

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 nearby 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 = 0.03 MG/day. There is controlled discharge once per year in the fall. 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 phosphorus 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 how the SolarBee makes applying ferric chloride for phosphorus reduction very easy with minimal labor and energy costs. In May 2005, the city acquired a second SolarBee to enhance ammonia and phosphorus reductions, and eliminate short-circuiting in pond #1. Since then, the amount of ferric chloride required has decreased, and in 2008 and 2009 phosphorus concentrations remained below 1 mg/L so ferric chloride was not needed. An additional benefit has been the observed reductions in BOD; e.g., initial BOD of 49 mg/L at the beginning was reduced to an average of 14 mg/L BOD when discharged. Operator has been very happy with the units in both ponds, and how reliably they run even during frigid northern winters. He also expressed strong appreciation for the attention and professionalism of the SolarBee service crews.

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