TENCATE Geotube®

Case Study

application	Municipal Wastewater Treatment
location	Prichard, AL
product	Geotube® Dewatering Technology
job owner	Waterworks and Sewer Board Prichard, AL
contractor	Smith Industrial Service Mobile, AL

TenCate™ develops and produces materials that function to increase performance, reduce costs, and deliver measurable results by working with our customers to provide advanced solutions.

THE CHALLENGE

Prichard AL is a town of about 30,000 people north of Mobile, AL. Paul David, the Sewer Board Superintendent, oversees the contract management of two (2) wastewater treatment plants. Actual plant management is provided by Severn Trent Services. The Carlos Morris WWTP is a permitted 4.0 MGD plant and the Brooks WWTP is a permitted 1.5 MGD plant.

The original design of both plants utilized sand drying beds. However, because the Mobile area is one of the wettest areas of the country, the drying beds were very inefficient and not able to effectively handle the daily production of digester biosolid sludge. Additionally, the removal of the dried sludge from the beds was extremely labor intensive and time consuming.

Small communities often struggle to maintain utilities and this plant was having problems staying in compliance with their discharge permits due to the lack of upgrades needed in the plant. A court-mandated consent decree ,requiring improved performance, had Mr. David looking for cost effective solutions to handle the sludge.

As his primary digester was impacted with sludge, he had no place to waste from the clarifiers. As the blanket of sludge built up in the clarifiers, he risked being out of compliance with his discharge permit. To supplement the drying beds, Mr. David periodically had mobile belt presses brought in to dewater the sludge.

THE SOLUTION

Having successfully used TenCate Geotube® containment and dewatering technology on other Industrial and municipal sludge dewatering projects, Smith Industrial Services (SIS) was awarded the contract to dewater the sludge at the Prichard WWTP using Geotube® technology. SIS placed 30' circumference x 50' long Geotube® units in the existing sand drying beds.

Geotube® dewatering technology would provide a cost-effective way to help the WWTP stay in compliance with their discharge permits and continue to operate without interruption.

Figure 1. 30'circumference x 50' long Geotube® unit in sand drying bed effectivly increases the capacity of the drying bed to dewater more sludge.

Dewatering with Geotube® technology is a three-step process. In the confinement stage, the Geotube® container is filled with waste materials. The Geotube® container's unique fabric confines the fine grains of the material.

In the dewatering phase, excess water simply drains from the Geotube® container. The decanted water is often of a quality that can be reused or returned for processing or to native waterways without additional treatment.

In the final phase, consolidation, the solids continue to densify due to desiccation as residual water vapor escapes through the fabric. Volume reduction can be as high as 90 percent.

Proper chemical conditioning is critical to successfully dewatering sludge in Geotube® units. WaterSolve LLC, a full service provider of water treatment products, conducted bench scale tests to identify the optimum polymer and dosage. Dewatering polymers were evaluated based on water release rate, water clarity as well as size and stability of the floc. Solve9244, a cationic emulsion was chosen as the best flocculant for this project.

THE PERFORMANCE

Between March and July of 2007, SIS pumped over 4 million gallons of sludge at 3% - 5% solids into 28 Geotube® units. The first dewatered solids were hauled off in roughly 60 days from the start. Solids were 18%-20%, easily meeting the paint filter test going into the landfill. Given the lack of detention time available in the digester until upgrades could be completed, Geotube® dewatering technology proved to be the ideal solution.

The TSS permit parameters for the Prichard WWTP are now in compliance, biosolids management is under control, ammonia levels have been reduced, the solids blanket levels are

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down in the clarifiers and are easily adjusted by pumping into the Geotube® units any time. The cost of Geotube® technology is less than $200 per ton over the scales vs. historical bids ranging $300 - $400 per ton.

"The bags have proved themselves to be cost competitive as well as operationally and environmentally agreeable. I was quite amazed at the volume of solids accumulated with such a passive operation." said Mr. David.

Figure 2. Geotube® units are manifolded together to manage the flow of sludge between units.

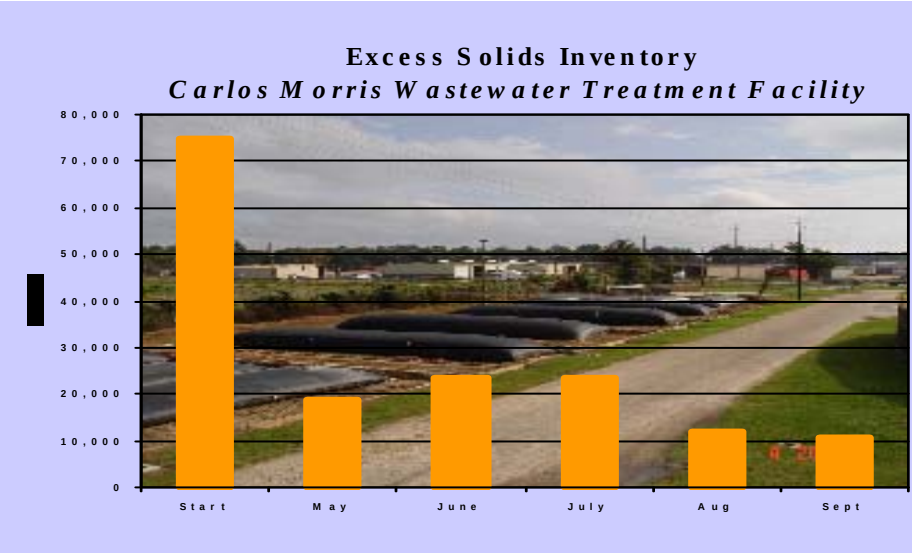

Figure 3. The plant operators have been able to reduce their solids inventory by using Geotube® dewatering containers.

SIS had a trailer specially fabricated to house the chemicals and equipment required to efficiently mix and deliver the polymers into the sludge as it was being pumped into the Geotube® units.

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