

State of Illinois

Environmental Protection Agency
Department of Public Health



PRELIMINARY REPORT ON LEAD IN PUBLIC WATER SYSTEMS

September 2016



Purpose of this Report: The Illinois Environmental Protection Agency (EPA) and Department of Public Health (DPH) respectfully submit this report to comply with the Ninety-Ninth General Assembly's request in House Joint Resolution 153 to make a preliminary formal report on lead in public water systems (PWS). This report will be followed by a final formal report prior to January 1, 2017.

Introduction: In Illinois, regulatory oversight of PWS¹ is shared by the Illinois EPA and DPH. The Illinois EPA was designated as Illinois' primary enforcement authority by the U.S. EPA on August 29, 1979. The Illinois EPA, through an Intergovernmental Funding Agreement, has empowered the Illinois DPH to administer the Non-Community PWS Program while the Illinois EPA retains regulatory authority over Community PWS².

The Illinois EPA regulates 1,740 community water supplies (CWS). These systems supply water to 12,007,441 consumers. The Illinois DPH regulates 3,815 Non-Community Public Water Supplies (NCPWS) that serve approximately 496,345 customers. NCPWS are subdivided into non-transient, non-community (NTNC) PWS³ (e.g., daycare centers, schools and factories) and transient non-community (TNC) PWS⁴ (e.g., campgrounds and highway rest areas). During 2015, there were 438 NTNC and 3,377 TNC PWS.

Background: The U.S. EPA has recognized the importance of an ongoing program to evaluate the water quality conditions of all PWS subject to the regulatory requirements of the Safe Drinking Water Act. Each quarter, the Illinois EPA and DPH submit data to the U.S. EPA's Safe Drinking Water Information System (SDWIS). The data submitted include, but are not limited to: the incidences of violations of Maximum Contaminant Levels; descriptions of monitoring, as well as treatment technique violations; and information on enforcement activity related to these violations.

In conjunction with most violations, public notification to consumers is required. Notification provides a means to protect public health, builds trust with consumers through open and honest sharing of information, and establishes an ongoing, positive relationship with the community. In the event that a problem occurs, educated consumers are more likely to understand the problem and support the actions a water utility must take. Many deadlines for public notice issuance depend upon prompt contact and discussion between the water system and Illinois EPA or DPH. Efficient communication with prompt reporting is the cornerstone for compliance. In 2015, less than two percent of the community water systems failed to meet all public notice requirements.

Specific to the lead program, PWS must provide lead public education materials to their customers if the system exceeds the lead action level in their most current round of monitoring. Approximately 99.5 percent of CWS were below the lead action level in their most recent round of sampling; therefore, public education was not required. During 2015, only one public education violation was issued.

¹ PWS serve 15 service connections or 25 residents.

² CWS serve 15 or more year round service connections or 25 or more year round residents.

³ NTNC systems that serve 25 or more of the same non-residents at least 180 days out of the year.

⁴ TNC systems that serve 25 or more different nonresidents at least 60 days out of the year.

Finally, every CWS must provide an annual report (sometimes called a Consumer Confidence Report or CCR) to its customers. The report provides information on local drinking water quality, including the water's source, the contaminants found in the water, and how consumers can get involved in protecting drinking water. If the consumers have been looking for specific information about their drinking water, this annual report will provide them with the information they need. In 2015, 96 percent of the CWS issued a satisfactory Consumer Confidence Report by the annual July 1 deadline.

Monitoring and Reporting (M&R) Compliance for CWS - The U.S. EPA has established contaminant-specific minimum testing schedules for public water systems. Water systems typically monitor for bacteria; protozoa and viruses; nitrate and nitrite; volatile organic compounds (e.g., benzene); synthetic organic compounds (e.g., pesticides); inorganics (e.g., arsenic); lead and copper; and radionuclides. Although failure to monitor does not necessarily suggest safety problems, conducting the required M&R is critical to ensure that problems will be detected. In 2015, 89 percent of community supplies were compliant with M&R requirements.

