Your Water, Wastewater, & Materials Dewatering Partner

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Dewatering of Biosolids from WWTP Lagoon

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Objective

A city in Colorado needed to remove biosolids from a WWTP lagoon which was no longer in service. The plan was to use a hydraulic submersible pump to remove the biosolids from the lagoon and pump them into Geotube® containers for dewatering. The biosolids would then be allowed to dewater in the Geotube® containers, before being excavated and removed for disposal. The city would self perform the project, with WaterSolve, LLC personnel on site for project start-up and training.

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 based on information provided by the city indicated approximately 2,200 cubic yards of biosolids would need to be removed in order to achieve project goals. It was determined that two Geotube® containers (60 ft. circumference x 200 ft. long) would be needed to dewater this volume of biosolids.

WaterSolve's Chemical Conditioning

A sample of the lagoon biosolids was sent to WaterSolve's lab for preliminary testing. Based on laboratory testing, Solve 127 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 an 4-mL (133-ppm/4.2-lbs per dry ton) dose was added to a 150-mL sample.

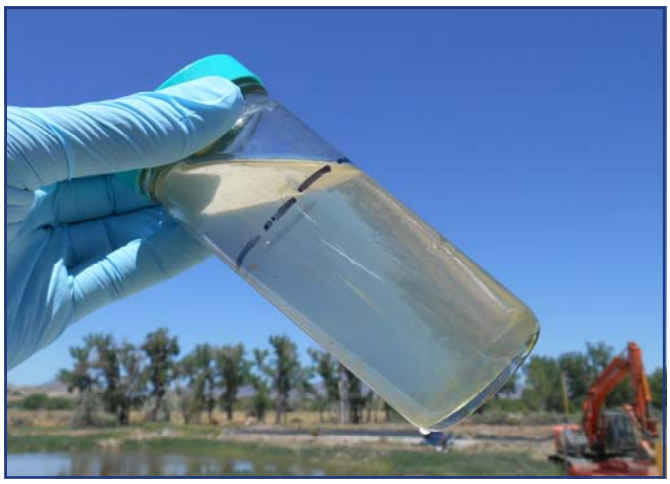
Biosolids lagoon during early stage of the project. A 6" submersible pump was suspended on a cable and the material was pumped to the Geotube® containers.

Geotube® containers are in place and ready to be filled. Because of windy conditions, the edges of the containers were kept in place using large stones. The stones were removed once material was pumped to the containers.

The Result

Watersolve LLC, was contracted by a city in Colorado to assist with project startup and training of city personnel. This included providing a liner, Geotube® containers, filtration fabric, a cationic polymer, a polymer feed system, and technical assistance. Watersolve prepared a layout drawing showing recommended dimensions and grading for the laydown area where the Geotube® containers would be placed. The city had the grading of the laydown area completed prior to our arrival. Upon arrival at the site, a 15-mL liner was laid in the containment area and secured around the edges. Filtration fabric, which assists with drainage between the Geotube® containers and the liner, was placed on the liner. The Geotube® containers were unrolled and 6" hoses were plumbed into the fill ports. The polymer feed system was placed between the lagoon and the Geotube® containers. The polymer feed unit selected for this project is capable of providing up to 10 gallons per hour of neat polymer. The drum of Solve 127 polymer was plumbed to the polymer feed unit and the made-down polymer supply line was plumbed into a 6" mixing manifold as part of the pipeline. The submersible pump was suspended in the lagoon with a 6" discharge pipeline exiting the lagoon and connecting to the mixing manifold. When the pumping began, initial solids content was low. Sampling of the treated material indicated a low dose of flocculating polymer was needed to treat the material. Solids content of the material increased as the project progressed. Continual visual monitoring of the treated material resulted in adjusting of the dosing rate as the solids content increased. The WaterSolve technician was on site for the first four days of the project to assist with operations and train city personnel that would be in charge of monitoring the dewatering aspect of the project for the remainder of the project. Operations continued until the lagoon cleanout was complete.

As the Geotube® containers begin to fill, the filtrate can be seen releasing through the pores of the GT500 material. The laydown area was graded to direct the filtrate to a holding area adjoining the low spot. By designing the site to utilize gravity flow for the filtrate, the cost of a filtrate return pump can be avoided.



A drum of Solve 127 and the make-down unit were placed next to the laydown area and header system. Made-down polymer was injected into the 6" line prior to the material entering the Geotube® containers. The material was monitored frequently to insure proper chemical dosing. Visual inspection of the filtrate shows the chemistry and Geotube® containers are performing well.