



PULP AND PAPER MILL, NEW YORK STATE

Case study showing approximately 50% sludge reduction; DO increase in hot weather, Elimination of noxious odors; Savings in chemical usage and Lowering of Effluent TSS.

This Pulp & Paper Mill is a high yield sulfite mill generating 200 tons/day paper production, discharging 1.5 MGD of high BOD pulp waste (35,000 lbs/day BOD) to a 50 MG ASB, plus 2.5 MGD of lower BOD paper waste (10,000 lbs/day BOD) to a 20 MG ASB. Discharge from the 50 MG basin flows into the 20 MG basin with final discharge from the 20 MG ASB after a quiescent zone designed to settle solids. There was 6-8' of sludge below diffusers in the 50 MG ASB and in the quiescent zone of the 20 MG ASB when treatment began. Continuous withdrawal of sludge from the end of the 20 MG basin is routed to a 20 MG sludge holding basin (functioning as a sludge digester) with overflow back to the 50 MG ASB. Sludge is also wasted to a filter press from the 20 MG ASB quiescent zone.

Pre-Treatment Conditions

- Low DO in both ASB's and high H₂S readings at mill boundary, leading to numerous odor complaints.
- Poor settling of solids in quiescent/settling portion of the 20 MG ASB, leading to high effluent TSS and total BOD. High percentage of biomass consisted of filamentous bacteria. Significant sludge buildup in bottom of both ASBs.

BYO-GON PX-109® Treatment Program & Results

Treatment began with applying a shock dosage of BYO-GON PX-109® into the surface waters of the 20 MG ASB, at the overflow from the 50 MG ASB. A daily maintenance dosage of the product was added into the influent of the 20 MG ASB on Day 2. Once positive impacts were seen in the 20 MG ASB, the 50 MG ASB was treated by directly injecting BYO-GON PX-109® into the sludge blanket of the 50 MG ASB followed by an elevated dosage of product to impact odor and sludge generation.

Odor complaints have been sporadic and very infrequent. Effluent TSS is reduced from 278 ppm to 85 ppm (84% reduction) on a consistent basis. The quiescent zone of the final ASB has developed a stable clear layer of final filtrate extending to nearly 75% of its depth.

A filamentous bloom that began prior to treatment is now gone, without using chemicals for control. Overall bacterial activity has increased as seen under the microscope. The receiving stream now has a clear flow with no solids visible. The plant no longer uses polymer to attempt to settle solids.



Supplemental sludge removal in the settling area has stopped because the existing sludge withdrawal system has the capacity to effectively remove any settled sludge solids. It appears that sludge production has significantly been reduced since treatment began. Sludge depths in both ASB's has reduced from 6-8 feet to approximately 3-4 feet in depth.

Core samples of sludge prior to treatment, had a uniform black septic color in bottom layers. Several weeks after applying shock dosage, sludge showed isolated areas of black sludge surrounded by a lighter brown, younger appearing sludge.

Plant is now in full permit compliance and odor complaints are very infrequent, even during the hottest summer months that have historically been the most problematic period.

Dissolved oxygen levels have increased in both ASB's, even without additional aeration. Increases seen during this summers hottest months have never been observed in the past.

(Reference: 1999 TAPPI International Environmental Conference)