



### ***Paper Mill, Beaver Falls, NY***

*Sludge reduction in lagoon system and elimination of odors.*

The paper mill, located in Beaver Falls, New York, operates a pond/lagoon system consisting of an initial settling basin, followed by an aerated lagoon and then an un-aerated oxidation pond. Treatment of the lagoon system with BYO-GON PX-109<sup>®</sup> was initiated in with the primary goal of odor reduction from all three ponds and the secondary goal of sludge reduction in anticipation of a project later in the year to close all three basins. The closure plan involved removal of accumulated sludge from the lagoons and transport from the site.

The first basin (settling pond – approximately 2.2 million gallon volume) was used to trap fiber and inorganic filler materials after primary treatment with a DAF unit at the paper mill. This basin contained about 4.5 feet of sludge with a volatile solids content of approximately 12%. Much of the sludge was black and septic, causing odors to be generated from the pond. Water depth had to be increased in the pond to facilitate access by boat and to provide a medium for biological activity in the basin.

The aeration pond, approximately 4.1 million gallon volume, used two surface aerators to provide dissolved oxygen for biological respiration. This lagoon contained an average of 4.4 feet of sludge but had some locations in the pond where sludge depths were recorded at over 9 feet. The oxidation pond, approximately 30 million gallon volume, was used as a quiescent settling pond. A significant buildup of secondary biological sludge had developed in the inlet of the oxidation pond and created odors. Effluent was discharged from a final polishing pond located after the oxidation pond.

Treatment of the settling and aeration ponds was completed by direct injection of BYO-GON PX-109<sup>®</sup> into the sludge mass in the ponds and daily addition of product into a sump at the plant which provided flow to the influent. The injection was repeated one month later at a lower dosage to increase biological activity in the basins. In July an injection was completed in the larger oxidation pond to reduce odors generated by the septic sludge mass in the bottom of the pond inlet area.

As a result of the application of BYO-GON PX-109<sup>®</sup>, odor generated by the sludge in all three ponds was greatly reduced. The larger oxidation pond odors were eliminated approximately one week after treatment. No odor complaints were received from neighbors adjacent to the facility during the summer treatment period. Even after the ponds were drained in preparation for closure, no odors were detected from the sludge mass remaining.

Early indications of increased biological activity were seen in both the settling and aeration lagoons with increased bubbling from the deposited sludge mass. Large sections of settled sludge in the aeration lagoon began to soften and “crack” three weeks after initial injection. Overall sludge reductions were measured at approximately one foot in the settling pond and nearly two feet in the aeration pond. It is estimated that approximately 325 tons of sludge were removed from the settling and aeration ponds as a result of the treatment with BYO-GON PX-109<sup>®</sup>.