has been found in groundwater tests adjacent to the D.C. water supply's main Dalecarlia Reservoir.[24] The Corps of Engineers was slow to act on this finding until publicity spurred it into at least doing further testing. There are reports that nearby buried munitions from World War I may contain perchlorate, but the Corps has stated that it will likely be many years before it removes any of these munitions.

Subsequent to this revelation, the Corps had repeatedly assured the public that there was no risk that the perchlorate could get into the city's water supply. Despite its assurances, testing of water at the treatment plant has revealed perchlorate at levels of as high as 1.8 parts per billion (ppb).[25] The draft EPA safety level, issued in January 2002, is 1 ppb. No final standard has been adopted yet for perchlorate. A recent National Academy of Sciences study suggested that very low perchlorate levels may pose risks to pregnant women and infants (after adjustment for body weight and consumption of perchlorate from all sources), suggesting that there is indeed a risk to at least some District residents.

Cancer-causing and potentially miscarriage- and birth defect-inducing chlorination byproducts in D.C. tap water. The Army Corps continues to use old-fashioned treatment, including heavy doses of chlorine as its primary disinfectant. Chlorine is an important and generally effective disinfectant for killing bacteria and some viruses, but when used on water containing substantial amounts of organic matter (such as broken down leaves and runoff in the Potomac River water used in D.C.), it creates significant levels of a family of toxic chemical known as chlorination byproducts. Chlorination byproducts have been linked to cancer, including bladder cancer, and potentially to miscarriages, low birth weight, and certain birth defects.

Rather than following the course of some other cities, such as Seattle, which are switching to modern treatment (such as ultraviolet light, ozone, granular activated carbon, or membrane treatment) that would nearly eliminate these chemicals from our water supply, the Corps instead decided to use a cheap band-aid solution. Instead of modernizing, the Corps decided to add ammonia after chlorination, forming chloramines and thereby modestly reducing the creation of these chlorination byproducts to levels somewhat below the current weak EPA standard. This on-the-cheap solution appears to have backfired, because the switch to chloramines apparently contributed to the lead in drinking water problem in the District.

The levels of chlorination byproducts in city water still are a health concern. EPA has agreed to strengthen the current standard in a now-overdue rule, and evidence continues to mount of the reproductive and cancer risks posed by these chemicals.

Recommendations Regarding D.C. Water Problems

While the various independent reports all provide many detailed recommendations, NRDC and the LEAD coalition believe that some of the most important include:

- WASA should immediately name a new staff management team that has public health protection as its first priority.

- WASA's board and the Army Corps of Engineers, in cooperation with EPA and citizens, should establish an independent panel of experts and independent citizen representatives to conduct a top-to-bottom review of all treatment, distribution system, and infrastructure replacement issues. This should include a complete review of available options for installing advanced treatment such as ultraviolet light, ozone, granular activated carbon, membranes and other technologies. The team also should review the distribution operation, maintenance.

- WASA should complete unidirectional flushing of the entire system every year.

- WASA should adopt an infrastructure replacement plan that assures that aging pipes and components such as valves, pumps and other components are regularly replaced before they fail. As required in other cities such as Los Angeles and Bangor, Maine, the District should install only completely lead-free components (i.e., less than 0.2 percent lead).

- WASA should immediately embrace an "open book" policy and be completely forthcoming with all water quality data, and should rely upon independent experts to characterize health risks. WASA should stop downplaying risks posed by water quality problems.

- WASA's board should include several individuals with expertise in public health and at least one member with an engineering background.

- WASA should enter into a written agreement with the Department of Health and EPA, as well as with major institutions in its service area responsible for providing health care (especially to vulnerable individuals) on how to handle water quality problems.

- WASA should establish a public outreach and communication plan that meaningfully involves citizens or the agency is destined to continue to repeat its failures. The plan should include providing new or replacement filters to all families with elevated lead levels or lead service lines.

- The mayor should make protecting drinking water and the environmental a higher priority. He should insist upon accountability at WASA, and should assist the WASA Board in cleaning house at WASA's senior management level.

- The Corps should immediately survey the area around Dalecarlia Reservoir for buried munitions, and should promptly remove any that are found. The Corps also should comprehensively test the raw water, groundwater, and treated water on an ongoing basis for perchlorate. It should also install modern, state-of-the-art treatment for disinfection and removal of contaminants.

- EPA should take aggressive enforcement action and fine WASA for its chronic failure to comply with the agency's lead and total coliform rules. EPA also should complete a full criminal investigation into WASA's violations. If criminal activity occurred, EPA and the Justice Department should proceed with prosecution.

- EPA should overhaul its lead rule to make its public notification provisions more effective, and strengthen and simplify the standard. We support a strict at the tap maximum contaminant level for lead.

- Congress should enact the Jeffords/Norton legislation (S. 2377/H.R. 4268) requiring an overhaul and strengthening of the EPA lead-in-drinking-water rules, and banning all uses of lead in any fixtures, fittings and other plumbing parts.

- The D.C. City Council should adopt the relevant provisions of the Jeffords/Holmes-Norton lead legislation as city code requirements for WASA and the Washington Aqueduct.

- The City Council should create a permanent citizen water board to oversee WASA and the Washington Aqueduct, and address longstanding problems with D.C.'s water supply.

- The City Council and Congress must improve its oversight of WASA and the Army Corps' Washington Aqueduct. The council should insist upon the top-to-bottom review of water quality, treatment, infrastructure, and threats to the city's water supply, and conduct comprehensive oversight hearings on the results of that review.

II. THE NATIONAL LEAD IN DRINKING WATER PROBLEM

Lead health threats

This Committee and other Congressional committees have heard extensive testimony about the adverse effects of lead on health, particularly upon young children and fetuses. New data show adverse effects from lead exposure at far lower levels than previously thought to pose risks. Dr. Bruce Lanphear of Children's Hospital in Cincinnati, an internationally-leading expert on lead, recently stated "There is no discernible threshold for lead toxicity; indeed, lead-associated deficits in children's intellectual function are incrementally greater at blood lead < 10 mg/dL, the CDC action level. There is increasing data linking lead exposure with other diseases, including delinquency, tooth decay and cardiovascular disease."[26]

While few would suggest that lead from tap water is the leading cause of lead poisoning for most children, it is clear that lead from tap water can contribute significantly to blood lead, and that any additional lead in the bloodstream, particularly of a developing child, poses a serious health risk. EPA has found that in some bottle-fed infants who drink formula reconstituted with tap water, lead from the water may constitute 80 percent of the child's lead exposure.

The National Lead in Drinking Water Problem

Washington of course is not the only city in the U.S. affected by lead or other important tap water problems. Although EPA has asserted that lead contamination is no longer a significant national problem, its own survey of medium and large public water systems, though clearly suffering from underreporting, shows that millions of Americans are still at risk from excessive lead levels in their water. EPA's brief report completed in January 2005 found that since 2000, over 10.2 million people got water from systems that exceeded the lead action level.[27] Moreover, the Washington Post[28] and EPA's own internal data audits have confirmed that this is likely a significant understatement of the extent of the problem.

The Lansing, Michigan water utility recently announced that it is replacing 14,000 lead service lines because of contamination concerns, and several other cities have struggled with lead contamination in recent years, including Seattle, greater Boston, St. Paul, Minnesota, Bangor, Maine, Madison, Wisconsin, Ridgewood and Newark, New Jersey, Oneida, New York, and many others. Yet EPA maintains no accurate, up-to-date national information on this issue; national drinking water databases required by EPA rules are incomplete. Furthermore, EPA has failed to address state failures to comply with federal reporting rules, making effective EPA oversight and enforcement impossible.

In addition, school systems in many cities across the country – including in Seattle, Boston, Baltimore, Philadelphia, and Montgomery County, Maryland – have found serious lead contamination problems, but often have been slow to inform parents and resolve the problem. Many school systems have entirely failed to comply with the Lead Contamination Control Act of 1988's mandate to test school water for lead and replace coolers that serve lead-contaminated water. Often, even when testing is done, parents, teachers, and other school staff have not been fully informed of the results.

EPA and many states have done a poor job of ensuring that the EPA lead rule and the school testing and cooler programs are fully implemented. Moreover, the Washington D.C. crisis and experience in other cities highlight that the EPA lead and schools program and public education recommendations are difficult to enforce and ultimately ineffective. A court decision in Acorn v. Edwards[29] holding that portions of the lead in schools program cannot be enforced should trigger Congressional action to reinstate the lead in schools and daycare provisions of the SDWA.

Inadequate Enforcement of the Lead Rule

EPA and state enforcement of the LCR has been inadequate, particularly in the recent past. Figures 1 and 2 summarize the actions that have been taken to date. EPA has brought just one case in court to enforce the lead rule over the past 10 years, and has issued 569 administrative orders, the vast majority of which imposed no penalties. States have issued about 835 administrative orders imposing no penalties, 876 administrative orders imposing penalties, and have filed 37 court cases to enforce the lead rule. The proof is in the pudding: there should be full compliance with the rule now, 14 years after its issuance, but there remain millions of Americans served by water systems that are in violation of the lead rule.

III. WHAT'S NEEDED TO SOLVE THE LEAD PROBLEM AND THE SHORTCOMINGS OF EPA'S PROPOSAL

The problems discussed above lead us to conclude that a comprehensive overhaul of the lead in drinking water and lead in schools and day care centers program is necessary. EPA's proposal earlier this month simply does not address most of the needed changes. Most of the changes recommended below are embodied in Rep. Norton et al.'s bill H.R. 4268 from last Congress, which we strongly recommend be enacted.

The issues are summarized in Table 1 at the beginning of this testimony, and are discussed in somewhat more detail here.

The Lead Pipe & Fixtures provision in the SDWA Must be Fixed
Section 1417 of the SDWA includes measures that were intended to ban lead-containing plumbing and fixtures, so that we are not adding to our lead in drinking water problems. However, this measure suffers from serious flaws that allow continued sale of lead-contaminated and fixtures, including that it defines lead free as containing up to 8 percent lead. The NSF protocol issued with the approval of the plumbing manufacturers allows substantial lead contamination to leach from so-called lead-free plumbing fixtures, meters, etc., according to data collected by the University of North Carolina at Asheville's Environmental Quality Institute. Congress should simply redefine "lead free" in SDWA §1417(d) to mean really lead free (no more that 0.1 or 0.25 percent lead) as required by Los Angeles, Bangor, Maine, and other cities.

Although many members of the water utility industry expressed support for banning lead from fixtures during the EPA workshops, EPA has merely proposed to hold a workshop on this issue, but suggested no changes to the law.

Congress should fix the public notice provisions in SDWA §1417(a)(2)
The SDWA in section 1417(a)(2) required public notice to consumers if the lead content of their system or corrosivity of their water may cause lead contamination of consumers' tap water. As our experience in Washington and many U.S. cities has highlighted, this provision is wholly inadequate. It should be amended to require a much more comprehensive and effective public education campaign. EPA proposes no changes.

Lead in Schools and Daycare Centers

1. **Congress should clarify SDWA §§1461-63 to eliminate any doubts about constitutionality.**

A court decision in Acorn v. Edwards, 81 F.3d 1387 (5th Cir. 1996), held that states can't be forced to develop school/day care lead testing plans under SDWA §1461-63, because this violates the 10th Amendment to the U.S. Constitution. The Court found that the provisions in the SDWA that require state officials to adopt these plans, subject to the possibility of direct penalties, interferes with states' rights. While NRDC does not agree with this decision, we urge that Congress eliminate any uncertainty about the constitutionality of the provisions by making them a requirement to obtain federal funds including SRF funds. EPA proposes no changes to the law, stating only that it will amend its guidance documents and urge voluntary testing.

