

## City of Mosinee Water Quality

A recent story broadcast on a local television network has cast a negative light on the Mosinee Water Utility and questions the quality of the water being provided to the utility customers – in particular copper in the drinking water. Please rest assured that the water being produced and distributed to our customers is completely safe. Utility operators perform numerous tests each day to insure that the highest quality water is being produced.

Water in the Wisconsin River Valley area in general contains high levels of iron, manganese and organic carbons. It is the nature of the water in this area and all water utilities up and down the Wisconsin River Valley are faced with similar struggles of trying to clean the water and provide high quality drinking water to their residents. Removal of iron, manganese and organic carbons requires sophisticated water treatment. Variations in the groundwater biology make treatment all the more difficult. There is not a single treatment process that will work exactly the same for any utility. The treatment system that we are currently operating does an excellent job of removing iron, manganese and organic carbons.

For many years customers were provided with drinking water that had little or no iron or manganese removal. Ph was adjusted to try and reduce the corrosivity of the water and chlorine was added for disinfection purposes. Many customers will recall the off color water that was common during this time. In 1995 a water treatment facility was built, based on the best available technology at the time and although the water quality was improved, iron and manganese still were not completely removed and continued to accumulate inside the water distribution system piping and occasionally sloughed off creating dirty water complaints.

In 2015 the west side water treatment facility was completely reconstructed and the treatment processes modified to improve overall water quality. The newly designed water treatment plant was the result of an intensive study and evaluation of the groundwater water in the aquifer from where the well water is being drawn. The water study and design of the treatment system was completed by Water Quality Investigations, Dr. Andrew Jacque from Madison. The treatment plant was designed specifically to remove iron, manganese and organic carbons from this groundwater and to treat the water to reduce its corrosive nature. The plant has been functioning very well producing water that normally contains no iron, minimal amounts of manganese (below DNR aesthetic standards) and removes organic carbon compounds which contribute to odor and taste concerns and could potentially form disinfection by products in the distribution system. Ph and alkalinity are adjusted to reduce the corrosive nature of the water.

Please rest assured that the water being produced at the water treatment facility and being pumped out of the City's east side wells does NOT contain copper or lead. Lead and copper levels may increase if corrosive water comes in contact with lead or copper plumbing and/or brass or copper-containing fixtures in premise plumbing systems. This normally occurs if corrosive water remains motionless in the plumbing system for six hours or more. Lead and copper in drinking water increases with the corrosivity of the water and the length of time it remains in contact with the plumbing. Recent media attention has focused on copper levels found in a number of homes during compliance monitoring. The Mosinee Water Utility is required by DNR and EPA to collect 40 water samples from homes, twice per year, and have those samples analyzed for lead and copper content. Prior to collection of these water samples we are required to let the water stagnate or sit in the service line and house plumbing for at least 6 hours. The first draw of water out of the faucet is what is collected and analyzed. So the water sample is being collected under a worst case scenario. During the round of testing that was completed in March 2017 we had 5 samples of the 40 collected that contained copper above the EPA action level of 1300 parts per billion. One bit of information the news media failed to report is that we missed EPA compliance by only one sample. That one sample contained 1400 parts per billion of copper. Copper in our diet is necessary

for good health. You eat and drink about 1000 micrograms (1000 ug) of copper per day. Drinking water normally contributes approximately 150 ug/day. On the average, drinking water accounts for less than 5% of our daily copper intake. As mentioned previously, the U.S. Environmental Protection Agency (U.S. EPA) has determined that copper levels in drinking water should not exceed 1300 ug/l. No adverse health effects would be expected if this level is not exceeded. We continue to fine tune our treatment schemes to make sure our water is as non-corrosive as possible.

