

## RECORD OF TELEPHONE CONVERSATION

Date: February 2, 2015 From: Joe Duncan, PE

Time: 10:30 am To: Dave Carr, Village of Willshire

Phone No: 419-495-4080 Project No./Name: 14063 Hinesburg Wells 4 & 5

Re: Village of Willshire, Ohio Water Treatment Plant

### Items Discussed:

- Dave is the Water Superintendent for the Village of Willshire, OH
- Willshire WTP is 160,000 gpd facility that treats groundwater for iron and hardness
- WTP was placed into service in 1998
- First municipal membrane treatment plant in Ohio
- Current average daily flow is 22,000 gpd; with economy they lost some larger users and are experiencing very low system demands
- Utilize greensand filters for iron and manganese removal ahead of the nanofiltration (NF) system for hardness removal; NF system consists of 2 trains
- Raw water hardness is 1,080 mg/l
- Treat hardness to 210 mg/l using membranes and bypass for blending; lose about 1/4 of flow through membranes; discharge concentrate to the WWTF
- Provide pH adjustment to maintain 7-8 SU
- Utilize 2 membrane trains manufactured by Tonka Water using Filmtec membranes
- Add chlorine for greensand filters and then sodium bisulfite to dechlorinate ahead of membranes since membranes degrade with chlorinated water; also dose anti-scalant ahead of membranes to minimize mineral scaling and extended periods of time between membrane cleanings
- Membrane permeate is dosed with chlorine and fluoride prior to discharge into the distribution system, as well as sodium bicarbonate and caustic soda for pH adjustment
- Utilize citric acid for cleaning membranes and it works well; started with a low pH acid and it didn't work well; manufacturer changed them to citric acid (higher pH) and it has been working well
- Replaced membranes for both trains in 2008; original membranes resulted in 1/3 water loss through membrane unit but new membranes have only 1/4 water loss (apparently they improved the membranes over time); considering replacing membranes in the next couple years since the current ones are about 7 years old (replacement is about every 8-10 years)
- WTP requires little maintenance and produces good quality water; overall it's a good system for hardness removal; their issue is the system is now oversized with downturn in system usage