2. **Congress should require ongoing retesting of all schools and day care centers.**

In the wake of the Acorn decision and widespread failures of state and local officials to assure that schools and day care centers are testing their water for lead, and in light of recent data collected in many cities showing serious school water contamination with lead, the law should be amended to require periodic testing of water in school and day care center tap water. EPA propses no changes to the law, but says it will update its guidance and urge voluntary testing.

3. **Congress should require strong notification of parents & staff**

A widespread problem is that even if lead is tested in schools, students, parents, and even staff are often not adequately informed of the results. This should be remedied through amendments to the SDWA. EPA proposes no changes.

4. **Congress should redefine "lead free" in SDWA §1461 to mean really lead free**

Like the general plumbing provision in the SDWA, the schools provisions also define "lead free" fountains etc. to mean up mean they may contain up to 8 percent lead. This provision also should be amended to redefine lead free to mean truly lead free (0.1 percent or 0.25 percent lead). EPA proposes no changes.

5. **Congress should order an EPA review of the effectiveness of lead fountain recall provision**

In light of information indicating that many lead-contaminated fountains apparently are still in use, Congress should amend the SDWA §1462 to require a full review of the implementation and effectiveness of the lead fountain recall provision. EPA proposes no changes.

Fix the EPA Lead Rule & Associated Regulations

1. **Adopt a 10 or 15 ppb MCL at the tap.**

The experience in Washington and across the nation indicates that the LCR is unduly complicated, includes so many loopholes and complexities that it is virtually impossible for most members of the public to understand, and is difficult for state officials and industry members to fully grasp and assure compliance. Moreover, its complexity offers numerous opportunities for manipulation of the results. We urge, therefore, that EPA return to a Maximum Contaminant Level for lead, as it had until 1991. The MCL should be set at 10 to 15 ppb, enforceable at the tap. If a utility could show that it has done everything possible to reduce corrositivity and to eliminate lead components of its system, this could be an affirmative defense. This rule

would protect everyone, and would not allow up to 10 percent of households to be sacrificed. EPA apparently has given no serious consideration to this approach during its review.

2. In the Alternative, EPA Should Completely Overhaul the Lead Rule

a. EPA should fix Action Level to protect health of all homes, and not exempt up to 10%

The action level for lead, as currently constituted, allows up to 10 percent of the homes tested to exceed the level without any required remedy. This should be changed: all households should be required to have safe water. EPA proposes no changes.

b. Corrosion Control

The rule should require review and revision of corrosion control plan if system comes out of compliance with action level. EPA proposes no automatic review or revision. In addition , the LCR should be revised to require immediate review and re-approval of corrosion control programs if systems make treatment changes, and require review periodically. Again, EPA proposes no change. Finally, water systems should be required to tell states in advance of treatment changes that may affect corrosion. EPA proposes that water system be required to nNotify state 60 days in advance of treatment change, but no review/approval or periodic review required [EPA Proposed Revision #6]

c. Public Notification & Right to Know

The Washington D.C. experience has highlighted the serious problems with the public education and notification provisions of the LCR. The rule should be strengthened and overhauled to replace the inadequate language required for public education, public notice, and warnings to vulnerable people. EPA proposes no such changes.

In addition, the rules should require more effective delivery mechanisms to reach public. EPA proposes no changes here either. Moreover, the rule should be revised to require information to be given to the public on where in system lead contamination is problem. EPA does not address this.

The consumer confidence report rules also should be strengthened. WASA's report declared on the cover "Your Drinking Water is Safe" and buried the facts about the lead problem. Similar problems were documented across the country in NRDC's 2003 and 2004 reports noted earlier. EPA proposes no changes to these rules either.

Other changes needed include requiring evaluation of effectiveness of system's public education program, requiring citizen participation in education efforts, and mandating immediate clear warnings and provision of alternative supply/filters if lead levels are far above safe levels. Water systems should also be required to tell consumers immediately about their home's results and clearly notify them of risks. EPA addresses none of these issues, except to suggest that it would require utility to notify customer of test results; EPA mentioned no time limit or warning [EPA Proposed Revision #7]

The rules should also require that water systems provide detailed info on filters and the possibility that faucets and other fixtures, especially new ones, may contain lead that can leach into tap water. They also should require longer flushing time recommendation to consumers if needed. EPA does not address the issue of filters and faucets, but does recommend more flexibility on flushing instructions [Revision #8]

d. Monitoring

The Washington experience, and the investigations of the Washington Post, demonstrate the need for an overhaul of the monitoring rules as well. EPA should increase number of homes tested so sample is statistically valid (50-100 for major city is insufficient). In addition, EPA should change monitoring requirements so systems cannot go for years without testing. The rule should also seek to avoid reporting problems by requiring certified labs to electronically report test results to EPA, states, and the utility simultaneously. Utilities could publicly petition within a set period to challenge the accuracy of data.

In addition, there is an need to strengthen and clarify how sample locations are selected to hit highest risks and reduce gaming of the system. For example, homes selected for testing and retesting should be fixed and based upon better-defined criteria that truly identify the highest risk homes. The rules also should automatically require increased monitoring if treatment changes could affect lead levels.

Even if the rules are not changed to eliminate all monitoring reductions, at a minimum, the rules should not allow waivers based on testing water quality parameters other than lead. EPA proposes to remedy none of these problems, though it does proposed to no longer allow testing waivers based only on parameters other than lead [Revision #5]

The rules also should be changed to more clearly prohibit systems from cherry picking test data or failing to report data contradicting reported information. EPA makes no such suggestions, though its November 2004 guidance says systems should report data collected from qualifying homes. EPA also says the rules should be clarified to say that all samples must be taken during same calendar year, and that number of locations to be tested and number of samples per location. In addition, the agency proposes to clarify these issues, but proposes no expansion of current testing requirements [Revisions #1, 2, and 4] While possibly helpful at the margins, none of the proposed EPA changes appears to go to the heart of the national problems identified by the Washington Post or reviews of the D.C. WASA experience.

d. Lead Service Line (LSL) Replacement

The Washington problems and other cities' data indicate that the rules should be amended to require full not partial LSL replacement, since partial replacement does not fully reduce lead levels. Moreover, the rules should be changed to expedite service line replacement to 10 or fewer years, and to require actual replacement of LSL, eliminating the loophole that counts a LSL as replaced based on testing showing low levels of lead (below the action level). The rules should also require replacement of high risk service lines first (e.g. homes with young children and high levels). At a minimum, even if the systems are not all required to complete full LSL replacement, water systems that approved or required use of LSLs should have to replace those entire lines if they are contributing to lead over the action level. The rules should also require that residents of homes with LSLs be told of the line and the possible risks.

EPA proposes none of these changes. However, EPA does propose to require that any line previously deemed to be replaced through testing be re-evaluated in the event that a subsequent treatment change causes the system to exceed the action level. [Change #9]

Enforcement

Enforcement of the LCR has been weak, particularly in recent years. Even with extensive evidence of known and likely knowing violations of the law in Washington, EPA imposed no penalties and filed no court action, EPA and states should enforce the law:, impose penalties, and initiate court cases. Without enforcement,

utilities in violation are not deterred from continuing to violate the law; they are not held accountable. Moreover, when a system like WASA is not penalized, other water systems hear the message loud a clear: violation of the law is not taken seriously, and is tolerated.

Other Key Changes Needed

1. **Require an overhaul and upgrade of EPA's poor compliance & data tracking system**

EPA's internal audits, and the EPA Inspector General have found that EPA's drinking water data tracking system needs to be upgraded. States that fail to report, or report incompletely, are not penalized, meaning the data in the EPA system is often unreliable. This must be remedied. EPA proposes no changes.

2. **Require in-home certified filters to be provided, particularly to high-risk people with high lead**

Water systems should be required to supply certified filters to people whose water is contaminated with elevated lead levels. The systems should also be required to provide installation and maintenance as required in 40 C.F.R. 141.100. EPA proposes no changes.

3. **Require federal buildings to be tested for lead levels, as has the Capitol complex**

The drinking water in all federal buildings should be tested for lead, as the Capitol complex has been. Elevated lead levels should be remedied.

NOTES

[1] EPA, Press Release, "EPA to Strengthen Protection from Lead in Drinking Water," March 7, 2005, available online at http://yosemite.epa.gov/opa/admpress.nsf/b1ab9f485b098972852562e7004dc686/e8e0702362bb3df685256fbd005aaf0b!OpenDocument and EPA, Summary of Lead Action Level Exceedences for Medium (3,300-50,000) and Large (>50,000) Public Water Systems," available online at http://www.epa.gov/safewater/lcrmr/lead_data.html.

[2] EPA, Summary of Lead Action Level Exceedences for Medium (3,300-50,000) and Large (>50,000) Public Water Systems," available online at http://www.epa.gov/safewater/lcrmr/lead_data.html

[3] Carol Leonnig, Jo Becker, and David Nakamura, "Lead Levels in Water Misrepresented Across the US: Utilities Manipulate or Withhold Test Results to Ward off Regulators," Washington Post page A1 (October 5, 2005).

[4] EPA Inspector General, "EPA Claims to Meet Drinking Water Goals Despite Consistent Data Quality Problems," Report No. 2004-P-0008 (March 5, 2004), available online at http://www.epa.gov/oig/reports/2004/20040305-2004-P-0008.pdf

[5] See Erik Olson, "What's on Tap," June 2003, available online at http://www.nrdc.org/water/drinking/uscities/contents.asp.

[6] David Nakamura, "Water in D.C. Exceeds EPA Lead Limit: Random Tests Last Summer Found High Levels in 4,000 Homes Throughout City," Washington Post page A1 (January 31, 2004).

[7] See, Washington Post, Metro Drinking Water Archive, available online at http://www.washingtonpost.com/ac2/wp-dyn/metro/specials/water/archive?start=0&per=20.

[8] Eric H. Holder, Jr., Covington & Burling, "Summary of Investigation Reported to the Board of Directors of the District of Columbia Water and Sewer Authority," July 16, 2004, available online at http://www.washingtonpost.com/wp-srv/metro/specials/water/wasa071604.pdf .

[9] D.C. Appleseed Center, "Lead in the District of Columbia Drinking Water: A Call for Reform," December 2004.

[10] The EPA investigation resulted in a series of letters to WASA, and ultimately in an administrative order to WASA on consent. See EPA Region 3, "Key Communications" at http://www.epa.gov/dclead/communications.htm; see especially EPA Administrative Order [to D.C. WASA] for Compliance on Consent," June 17, 2004.

[11] Government of the District of Columbia, Office of the Inspector General, "Audit of the Elevated Levels of Lead in the District's Drinking Water ," January 5, 2005, available online at at http://oig.dc.gov/news/view2.asp?url=release%2FWASA%5Ffinal%5FReport%5Frevised%5F04%2D2%2D17LA%2Epdf&mode=audit&archived=0&month=00000

[12] See Debbi Wilgoren, "Report by D.C. Council Panel Urges City Oversight of Water: Some Proposals Similar to Those of Appleseed Center Study," Washington Post page B04 (December 24, 2004).

[13] CDC, "Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water — District of Columbia, 2004," Mortality & Morbidity Weekly Report, vol. 53, no. 12, April 2, 2004.

[14] Mayor Anthony Williams and Councilmember Carol Schwartz, "Final Report of the D.C. Interagency Task Force on Lead in Drinking Water and Recommendations of the Co-Chairs," April 22, 2004.