Cleaning up the source water is the first step. But a second component which also needs to be addressed is the water distribution system. From many years of pumping water through the pipes that contained iron, manganese and microbiology, the insides of the water distribution system piping are coated with layers of undesirable materials. The inside of the water distribution piping is coated with iron, manganese and microbiology that thrives in this type of environment. At times this material will slough off the pipe creating discolored water. This material can also combine with lead and copper from service lines and premise plumbing, sometimes creating a pipe coating that prevents corrosion, but at other times can slough off and contain the higher amounts of lead and copper – which can show up in compliance testing. The Mosinee Water Utility has also contracted with Process Research Solutions, Ms. Abigail Cantor, PE from Madison, to evaluate our water distribution system and recommend a process for cleaning it. The primary method of cleaning the water system is a process referred to as Unidirectional Flushing or UDF. The UDF program utilizes computer generated models and system mapping to determine a sequence for flushing/cleaning individual sections of water main in a systematic method. Advantages of UDF over normal flushing: it minimizes the water needed to flush the system and removes more sediment and pipe scale buildup. The UDF process requires that we close valves to isolate short sections of pipe. The program is designed to flush dirty pipes with water from pipes that have just been flushed clean. The sections of main being flushed are fairly small and water flow in the pipes is in one direction. When a flushing hydrant is opened, water comes from recently flushed (clean) mains through un-flushed (dirty) mains and out the hydrant. This process decreases the possibility of dirty water complaints, but can affect water pressure while hydrants are flowing. UDF does not scour the pipe clean down to bare pipe in one flushing event. It removes buildup from the water mains in layers. With the clean water being produced at the water plant and pumped into the system the microbiology in the water systems dies off and is flushed out in layers. A layer dies off because the clean water from the WTP does not contain nutrients for biological growth. This layer is then flushed out exposing another layer of biology, which then dies off due to lack of nutrients and so on. Therefore, it is difficult to estimate how long it will take to get the system absolutely clean. We will continue to flush using the UDF method, annually, as long as it takes to get the system cleaned up. The cleaner the water system is, the less the chances of having a lead or copper non-compliance event. We continue to work with both Ms. Cantor and Dr. Jacque for assistance in optimizing our water treatment and monitoring the effects of those treatment “tweaks” in the water distribution system.

The water treatment plant treats the water from the three west side wells. We also have three east side wells. The iron and manganese concentrations in the east wells are low enough that filtration treatment is not yet necessary. Well #2 contains higher amounts of manganese so we are treating this water with a product that sequesters the manganese so it does not create problems in the distribution system. The Utility has also spent approximately \$100,000 on rehabilitation of two of these wells, based on recommendations from Dr. Jacque, to insure a higher quality of water.

Another component of the water distribution system are the water service lines that bring water to each home and business in the City. Many homes in older parts of the City are served with lead water service lines. Copper pipe serves the majority of homes and businesses in the City. The City of Mosinee has been replacing the

portion of lead water lines located in the street right of way, but we do not replace the section located on private property. The potential health risks associated with the ingestion or inhalation of lead are well documented. Lead exposure can come from paint, dust, soil, air, food and water. The USEPA is working to reduce the risk of lead exposure in all of these areas. To reduce the risk of lead exposure from drinking water the USEPA is recommending the removal of all lead water lines that serve homes, daycares and schools. To accomplish this grant funds are being made available to assist homeowners in paying for the removal and replacement of privately owned lead water service lines.

The City of Mosinee has applied for and will be receiving a \$300,000 grant to be used to fund a portion of the costs related to the replacement of privately owned portions of lead water service lines. This funding is being made available from the USEPA through the Safe Drinking Water Loan Program administered by the Wisconsin Dept. of Natural Resources. The DNR has oversight over the municipal programs for lead line replacement. We are **strongly** urging homeowners and daycares with lead water service lines to consider having them replaced using the funding available through this program. The City of Mosinee has a program in place for homeowners to apply for funding for the lead line replacement. This program will fund the actual replacement cost up to a maximum of \$1500 per service line.

In summary, although The City of Mosinee has received some negative press related to water quality the reality is that the water quality is very good. We realize that the water distribution system still needs some work to get it cleaned up, but we continue to work on that. Another round of water samples will be collected later this year and analyzed for lead and copper content. We anticipate that with minor changes to the water treatment processes and continued flushing of the distribution system that we will be in compliance with both lead and copper by the end of this year. Please rest assured that the water being supplied to you does not contain lead or copper. Lead and/or copper are picked up from each water service line or house plumbing. *The easiest and most effective method for reducing exposure to lead or copper is to avoid drinking or cooking with water that has been in contact with your house plumbing for more than six hours. When first drawing water in the morning or after a work day, flush the system by running the cold water faucet for 2-3 minutes, or until the water gets as cold as possible. (If you live in an apartment complex, flushing the system may take longer). Water used for showering or washing also helps flush the system. It is still a good idea to flush each faucet where water is drawn for drinking or cooking purposes since some fixtures contain brass or copper.*

If you have questions or would like any additional information please feel free to call me at 715-693-3840 or email to: [publicworks@mosinee.wi.us](mailto:publicworks@mosinee.wi.us).

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