Your Water, Wastewater, & Materials Dewatering Partner

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Emergency Dewatering of Biosolids

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Objective

This Minnesota municipal wastewater treatment plant was reaching full capacity for storage of their biosolids due to persistent spring rains and no opportunities for field applications. The objective was to dewater enough biosolids from the storage facilities to get them through the summer. The facility had enough laydown area for up to 3 thousand cubic yards of storage with Geotube® containers. The Geotube® dewatering system allowed the manager to use plant employees to operate the equipment and store the biosolids until the fall when they could be applied on nearby farms.

This sample jar contains the treated 2.8% biosolids being pumped.

WaterSolve's Conditioning Chemical

One five-gallon container of the biosolids was received at WaterSolve's Laboratory. Chemical conditioning with Solve 216B was determined to flocculate and dewater the residual most effectively compared to the other products. Water clarity and flocculent appearance were good to excellent when a 9-mL (300-ppm/21.4-lbs per dry ton) dose was added to a 150-mL sample. The residuals provided were 2.8-percent dry weight solids. After passing a 1000-mL chemically conditioned (300-ppm Solve 216B) test sample through a GT500D Geotube® filter, percent solids increased to 7.3-percent after sixty minutes of dewatering time.

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. Estimates indicated 3 million gallons of the 3% (dry wt. solids) biosolids would require 600 linear ft. of 60 ft. circumference Geotubes®, based on a goal of 15% dry weight solids, after dewatering.

TENCATE Geotube®

The Result

WaterSolve was contracted to provide the Geotube® containers, a liner, filtration fabric, polymer, polymer make-down unit, installation, and training for the operation of the system. A WaterSolve technician was on site to assemble the polymer make-down system and deploy the liner as well as the Geotube® containers. The facility managers decided to start with 3 - 60’ circumference by 100’ long Geotube® containers and add more if they needed to later in the summer. A liner was placed in the containment pad adjacent to the holding pond to which the filtrate water would be directed. Filtration fabric (designed to allow water release between the bottom of the Geotube® and the liner) was placed on the surface of the liner. The Geotube® containers were then deployed. A 6” hose was laid from the pump in the facility to the containment pad with a valve and hose connected to each Geotube®. The make-down unit was installed to dilute the Solve 216B polymer and inject it into the 6” pipeline transferring the biosolids. Once they started pumping biosolids to the Geotube® containers, the WaterSolve technician trained the facilities operators how to visually read the pail samples taken from an inline sample port and make adjustments to the polymer make-down unit. The pumping rate was 500-gpm and the polymer dose was 8 to 10 gallons per hour. The project was successful and the plant was no longer in “emergency” status.

The Geotube ® containers are placed on the containment pad adjacent to the holding pond where the filtrate is free to enter.

A polymer make-down unit dilutes the polymer and injects it into the biosolids pipeline. It was placed under the shelter with the polymer for protection from the weather.