[15] See, for example, Holder report, supra note 4, EPA Administrative Order, supra note 6, and IG Report, supra note 7.

[16] Ibid.

[17] Compare WASA's original February 2004 announcement proclaiming that "extensive testing shows…the vast majority of the DCPS and facilities have extremely low levels of lead in the water…," http://www.dcwasa.com/lead/school_tests.cfm, with subsequent tests done (after extensive criticism of the first tests as misleading) in accordance with standard EPA protocols and showing, according to WASA's April announcement, that "Forty-three sinks and water fountains in 28 schools and one administrative building had lead levels above 20 ppb. These have been removed from use and replacement fixtures will be installed." http://www.dcwasa.com/lead/school_tests_april_2004.cfm.

[18] Holder report, supra note 4, at 3.

[19] See EPA, Supplemental Administrative Order for Compliance on Consent, Docket No. SDWA-03-2005-0025DS, January 14, 2005, available online at http://www.epa.gov/dclead/aowasa_supplement_011905.pdf; Carol Loennig, "WASA Breached Law, EPA Says Replacement of Lines Ordered After Flawed Lead Tests," Washington Post, page B01, January 22, 2005.

[20] See Carol Leonnig, Jo Becker, and David Nakamura, "Lead Levels in Water Misrepresented Across U.S. Utilities Manipulate or Withhold Test Results to Ward Off Regulators," Washington Post page A1, October 5, 2004.

[21] Letter from John Dunn, WASA, to Karen Johnson, EPA, "Re: MCL Violation, Total Coliform Rule," September 24, 2004, available online at http://www.epa.gov/dclead/WASA_TCR_letter_9-24-04.pdf.

[22] Letter from Jon Capacasa, EPA Region III, to Tom Jacobus, Army Corps of Engineers, and Jerry Johnson, WASA, August 3, 2004, available online at http://www.epa.gov/dclead/Aug_3_letter_EPA_to_WASA_and_Washington_Aqueduct.pdf.
[23] Personal Communication with Rick Rogers, EPA Region 3, December 2005.
[24] See Carol Leonnig, "Groundwater Toxin Near Aqueduct: Army Engineers Faulted for Inaction Since 2003 Finding," Washington Post page B1, October 27, 2004.
[25] See, Carol Leonnig, "DC Water Test Finds Toxic Substance," Washington Post page B1, November 19, 2004; "Trace Levels of Perchlorate Detected at Dalecarlia Treatment Plant," http://www.ci.falls-church.va.us/services/perchlorate.html
[26] Statement of Dr. Bruce Lanphear, Cincinnati Children's Hospital Medical Center, Before the House Energy & Commerce Committee, Subcommittee on Environment and Hazardous Materials, July 22, 2004, available online at http://energycommerce.house.gov/108/Hearings/07222004hearing1340/Lanphear,2195.htm.
[27] EPA, Summary of Lead Action Level Exceedences for Medium (3,300-50,000) and Large (>50,000) Public Water Systems," available online at http://www.epa.gov/safewater/lcrmr/lead_data.html
[28] Carol Leonnig, Jo Becker, and David Nakamura, "Lead Levels in Water Misrepresented Across the US: Utilities Manipulate or Withhold Test Results to Ward off Regulators," Washington Post page A1 (October 5, 2005).
[29] 81 F.3d 1387 (5th Cir. 1996).

Chairman TOM DAVIS. Mr. Elder, thanks for being with us.

STATEMENT OF JAMES R. ELDER

Mr. ELDER. Mr. Chairman, Congresswoman Norton, I thank you for the invitation to testify on the regulation of lead in drinking water. I want to make clear that my statements and responses are entirely my own and do not represent the point of view of any third party or organization.

I've had a 28-year Federal career, 24 of those at EPA and the last 12 I worked in the headquarters' water program. In April 1991, I was reassigned to head the Safe Drinking Water Act program. At that time we aggressively made certain that the States and the EPA region took hundreds of Federal enforcement actions during the first phase of the lead rule for failure to monitor, and subsequently, for failure to proceed on optimal corrosion control.

Although I retired in 1995, like anyone who has worked on such an important public health program, I cannot stop feeling passionate about the importance of our Nation's drinking water. Therefore, I believe it is critical for Congress to exercise its oversight authority for the Safe Drinking Water Act, and I applaud this committee for doing so.

Specifically regarding Washington, DC, indications are that the lead contamination levels are improving, as described this morning, but this is mostly due to the late introduction of orthophosphate in the distribution system. As others have said, it is too early to declare victory.

I personally am not pleased with the total contents of the administrative consent order issued by Region 3. They did an excellent job of documenting all the violations and then the supplemental order after the Holder report, but given the magnitude of the violations, in my experience, to not have any up-front or stipulated penalties is a gross mistake. I think such weak enforcement actions have little deterrent value for other public water systems.

Nearly a year ago, I recommended in the Washington Post opinion piece that in addition to short-term measures, two long-term actions were essential to changing the track record of poor water quality in the District. The first was to invest the necessary millions to upgrade the District's treatment plants with state-of-the-art technology to include granular activated carbon.

My other recommendation was to remove the U.S. Army Corps of Engineers from responsibility for the collection of water from the Potomac and its treatment. The origin of the Corps in operating the treatment plants and in the collection system goes back to the 1850's in anticipation of the Civil War. This situation is more than an anachronism to me.

Moving on to the national picture, I was pleased that the Post decided to investigate lead contamination and compliance around the country. The Post's October 5th story revealed gaming and manipulation of the lead rule by 12 large systems. I am not aware that any of the Post's findings have been refuted.

On the day of the story, Tom Skinner, EPA's Acting Administrator for Enforcement, stated during an NBC Nightly News interview that "If there's anybody out there who is misleading the public or, more importantly, not submitting to EPA or the States the

data they are required to submit, we are going to go after them." I am still waiting for that to happen.

According to my information, since that article, EPA has not issued a single enforcement action other than the supplemental order with D.C. cited above. Erik has alluded to the special audits that were conducted of the lead rule. I have tried mightily to get copies of any of these. I have not succeeded, but I don't understand how EPA could have come up with its lead reduction plan without having those studies completed.

Turning to the latest plan put forward by EPA on Monday, I think there are several steps in the right direction. However, I question several aspects of what the agency is proposing. I outlined these specifically in my testimony. I want to make one particular point from my testimony.

For instance, the table presented showing how well the systems were doing, 12 of the systems that originally exceeded the action level have now achieved a result of zero parts per billion for lead at the 14th percentile. Another nine reported 1 part per billion. If true, these results would be remarkable.

Unfortunately, I have talked to several different chemists and engineers in the field, and they have convinced me that these results are too good to be true.

I make other specific points about the content of the plan. One that particularly bothers me, in terms of regulatory proposals is this idea that communities would have the ability to recommend different amounts of time to run the water prior to consuming it. I do not think that's practical, and if the conditions require a 10-minute flushing time, they should be given bottled water or filters. You can't realistically expect people to run their water for 10 minutes.

In conclusion, for many years I believed the lead rule was very creative and dealt wisely with the real issue of how to regulate a contaminate that for the most part showed up after the water entered the distribution system. I still believe the 1991 rule was 90 percent correct.

However, given the 14 years of experience since the original rule, I now believe substantive changes are necessary, as I have noted. Additionally, Erik Olson has provided a very valuable list of needed actions compared to EPA's proposal.

I thank the committee, and EPA should approach his recommendations on the basis of why not. My one concern is about his recommendation for an MCL for lead. I do not think that is practical. So, therefore, I would oppose that.

Therefore, in final comment, I appreciate the opportunity to express my views and I look forward to any questions you might have. Thank you.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. Elder follows:]

STATEMENT OF
JAMES ELDER
WATER CONSULTANT
AND
FORMER DIRECTOR OF
EPA'S OFFICE OF GROUND WATER
AND
DRINKING WATER

BEFORE THE
COMMITTEE ON GOVERNMENT REFORM
OF THE
HOUSE OF REPRESENTATIVES

REGARDING
LEAD CONTAMINATION OF DRINKING WATER
IN THE DISTRICT OF COLUMBIA
AND
NATIONWIDE

MARCH 11, 2005

STATEMENT OF JAMES ELDER

Mr. Chairman and distinguished members of the Committee, I thank you for the invitation to testify on the regulation of lead in drinking water. I want to make clear that my statement and responses are entirely my own and do not represent the point of view of any third party or organization.

In my 28 year Federal career, 24 of those years were served at the U.S. EPA, the last 12 of those were in the headquarters water program. In April of 1991 I was reassigned from directing EPA's national Clean Water Act wastewater regulatory program to manage the Safe Drinking Water Act program. That same month, then EPA Administrator Bill Reilly signed the final Lead and Copper Rule that was subsequently published in the Federal Register on June 7, 1991. One of my highest priorities was to ensure that the new rule was implemented as intended. Until late 1993, my office, like all EPA program offices at the time, had national responsibility for administrative enforcement. We aggressively made certain that the States and EPA regions took hundreds of formal enforcement actions during the first phase of the rule for failure to monitor and subsequently for failure to proceed on optimal corrosion control.

Although I retired in 1995, like anyone who has worked on such an important public health program, I cannot stop feeling passionate about the importance of our nation's drinking water. Therefore, I believe it is critical for Congress to exercise its oversight authority for the Safe Drinking Water Act and I applaud this Committee for doing so.

WASHINGTON, D.C. ASSESSMENT

Indications are that the quality of the District's drinking water in terms of lead contamination is improving primarily due to the belated addition of orthophosphate in the distribution system. However, it is too early to declare victory. The 90th percentile result for July to December 2004 was 58 parts per billion, still well above the 15 ppb action level. Yet, more recent tests look promising with 19 tests taken in 2005 all below 16 ppb. Without dwelling on the history, which has been well documented by the Washington Post, the so-called Holder Report, and others, I believe WASA's performance was unforgivable and EPA's response has been regrettable. EPA's Administrative Consent Order of June 2004 superbly documented in 35 pages eight major areas of violations by WASA of the Safe Drinking Water Act Lead Rule. However, the Order did not contain any "upfront" or stipulated penalties. Further, after reviewing the Order, I am convinced WASA management intentionally covered up the severity of the situation. Lacking any penalties, this was equivalent to a "slap on the wrist" for some of the country's most egregious environmental violations since EPA was created in 1970. Based on the Holder Report, EPA issued an eight page Supplemental Order also without penalties. Such weak enforcement actions have little deterrent value for other public water systems.

Nearly a year ago I recommended in a Washington Post opinion piece that in addition to short term measures such as adding an orthophosphate, two long term actions were essential to changing the track record of poor quality drinking water in the District The first was to invest the necessary millions to upgrade the District's treatment plants with state-of-the-art technology to include granular activated carbon. This would not only reduce the lead problem but would ensure compliance with more complex current and future drinking water requirements such as enhanced surface water treatment and disinfection by-products. The existing treatment plants, McMillan and Dalecarlia, were built in 1928 and 1956 respectively. Perhaps, they should be deeded to the Smithsonian or designated properly by the National Trust for Historic Preservation.

My other District recommendation was to remove the U.S. Army Corps of Engineers from responsibility for the collection of water from the Potomac and its treatment. The basis for the Corps' role goes back to the 1850's in anticipation of the Civil War. The Corps does not operate any other water treatment plant in the U.S. other than at military installations. This situation is more than an anachronism. It is way past time to get the Corps out of the picture and centralize responsibility in a single regional entity reporting to a governing body representing all served jurisdictions.

