

ADI-BVF[®] Low-Rate Anaerobic Treatment Proves to be the Best Solution for Difficult Pharmaceutical Wastes

Bristol-Myers Squibb in Syracuse, NY, a major manufacturer of penicillin, was asked by the County to pretreat its raw wastewaters. A schedule for compliance was established and the search for suitable treatment technologies began.

Bristol-Myers Squibb initially studied high-rate upflow anaerobic sludge blanket (UASB) pretreatment, but these pilot studies did not prove successful. Likewise, in 1986, Abbott Laboratories in North Chicago experienced difficulties with the same technology in pretreating the wastewater produced in the manufacture of antibiotics. In both cases, the difficulties were believed to be from toxicity caused by high sulfate concentrations and occasional high concentrations of solvents.

ADI installed low-rate BVF[®] reactors at Abbott Laboratories, which proved to be far more resistant/forgiving and stable to the toxic impact of these problem substances, while still providing a high degree of performance. Due to this success at Abbott Laboratories, Bristol-Myers Squibb retained ADI to conduct a two-stage, six-month pilot study involving its low-rate BVF[®] reactor and SBR technology for aerobic polishing.

The pilot study achieved COD, BOD, and TSS removals of approximately 65, 80, and 80 percent, respectively, with an operating temperature of 27°C and a COD loading of 1.0 kg/m³d. Based on these results, it was decided to proceed with a full-scale system.

A significant advantage of the low-rate BVF[®] reactor with this fermentation wastewater, is its ability to remove the high suspended solids concentrations (mycelia) and to digest over 80 percent of these solids; thus minimizing waste sludge disposal.



The full-scale BVF[®] system consists of four above-ground steel tank reactors having a total volume of 11 MG. Construction commenced in 1995, and start-up in 1996.

Each reactor has a floating, insulated, membrane cover to conserve heat and trap biogas. A biogas system collects all of the biogas produced under a slight vacuum, compresses the biogas for delivery to a hot water boiler. This system includes a packed tower scrubber to remove hydrogen sulfide. The energy produced in the biogas boiler is used to heat the reactors. Any excess gas is burned in an enclosed flare.

The general contractor for the complete wastewater treatment system was OBG Technical Services Inc. of Syracuse, NY. ADI was responsible for the ADI-BVF[®] process engineering, biogas design, and supply and installation of all reactor internals and covers.