

CITY OF CORNELIA WATER POLLUTION CONTROL PLANT PROCESSES

PRELIMINARY TREATMENT: The City's wastewater comes into the plant from the City's collection system to a flow diversion box. At the flow diversion box, the Plant can divert flow into two different structures. One is a holding pond that holds more than 3 million gallons and the second is a concrete equalization tank that holds approximately 1 million gallons. Flow is only diverted in emergency situations or if maintenance needs to be performed in the plant. After the flow leaves the splitter box it then goes into a parabolic two channel grit chamber. This design ensures that the flow does not change during fluctuations of high- or low-level influent so that the grit settles out at less than 2ft/s. Next the flow goes through a step screen where all the rags and other debris is taken out to prevent pump damage. This is where we have our influent flow proportional refrigerator sampler set up. All plant recycled process water, belt press filtrate and supernatant water enters the Plant influent after the influent is sampled. The Plant has a backup generator that supplies emergency power to the upper end of the plant.

PRIMARY TREATMENT: The flow enters our primary clarifier next where the heavier solids are settled out. The solids are removed by using head pressure to pump the solids into a box where we have two pumps that pump the solids to our digester. All the floatable solids and grease is skimmed off the top and flow into this same box to be pumped to the digester.

SECONDARY TREATMENT: The flow leaves the primary clarifier and flows into our activated sludge basin consisting of 3 basins with 4 cells each. The flow worms through the 12 cells like a snake. The plant has the capability to use them in series or parallel. The plant process can split the flow between all three basins or bring flow into one basin and then split between the other two basins. Higher mixed liquors are preferred in the aeration basin than normal due to treating high strength poultry waste. Approximately 70% of our daily flow comes from poultry waste. The process we use is very similar to a plug flow aeration system. Next the flow leaves the aeration basin and splits into two secondary clarifiers. Return rates are set so that approximately 75% of the solids are returned. Solids are pumped from the bottom of the clarifiers with a wasting pump to the digester. Wasting rates are determined by MLSS, RAS, and MCRT values. The MCRT value is usually set between 30 and 60 days. At the Plant the mixed liquors are 4,000 to 4,500 MLSS in the winter with a RAS of 8,000 to 9,000 and in the summer months a 3,000 to 3,500 MLSS and a RAS of 6,000 to 7,000 is desirable. The Plant averages BOD's leaving the plant around 1.5mg/l or 99.0% removal.

DISINFECTION: The flow travels next through a pipe into a box where it is then pumped to our disk filters. The wastewater is chlorinated as it leaves the pipe before entering the disk filter pumping station. The Plant uses sodium hypochlorite 12.5% for disinfectant. Chlorination takes place before the flow enters the disk filters to help keep algae from building up in the filters and to give a longer detention time for the chlorine to inactivate the organisms. The Plant feeds approximately 25gal/day to 30gal/day of sodium hypochlorite depending on the flow. Typically, the Plant rarely sees fecal above 10/100ml leaving the Plant.

Tertiary Treatment: The flow after being chlorinated goes into the disk filter pumping station where it is pumped to two Aqua Aerobic disk filters. The filters are backwashed according to flow and/or time. The backwash water is sent back to the head of the primary clarifier. On average Plant TSS levels leaving the plant are around 2.0mg/l or 98.5% removal.

DECHLORINATION: After the flow leaves the filters it is then carried through the chlorine contact chamber. After working its way through the chamber, the water is de-chlorinated using sodium bisulfate. The Plant typically feeds 10gals/day to 15gals/day sodium bisulfate for chlorine removal. The Plant typically sees around .01mg/l of chlorine residual and never exceeds .05mg/l of chlorine residual.

POST AERATION: The flow after leaving the chlorine contact chamber is then cascaded down a series of steps helping to add dissolved oxygen back into the water before entering the receiving stream. We typically see dissolved oxygen in the range of 7.5mg/l in the summer and 9.5mg/l in the winter. Typical PH range for the treated effluent water leaving the plant is 7.0 - 8.0 S.U.'s going into the receiving stream.

DIGESTERS: The plant has two aerobic digesters capable of holding about 600,000 gals of solids each. One digester is filled while the other is being decanted for supernatant to prepare to run to the belt press.

BELT PRESS: The Plant has a 2.2-meter Komline Sanders extended drainage deck belt press. The belt press is typically operated 4 days/week. 19%-21% cake solids are achieved on the belt press under normal conditions. The belt press averages processing 150,000 to 200,000 gals of digester sludge per week, with 125 to 150 tons of wet solids hauled to the landfill and 25 to 30 dry tons of solids removed from the plant process.