THE NATIONAL PICTURE

During the summer of 2000 I became concerned with the reliability of what certain large community systems were reporting to their customers in Congressionally mandated Consumer Confidence Reports, especially regarding lead. For example, the narrative language in some annual reports informed the customers that the water quality was just splendid but some of the tables in the back of the report said otherwise. When I called an EPA staff person about my concerns, I was told the Agency was delighted that community systems were merely issuing the reports and that quality control issues would be dealt with in future years.

After the D.C. experience, I was pleased the Washington Post decided to investigate lead contamination and compliance around the country. The Post's October 5, 2004 story revealed gaming and manipulation of the lead rule by 12 large systems. I am not aware that any of the Post's findings have been refuted. On the day of the story, Thomas Skinner, EPA's Acting Assistant Administrator for Enforcement and Compliance Assurance, stated during an NBC Nightly News interview that, "If there's anybody out there who's misleading the public, or more importantly, not submitting to EPA or the States the data their required to submit, we're going to go after them." I am still waiting. According to my information, since the article, EPA has not issued a single enforcement action other than the supplemental order with D.C. cited above. The State of New York has issued a Notice of Violation, the mildest form of "action", to New York City on December 24, 2004 for concealing monitoring results that would have triggered lead service line replacement.

Between August and December of 2004, EPA did conduct special contractor supported audits focusing only on Lead Rule compliance in 10 States, one in every EPA region. Unfortunately, EPA has not made any of these reports available claiming nothing can be disclosed until late April or May. If these reports aren't final then how is EPA able to reach so many conclusions for its new Lead Reduction Plan?

EPA'S LATEST PLAN

EPA's Lead Reduction Plan announced the beginning of this week does take some steps in the right direction. However, I question several aspects of what the Agency is proposing. First, the data the Agency made available in conjunction with the plan is suspect since it relies solely on the validity of SDWIS/FED information. EPA's Inspector General recently criticized SDWIS in a March 2004 report. To further support my point, an Office of Water Data Verification Report on all aspects of South Carolina's drinking water program issued February 24, 2005 contains a section on compliance with the Lead Rule. Of the sample of 24 Community Systems reviewed just for compliance with the Lead Rule, 12 had violations. The audit of the Nontransient Noncommunity Systems showed five out of 18 had violations of the Lead Rule. This data verification by itself seems to contradict EPA's SDWIS-based position in its March 7th pronouncement that their "year long evaluation did not reveal a national problem comparable to the situation observed in the District of Columbia in 2004".

Second, EPA provided a table comparing large (service population of 50,000 or greater) systems from the 1992/93 timeframe with the most recent data claiming that the number of systems exceeding the action level had dropped from 166 to 15. The 15 include only two (D.C. and Bayonne, N.J.) of the 12 systems that the Post documented as gaming the lead regulations. Further, this EPA table reflects a fixed universe of systems from the 1992/93 period and would not capture any newly noncompliant large systems.

Third, this same table presented information showing 12 systems that originally exceeded the action level had now achieved a result of zero parts per billion for lead at the 90th percentile. Another nine reported one part per billion. If true, these results would be remarkable Unfortunately, conversations with water quality chemists and engineers have me convinced these results are too good to be true.

Fourth, EPA provided another table from SDWIS as of January 25, 2005 that summarized there were only 111 large and medium size systems exceeding the action level. The Post study identified 274 different systems exceeding the action level since 2000. With such a large difference, either we have a remarkable recent improvement or an apple and oranges situation with the data.

Turning to the substance of the Lead Reduction Plan, I would like to make a few observations. On the positive side, the scope is broad by touching on lead in schools and day care facilities, plumbing fittings and fixtures, and the basic regulations for community systems. On the negative side, the major shortcoming of the Plan is a total avoidance of compliance or enforcement initiatives. EPA issued only 12 Administrative

Orders in 2004 and 14 in 2003 relating to the Lead Rule and these were mostly to small systems. Based on my entire EPA experience, I know well that no matter how well EPA does its job of writing regulations and guidance, no environmental program is self-implementing. EPA must compel the States to be more aggressive and EPA must systematically step in where necessary.

Other shortcomings of the Plan include: 1) leaving in place the current practice that failure to replace lead service lines when required will not constitute significant non-compliance; 2) several times EPA states that it intends to "promote" research in many areas but does not offer a dollar of its own several hundred million dollar research budget; and 3) of the nine contemplated regulatory changes, details are few - the term "clarify" or "modify" is used repeatedly. Given the magnitude of the problem and the time that has elapsed, I would have expected more specifics.

Three of these nine regulatory ideas deserve special comment. One proposal would authorize States to allow utilities, when in violation, to modify public education requirements to tell customers to run their water for different amounts of time prior to consuming the water, citing the current 10-minute recommendation for D.C. Aside from being impractical, if the conditions are that hazardous those homes should be on bottled water or have a certified filter. Another proposal would only require a water system to notify a State of treatment changes such as occurred in D.C. by switching from chlorine to chloramines. It clearly should be approval, not just notification. The third dubious proposal states that EPA will reconsider allowing large systems above the action level to reduce tap water monitoring based solely on their water quality parameter monitoring. Given the recent track record, reducing monitoring for this reason should be prohibited outright.

CONCLUSION

For many years I believed that the Lead Rule was very creative and dealt wisely with the rare issue of how to regulate a contaminant that for the most part manifested itself after the water entered the distribution system. I still believe the 1991 rule was 90% correct if implemented in good faith by the systems and the States.

However, given the 14 years of experience since the original rule, I now believe substantive changes are necessary as I have noted above. Additionally, Erik Olson has provided a very valuable list of needed actions compared to EPA's proposal. While I have not had the time to review them in depth, I believe they provide an excellent starting point and should be approached on the basis of "why not" by this Committee and EPA. An exception to this endorsement concerns an MCL for lead. I am still opposed to the idea of an MCL at the tap. Admittedly, if complied with, an MCL would be more protective of public health but I strongly believe it would be impractical to implement at a level of 15 ppb or below.

Thank you again for this opportunity to express my views and I look forward to any questions.

Chairman TOM DAVIS. Mr. Smargiassi, let me start with you. You point out that the primary cause of lead contamination is lead in home plumbing and fixtures and, therefore, advocate corrosion controls as the primary means of eliminating lead levels. In light of this, do you think, though, the EPA's plan of action announced this week adequately addresses corrosion water in water plans?

Mr. ESTES-SMARGIASSI. The EPA's plan—we obviously haven't seen all the details, and the devil is in the details, but the broad outline of it does point us in the right direction. We are particularly interested in some of the issues that they are going to deal with on the simultaneous compliance.

Corrosion control is complicated, it's different for every single water. You need to be cautious when you make changes that those changes don't result in unexpected consequences. So we are pleased we are headed in that direction.

Chairman TOM DAVIS. Would you make any additional suggestions from what you have read with the strength of corrosion control measures?

Mr. ESTES-SMARGIASSI. Not that we are aware of at this point, but we haven't seen the details yet.

Chairman TOM DAVIS. OK.

Mr. Elder, do you have any comments on—have you seen EPA's announced plan of action?

Mr. ELDER. Yes, I have reviewed almost all of the documents that were put on EPA's Web site on Monday.

Chairman TOM DAVIS. What is your opinion?

Mr. ELDER. I think that it is not specific enough, and I think that it is too weak and some areas are not addressed at all that I outline in my statement, my complete statement, that should be addressed.

Chairman TOM DAVIS. OK.

Mr. Smargiassi, you highlight the fact that different lead requirements apply to schools and child care facilities than to water systems. Do you think the requirements in the lead and copper rule should apply to schools and child care facilities?

Mr. ESTES-SMARGIASSI. I think the question would be which requirements. We are concerned that schools be tested, that schools be—if there are problems, that the parents get notified and that those problems be resolved. Those are some of the same general themes that you find in the lead and copper rule.

But one deals with public water supplies, the other deals essentially with buildings. I am not sure that the regulatory frameworks could ever be exactly the same.

Chairman TOM DAVIS. One of the problems is—a potential significant source is the customer's plumbing system, and that is beyond the control of the water system.

Mr. ESTES-SMARGIASSI. We are the experts on water. We think we need to work with those individual facility managers, if there are problems, to help them resolve them. But ultimately it is—the plumbing belongs to the building owner. We can do our part; they have to do their part. We shouldn't fully ignore it, and with the help of EPA's and, I think, with Erik's position, this is a problem that needs to be dealt with.

Mr. ELDER. Mr. Chairman.

Chairman TOM DAVIS. Mr. Olson——

Mr. ELDER. Could I add one comment?

Chairman TOM DAVIS. Yes, sure.

Mr. ELDER. I think the structure of the Safe Water Act is deficient in that it carves out different responsibilities based on what type of system you are. When you talk about lead in schools and lead in day-care facilities, there's a particular void, if you think about those facilities that have their very own drinking water supply, as opposed to getting the water from a community system.

So I think that Congress and EPA should pay more attention to that area as well.

Chairman TOM DAVIS. Thank you.

Mr. Olson, you are critical of the fact that WASA is leaving it up to individual residents to replace lead lines on their property, but ownership and jurisdiction of those lines really varies in every municipality across the country. Given that situation, how would you suggest that the goal of replacing lead lines in individuals' properties be accomplished?

Mr. OLSON. Well, I think it would be worth having 2 seconds of history, because here in D.C., the lead service lines actually were installed, many of them, over 100 years ago, by Federal officials. It was the Corps of Engineers and other engineers, that were federally operated, that installed them and required them to be used.

Now where we are is, we have to replace them somehow; and I was pleased to hear AWWA say this morning that they think partial lead service line replacement doesn't really solve the problem. At the EPA workshop on that very issue, there was a lot of data presented that shows levels go up after—immediately after replacement; and they drop down somewhat, but they never get as low as they would be if you fully replaced the lead service line.

So what we think—the original rule that was issued in 1991 actually required full service leaded line replacement, and it was under the control of the water system. That was challenged by AWWA in court, and because the notice was deficient that EPA hadn't fully revealed that. That's where we think we ought to go back. We ought to have a control, not an ownership requirement.

So if the system has the authority under local law to go forward with replacement, they should do that. Ms. Norton's bill actually does require that. There would have to be full notice and so on. A homeowner could refuse and say, no, I don't want you coming on my property.

But we think that, frankly, WASA is going to spend $300 million partially replacing lead service lines, and it may not solve the problem. Nobody is going to look good if that is what happens if we are spending hundreds of millions of dollars and we haven't resolved the lead problem.

Chairman TOM DAVIS. Who pays under that scenario?

Mr. OLSON. Well, ultimately, it will be divided up. It will be spread across the consumers; it will be spread across the consumers over a period of time. Some of it may come out of Federal funding, particularly if—in our view, if the Federal Government said, these are the lines that should be used in the District, the Federal Government ought to bear some responsibility for helping to replace them.

Chairman TOM DAVIS. Mr. Smargiassi, do you want to react to that at all? You don't have to.

Mr. ESTES-SMARGIASSI. To the extent to which there is a local history that may be illuminating for the committee nationally, I think the situation is much more mixed. In many municipalities, the municipality doesn't own, doesn't control and has no legal authority to require action on private property. Many municipalities do not have the legal authority to spend money on private property.

Now, as much as a municipality may, and many do, want to deal with the homeowner-owned portion, they may not have that authority. We are trying to create the kind of matrix guidance that says, if you are in this situation, here are some ideas; if you are in this situation, here are some ideas to get the homeowners involved.

