

The Lake Iroquois Water Committee met on Monday, September 19 and Friday, September 30 to discuss the water issues that have been occurring at LIA. Members on the committee are Darrell Aders, Steve Garbaciak, Mike Johnson, Perry Draper, Dennis Watson, and Don Cleary.

Two committee members went out on September 20 and 21 with ERH to monitor the flushing of the hydrants. It was decided to pull samples prior to and after the flushing occurred for testing. Their presence will give the committee a better idea of how they are doing the flushing, its effectiveness, and whether changes are needed. During this time, the committee learned there were a number of cul-de-sacs that do not have a hydrant at the end of their dead-end lines and are unable to be flushed.

The committee discussed the water softeners as the daily test results for the treated water indicate the water was hard during the months of May, June, and July. Residential complaints and members who had their water tested also indicate the water was hard over the past several months. In conversations with ERH about this issue, they determined that the regulating valve for the main well was broken and the water capacity coming through the water plant was exceeding the flow rate of the water softeners. ERH worked to slow down the flow rate and instead of blending the water, will now be softening all of the water that comes through the plant. The slower flow rate means the water treatment plant systems will operate for a longer period of time each day but will still be able to make the same amount of water daily. LIA and ERH will work on trying to install a control module to better regulate the amount of water coming from the pump on well number 1 and to allow wells number 2 and 3 to operate simultaneously with the proper amount of water flow.

The water committee believes that all of the water mains at LIA are plastic but will continue to do some testing in an effort to confirm this. To date, all water main repairs that have been made have been on plastic mains, which should indicate that anything beyond those in the distribution system would also be plastic. The committee has access to a low voltage utility locator which the water committee can utilize to attach to hydrants and possibly water valves to determine if the water mains going both directions from the hydrants are iron or plastic. Iron pipes will carry a current while plastic pipes will not. ERH did this in the southwest area of the subdivision and could not locate any iron pipes. If there are any locations where the test results are undetermined or indicate the presence of iron pipe, the committee has access to a water vacuum excavator on a trailer that could be used to dig down to the water main without risking any damage to the main.

ERH asked Hawkins Inc, their chemical supplier, to run water tests on water samples from LIA. On September 9, samples were collected from the raw water, multiple points within the water treatment plant, and the treated finished water. Additionally, 12 samples were collected that day from nine different residences at LIA. In addition to the standard water testing, Hawkins did extensive testing on the water samples to include metals, non-metals, saturation levels for different substances, free ion momentary excess, bound ions, chemical properties, as well as sample indices. The results indicated that there was a higher-than-normal presence of manganese and iron in the samples taken from the homes than what was present in the finished water leaving the water plant. Hawkins determination was that this presence of iron and manganese, as well as increased hardness in the water distribution system, seems to indicate that old deposits in the water mains are being stripped off and re-introduced into the water prior to entering the houses. These issues could lead to discoloration of the water. They

also detected ammonia in the water softener process which could increase nitrification. The nitrification could affect the chlorine residual issues and would also contribute to discoloration.

Hawkins advised that hot water heaters could pull the iron and manganese out of solution in the water and react with bleach to cause coloring of the water and clothing. They recommend that all homeowners flush their hot water heaters on an annual basis to help alleviate the settling of these materials in the tank. Hawkins also stated that since adequate water softening occurs at the water treatment plant, water softeners inside the homes should not be used, because they will strip out the calcium hardness which provides natural protection against corrosion. The result can increase the corrosion of pipes in a home which weakens the pipes and could contribute to discoloration.

The committee believes LIA should also conduct their own independent water testing in order to confirm the results which have been received from other testing facilities and ensure there are no other substances in the water which could create any health or water quality issues. The committee found many testing kits available on-line which were all similarly priced and included the actual water testing and analysis. The committee suggested that LIA purchase the Tap Score water tests recommended by SimpleLab. Semi-annual testing should be completed utilizing the Advanced Test kit which tests for 109 substances to include byproducts, fertilizer, heavy metals, non-metal inorganics, oils, VOCs, and standard properties and parameters in the following four locations.

1. Water Plant
2. Chippewa
3. Pool/park area
4. Comanche

Additionally, six essential test kits that test for 47 substances, standard properties, and parameters should be kept on hand to perform water testing when needed due to issues or complaints.

Upon recommendations from Illinois EPA and from Hawkins Inc., the committee believes that a scouring flush needs to be performed in order to remove as much of the sediment from the water mains as possible. This cannot be adequately accomplished if there is no way to flush the dead-end lines on the cul-de-sacs and areas where development was unfinished. New two-inch one-way fire hydrants should be purchased and installed where the current one and one-half inch flushing hydrants are located at the end of Wyandotte, Chippewa, South Mohican, Miami, and Ponca Point. The existing flush hydrant are inadequate and three of them are non-operational. This can be done by LIA personnel since there are existing shutoff valves at each location. Additionally, new two-inch one-way hydrant should be installed at the ends of North Mohican, Pima, Yuma, Crow, Sioux, and County Road 300 North where there are currently not any hydrants or flushing mechanisms. Two larger two-way fire hydrants should be installed at the end of Arapho and Dakota as this is likely a four-inch and six-inch water main which dead-ends. LIA would also benefit from a two-way hydrant on Wyandotte to allow flushing of water in a loop where inadequate flushing capability exists. This will incur a substantial cost, and an inconvenience to LIA members but is necessary. The water committee believes that if the residue and deposits can be removed from the water mains, then the high-quality water being produced at the water plant can be delivered to the LIA homes. A scouring flush would take place over a week time period and requires certain parts of the water mains to be turned off in order to focus the water velocity in each section of pipe and remove sediment that normal flushing otherwise would not remove. This could result in some temporary boil orders during this process. The committee would recommend that all homes change their water filters and flush their hot water heaters after this is completed.

In further conversations that ERH had with one of their contractors, Gasvoda and Associates, they are recommending the chlorine injector be upgraded. The current system works through the use of a pump to pull chlorine into the water line through a venturi process as it passes through the injectors. ERH would like to install a booster pump that will do a better job of spreading the chlorine through the water. Installation of such a pump for the chlorine should make it easier to control the levels of chlorine and chlorine residual in the water distribution system. This should result in less variance in the chlorine level while still being able to maintain the minimum chlorine level required by Illinois EPA at the farthest point of distribution.

The committee worked with the results of the water quality survey that was put out to LIA members for their feedback. We are able to produce charts, analytics, and maps of the different types of incidents that have occurred and their frequency. This provides the committee the opportunity to compare those results with the water main dead ends and also with the change of elevation in the water lines which operate under pressure. The committee would like to know if there is any correlation between water lines that are deeper and create low spots and an increase in the build-up or settling of sediment at these locations. The results of these maps and results are being shared with ERH for their referral.

In order to complete the high velocity flush of the LIA water distribution system, LIA and ERH will have to locate all of the shut-off valves throughout the water mains as some of them have become buried over time. Once the water mains are scoured with high velocity water, a normal maintenance and good flushing program needs to be maintained to prevent the future build-up of sediment and debris. The sediment and debris build-up may have occurred over a period of multiple years since the LIA infrastructure is more than 50 years old. If the scouring does not remove the debris effectively, the cost of water main replacement is prohibitive, and LIA will have to look at other options such as the use of Orthophosphate to coat the water lines and inhibit the debris from dislodging in the future. Depending upon the outcome of this water main scouring and the ability to deliver quality water to residents, LIA and ERH may consider changing the iron removal process at the water treatment plant away from potassium permanganate to a system which utilizes air.