Both NTNC and TNC systems, like CWS, are required to monitor for contaminants and issue public notification if in violation. However, TNC systems only monitor for nitrates and coliform bacteria, and they are subject to some requirements of the surface water treatment rule (if they use surface water). NTNC systems monitor for the same contaminants as CWS; however, they are not required to monitor radionuclides or issue/publish a consumer confidence report.

Lead Violation Summary - The following tables summarize the number of PWS in violation with aspects of the Lead and Copper Rule during 2015. (Note: these violations include issues with copper as well as lead.)

Lead and Copper Violations during Calendar Year 2015					
	Total Number of Regulated Systems	Treatment Techniques		Significant Monitoring Reporting	
		Number of Violations	Number of Systems*	Number of Violations	Number of Systems*
CWS	1,740	7	5	15	13
NCPWS	3,815	0	0	44	41

The following table summarizes the actions taken to address violations during 2015 noted in the previous table.

PWS Type	Violation Category	# of Violations	# of Resolved Violations	# Systems in Violation
CWS	Monitoring and Reporting	15	10	13
CWS	Treatment Technique Violation	7	4	5
NCPWS	Monitoring and Reporting	44	7	41

PWS information and all sample results can be found at the Illinois EPA public website at: <http://epa.illinois.gov/topics/drinking-water/index>. NCPWS information and all sample results can be found at the Illinois DPH public website at: <http://www.dph.illinois.gov/topics-services/environmental-health-protection/non-community-public-water-systems>.

Further discussion of the prevalence and risk posed by lead service lines:

Based upon information reported to the Illinois EPA and considering the regulatory requirements of the Lead and Copper Rule, 1,625 of the CWS in Illinois have (based upon existing regulations) a low enough risk for lead leaching from service lines to have their monitoring reduced to once every three years. Of these systems, 1,307 have reported that they do not have lead service lines within their respective communities. Additionally, 1,514 (87 percent) of the 1,625 systems on reduced monitoring have not had a lead service line exceedance since calendar year 2004 and 1,188 (73 percent) of them have never had an action level exceedance.

Of the 1,740 community water supplies in Illinois, 343 have reported that they have lead service lines. Additionally 259 of Illinois' water systems add a corrosion inhibitor to the treated water.

To determine the effectiveness of controls used to prevent plumbing from leaching lead into drinking water, CWS ask consumers at the highest risk of lead exposure (generally, those with lead service lines or copper lines with lead solder) to volunteer to collect drinking water samples to be analyzed for lead. If test results exceed U.S. EPA lead action levels, CWSs may be required to make treatment changes to minimize lead leaching from plumbing.

Currently, the regulations that require CWSs to sample for lead do not require monitoring of specific facilities (e.g., day cares or schools). Further, lead action level exceedances do not require replacement of lead service lines or other plumbing not owned by the CWS.

Regardless of lead concentrations, volunteer consumer testing locations are advised of their individual lead results and are given educational materials regarding how to reduce the risk posed by lead in their drinking water.

U.S. EPA is expected to develop a "household action level" by the end of Calendar Year 2016. The current U.S. EPA lead action level (15 ppb) is not a health-based standard.

The Illinois DPH conducts a thorough review of sample results at NTNC PWS with special emphasis on schools and daycare centers. The Illinois DPH has revised sample site selection criteria and sampling protocol based on the recent recommendations from U.S. EPA. Illinois DPH has sent these documents to all NTNC PWS for implementation in all future Lead/Copper sample collection. These revisions will ensure that sample site locations represent the highest level of health protection based on the criteria of human consumption and "worst case" risk for lead leaching. Only 4 of 438 NTNC PWS exceeded the lead action level in their most recent round of sampling. In addition, Illinois DPH prepares a summary of each NTNC PWS Lead Sample results in a two page document that is required to be posted at the facility for public notification to water system consumers.