The goal, I think, is exactly the same. If the lead line is contributing to the problem, get rid of the lead line. But our issue, essentially, is so much variability across the country, and authority guidance may be what's necessary. It may not be able to handle one-size-fits-all through regulation.

Chairman TOM DAVIS. Thank you.

Mr. Olson, let me just ask you, too, what would you do to assure that testing protocols are accurately followed throughout our water system?

Mr. OLSON. Well, I think that's a very difficult question to answer. First of all, one of the basic problems is, we don't have statistically valid samples. So in a city the size of New York, testing 100 samples for the entirety where you have tens of millions of taps really is inadequate, so that is one thing.

Second, you need to have really clear criteria for where you test, and that you don't have households in and out of the testing regime, which can really skew your results.

So I think the rules need to be much more specific and take into account what the Washington Post reported, as well as what these data verification audits are showing, so that we get at where the problems really are, at the highest-risk homes.

Thank you.

Chairman TOM DAVIS. Mr. Elder, you stated that EPA should be more aggressive in enforcement of the lead and copper rule. Would that include more use of civil and criminal sanctions?

Mr. ELDER. Absolutely, it would.

Chairman TOM DAVIS. They don't use that very often, do they?

Mr. ELDER. No, as Erik's table indicates, even administrative enforcement actions, which now include the possibility for administrative penalties, have basically gone through the basement. And there was no judicial action that I am aware of, civil or criminal, relating to enforcing the lead and copper rule; and I think in some cases that would be appropriate.

Chairman TOM DAVIS. Thank you very much.

Ms. Norton.

Ms. NORTON. Thank you very much, Mr. Chairman.

Following up on the chairman's question about partial replacement of lead lines, I wonder—in the District, we saw some replacement of the public portion, and then we saw, still, lead, and the conclusion was that it was coming from the private portion.

Do you think it's better to have no replacement rather than full replacement, to go to corrosion control or some other—or some other method if, in fact, full replacement cannot be done?

This is very costly. So if the jurisdiction is going to go to replacement of public lines, will there be enough reduction in lead so that you can say that has been worth the expenditure?

Mr. OLSON. Let me take a crack at that.

At least according to the data that I have seen, and these are ballpark figures, WASA is saying that it costs around $10,000 to do partial replacement, on average; and to do full replacement, it's $12,000 or in that neighborhood.

It would seem like if you are going to go to the $10,000 arena, you might——

Ms. NORTON. Who says?

Mr. OLSON. Those were WASA's original figures, I don't know if they have changed them or not, but we would certainly be happy to put into the record what the most recent figures are.

But the point is, once you are up there and digging and pulling out pipe and so on, it's relatively less expensive to just complete, complete service line replacement.

Our position publicly has been and continues to be that rather than expediting and trying to replace partial service lines really fast, why not just do the full service lines and perhaps back off somewhat, so that you can really take care of the problem.

Ms. NORTON. I just don't know whether we are making—this is a lot of make work, and we will be back, you know, 10 years from now and say, what was that all about.

Mr. OLSON. Well, I think there is a risk of that. I don't think you are going to see the levels permanently going up as a result of partial service line replacement. The point is, though, that you are not getting as much benefit at all as you would with full replacement.

Mr. ELDER. May I please add something?

Ms. NORTON. Yes, please.

Mr. ELDER. There is also a risk associated with partial lead service line replacement that you—because that change involves electrochemistry that you may then leach more lead out of the part that was not replaced, that was previously leaching before you took out any of the lead service lines.

Ms. NORTON. Yes, that was what was in my mind. There was testimony in one of our hearings to that effect, actually, Mr. Olson, not that you might not cure the problem, but that you might be making it worse.

Mr. ELDER. It's a gamble for a city to approach it in terms of partial line replacement in terms of making sure that action would get you below the 90th percentile number to meet the EPA regulation.

Mr. ESTES-SMARGIASSI. Congresswoman, we would agree that there are situations where local partial lead service lines may not be appropriate. Clearly, if you are going to replace the line, replacing all of it is better. In fact, there may be circumstances where replacing part of it makes it worse or at least is a bad investment.

Ms. NORTON. This is rather absurd. I can understand we are getting into these problems in life; that is just the way it is. But you know that in the District they are now beginning to at least experiment with a change in water chemicals, so whether or not you were

for partial lead replacement or full pipe replacement, it does seem that we have something going now that could happen more rapidly than either.

I am not suggesting that what—we do one or the other. But isn't that essentially what we have to rely upon for the foreseeable future?

Mr. ESTES-SMARGIASSI. I think in most systems, corrosion control, because it deals with every home and can be done across the system in a matter of months to years, depending on the amount of construction and the amount of acclimation time, may in fact, be better than a many many-year program of removing lead services, particularly if removing the lead services yields only partial replacement.

So that's one of the reasons why, in our testimony, in our approach, we have been consistent to say as such: Wide corrosion control effectively applied is a benefit to all the homes, to every consumer.

Mr. ELDER. If I could add, the original EPA rule from 1991 required every system serving greater than 50,000 population to optimize corrosion control no matter what their monitoring results. It was only after you had experience with corrosion control, if you then did more monitoring and still failed to meet the action level, that you would be compelled to begin a lead service line replacement program.

So it was definitely staged along the lines that these gentlemen are talking about.

Ms. NORTON. I, of course, am not suggesting one or the other. I will tell you, I am suggesting this. The public rightfully does not like remedies that will, in fact, take place in their great-great-grandchildren's lifetime. I am very concerned. I was very concerned that instantly everybody thought that replacement of pipes by the public was the answer.

Our problem here—and then of course we had to do some investigating before we found out that the problem may have been an EPA reluctance or, in fact, not requiring a corrosion control study when there was a change in water chemicals. That, of course, was absolutely shocking.

If you tell people that you can put something in each's waters, just change it and, you know, they say this is generally safe, but do no studies, I think most people would be shocked by that.

Do you all agree that the problem here was probably the change in chemicals, a change that was made in good faith because of what we know about the cancer-causing properties of chlorine; that the change was probably indicated, but the problem was with the lack of an appropriate study?

Mr. ELDER. Yes. I clearly believe that and said so in an opinion piece last March.

Mr. OLSON. I would agree that appears to be one of the significant sources. Another one is that the corrosion control plan that the Corps of Engineers put into place many years ago was not using orthophosphate, as some experts had suggested. It may be if they were using orthophosphate all along, the change wouldn't have——

Ms. NORTON. Why weren't they doing that?

Mr. OLSON. It was cheaper to use the alternative.

Ms. NORTON. Well, the other thing—to come again—we just don't sit here and tell the regulators to find the best and most expensive thing to do, the way we might do at home. We know we are always dealing with cost and benefit.

I don't have any problem with a utility using the most cost-efficient way to control a public health problem. I think it's real important for those of us who believe in regulation to make that clear. The problem I have is if you don't know that it is a safe replacement. We were shocked to find that they were using a new chemical that introduced new problems, even as they tried to get out of old problems from the other chemical—in this case, chlorine.

I must say this graph, I think it was in Mr. Olson's testimony, is another shocker, because it shows levels of enforcement not declining, but disappearing. I am not sure how that particularly—what does that mean? What was happening? Perhaps we should ask Mr. Elder.

When you go from levels this high, you know, does it mean that things improved dramatically throughout the country and precipitously so that enforcement just wasn't as necessary?

Maybe they found something to do. I just need to know how anybody would explain—I couldn't get to this when EPA was here, but I would like to know, first, how do you explain it, and then how do you think EPA would explain it?

Mr. ELDER. I certainly would not like to justify it, but I will try to explain it.

In the early part of the program, it was a lot easier to go after systems that did not do the monitoring on time or submit the results properly to the State agencies, and also to issue administrative orders about systems not proceeding with optimal corrosion control.

If most of the systems did those first two steps of implementing the rule, then the likelihood that you had the same degree of noncompliance certainly would have dropped off. But what this graph shows is that, as you said, it's basically disappeared. And given all the statistics that are out there, and all the anecdotes that have been documented in the Post and the data that's in, even EPA, what about—what are they doing about the 4 percent of the systems that they claim are in noncompliance? Are they taking enforcement actions against them? Apparently, not yet. So why aren't there enforcement actions up there?

Ms. NORTON. Would either of the two of you like to make a comment on the level of this enforcement?

Mr. ESTES-SMARGIASSI. I would like to add one clarification to Mr. Elder's statement.

Systems which are above the action level and which are providing public education, as required by the rule and, if required, are doing lead service replacement, are in compliance with the lead and copper rule.

Mr. ELDER. That's correct.

Mr. ESTES-SMARGIASSI. So, in fact, the 4 percent of systems which may be above the action level, I don't know what number of those, but in fact they could all be in compliance with the rule; and if that were the case, then no enforcement action——

Ms. NORTON. So you think that might be the case here? That might explain some——

Mr. ESTES-SMARGIASSI. One of the things that I think—I haven't reviewed Erik's charts, but it is true that we have waves of regulations, as Mr. Elder indicated. When the new regulations come out, they have specific timetables; there is a lot of transition as people get informed about them. You do typically expect to see more actions by the State drinking water agency each time a new rule comes out.

Over time, we, one, get the facilities built, get into compliance; and two, get better at figuring out how to better do the monitoring and compliance. And we would expect those numbers to go down. I don't want to comment any further on that.

Mr. OLSON. I just want to add one thing.

It is true that you are not completely out of compliance if you are over an action level. However, if you are over an action level, we are well past the time when you are supposed to have started lead service line replacement, and there are very few cities that are in the process of doing that.

So I think part of the problem is that it's a big bullet to bite to force a city to start lead service line replacement, which very often is going to be where you are.

I know MWRA was recently cited for a monitoring violation. There are probably a lot of those also in here that wouldn't even be reflected in the so-called 4 percent above the action level. So there are probably a lot of violations that wouldn't be included in here.

Mr. ELDER. Could I add one last point?

Ms. NORTON. Yes, please.

Mr. ELDER. That is that of the 12 systems that the Post documented on October 5th, only 2 of those show up as still being in noncompliance in their most recent table that was released on Monday. Had those systems properly reported and sampled, I believe that they would have exceeded the action level. So by manipulating the data, they show up in the data system as being in compliance when I don't believe that they should have shown up that way in the first place.

Ms. NORTON. So you do believe manipulation of the data is still occurring?

Mr. ELDER. Yes.

Ms. NORTON. What do you think should be done about that?

Mr. ELDER. I think, among other things—maybe Mr. Grumbles addressed it this morning.

EPA has not had a history of making actual site visits to cities. When they do data verification audits, they typically go to a central location in a State and look at files and do a file review. That is not the same as going and taking samples on your own.

That would be like relying on airplanes to be safe, without having any actual inspection of the aircraft by the FAA. EPA just doesn't have the priority or the resources to do the type of field work that I think is needed.

Ms. NORTON. Given the fact that you were at EPA and saw that to be the case, should they do this on a random basis? How do you think they could therefore even do this?

Mr. ELDER. Random and targeted, yes. Certainly, if they don't have a list, the list in the Post would be a good place to start doing that.

Ms. NORTON. One more question.

The particular concern we have, of course, is not so much the overall population as much as we know that none of us should have—should be drinking lead-contaminated water. Our particular concern is of certain vulnerable populations, children under 6, nursing women, pregnant women.

My understanding—in fact, I think there was testimony from one of you—is that the rules involving testing in schools were thrown out, apparently because of the commerce clause and how the rule is being structured.

