

## Joy, IL July 2022 Council Report

I would like to thank the Village of Joy for trusting us with your facilities. We hope to prove that your faith in us was well placed.

I'm going to give a brief overview of your facilities and our general assessment.

### **Water System**

Obviously, the village has done a major amount of work to the water system over the last year. A new tower, new treatment system, ground storage tank, etc. I understand that there have been some issues with the engineer and some concerns about the finished product. I will give my take on what we've seen so far and how we can go about making sure your new investment works properly and is maintained properly.

### **Water Tower**

Upgrading the water tower was a very wise move. I've been driving through Joy daily for the last few years and moving from that old style of tank to single-pedestal spheroid with a higher elevation will make things easier to clean and maintain and will provide much better pressure throughout the community. I know there are some concerns that maybe it was built too tall, but it is providing pressure readings in the mid-50s which is excellent pressure for a water system without being too high.

### **Wells**

Currently, Well 1 is the only well in use. Well 2 continues to fail to pass basic bacteria testing. As of today, I know that the last of cast iron fittings have been replaced. After the line is pressurized, we will be taking samples. If the samples do not pass, we have no other choice than to do a chemical treatment of the well and raw water main. It is important for the operation of the water plant that both wells are in service.

Also, at Well 2, we are having an issue with it not running at full capacity. The well should produce around 45-50 gallons per minute. It is only producing 33 gpm. I've spoken with both the electrician and well company about this problem. There are three different scenarios that could be causing this issue. One, the variable frequency drive was sized too small for the well motor. Two, the VFD is malfunctioning. Or three, the motor in the well is malfunctioning. Initial talks with Gary Davis would lead us to think that the VFD is sized appropriately so we are mainly looking at whether something is wrong with the VFD or motor. I plan to have Cahoy Well and Pump and the electrician on site at the same time so we can run a series of tests to determine the cause of the issue.

### **Treatment Plant**

The treatment plant is probably a little more complex than it needed to be. There are a lot of moving parts, and it is so heavily incorporated into a SCADA system that it can be a bit complicated to operate.

When we first started, there were daily alarms related to the softeners regenerating. Generally, it was both a high brine flow and low brine flow alarm. I looked at the meter that monitors this flow and found that it is neither sized appropriately or mounted appropriately. I spoke with a tech at Kurita (the

company who makes the equipment) and they agreed that the meter needs replaced with an ultrasonic meter. I brought Gasvoda into the discussion as this should be changed under warranty and not at the cost of the village.

With Well 2 out of service, we are only operating at half capacity. The plant is designed to run around 100 gallons per minute and we're currently running at 50 gpm. This does make a few things a little harder to assess since we are not operating the plant how it was designed.

The chlorine system was WAY over done. I can't overstate this enough. Giant pumps that are only controlled by four-part SCADA equations. I have no idea who decided this was a good idea but it's one of the worst chlorine injection systems I've ever run across. Fortunately, I should be able to simplify this without a lot of effort. We are simply going to disconnect the pumps from the SCADA system and run them manually. We are also going to install much smaller pump tubes in the pumps. You only pump around 3-4 gallons a day of chlorine. One pump is sized for 45 gallons per day and the other is sized for 85 gallons per day. By changing the tubes in the pumps, we can make the pumps way more efficient.

Adding a large dehumidifier is a must. If we do not add one, anything metal in these rooms are just going to corrode. All the piping and vessels collect large amounts of condensation that drip all over.

This biggest aspect of the new plant is how the city would like to go about softening their water. Your raw water hardness is around 190 mg/L. This isn't particularly hard for a municipal supply. Your plant is designed to take the hardness down to 100 mg/L. There is a lot of flexibility in how we soften. We can soften well below 100 mg/L or we can soften to any point in between. I do think the 100 mg/L range is what the city should be shooting for. Generally, once you get to that level, your glassware looks better, your shower heads don't scale as bad, etc. I know there are concerns with the cost of salt. Once the plant is running at full capacity, we should be able to dial it in much better and get the salt use going much more efficiently.

This is just after a few weeks of operating your plant. The more familiar we get with the system, the more we'll figure out and the better we'll get things dialed in. This is not the first softening plant we have operated so we are familiar with how these plants run and how to make them run correctly.

### **Wastewater System**

There isn't a lot to say about the wastewater system considering that it's a single lift station and a set of lagoons. It does have an excellent monitoring system for flow, pump hours, and levels. It is also great that there is an onsite generator.

We will be collecting and analyzing the samples in house.

Chad McCleary  
Ion Environmental Solutions