Beyond the regulatory requirements of the Lead and Copper Rule:

- The Illinois EPA has made revisions to sampling instructions and education materials to CWSs based upon information supplied by U.S. EPA, including deletion of any mention of “pre-flushing” lead service lines the night before sample collection and removing faucet aerators; and
- Water supplies have expedited the path from lab analysis of samples to consumers, in that CWSs now notify consumer/volunteer sample collectors of results greater than 15 ppb within 10 days of becoming aware of lab results.
- Water supplies have been asked to conduct other activities (see Attachment 1 to this report from former Illinois EPA Director Lisa Bonnett).
- The Illinois DPH has revised sample site selection criteria and sampling protocol based on the recent recommendations from U.S. EPA and has provided this information to all NTNC PWS.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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BRUCE RAUNER, GOVERNOR

LISA BONNETT, DIRECTOR

April 18, 2016

Dear Water Supply Official:

Following the high-profile situation in Flint, Michigan, the Illinois Environmental Protection Agency has identified several enhancements to public health protection as the federal Lead and Copper Rule is being implemented. Those enhancements include action items to be taken by Community Water Supplies (CWSs).

Current regulations are designed to inform water system consumers of wholesale problems in their water supply. The regulations place emphasis on optimizing the chemical properties of the distributed water to reduce its corrosiveness (such as pH or alkalinity adjustments) and thereby reduce the risk of lead contamination. Further, existing regulations promote the use of corrosion inhibitors that are added to the treated water to promote a coating on consumer plumbing thereby creating a barrier to the leaching of lead and copper from plumbing. While these measures can be effective in a large sense, they may not be effective with respect to individual properties subject to site specific conditions that increase their risk.

The Illinois EPA acknowledges the high level of compliance achieved by Illinois community water supplies ("CWS") on this and other drinking water rules. However, it seems appropriate to identify additional actions to take to further improve public health protection.

As you know, owners and official custodians of public water supplies in Illinois are required to provide continuous operation and maintenance of public water supply facilities so that water shall be assuredly safe in quality, clean, adequate in quantity and of satisfactory mineral characteristics for ordinary domestic consumption. 35 Ill. Adm. Code 601.101.

To ensure continued compliance with this requirement, the Illinois EPA is requiring the following actions be taken by CWSs.

Improved Sampling Instructions and Education Materials

Attached to this letter, you will find revised sampling instructions and educational materials related to Lead and Copper Rule monitoring. Please note changes in instructions related to flushing practices and advice to reduce lead exposure.

CWS ACTION: Implement use of the updated instructions and educational materials.

Prompt Notification of Lead Action Level Exceedances

Current regulatory requirements for the community water supply are triggered if the 90th percentile of samples is above 15 ug/L, thereby exceeding the lead action level. The Illinois EPA

believes it is important for residents where an individual sample exceeds the lead action level to know as soon as possible of a potential lead hazard.

CWS ACTION: As soon as you receive a lead result above 15 ug/L, ensure the affected resident is informed of their respective lead results and are provided with appropriate consumer education information within 10 working days. Provide a contact person at the local or state health department if there are follow-up questions about reducing lead exposure and/or health effects of lead.

Notify Residents of Water Main or Lead Service Line Repair/Replacement

A recent study by U.S. EPA found that construction activity to repair or replace water mains may loosen lead-containing particulate that ends up in water consumed by nearby residents. Similarly, the study found that disturbed lead service lines had the highest lead levels, and there is reason to believe that lead levels can be elevated for days to weeks following repair or replacement of a lead service line, particularly PARTIAL replacement.

CWS ACTION: Notify residents in the block where water main repair/replacement is planned that the work may result in sediment, possibly containing lead, getting into their water. Residents should flush their lines during and after the completion of work, and should also remove/clean faucet aerator screens. Notify residents where water meter or partial lead service line replacement occurs of the steps they can take to reduce lead exposure following replacement. The length of time that lead levels may be elevated is variable (weeks, months, possibly years) so full replacement of lead service lines and lead-containing plumbing should also be recommended.

