

Key Words: municipal wastewater, ammonia, phosphorus, BOD, short-circuiting



Photos: SolarBee 4000sv12 installed in pond #2, tethered with flipped panel.

Reservoir or Lake Use: Municipal wastewater treatment system for a city.

System Overview and Reservoir: System consists of a series of ponds located NE of the city. Storage pond #2: surface area is 4.2 acres, maximum depth is 12 feet deep, minimum depth is 2 ft, volume is about 10 million gallons, with an average daily flow = .030 MG/day. There is controlled discharge once per year. There is no grid aeration. Storage pond #1 has a surface area of 1.3 acres, with a volume of 3.5 million gallons.

Reported Problem Before SolarBee Installation: System needs to meet a discharge limit of 1.0 mg/L of total phosphorus. Past years, before chemical applications, phosphorus levels were reported between 2.0 and 4.0 mg/L. Primary function of the SolarBee for pond #2 is to apply chemicals (ferric chloride) to reduce phosphorous concentrations in discharge water.

SolarBee Installation: Date: August 2004: Installed one (1) SB4000v12 SolarBee in storage cell #2, along with a 6 gal/hour chemical injection pump on shore with a hose attached to the SolarBee. Depth of intake hose was set at 5-6 ft. May 2005: installed one (1) SB1250v12 in cell #1; unit tethered diagonally because of available shore power location.

Results: Customer is very pleased with equipment and the easy method of applying ferric chloride for phosphorus reduction. Customer applied 715 gallons to remove 0.9 mg/L (= 75lbs/pond) of phosphorus in 10 million gallons of water before discharging with minimal labor and energy costs. An additional benefit has been the observed reductions in BOD; e.g., 49 mg/L BOD at beginning of application was reduced to an average of 14mg/L BOD when discharged. In May 2005, the city acquired a second SolarBee to enhance ammonia and phosphorus reduction, and eliminate short-circuiting in pond #1. Operator has been very happy with the units in both ponds, and expressed strong appreciation for the attention and professionalism of the SolarBee service crews.

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