A Case Study;

Mid-American Dairy
Winthrop, Minnesota

Background

Mid-American Dairy (Mid-Am) is one of the largest Dairy Co-ops in the Midwestern United States. Mid-Am has been in operation for more than 75 years in Winthrop, Minnesota and processes milk and milk products. An oxidation ditch extended air treatment system with a clarifier was built about 18 years ago to treat the wastewater. The aeration was provided by (2) 30HP brush rotor aerators. But by 1985, Mid-Am realized that the treatment system was overloaded and inadequate. Mid-Am upgraded their system with (2) 30HP floating aspirating aerators. However, it was evident that adding aeration alone did not alleviate overloading during peak flow conditions.

Mid-Am normally generates 20 to 60 thousand gallons of process water per day, with the peak flow exceeding 110,000 gpd. The Biochemical Oxygen Demand (BOD) loading ranges from 850 to 4200 mg/l. Total Suspended Solids (TSS) range from 532 to 1900 mg/l and fat loadings range from 76 to 1370 mg/l. Though the oxidation ditch can handle the normal loading rate, it cannot handle the peak loadings.

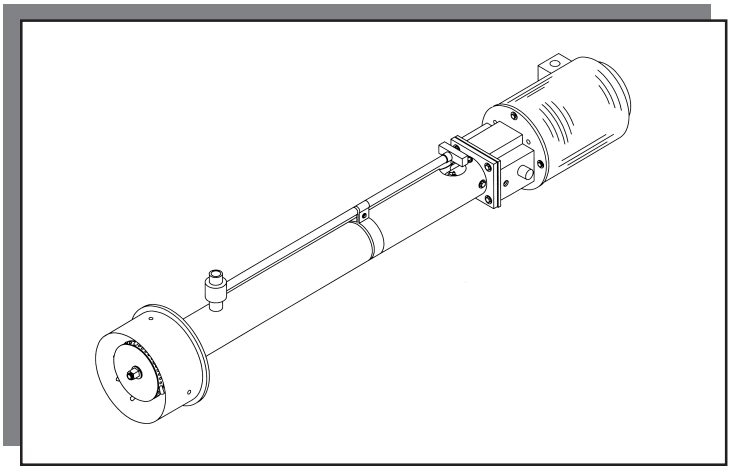
Problem

1. Systems overload
2. Low dissolved oxygen concentration
3. Odor problems
4. Unable to meet the discharge limits

Solution

1. Remove the excess fat and solids from the wastewater before it reached the ditch.
2. Expand the existing oxidation ditch
3. Reduce plant production

Mid-Am contacted AEROMIX Systems from recommendations. AEROMIX suggested installing (1) 2HP ZEPHYR Induced Air Flotation System to remove a portion of the fats and solids from the process water before it reached the ditch. The ZEPHYR was installed in a 10'x6' tank with a 6' water depth and a top skimmer. All process water was now fed to the ditch through this tank.



Results

The ZEPHYR System has been in operation at Mid-Am since August 1992. According to the plant superintendent, "After installing the ZEPHYR, we discontinued the operation of the (2) 30HP surface aerators because of the 2HP Air Flotation System removes more than 20 to 35% of the total BOD loaded to the ditch system.

Benefits

1. Energy and cost savings; With the 2HP ZEPHYR, the company saved 60HP worth of energy.
2. Excellent and consistent removal rate
3. Simple modular design
4. Low maintenance cost
5. Low capital cost
5. High reliability

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