CASE STUDY

QUANTAER® Fine Bubble Aeration System Saves Resources

Victor Valley Saves Over 50% On Operating Costs

The Challenge

Victor Valley Wastewater Reclamation Authority (VVWRA) is an 18 MGD activated sludge plant located 90 minutes north of Los Angeles in California. VVWRA uses plug flow extended aeration with anoxic selectors for alkalinity recovery process for biological treatment of their wastewater. The originally installed aeration system utilizing membrane tube diffusers provided insufficient and inconsistent oxygen transfer required for removing ammonia (nitrification). As a result, VVWRA couldn't meet their monthly average ammonia discharge limits on a consistent basis. The inconsistency in nitrification also lead to inconsistent denitrification within the biological treatment process. Inconsistent denitrification, required operation of the Mixed Liquor Recycle (MLR) pumps at 4.75 times the influent flows to remove nitrogen, resulting in excess of $150,000 annually for chemical costs for the addition of alkalinity.

The Solution

In 2013, VVWRA evaluated an energy savings program at VVWRA for four (4) of their aeration basins (basins 9 – 12) by upgrading the existing tube diffusers to 9" Quantaer membrane disc diffusers provided by Aquarius Technologies, LLC.

Collaborating with Mr. Gilbert Perez, the plant's Director of Operation, Aquarius was able to provide designs, calculations and equipment costs to retrofit the plant to newer and more efficient fine bubble disc diffusers. During the initial design, energy and chemical cost savings for the retrofit were expected to be 30 - 40%. However, shortly after the installation, Mr. Perez and operators noticed the higher efficiency of new disc diffusers, dropped the air requirement 15%, and the MLR pump energy requirement by 45%.

Victor Valley Wastewater Reclamation Authority, California

Quantaer EPDM Membrane Disc Diffusers Operating at Startup

As a result, VVWRA is realizing **over $30,000 in annual energy savings**.

VVWRA's operations included dosing magnesium hydroxide (MgOH) for recovering alkalinity in the wastewater, which is consumed in the nitrification process. Since the denitrification process, which recovers alkalinity was inconsistent, large doses of MgOH were regularly required. After the installation of Quantaer Fine Bubble Aeration System, higher oxygen transfer efficiency of the system provided

complete nitrification. The consistency in nitrates recycled into the anoxic tanks allowed for stable denitrification. As a result, the MLR pumps were turned down to 2.5 times the influent flowrate. The denitrification process now recovers sufficient alkalinity to eliminate the need of MgOH dosing thereby **saving VVWRA over $150,000 in chemical costs**!

After twelve months of operating basins 9 - 12, VVWRA contacted Aquarius with a similar request for an aeration retrofit in the remaining 8 basins (basins 1 - 8) as part of Phase 2. Aquarius teamed up with a consulting engineer and contractor to provide a more efficient system to further reduce the operating costs for the plant.

Operational Benefits

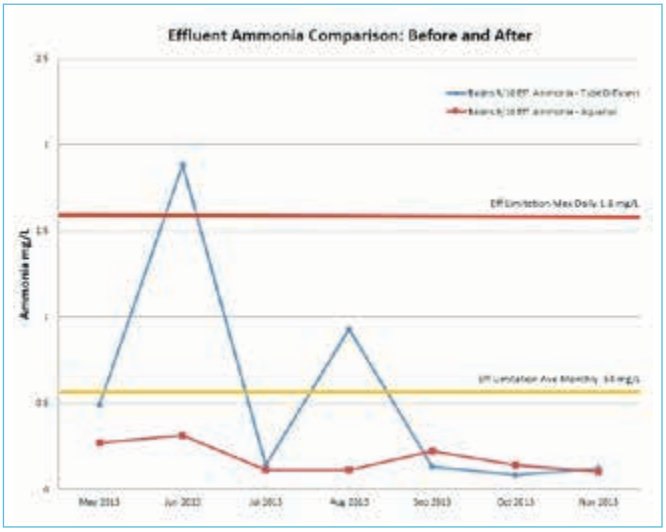
- Improved Oxygen Transfer Efficiency
- Improved Nitrification
- Reduced Mixed Liquor Recycle Rate
- Improved Denitrification
- Stable Operation
- Consistently Meeting Discharge Permits

Economic Benefits

- Alkalinity Recovery Eliminating Magnesium Hydroxide Usage
  Annual Chemical Savings: $151,935
- Reduced Electrical Usage
  Annual Electric Savings: $30,875

The high efficiency aeration system and coordination between Aquarius and VVWRA has resulted in a system demonstrating the lowest cost of ownership. Contact Aquarius to learn how your aeration process can be upgraded with a Quantaer Fine Bubble Aeration System and enjoy similar savings at your wastewater treatment plant.

Source: VVWRA Operating Data



Quantaer Fine Bubble Disc Diffuser System