



Biotifx[®] Helps Municipality Forgo Lagoon Dredging

SUMMARY

A municipal wastewater treatment lagoon had accumulated high levels of sludge after decades of loading and was due to be dredged. The facility began treatment with Biotifx[®] to help digest their organic sludge and forgo dredging. After three months of treatment, the lagoon experienced significant sludge reduction. An independent third-party engineering firm estimated that **Biotifx[®] 40B saved the facility from paying \$336,000 in dredging costs for a 4.5:1 return on investment.**

BACKGROUND

The municipal lagoon was eight feet deep with a design volume of 99 million gallons (Figure 1). After fine screen primary treatment, the lagoon performed secondary treatment with aeration (Figure 1). Historically, the lagoon received an average of 2.5 million gallons per day (MGD) at 112mg/L total suspended solids (TSS) (2,340 pounds per day). The lagoon was measured and found to contain 20.5% sludge. The cost to dredge the entire lagoon was estimated at \$2.5 million.

Concerns for the facility included:

- High sludge levels, limiting hydraulic retention time
- Dredging cost to remove sludge

TREATMENT OBJECTIVE

The goal of treatment with Biotifx[®] was to reduce the sludge in the lagoon and prevent dredging.

MATERIALS AND METHODS

Before treatment, the lagoon was surveyed with sonar by a third-party engineering firm to measure the volume of sludge in the lagoon. After three months of treatment with Biotifx[®], this process was repeated to measure results. Treatment began by initially dosing the lagoon with Biotifx[®] for the total volume. Subsequent dosing at a rate based on daily flow and loading continued five days a week for three months. Biotifx[®] powder was hydrated in water and the solution was applied directly into the lagoon around its perimeter. Treatment was stopped after three months once the lagoon's temperature fell below 50°F.

Treatment stopped after three months, but the added bacteria were still digesting and working after the last dose was applied. Because of this, a final sonar was conducted five months later to account for and capture this additional digestion.



Figure 1: Municipal wastewater lagoon before treatment with Biotifx[®].



Figure 2: Another photo of the municipal wastewater lagoon.



RESULTS

REDUCED SLUDGE

Sludge volume in the lagoon decreased significantly after treatment, despite continuous loading of solids into the lagoon. It was calculated that **425,674 dry pounds of sludge were removed from the lagoon.**

Since the wastewater treatment plant was continuously adding solids during this time, the total amount of sludge digested by Biotifx® can be calculated like so: (total solids before – total solids after) + solids loaded. The average daily flow and influent suspended solids concentrations are summarized below (Table 1).

Table 1: Average lagoon flow and loading data.

	AVERAGE DAILY FLOW MGD	AVERAGES OF SUSPENDED SOLIDS		TOTAL LOADING
		mg/L	lbs/day	lbs over 5 months
SOLIDS LOADING	3.08	97.2	2,323	352,835

Given a loading of 352,835 dry lbs over the course of five months, it is estimated that 246,985 lbs would have remained in the lagoon (70% retention based on a third-party engineering firm's calculations). Therefore, the total sludge reduction by Biotifx® was 672,659 dry lbs (425,674 lbs + 246,985 lbs).

TOTAL SLUDGE LOADED AS TSS	352,835 lbs
SLUDGE RETAINED FROM LOADED TSS (70%)	246,985 lbs
SLUDGE DIGESTED FROM LAGOON AS MEASURED BY SONAR	425,674 lbs
TOTAL SLUDGE DIGESTED	672,659 lbs

SIGNIFICANCE

By using bioaugmentation with Biotifx®, this municipal wastewater treatment lagoon was able to forgo dredging, greatly reducing costs related to labor, dredging equipment, and sludge disposal. Treatment with Biotifx® resulted in an excellent return on investment for the facility.

If you'd like to learn more about Biotifx® wastewater treatment and how to become a partner, Visit WWW.MDGBIO.COM