



## WASTEWATER EFFICIENCY – PINE RIVER AREA SANITARY DISTRICT

### Challenge

Staff at the Pine River Area Sanitary District were interested in reducing their operating costs. The plant manager, Andrew Schwartz, was aware that his oxidation ditches and aerobic digestion process used a lot of energy. Andy wanted to quantify that observation and to learn how he could operate more sustainably. He scheduled a MnTAP energy assessment to get these questions answered.

### Approach

MnTAP staff came out to the plant to gather information on blowers, rotors, setpoints, and dimensions. This information was used to identify opportunities to optimize operations to save energy.

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## Results

Energy Savings:

51,000 kWh / yr

Cost Savings:

\$4,100 / yr

Time cycle digester  
blowers to match  
required airflow

Maintain a DO of .5  
behind the oxidation  
ditch rotors

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## Findings

### **Adjust digester blower operation to match recommended airflow (33,000 kWh, \$2,650 per year)**

At the time of the energy assessment, the digester blower was cycling to run for two hours on, and one hour off. This type of cycling is a very good practice for wastewater plants looking to reduce aeration costs. MnTAP was able to determine that the airflow generated by the digester blower averaged to 397 scfm over the full blower cycle. This number was compared to the Ten State Standards airflow for the sludge, which recommended running between 151 and 252 scfm, depending on the sludge depth. MnTAP recommended that the plant reduce their aeration cycle times to better match the Ten State Standards values. Pine River staff made the change gradually over the course of several weeks. After weeks of testing, the plant reached a point where the digester started to develop some minor odors. The plant operators turned the cycle times back up to the last working test point (60 minutes on, 90 minutes off, 238 scfm averaged over the cycle). This testing allowed plant staff to optimize their digester blower cycling, resulting in savings of 33,000 kWh per year, worth \$2,650 annually.



Reid Priedhorsky, English Wikipedia

### **Reduce Dissolved Oxygen Level in Oxidation Ditches (18,000 kWh, \$1,450 per year)**

The staff at Pine River had already been maintaining a dissolved oxygen level of approximately 2 ppm within the oxidation ditches. This is very close to ideal, but there is some small opportunity for further optimization. Typically the dissolved oxygen level should be kept within the .5-2 ppm range to ensure that the microorganisms performing treatment stay healthy. For oxidation ditches, this value can be measured and maintained just behind the rotors that add oxygen to the water. This is the optimal way to maintain a healthy and efficient oxygen range within the ditches. By switching the standard operating point from 2 ppm to .5 ppm, the plant staff are reducing their annual energy usage by 18,000 kWh, worth \$1,450 per year.

### **Getting Started with Energy Efficiency**

Benchmarking your wastewater plant is a great way to get a sense for the magnitude of savings potential for your plant.

<http://mn.b3benchmarking.com/WastewaterTreatmentPlants>

For more information on wastewater treatment efficiency, please give us a call (612) 624-1300 or visit our website:

<http://mntap.umn.edu/POTW/wwtp.html>

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