Sample Sites and Monitoring Frequency

Another area that merits attention under the existing regulatory framework is the characterization of the risk of lead (and copper) leaching in your water system. As you are aware, your water system has selected sample sites for routine data collection under a tiered system with defined monitoring periods. The frequency of these monitoring cycles is dependent upon the initial and subsequent monitoring results. To ensure the most accurate and up to date assessment possible, the Illinois EPA will revisit the monitoring frequencies allowed under the current regulatory framework and may increase frequencies under our other statutory authority. Illinois EPA will also audit existing monitoring locations to verify compliance with proper monitoring protocols.

CWS ACTION: Reevaluate your monitoring site plans and certify that the locations truly represent the “worst case” risk for lead leaching. Review the status of plumbing connections to your distribution system with respect to the categories under the federal Lead and Copper Rule.

Operational Reviews and Follow-Up

The Illinois EPA believes that operational concerns must be further evaluated in water systems to maximize corrosion control benefits. As such, we envision, as part of routine engineering evaluations/sanitary surveys of water systems, field engineers will begin evaluating the stability of finished water through the review of daily operational reports that demonstrate the water

quality parameter ranges are being met on a daily basis. The operation of your water supply is as important as design when it comes to maintaining water quality. Field engineers will verify that water systems are following up on all individual user results showing lead levels above 15 ug/L.

CWS ACTION: Follow-up on all individual user lead level results above 15 ug/L and encourage either lead service line replacement or replacement of premise plumbing that contains lead, especially if high lead results occur repeatedly at the same address. Initiation or improvement of corrosion control treatment at the water treatment plant may need to be considered.

Consumer Complaints

The Illinois EPA and community water supplies in Illinois have always taken consumer complaints seriously. The adverse drinking water situation that occurred in Flint, Michigan reaffirmed the need to be responsive and proactive to these types of concerns.

CWS ACTION: Follow-up on all consumer complaints in as timely a manner as possible. As necessary, consult with your Regional Office of the Illinois EPA for technical assistance and follow-up recommendations.

Transparency and Materials Inventory for the LCR

Illinois EPA uses the public facing Safe Drinking Water Information System (SDWIS), known as Drinking Water Watch, to make sample results available to the public and water system personnel, along with information regarding violations, enforcement actions, inventory and contacts. To further expand transparency related to the LCR, the Agency believes it will be beneficial to provide the public with the materials inventory your system was required to complete under the LCR. Illinois EPA is evaluating how best to proceed with posting statewide information through the use of geographical information systems.

CWS ACTION: Post, on your public website, the materials inventory your system was required to complete under the LCR, including the locations of lead service lines, together with any more updated inventory or map of pipe materials connected to the distribution system. If your community or water system does not have a public website, please provide the updated information to Illinois EPA such that it can be posted on the Illinois EPA website in the future.

Additional State-Level Program Changes

Illinois EPA has identified some future initiatives that will be implemented to address a number of the problems highlighted in Flint.

- A new form is being developed for submission with any Application for Construction Permit involving a change in source or treatment. This form will document that water stability has been evaluated prior to a change in source water or treatment.
- The Illinois EPA will require three (3) 6-month rounds of initial lead and copper monitoring following an operating permit.

- The Illinois EPA's Bureau of Water Division of Public Water Supply's Permit Section will begin including a special condition on all water main replacement permits that requires a notice to each service connection regarding flushing of premise plumbing to reduce lead consumption risks. The notice must also state that properties with lead service lines may experience an increase in lead concentration that could last several months and that full lead service line replacement is recommended. This condition is an enhancement to the current flushing notices that water supplies provide and is seen as an opportunity to educate consumers on the lead risks in their plumbing.

Illinois EPA will maintain contact with community water supplies on the matter of reducing the risk of lead exposure from drinking water. It is very important that we communicate as soon as possible to enlist your support in our shared mission of protecting public health. If you have particular questions about the information provided here, please contact Dave McMillan, David Cook or your appropriate Regional Office inspector.

Sincerely,

A handwritten signature in cursive script that reads "Lisa Bonnett".