What is being done now, for example, by EPA and, for that matter, by the States to test drinking water in schools? Is there annual testing? Is there regular testing? How do we know that children in schools are being protected today from lead-contaminated water?

Mr. ESTES-SMARGIASSI. Congresswoman, this is a State issue at this point under the existing structure.

Ms. NORTON. I can't hear you.

Mr. ESTES-SMARGIASSI. Different States are approaching it differently. I can speak to my home State.

Ms. NORTON. Why is this a State issue and not an issue for the EPA?

Mr. ESTES-SMARGIASSI. I am not sure I can speak to the legal issues which arose out of the original structure back in 1988, but as I understand it——

Ms. NORTON. So you are saying the States still would be required even if the Federal Government——

Mr. ESTES-SMARGIASSI. The States have the authority to require this. It is not clear—as I understand it, it is not clear under the current structure that the Federal Government does. But for instance, in my home State, Massachusetts, our Department of Public Health and our Department of Environmental Protection, the two agencies which are charged with dealing with lead issues in all venues, have sent letters to every single school superintendent, every single chief elected official and every single public water supplier, giving them information, urging them to do testing and to provide testing results back to the State, creating a data base. And then they are in the process now of essentially going back, and they are iterating through if folks are not moving forward on that. It does not yet appear to be a mandatory program, but they are very aggressively moving forward.

Our experience has been that when school departments receive this information and their local water department and the school department are involved, they do move forward.

I think Mr. Olson indicated in my home city, Boston, the city of Boston schools, if they find a tap or a kitchen faucet which is high, they take that out of service. And until they can replace the fixture and ensure that fixture is not yielding high lead, they will provide bottled water, if that's appropriate; or they may just close it off, if there's another one down the hall which is below the action level.

Those are reasonable steps. They achieve the purpose of identifying whether there's a high exposure and remediating it. If there's lead coming out of the tap, that tap should be shut off.

Ms. NORTON. Would either of you—I am pleased to hear that Massachusetts and the school systems know what to do and are responsive.

Do either of the other witnesses have the sense that Federal regulation may not even be required here because the States have taken this responsibility for lead in the schools?

Mr. OLSON. No, this is a situation where the Safe Water Drinking Act is broken. It does not right now state it is up to the individual State. We have seen evidence from Philadelphia, Seattle, the District here, where many school systems, if they test, find problems.

Very often they don't even inform the parents or the staff that there is a contamination problem. They are not retesting periodically. Some of them apparently didn't take out, many years ago—10 years ago—the fountains that were supposed to be taken out that had excess lead.

So this is a problem that really only Congress can fix.

Mr. ELDER. I might add that my understanding in Virginia, where I live, is that this responsibility is vested at the county level. The county health director has the authority to mandate the type of testing in schools that the gentleman from Massachusetts spoke of.

Ms. NORTON. And therefore?

Mr. ELDER. So therefore it's not a nationally consistent program and basically is left up to each State—in Virginia's case, the county—to decide if they really ought to go after this issue.

Ms. NORTON. Thank you very much, Mr. Chairman.

Chairman TOM DAVIS. Thank you very much. This was very helpful to us, and we appreciate your being with us today to give testimony and to answer our questions. Thank you.

This hearing is adjourned.

[NOTE.—Additional information from DCWASA is on file with the committee.]

[Whereupon, at 12:16 p.m., the committee was adjourned.]

[The prepared statement of Hon. Jon C. Porter and additional information submitted for the hearing record follow:]

CONGRESSMAN JON PORTER (R-NV-3)
COMMITTEE ON GOVERNMENT REFORM
OVERSIGHT HEARING
MARCH 11, 2005

Mr. Chairman, I appreciate your holding this hearing today. I would also like to thank the witnesses for coming here to Capitol Hill to testify before us today.

Since my being elected to Congress to represent Southern Nevada, issues surrounding water safety and clarity have been of special interest to me. In Southern Nevada, we have a little something called perchlorate that we have to worry about. In Washington, D.C., where I live during sessions of Congress, we have lead and copper to worry about.

Mr. Chairman, I am especially sensitive to this subject because safe drinking water is something that we must have available to Washington, D.C. residents and tourists. Every year, millions of residents and tourists come through the Washington, D.C. area, and every one of these people should have readily-available access to drinking water that is free of lead and copper. Residents and tourists should not have to worry about what will be coming out of their faucets on a daily basis, or how this water could be affecting their family's health. In other words, visitors to our nation's capital should not have to find signs asking people not to drink the water in the public restrooms anymore.

If Las Vegas were to have a water safety crisis like the one that Washington D.C. was facing, I could only imagine what the health and economic impacts might be.

It has been one year since the initial hearing on the Committee's last hearing on this subject on May 21, 2004. We, as a Committee, must make sure that the Environmental Protection Agency (EPA) is taking proper administrative action on this subject, as well as the steps that the EPA plans on taking along they way to ensure that no one ever experiences a problem like this again.

Again, Mr. Chairman, thank you for holding this hearing today.

* * *

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
WATER

The Honorable Henry A. Waxman
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Waxman:

Thank you for your letter, dated March 31, 2005, conveying questions for the record from the March 11, 2004 hearing held by the Government Reform Committee on efforts to evaluate the issues associated with lead in drinking water in the District of Columbia and nationwide. I can assure you that this matter is of great concern to the U.S. Environmental Protection Agency (EPA) and that we have a number of actions underway to correct the problem. An attachment to this letter provides responses for the specific questions submitted by you and Delegate Norton.

Over the past year, staff in EPA's Regional and Headquarters offices have focused their efforts on understanding the specific problem in the District and evaluating implementation of the Lead and Copper Rule nationwide. As I noted at the hearing, the plan that I announced on March 7 represents the first set of actions that we are taking in response to our review. The immediate changes to the regulations should help to address some of the concerns that you raised at the hearing and in previous correspondence. I can assure you that EPA will continue to give the remediation of the lead corrosion problem in the District and the protection of the health of the nation's citizens our highest attention. EPA wants to ensure that citizens in the District and across the country have confidence in the safety of their drinking water.

I look forward to working with the Committee to respond to additional questions or concerns that you may have. If you have any questions, please contact me, or your staff may contact Steven Kinberg of the Office of Congressional and Intergovernmental Relations at (202) 564-5037.

Thank you

Sincerely,

Benjamin H. Grumbles
Assistant Administrator

Attachment

Questions for the Hearing Record for Mr. Grumbles
March 11, 2005 Government Reform Committee Hearing
from Delegate Norton and Representative Waxman

1.) ...Over the past year, EPA has filled in much of the missing data. However, EPA still does not have monitoring results for about 5% of the mid-sized systems and about 1-2% of the large systems.

1.a) When will EPA have lead monitoring results in its SDWIS/FED tracking system for all of the water systems that are required to report?

As of January 2005, we could account for 98% of the large (>50,000) and 95% of the medium (3,300-50,000) systems required to report. This includes systems that had reporting data in SDWIS/FED and systems that were not required to monitor and report because they had waivers or were part of a consecutive water system. This is considerably greater than the less than 25% of systems that were represented in early 2004. We are continuing to work with states to ensure that all systems required to report data do so and will periodically review the system to ensure that we are getting to 100%.

1.b) How many people are served by drinking water systems for which EPA's tracking system is still missing data on monitored lead levels (from 2000 on)?

As of January 2005, 20 large systems serving a total of 2.9 million and 405 medium systems serving 3.5 million did not have data in SDWIS/FED.

2.a) Does EPA agree that any public health threat that has potentially affected up to 10 million Americans in the past five years should be viewed as serious?

Yes, EPA views any exceedance of the action level as potentially serious due to its health effects on children, however, it is important to remember that although 10 million people may have resided in communities where the water utility exceeded the action level during one or more monitoring periods, not every customer within the community would have been subject to elevated lead levels because lead exposure is a function of site conditions rather than the quality of the source water. This is why monitoring is focused on the homes that are expected to have the highest levels.

2.b) If so, why does EPA portray the lead rule, which is supposed to remove this threat to public health, as successful?

EPA views the rule as successful because, when the rule was first issued, a considerably greater population was subjected to elevated lead levels. This can be demonstrated by comparing reported 90th percentile lead levels for initial rounds of monitoring with recent monitoring results. More than 38 million people were served by the 166 large utilities (>50,000) that exceeded the action level during initial rounds of monitoring. Since 2003, the population

served by large utilities that have exceeded the action level is approximately 5 million people - a decrease of approximately 85% from the initial monitoring. Actions taken by utilities have been effective at lowering levels of lead.

3.a) ...the Post story noted that NYC claimed to have lead levels below the action level. Our understanding is that in fact, the water authority did not report all of its samples as required by law. In actuality, the city exceeded the action level, which should have triggered public notice and lead line replacement. Is this understanding correct?

It is correct that NYC failed to report all of its compliance samples. Had the utility included all required compliance samples, the 90th percentile level would have increased from 13 ppb to 16 ppb in 2000; 15 ppb to 16 ppb in 2001 and 2002; and from 11 ppb to 13 ppb in 2003. In 2004, the utility's 90 percentile level was 14 ppb. Therefore, the City would have exceeded the action level between 2000 and 2002. The State Department of Health issued a notice of violation to the City on November 24, 2004 for failing to report all sampling results and failure to collect samples during June-Sept 2004. The State required the City to submit a monitoring plan and lead service line replacement plan and schedule and reinitiate the City's public education program.

3.b) The fact that NYC actually exceeded the lead action level since 2000 does not appear to be currently reflected in EPA's database. Is this correct? Once EPA corrects the data in the database and the tables in the June 1, 2004 summary report, won't they indicate that an additional roughly 6 million people, beyond the 10 million people indicated by EPA's data, are served by water systems that have exceeded the lead action level since 2000?

It is correct that the adjusted 90th percentile levels were not corrected in EPA's database as of January 2005. We will work with the state to ensure that the values are corrected. This would indeed change the population served by systems that exceeded the action level. However, the degree by which NYC exceeded the action level (1 ppb) does not present as great a concern as was faced by the District of Columbia. Additionally, the City has been below the action level since 2003.

3.c) What, if any, process has EPA established to investigate allegations of inaccuracies in the lead monitoring data reported to EPA, including but not limited to the allegations in the Post story?

EPA staff worked with contacts in states to review the allegations made in the Post article. EPA also will continue to review lead reporting data as it carries out its data verification audits of state drinking water programs. At this time the Agency is not considering any additional initiatives in this area, but will impress upon states the importance of ensuring that utilities are monitoring, correctly calculating their 90th percentile levels, and reporting them to state programs. With respect to the specific utilities mentioned in the Post article, EPA's follow-

up identified issues of concern in only a few cases.

3.d) Will you commit to correct, within a specified time period, any data in the SDWIS/FED data system as necessary based on the results of such investigations? If so, please indicate when you will make these corrections.

Should EPA identify incorrect data, we will work with the states to ensure that they make any necessary corrections to the data. We have no set timeline for ensuring that corrections are made. States will review and update the database in accordance with their established timeframes.

3.e) With respect to the allegations made public by the Post, will you make public the results of EPA's investigations for each jurisdiction? If not, why not, and how would you expect the public to have confidence in the safety of the drinking water, given unrebutted allegations of inaccuracies in monitoring and reporting?

EPA will consider making the results of its review of the cities identified in the Post available to the public after conferring with state drinking water programs, who have primary enforcement responsibility for overseeing utilities within their jurisdiction.

4.a) Given apparent numerous inaccuracies in the data that has been reported to the system, what is the basis for EPA's claim that "the LCR has been effective in more than 96% of the water systems that serve 3,300 people or more"?

