

CITY OF FOND DU LAC - Memorandum

Water Utility

Date: February 3, 2016

To: City Council
Joe Moore, City Manager
Jordan Skiff, Director of Public Works

From: Kathryn Scharf, Water Operations Manager

Re: Drinking Water and Lead Water Piping

The water contamination problem in Flint, Michigan has brought the topic of lead pipe corrosion and its potential health risks to the public's attention. As leaders of this community, I thought you would like to be familiar with a little background on the issue as well as Fond du Lac's past corrosion control efforts and actions to assure delivery of a safe product to our customers.

You have probably read enough to know that the main source of lead in drinking water is old lead piping and lead-combining solders. Roughly 10 million American homes and buildings receive water from service lines that are at least partially made of lead according to the Environmental Protection Agency. Service lines are the pipes connecting water mains to individual houses. Lead lines are found predominantly in the Midwest and Northeast and despite the life-altering potential consequences of lead poisoning, there is no national plan to replace them. A top reason for continuing to use lead service lines instead of immediately digging them up is that utilities can treat water so it forms a coating on the interior of the pipes -- a corrosion barrier that helps prevent lead particles from dislodging and traveling to your faucet. Removing old piping is costly to both the municipal utility and property owners alike.

Water chemistry is also a huge part of corrosion. The amount of lead that may dissolve in water depends on acidity (pH), temperature, water hardness and standing time of the water in pipes. Homeowners with lead service lines are encouraged to flush the pipe after long periods of inactivity prior to consuming.

There are plenty of articles and information available on-line if you want more details on the history of lead piping products and the subsequent federal Lead and Copper Rule regulating municipal water suppliers, but specific to Fond du Lac, our history of managing corrosion started more than forty years ago. The Fond du Lac Water Utility began adding polyphosphates to the water in 1972 as both a means to sequester iron and as a corrosion inhibitor. Due to high iron content in our well water, treating with polyphosphates prevented red iron build-up on plumbing fixtures. It also successfully reduced the soluble lead and copper in the potable water supply.

With approval from the Wisconsin Department of Natural Resources (DNR), the Utility discontinued using a corrosion inhibitor in 2012 as we converted our water treatment facilities to a hydrous manganese oxide (HMO) process for radium removal. The HMO method does a great job of not only removing radium and a high percentage of iron and manganese, but also reduces arsenic levels. As Fond du Lac initially started using polyphosphates to sequester iron, the DNR granted the permission to discontinue their use. Discussions of new regulations on phosphates in wastewater discharge also played a role. Water utilities were adding it at low cost, and future regulations may require wastewater utilities remove phosphates at a very high cost.

That aside, a stipulation of the DNR approval states that results of future lead and copper sampling may require some form of corrosion treatment to start again. Fond du Lac is currently on a 3-year cycle for sampling, and next will be required in 2017. In light of the problems in Flint we can certainly conduct investigative sampling this year if desired.

The biggest impact on corrosion of piping is the chemistry of the water itself. Fond du Lac has hard water, which naturally provides some scale formations on pipes. The water pH also contributes to the tendency of lead or copper pipes and fittings to corrode. A low pH means the water is acidic and more prone to corrosion. A high pH indicates alkaline water, which may form a chemical scale that might actually protect against corrosion. The pH in Fond du Lac is fairly neutral, so it's neither scale forming nor corrosive – it's nonaggressive.

The Utility maintains records of pipe materials on facilities within the public right-of-way. We currently have 2,986 lead service lines in use from the water main to the shut-off box in the terrace. Another 463 inactive lead services exist. The total number was 4,190 back in 2005, so we have made headway with our annual water main replacement program. Unfortunately, we do not have record of materials on private property.

Here are some steps that citizens can take to confirm or respond to concerns about lead in their home's water supply:

1. Check by looking at pipe material where it first enters the building – typically a basement wall or floor facing the street. Material of pipe where it immediately enters the home usually indicates the same material continues to terrace shut-off box.
2. Confirm the age and material of the water service in the right of way by contacting the City.
3. Have your water tested for lead and other metals.
4. Purchase a filter for your water.
5. Have children (especially under age six) and pregnant women tested for lead poisoning.
6. Use cold water for cooking or drinking (hot water tends to corrode pipes more).
7. Run water for two to three minutes first thing in the morning. This tends to flush out metals that may have settled.
8. Draw and refrigerate a large jug of water in the evening for use first thing in the morning.
9. Inspect and clean out your faucet aerator, where flecks of metal may be caught.

On the community-wide level, here are some steps that we can take (ranked from most cost-effective to least):

1. Continue to thoroughly flush water mains and services after any repair work that may have dislodged lead or other metals.
2. Increase the frequency and/or scope of our sampling program.
3. Restart a corrosion control program, adding polyphosphates to our water supply. Understand that this would require more expense to eliminate this phosphorus in our wastewater treatment plant.
4. Increase our program to replace known lead-service lines within the right of way.
5. Replace suspected lead service lines all the way to the home, perhaps through a cost-share program. The public would need to understand that a fair portion of most lead service lines are on their private property or within their homes.

In summary, poor decisions led to the problems in Flint, Michigan. More care should have been taken when changing water sources and discontinuing a corrosion control program. Be assured that operators and staff of the Fond du Lac Water Utility have always followed DNR regulations, listened to concerns of customers and will continue to monitor our system. Providing clean safe water is our top priority.