



Lagoon Cleaning with Geotubes® to Upgrade the System

The Objective

Biosolids had been clogging the sand filters when water was being land applied through a sprinkler system. The objective of this project was to remove the biosolids in the lagoon system and dewater them for subsequent hauling. Once the lagoons were cleaned, some additional piping was installed to prevent the biosolids from getting to the sand filters.

WaterSolve's Chemical Conditioning

A representative sample of the lagoon sludge was sent to the WaterSolve laboratory. Dewatering polymers were evaluated based on water release rate, water clarity, and flocculent appearance. In addition, dosing rate(s) were determined during bench-top dewatering experiments and recommendations were made to estimate the needs for the project. Solve 9244 was selected as the most effective polymer with the lowest dose.

Geotube® Container Sizing

Geotube® containers are manufactured from high strength polypropylene fabric and designed to allow effluent water to escape through the pores of the fabric while retaining the chemically-conditioned solids. There was limited space between the fencing and lagoon #1. After reviewing a site map, WaterSolve provided a drawing that detailed the Geotube® containment for three 30' circumference by 50' long tubes and one 45' circumference by 57' long tube. The combined capacity was 500 cubic yards of working capacity for the biosolids.



#1 A Geotube® containment pad was placed adjacent to the lagoon. The liner was placed over railroad ties and secured with gravel and sand bags.



#2 The polymer make-down unit injected Solve 9244 polymer into the pipeline prior to the Geotube® containers.

The Result

The wastewater engineer for the facility selected Geotube® dewatering for the project because there was adequate space at the site and it was the most effective process available. WaterSolve provided all the equipment, supplies, drawings, and two technicians to operate the project. The theme park provided some workers to deploy the system and help spray the walls of the lagoons during the pumping. On the first day the liner, filtration fabric, Geotubes®, piping system, and the pumps were installed. At the end of the day some water was pumped into the Geotube® containers to prevent them from blowing off the pad if it got windy. During the next three days, a total of 3 lagoons were cleaned and pumped to the Geotube® containers. Some new risers and a diversion pipe were installed in the lagoon system immediately after the lagoons were cleaned. The management was very happy to get 3 lagoons cleaned and make the improvements. Based on the solids in each lagoon it was determined the system was short circuiting and solids were going to the last lagoon too quickly. The improvements will eliminate this problem. On the final day, the WaterSolve technicians washed the equipment and packed it up to be removed from the site. The theme park is now ready for business and there will no longer be biosolids clogging the sand filter system when they spray water on their fields.



#3 This Geotube® container is filling and dewatering very well. The filtrate water is returning to the lagoon on the lower right of the photo.



#4 This lagoon is almost empty. A 6” hydraulic pump is removing the biosolids as the walls are being sprayed.



Once the lagoons were empty improvements were installed.