Lisa Bonnett
Director

Consumer Notice of Tap Water Results for Lead

Sample Location: _____

Date Collected: _____

Dear _____,

We would like to thank you for your participation in the lead tap monitoring program. Below is the lead result for the sample location listed above. Additional general information concerning lead in drinking water follows. For more information on reducing lead exposure around your home and the health effects of lead, visit USEPA's Web site at www.epa.gov/lead, the CDC Web site at www.cdc.gov/nceh/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider or local health department.

If you need more information concerning this result, please call the _____ community water supply at _____ and ask for _____.

ONLY the statement that is checked below is applicable to your sample location.

Lead was NOT DETECTED at this sample location.

Lead was detected at _____ parts per billion (ppb). This result is **BELOW** the lead action level of 15 parts per billion.

Lead was detected at _____ parts per billion (ppb). This result is **ABOVE** the lead action level of 15 parts per billion.

The 90 percentile value for our community water supply was _____ parts per billion (ppb).

What Does This Mean?

Under the authority of the Safe Drinking Water Act, USEPA set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (90th percentile value). *The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.* If water from the tap does exceed this limit, then the utility must take certain steps to correct the problem. Because lead may pose serious health risks, the EPA set a Maximum Contaminant Level Goal (MCLG) of zero for lead. *The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.*

If detected, your lead level may be due to conditions unique to your home, such as the presence of lead solder or brass faucets, fittings and valves that may contain lead. Our system works to keep the corrosivity of our water as low as possible (corrosive water can cause lead to leach from plumbing materials that contain lead) and there are actions you can take to reduce exposure. We **strongly urge** you to take the steps below to reduce your exposure to lead in drinking water. If the current, or a future, lead 90 percentile for the community water supply exceed the lead action level, you can rest assured that we are taking a number of steps to correct the problem. Such steps will or would include; monitor our source water, initiate controls to reduce the corrosivity of our water (corrosive water can cause lead to leach from plumbing materials that contain lead) and initiate lead service line replacement if needed.

What Are The Health Effects of Lead?

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood

cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants (particularly if they drink formula prepared with water containing elevated levels of lead), young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

What Are The Sources of Lead?

The primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated residential soil. Exposure to lead is a significant health concern, especially for young children and infants whose growing bodies tend to absorb more lead than the average adult. **Infants that drink formula prepared with lead-contaminated water are at a greater risk because of the large volume of water they drink relative to their body size.** Lead is rarely found in source water, but enters tap water through corrosion of plumbing materials. Homes built before 1986 are more likely to have lead pipes, fixtures and solder.

What Can I Do To Reduce Exposure to Lead in Drinking Water?

If the level of lead found in your drinking water is above 15 ppb or if you are concerned about the lead levels at your location, there are several things you can do:

- ***Run your water to flush out lead.*** If water hasn't been used for several hours, run water from your kitchen tap or whatever tap you use for drinking and cooking for **at least 3 minutes** and it becomes cold or reaches a steady temperature before using it for drinking or cooking. This will help flush lead-containing water from the pipes. In order to conserve water, you can fill multiple containers after flushing for drinking, cooking, and preparing baby formula.
- ***Bottled drinking water should be used by pregnant women, breast-feeding women, young children, and formula-fed infants at homes where lead has been detected at levels greater than 15 ppb.***
- ***Use cold water for drinking, cooking, and preparing baby formula. Do not*** cook with or drink water from the hot water tap; lead dissolves more easily into hot water. ***Do not*** use water from the hot water tap to make baby formula.
- ***Do not boil water to remove lead.*** Boiling water will not reduce lead.
- ***Look for alternative sources or treatment of water.***
- ***Test your water for lead.*** Call us at the number below to find out how to get your water tested for lead.
- ***Identify if your plumbing fixtures contain lead.*** New brass faucets, fittings, and valves, including those advertised as "lead-free," may contribute lead to drinking water. As of June 19, 1986, new or replaced water serviced lines and new household plumbing materials could not contain more than 8% lead. Lead content was further reduced on January 4, 2014, when plumbing materials must now be certified as "lead-free" to be used (weighted average of wetted surface cannot be more than 0.25% lead). Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Lead/Copper Sample Collection Instructions (revised Feb2016)