EPA based its statement on the data that has been provided to the Agency by state drinking water programs. We believe that the data that has been provided by states with respect to 90th percentile levels is largely accurate.

4.b) How many people are served by systems that serve less than 3,300 people?

Approximately 25 million people are served by more than 44,000 community water systems that serve fewer than 3,300 people. An additional 6 million people receive water from more than 19,000 non-transient non-community water systems that are also subject to the rule.

4.c) How effective is the lead rule with respect to water systems that serve less than 3,300 people, and what is the basis for this assessment?

While we believe the rule has also been effective for smaller water systems who have taken action to control corrosion, it is not as easy to come to a firm conclusion. States are only required to report 90th percentile levels for small community and non-transient non-community water systems when they exceed the 15 ppb action level. A review of information in SDWIS, as of January 2005, indicated that 2,663 small systems reported that they had exceeded the action level for one or more monitoring periods ending in 2000 or later and 878 systems had exceeded it for monitoring periods that ended in 2003 or later. However, as with other drinking water

regulations, smaller water systems can be challenged in implementing drinking water regulations. In reviewing violations for 2004, small systems accounted for 95% of the 8,370 community water systems with Lead and Copper Rule monitoring and reporting violations and 95% of the 1,095 community water systems with Lead and Copper Rule treatment technique violations. Note that some of these violations may have addressed exceedances for copper rather than lead.

5.a) When will those reviews [detailed state reviews] be finalized?

We are currently reviewing the information provided by our contractor summarizing the results of the 10-state review. EPA expects to finalize a report summarizing the national results of the review some time in July.

5.b) Will EPA commit to make the reviews public once they are final? If not, why not, and will EPA make the reviews available to the Committee?

This report will be posted on EPA's website, and we will send a copy of the report to the Committee as well.

5.c) Will EPA correct the data in SDWIS/FED as necessary to reflect any discrepancies revealed by these reviews? If so, by when will EPA make any such corrections?

Should EPA identify any inconsistencies in data or implementation, we will work with the states to update SDWIS and to take any necessary compliance actions.

5.d) Based on the results of the reviews received thus far, has EPA initiated any enforcement actions?

To date, EPA has not initiated any enforcement actions that are based on findings from the 10 state review. Enforcement actions were initiated by New York and Rhode Island as an outcome of their review of the Post allegations.

6) ...results portrayed in EPA's charts entitled "Lead 90th Percentile Levels for 166 Large Water Utilities - Then and Now". That chart shows that a number of the systems that had exceeded the action level in 1992/93 are showing monitoring results of zero or one part per billion. According to Mr. Elder, these results are likely "too good to be true".

6.a) Does EPA agree that such apparently precipitous drops in monitored lead levels may indicate questionable data, or are results this dramatic to be expected from implementation of a corrosion control program?

EPA has no reason to believe that significant benefits cannot be derived from the effective implementation of a corrosion control program. The 1991 rule indicated that the

method detection limit for lead using several different analytical methods is 1 ppb. The method detection limit is the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the true value is greater than zero. It is likely that results of zero in the table reflect concentrations below the method detection limit of 1 ppb and are in essence "non-detects".

6.b) Have EPA or the relevant states conducted any audits to verify these data? If so, which systems were audited and what were the results?

EPA has not specifically audited the results of the data referred to in the question.

7.a) Does EPA agree that insufficiently stringent notice requirements contributed to the lead in drinking water crisis in the District?

We agree that more effective public communication on the part of DC WASA could have served to alleviate the significant concerns that the residents of DC and Congress have had about the situation. However, we also believe that the problem was not so much with the requirements as it was with the failure to adequately implement the existing requirements.

7.b) If not, or if EPA is uncertain, what is the basis for EPA's uncertainty?

EPA is not uncertain.

8) In their letter of March 17, 2004, Chairman Davis, Rep. Waxman and Del. Norton provided a set of recommendations for strengthening the rule's public notice requirements....

8.a) Does EPA agree that the [public] "notice must immediately convey to people that there is a problem that presents a risk to their health and the health of their children"? If not, why not?

Yes, EPA agrees that an exceedance should result in immediate notice so that consumers can make informed decisions about their health.

8.b) If EPA agrees with the above statement, does EPA believe that the current wording of the required notice conveys this? If yes, please provide evidence supporting that belief.

EPA believes the current wording of the required notice could be improved to better convey potential risks to consumers.

8.c) If EPA does not believe that the requirement currently conveys the meaning described in (a), will EPA commit to propose changes to the notice requirements to ensure that the notice will convey such a meaning in the future? If not, why not?

EPA intends to carefully review the existing public notice language to determine what changes can be made to improve its effectiveness. Modifying the public education language in the rule requires a regulatory change that will take time. During our public education expert workshop, held last September, there was general agreement that public education can be improved, however the suggested approaches varied. Extensive collaboration with health professionals and risk communication experts will be needed to improve message and delivery. Although this subject was not listed in our immediate plan, we intend to work with risk communication and health professionals to review the range of issues with public education, not only the required language, but the way the message is delivered, to identify and recommend appropriate changes to the rule.

8.d) Does EPA agree that this notice "should inform people that EPA's health-based standard for lead in zero because any exposure to lead in drinking water could cause adverse health effects"? If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

See answer to 8c.

8.e) Does EPA agree that the notice "should state that lead is highly toxic and a probable human carcinogen"? If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

See answer to 8c.

8.f) Does EPA agree that the notice "should make clear that lead exposure not only slows a child's normal mental development, but also appears to cause irreversible damage?" If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

See answer to 8c.

8.g) Does EPA agree that the notice requirements should no longer refer to "amounts of lead that won't hurt adults"? If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

See answer to 8c.

9.a) Does EPA agree that the notice should be sent to all households, not just those receiving water bills? If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

In addition to considering changes to the language used in public notices provided to customers, we will also ask experts to consider what, if any, changes are needed for the delivery of such notices. It is important to note, however, that the current regulations require water

systems to notify customers through additional methods in addition to home mailings. Systems are required to provide public service announcements through radio and television and deliver pamphlets and other informational material to organizations within the community (e.g., school boards, clinics, hospitals, welfare agencies).

9.b) Does EPA agree that in communities with substantial numbers of non-English speakers the notice should be provided in the relevant language(s)? If not, why not? If EPA agrees, will EPA commit to propose this change to the notice requirements?

As noted in the previous response, EPA will consider delivery of materials as part of its review. However, the current regulations already require that public education materials be communicated in the appropriate languages in communities where a significant proportion of the population speaks a language other than English.

10) ...EPA does plan to propose to require that a water system notify residents of the test results for their own home. However, EPA has not indicated that it would propose to set any deadline for providing such results. In the District, some residents did not receive their test results for months after the tests, but EPA's planned proposal would do nothing to address that problem.

10.a) Does EPA agree that it is important that residents receive timely notice of the test results for their own home?

EPA agrees that it is important that residents receive a timely notice of the test results for their own homes.

10.b) If so, will EPA commit to propose to add to the rule a deadline for notifying residents of their test results, such as two weeks from the date the water system receives the results? If not, why not?

EPA believes that prompt notice to residents of the results of the lead tests for the samples collected from their homes is warranted and, as part of our rule-making, we will likely identify an appropriate time frame in which that notification should be completed.

10.c) Does EPA agree that notice of the test result must also include sufficient information regarding health risks and the effects of lead to give people a sense of the significance of their results? If so, will EPA commit to propose to add this requirement to the rule? If not, why not?

As part of its review EPA will consider what, if any, additional information should be provided with homeowner notification. EPA believes that requiring notification of all residents of the results of the tests of samples collected from their home would enable them to consider the steps they can take to further reduce their lead exposure.

11.a) Neither Mr. Grumbles' testimony nor EPA's action plan discusses these concerns [homes that test above the action level] with the lead rule. Rep. Waxman raised these concerns back in 1991. Members of this Committee asked EPA to consider these concerns a year ago. Has EPA done that?

EPA has considered and will continue to consider the concerns expressed that, even if a system is in compliance with the Lead and Copper Rule, samples from some homes may exceed the action level.

The Lead and Copper Rule sampling requirements recognize that lead levels in drinking water vary among households in a system based in large part upon the lead content of their household plumbing and service line. This is precisely why the existing rule's sampling targets multiple households with lead service lines and plumbing that contains lead.

Optimized corrosion control treatment is the primary mechanism that utilities use to ensure that leaching of lead from lead-bearing materials is minimized. The effectiveness of the corrosion control treatment is evaluated based upon whether 90 percent of the samples from these households are below the lead action level of 15 ppb. EPA determined that this threshold represented the feasible level for optimized corrosion control treatment. In addition to the 90th percentile threshold, EPA requires utilities to include a notice regarding lead in their annual water quality report if they exceed the action level at the 95th percentile (i.e., more than 5% of the homes tested are above the action level).

11.b) If so, why has EPA failed to propose any action to address these concerns?

We will ask the group reviewing the public education material to consider what changes to the rule could address concerns about making people aware of the potential for lead in drinking water. Ultimately, however, the only way for any homeowner to know if their drinking water contains lead is to have their own water tested. It may, for example, be appropriate to develop a baseline message that would always be included in the annual water quality report to make this point to consumers.

12.) The authors of the March letter specifically recommended that EPA reconsider whether it is feasible to set an enforceable MCL for lead at the tap. The authors also recommended that if EPA didn't set such a limit, at a minimum EPA should require remediation whenever a water utility finds elevated lead levels.

12.a) What analysis has EPA conducted of these recommendations?

At this time, EPA continues to believe that the approach taken in the 1991 rule is appropriate. Setting an enforceable MCL at the tap is difficult because contamination at the tap may be from different sources beyond the control of the water system (e.g., household plumbing). In 1988, EPA initially proposed an MCL of 5 ppb at the entry point to the distribution system. However, at that time, only an estimated one percent of all systems had lead

levels in source water exceeding 5 ppb. Commenters to the proposed rule that supported the MCL approach agreed that EPA had no authority to set an enforceable MCL at household taps "since most lead and/or copper contamination detected at these taps is from sources beyond the control of public water systems (e.g., household plumbing)."

EPA recognized that, while the water systems may not have control of factors that cause variability in lead levels at the tap, they can control the corrosivity of water. Therefore, EPA selected a treatment technique that focused on corrosion control as a means to control levels of lead, with additional requirements for source water treatment (if appropriate), lead service line replacement and public education. Nothwithstanding the recent situation in DC, we believe the treatment technique approach has been effective in reducing lead levels.

The March letter also recommended that EPA consider that additional actions be required when lead levels exceed some higher threshold. As part of our on-going efforts in reviewing the rule, we are continuing to consider whether it would be appropriate to identify a second higher threshold that would require additional intervention actions on the part of the utility. We are currently working to evaluate research in developing a health advisory and revising our model that predicts blood level levels resulting from lead exposure from a variety of media. Once these efforts are completed, we may be able to use them to inform consideration of a second, higher action level that would require utilities to carry out additional intervention actions. We expect these efforts will not be completed until later this year.

12.b) Are these recommendations still under consideration by the Agency? If so, when will EPA make a decision as to whether to propose each of these changes to the rule?

See answer to 12a.

12.c) If not, what was the basis for rejecting each of these recommendations?

See answer to 12a.

13. ...In their letter of last March, members of this Committee recommended that EPA examine the issues related to monitoring and increase the number and frequency of sampling. The members also recommended that EPA require increased monitoring at the tap after a change in treatment processes.

