



GEOTEX® REPORT

A Geotextile Case Study From SI® Geosolutions

Geotex® Tubes Used to Dewater Tannery Sludge

Problem

A Mid-Atlantic tannery was faced with a critical decision when production outpaced the capacity of its wastewater treatment system. Sludge, the waste product of the tanning process, had built up over time and was continuing to accumulate. Fines from the state environmental agency, odor complaints from area citizens and the looming threat of being shut down plagued tannery management. So, why did the tannery not simply haul the sludge to the dump? Sludge will not be accepted at a landfill unless it has been dewatered to an acceptable solids level. The typical method of dewatering sludge is to use settling tanks and filter presses. This process can only treat small amounts of waste at a time; therefore, the method was not sufficient for the volume required to be removed.



Tannery Sludge before dewatering



Empty GEOTEX® Tubes are spread throughout graded area in preparation for filling.

Solution

With no obvious solution in sight, tannery management needed a creative idea, and fast. An innovative biological consultant working with C-Horse Construction suggested using Geotex tubes made by SI® Geosolutions to filter and contain the sludge. The plan was to pump sludge into large tubes fabricated from high strength geotextiles. Experience has shown that water filters from the sludge through pores in the woven fabric. Geotex tubes were used as a cost-effective alternative to belt and filter presses because of their large capacity and ability to be filled quickly. The goal was to enable the plant operator to re-establish proper waste management parameters such as odor, pH, and acceptable solids levels in order to bring the tannery back into regulatory compliance.

Design

The dewatering site was prepared by grading a 125' X 75' area and lining it with an impermeable plastic sheet. Water draining from the tubes during dewatering was to flow into a sump to be pumped back into the waste collection system. Five different tubes were used. A small polypropylene tube, fabricated 15 feet in circumference and 40 feet in length and 4 high strength polyester tubes, fabricated 30 feet in circumference and ranging in length from 40 to 200 feet. The polypropylene tube was made from Geotex 4X6 and the polyester tubes were made from Geotex 12X12 and Geotex 10X10. As the tubes were filled, the geotextile tightened due to the pressure and spaces between the weave became smaller; as a result, even extremely small-sized solids were prevented from escaping. Two types of dewatering occurred during the process. Initially, dewatering was mechanical due to pumping, and then passive dewatering followed over a period of weeks.



Tannery sludge is pumped from the holding tank into GEOTEX® Tubes.

Results

A sample of sludge pumped into a tube, tested by Hera Tech Inc., had a Total Suspended Solids (TSS) of 441 grams/liter. Water leaving the tube had a TSS of 0.65 grams/liter. This indicates that 99.998% of the solids pumped into the tube was retained. Chromium within the sludge was reduced from 3.370 mg/l pre-tube to 0.8437 mg/l post-tube. After two weeks, the primary sludge had reached a percent solid greater than 25% while the biological sludge varied between 18 and 30%. The landfill requires sludge to be at a solids level greater than 17%; therefore, the sludge was ready to be excavated from the tubes.



Water filters from tannery sludge.

Conclusion

Geotex tubes successfully solved a problem for which the traditional method of using belt or filter presses was not sufficient; furthermore, the problem was solved quickly and cost effectively. By containing and dewatering approximately 1,400 cubic yards of tannery waste in geotextile tubes, the plant was able to return to optimal operating conditions while simultaneously complying with regulatory agencies.



6025 Lee Highway, Suite 435 • Chattanooga, TN 37421 • USA
(423) 899-0444 • Toll Free in U.S.A. (800) 621-0444 • Fax (423) 899-7619
www.fixsoil.com