When collecting lead and copper tap samples, you must follow the procedures listed below:

- Always collect a 1-liter sample in one container only (e.g., do not split the sample between two containers).
- Always collect a first-draw sample from a tap where the water has stood in the pipes for at least six hours (e.g., no flushing, showering, etc). However, make sure it is a tap that is used regularly, and not an abandoned or infrequently used tap.
- **No** pre-flushing is allowed prior to sample collection.
- Wide-mouth 1 liter bottles should be used in order for the samples to be collected by opening the cold water faucet gently but fully so that filling of the sample bottle is similar to how a resident would fill a cooking pot or drinking glass.
- **DO NOT** remove or clean aerator prior to collecting sample.
- If your water system is a NTNCWS or CWS (such as a prison or hospital) that does not have enough inside taps where the water stands unused for at least six hours, you are allowed to use interior taps from which water is typically drawn for consumption and which are the most likely to have remained unused for the longest period of time.
- First-draw samples collected at single-family residences should always be drawn from the cold-water kitchen tap or bathroom tap.
- First-draw samples collected from buildings other than single-family homes should always be drawn from an interior tap from which water is typically taken for consumption.
- You may allow residents to collect sample, but you must supply the residents with instructions as to the sample collection procedures. Be sure to properly label sample bottles prior to distributing them to residents.
- As a general rule, you should collect your lead and copper tap water samples early in the monitoring period in case you exceed the lead or copper action level. This is because you will be required to also collect WQP samples. In addition, you will need to submit your monitoring results within 10 days after the end of the monitoring period (e.g., by October 10 for systems that monitoring during June - September).
- After the sample is drawn, acidification of the sample should be completed by the laboratory personnel upon receipt of the sample, but in no case later than 14 days after sample collection. Neither the homeowner nor the sample collector should handle the nitric acid used for sample acidification.

If you cannot gain access to an original sampling site during any subsequent sample collections, the CWS should select an alternate site that has been previously approved. In this event, you will need to contact the Illinois EPA Lead /Copper Coordinator at 217-785-0561 to get the switch recorded in State records.

Suggested Directions for Homeowner Tap Sample Collection Procedures

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your State, and is being accomplished through the cooperation of homeowners and residents.

Please read the following directions prior to collection of the sample.

1. Prior arrangements will be made with the customer to coordinate the sample collection event. Dates will be set for sample kit delivery and pick-up by water department staff.
2. There must be a minimum of 6 hours during which there is no water used from the tap the sample is taken from and any taps adjacent or close to that tap. The water department recommends that either early mornings or evenings upon returning home are the best sampling times to collect the sample.
3. A kitchen or bathroom cold-water faucet is to be used for sampling. Be sure to use a faucet that has been in recent general use by your household. If you have a water softener on your kitchen tap, collect your sample from the bathroom tap that is not attached to a water softener, if possible. **Do not remove or clean the aerator prior to sampling.** Place the opened sample bottle below the faucet and gently open the cold water tap. Fill the sample bottle to the line marked "1000-mL" and turn off the water.

DO NOT FLUSH ANY WATER FROM YOUR FAUCET PRIOR TO FILLING THE BOTTLE

4. Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.
5. ***IF ANY PLUMBING REPAIRS OR REPLACEMENT HAS BEEN DONE IN THE HOME SINCE THE PREVIOUS SAMPLING EVENT, NOTE THIS INFORMATION ON THE LABEL AS PROVIDED. ALSO IF YOUR SAMPLE WAS COLLECTED FROM A TAP WITH A WATER SOFTENER, NOTE THIS AS WELL.***
6. Place the sample kit outside of the residence in the location of the kit's delivery so that department staff may pick up the sample kit.
7. Results from this monitoring effort will be provided to participating customers when reports are generated for the State. However, if lead levels greater than 15 ppb and/or copper levels of concern are found, immediate notification will be provided.

Call _____ at _____ if you have any questions regarding these instructions.

TO BE COMPLETED BY RESIDENT		
Water was last used:	Time _____	Date _____
Sample was collected:	Time _____	Date _____