

PLANT UTILITY EFFICIENCY

For as old as the wastewater treatment plant is, it is an energy efficient marvel. Over 99% of the raw wastewater is pumped by the two Waukesha engines fueled by either digester gas or natural gas. The four anaerobic sludge digesters generate about 30,000 cubic feet of gas per day. One Waukesha engine (pumping 24 hours per day) uses 20-22,000 cubic feet of digester gas per day. The remaining digester gas is used to fuel a boiler (for #4 digester) to heat the sludge, to maintain 95-100 degree F. temperature, to break down the volatile solids in the sludge, and produce more digester gas.

A cooling water system is in place to take the warm water generated from the Waukesha engines and circulate it through heat exchangers (for #1, #2, #3 digesters) which warm the sludge, breaks down the volatile solids, and produces more digester gas. The heat from the engines is able to maintain the preferred 95-100 degree F. digester temperatures 6-7 months of the year. In the colder months a natural gas auxiliary boiler is brought on line to maintain temperature.

Once the raw wastewater is pumped (the first 6 MGD); it proceeds through treatment (grit channel, primary clarifiers, trickling filters, fixed nozzle filter bed, and intermediate clarifiers- Plant 1-Old Plant) by gravity. Electric motors (40 Hp) then pump this first 6 MGD to a second treatment (primary clarifiers, trickling filters, final clarifiers, and discharge-Plant 2-New Plant) by gravity. Any flow greater than 6 MGD proceeds directly to Plant 2.

The circular trickling filter distributor arms in both plants turn by the reaction of the discharge of the wastewater from the distributor arm. (Every action has an opposite and equal reaction.) The fixed nozzle filter bed is operated by the dosing tank. The dosing tank is filled by gravity from the primary clarifiers in Plant 1. A siphon action allows the dosing tank to empty and fill, thus discharging wastewater through the fixed nozzles intermittently.

The trickling filter process is much less costly to operate than an activated sludge process, which requires large electric motors and blowers to force air into tanks of wastewater. A similar sized activated sludge plant would require 4-5 times the electricity to treat the same amount of wastewater. Currently, the wastewater plant's electrical usage is \$6-7,000 dollars per month.