13.a) EPA's action plan is not entirely clear on this point, but it does not appear that EPA plans to propose any increase in the number or frequency of samples. Is this correct?

During its expert workshop and subsequent review, EPA examined many issues related to monitoring and sampling issues. As part of our short-term actions, we are planning to address several issues related to monitoring. For example, we plan to revise the language so that systems

that are exceeding the action level may not reduce monitoring for lead and other water quality parameters. With respect to requiring increased monitoring after a change in treatment process, we are planning a requirement for advance notification that will provide states with better opportunity to review proposed treatment changes so that they may require increased monitoring where it is appropriate. We are continuing to consider a wide range of monitoring issues as part of our on-going review of changes to the regulations.

13.b) If no, why not? Please describe the process that EPA used and any evidence that EPA relied on to conclude that the current sampling and monitoring requirements are statistically robust.

In promulgating the 1991 rule, EPA analyzed whether the number of samples required was sufficient and was satisfied that the monitoring strategy would reflect, with a reasonable level of confidence, the levels throughout the system. EPA based this analysis on private industry practices to estimate the fraction of a population that exceeds an acceptable standard. Based on this analysis, EPA found there would be a 90 percent confidence level that all systems exceeding the action level would be correctly identified by collecting the minimum number of samples specified in the rule.

This analysis was based on sampling conducted at random locations. Because the rule requires sampling at targeted locations believed to have a greater potential for elevated lead levels, it is likely that EPA can have greater confidence in the results than indicated by the analysis.

13.c) Will EPA propose to require increased monitoring at the tap after a change in treatment processes as the members recommended? If not, why not?

At this time, EPA does not have short-term to plans to revise the rule to require additional monitoring after treatment changes. However, in revising the Simultaneous Compliance Guidance coinciding with the release of the Stage 2 Disinfection Byproducts Rule, EPA does plan to provide guidance that will assist states and utilities in assessing treatment changes and how these changes may or may not affect corrosion control. This guidance will explain distribution system best management practices that could help systems control corrosion after treatment changes, which will include suggestions on how to address monitoring.

14.) ...In the March letter, the members also recommended that EPA consider revising the regulations to require that if a drinking water treatment method is changed, the water system and the state or EPA must review the applicable corrosion control plan to ensure that it remains effective in light of the change.

14.a) How does EPA's proposal address the concern that a change in treatment can cause corrosion problems?

EPA's Drinking Water Lead Reduction Plan includes a provision to update the 1999

guidance on simultaneous compliance. The Agency is currently revising the document to support the Stage 2 Disinfection Byproducts Rule and plans to enhance the discussion of potential effects of treatment changes on maintaining corrosion control in a distribution system. We are also proposing to revise the regulation to require that utilities notify the state of treatment changes which could affect corrosion control prior to such changes rather than after. This, combined with the additional guidance, should raise awareness on the part of states and utilities of the importance of evaluating potential side-effects of changing treatment processes.

14.b) Did EPA consider revising the regulations as described above? If so, what is the basis for EPA's decision not to propose to make this change?

EPA considered revising the regulation to require states to determine if treatment changes warrant review of corrosion control treatment. However, at this time, the Agency believes this issue will be better handled through additional guidance to states and utilities. The Agency plans to highlight which treatment changes may cause concern with compliance with the lead and copper rule in the updated Simultaneous Compliance Guidance Document. This will allow utilities and states to determine the types of treatment changes that may warrant review of corrosion control treatment practices.

The Agency will continue to evaluate possible additional changes to monitoring requirements for the rule. More extensive changes will require greater consultation with stakeholders and additional analysis to ensure that all relevant technical and implementation issues are addressed.

15.a) Please describe the specific factors that in EPA's view allowed the lead in drinking water crisis to occur in the District.

15.b) For each factor, please indicate whether, in EPA's view, a change in the regulatory requirements could make such a factor less likely to occur again here or elsewhere.

15.c) For each factor, please identify and explain the element of EPA's plan, if any, that would help prevent its repetition.

Generally, we believe there were 3 major factors that exacerbated the lead crisis in D.C. The first factor was related to the utility's loss of corrosion control within the distribution system. EPA is reviewing past reports and performance data related to how the water was treated and how water chemistry changed in the Washington Aqueduct wholesale customers' distribution systems. The review will investigate several factors which could have affected chemistry in such a manner so as to increase corrosion. These factors include the following:

- The process change from chlorine to chloramine disinfection in November 2000 and the potential impacts of nitrification
- The effects of water distribution system maintenance and operation practices
- The effects of corrosion control treatment management practices

The results of this review will help inform the Simultaneous Compliance guidance and any additional guidance to make utilities and states more aware of treatment changes that can affect optimal corrosion control. Additionally, as a short-term regulatory change, the Agency will

propose that utilities notify states of treatment changes in advance so that states can recommend any additional studies or monitoring they deem appropriate. Both of these efforts should help to prevent the repetition of high lead levels in the District and elsewhere.

Secondly, there were several issues associated with monitoring that were identified by the region during its compliance audit of WASA. For example, the Region found that the utility had under reported sampling results such that the 90th percentile level was not exceeded. We are addressing issues associated with grounds for invalidation, sample collection, and calculating the 90th percentile through supplemental guidance and targeted changes to the regulation. We are also considering additional issues associated with monitoring as part of our continuing review.

Finally, the situation in the District was made worse by poor communication. Homeowners were notified of the results of testing, but often times, the notification was sent out months after the testing was conducted. The public education message was not clear (e.g., flushing time) or appropriate in conveying risks and the urgency of the situation. As part of our short-term regulatory changes we will propose to change the regulation to require that customers be informed of the results of any testing in their home within a certain period of time. We will also propose changes to the standard public education language to allow utilities to use information on flushing times that is more appropriate to their situation. We also intend to carry out a complete review of the public education language to make it more relevant and easy to understand (see answer to 8c).

However, failure to implement the existing requirements also contributed to the situation in the District, particularly with respect to monitoring and public education. As noted, WASA failed to comply with requirements related to calculation of the 90th percentile. EPA also identified deficiencies in the public education materials produced by WASA following the reported exceedance in 2002. For example, WASA failed to demonstrate that it issued a public service announcement in April 2003 and failed to demonstrate that it provided public education materials to major newspapers in September 2003, as required by regulation. EPA also found that language used in several WASA public education items did not track exactly with the mandatory language contained in the regulations - leaving out key words that would have helped convey the seriousness of the problem.

16) One general problem with the implementation of the lead rule to date appears to be inadequate enforcement by the states and EPA. What specific regulatory, policy, or other changes will EPA make to address this problem?

Implementation is certainly critical in ensuring that the public health protections envisioned by regulations are achieved. Oversight and enforcement are important components of ensuring that implementation is carried out, as is compliance assistance. At the national level, we're going to look very closely at the specific results from our review of implementation of the rule at the state and utility level to identify areas where compliance assistance or enforcement initiatives may be needed. In the near term, we will work with Regions and states to address utilities that have a history of violations (i.e, for corrosion control, public education) and see that

they are addressed through appropriate enforcement actions to return them to compliance.

17) ...The sole point of service line replacement is to reduce lead levels in drinking water. If partial replacement does not achieve that goal, EPA must address this issue or risk a tremendous waste of money and resources, as well as continued public exposure to lead in drinking water.

17.a) What is EPA doing to address this issue [partial lead service line replacement]?

In reviewing data on partial replacement, we have found that in most cases it is effective in reducing exposure to lead. While there are some short-term increases in lead levels immediately following the replacement, data show that the lead levels are reduced within a few weeks. The short term increases can be minimized by immediately flushing the lines following replacement. Nonetheless, the Agency agrees that full lead service line replacement is a more effective means for reducing lead exposure from drinking water.

At the expert workshop on lead service line replacement held last October, several participants indicated a need for a revision of EPA's existing guidance on lead service line replacement (2000 Notification and Reporting Guidance for Partial Lead Service Line Replacement). Suggestions were made that this document be expanded to address all issues related to lead service line replacement including actual replacement techniques, methods to prioritize lead service line replacement based on sensitive population needs, and possible strategies and incentive programs to persuade water systems, residents, and building owners to replace full service lines.

17.b) Specifically, is EPA conducting any research to determine the lead levels that result from partial versus full lead service line replacement under a variety of conditions? If so, when does EPA expect to have the results of such studies? If not, how does EPA propose to resolve this concern?

The EPA plans to work with its Office of Research & Development and outside partners such as the American Water Works Research Foundation (AwwaRF) to identify, prioritize and fund research projects to help improve the Lead & Copper Rule and its implementation. We anticipate that techniques in replacing lead service lines would be considered one of many potential research topics. In collaboration with EPA, AwwaRF recently initiated a research project that will evaluate the contribution of service line and plumbing fixtures to lead in drinking water (http://www.awwarf.org/research/TopicsAndProjects/projectSnapshot.aspx?pn=3018). As part of the project, the contractor will evaluate the relative benefits of partial and full service line replacement and how different cutting techniques may affect lead levels at the tap. The project is expected to be completed in 2008.

17.c) Depending on the results of any planned or ongoing studies, will EPA consider changing the regulations to require full replacement of lead service lines (at least

with respect to the portion of the line under the control of the water system), at the water system's cost, upon exceedance of the lead action level? If not, why not?

EPA will consider changing its lead service line replacement requirements after considering the results of relevant research.

18) Has EPA sampled the lead levels in drinking water in schools and daycare centers during the past five years? Has EPA received test results from the states regarding sampling of drinking water in schools and daycare centers during the past five years? What were the results, and what, if any, follow-up actions have been taken?

Although there are no requirements for testing drinking water in schools that are not also public water systems, several EPA Regions have worked with states on initiatives to test water in schools. We are not however, tracking efforts by individual states or requiring that the results of any testing be provided to the Agency. Many schools that are conducting voluntary testing have made the testing results available to the public, primarily through web sites (e.g., Seattle, Montgomery and Prince Georges Counties in MD). The results appear to be widely variable from school to school within a district, and between different school districts across the country. Even lead results within a single building can vary widely from outlet to outlet. Of the schools and child care facilities where EPA is aware of testing, districts and/or facilities have developed plans for fixing identified problems.

As part of its Healthy Schools Initiative, EPA's Region I office has been working with Massachusetts and the Boston Public Schools to ensure that water used in food preparation at Boston's public schools does not contain lead. In March 2004, the Region announced that it was expanding its partnership with the state to address lead in drinking water in schools and awarded a grant to the New England Interstate Water Pollution Control Commission to conduct testing in child care centers in Massachusetts.

As part of its Children's Health Initiative, EPA's Region II office worked with the New York City Board of Education to perform sampling at all 1,200 public schools under the Board's jurisdiction. At least one tap in 370 schools was removed from service because the lead concentration exceeded the guidance level. Based on its success with this program, the Region has extended its efforts to seven school districts in NY and 3 districts in New Jersey. The districts are in various stages of testing.

EPA's Region III office has worked with many school districts under its jurisdiction including, Philadelphia and Baltimore, to address excessive lead levels in school drinking water. Over the past year the Region has been providing technical assistance to school districts in the greater Washington, D.C. area to conduct sampling in schools.

As part of our Drinking Water Lead Reduction Plan, we are undertaking several activities that are aimed at encouraging more schools to test for lead in their drinking water. We are updating guidance that provides information to schools on how to test for lead, remediate

fixtures, and inform the public of results. We are also working with industry groups, the Department of Education and the Centers for Disease Control and Prevention on a broader initiative to encourage greater testing.

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