



Dredging and Dewatering Contaminated Creek

Objective

A contractor was tasked with removing PCB laden residual from seven thousand linear feet of creek in Western Ohio. The objective was to dredge and dewater the sediment so the solids could be hauled to a landfill and clean filtered water could be returned to the creek. Due to the variety of depth changes in the creek (1' to 5'), and the bends in the creek, the contractor chose to place a hydraulic pump on a raft and have workers use two 4" suction hoses to remove the residual. The system was designed to pump 500 to 750-gpm and transfer the residual up to 7,000 linear feet through an 8" HDP pipeline to the dewatering pad. Geotube® containers were selected to filter the residual because of their ability to filter the sand, soil, sticks, rocks, leaves, etc. that the pump would send and process the material at the 500 to 750-gpm flow rate. A water treatment plant was designed to take the filtrate water from the containment pad and remove any remaining contaminants before returning the water to the creek.

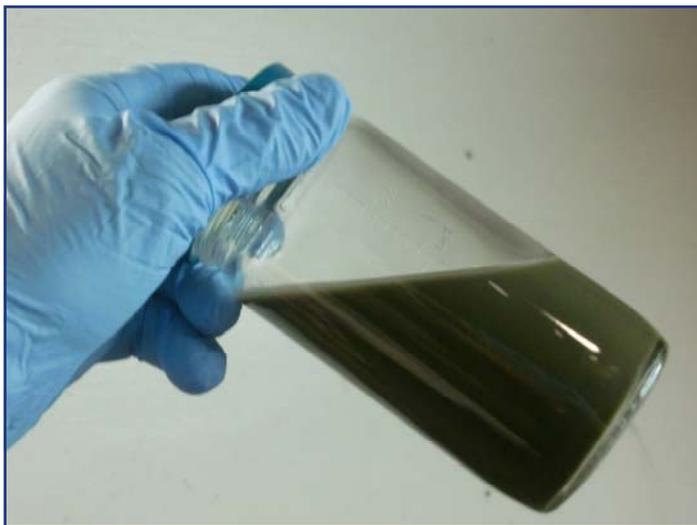
Geotube® Container Sizing

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 there was potentially 10,000 cubic yards

of 75% dry wt. solids to be removed from the creek. The dewatering pad was built to accommodate six 60' circumference by 100' ft. long Geotube® containers which hold 500 cubic yards each. The contractor would have the option to excavate some of the containers as they met paint filter testing or stack in layers to store the material until the dredging was complete.

WaterSolve's Chemical Conditioning

WaterSolve, LLC was tasked to perform a Geotube® dewatering performance trial and Cone Test on Dredge Spoils from the creek in Ohio. The objectives of these dewatering trials were to identify chemical conditioning program(s), identify polymer flocculent(s), and dosing rate(s) for a potential Geotube® dewatering application. The objectives of subsequent Cone Tests were to measure total solids (TS) of the flocculated, contained, and dewatering residuals after passage through a GT500D Geotube® filter. Chemical conditioning with Solve 137 was determined to flocculate and dewater the residual most effectively compared to the other chemical conditioning programs. Water release volume and flocculent appearance were good to excellent at a 2-mL (67-ppm) dose of Solve 137 in a 150-mL sample. As shown below untreated water on left side and treated water with Solve 137 on right.



Raw sample from creek.



Sample after treatment with Solve 137.

The Result

WaterSolve was contracted to provide the Geotube® containers, 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. The polymer make-down unit was placed in a containment area with the Solve 137 prior to the dewatering pad. An electric pump was placed in a frac tank containing the filtrate from the dewatering pad and it supplied the make-down unit with water. A large site generator supplied the electric to the make-down unit. The polymer was injected into the 8” HDP pipeline with a 1.5” braded hose. The

header system in the Geotube® containment had 6” T’s coming off the 8” pipeline with valves for each of the hoses going to the Geotube® containers.

The WaterSolve technician trained the workforce how to unroll and deploy the Geotube® containers. He also started the polymer feed system when the hydraulic pump on the raft sent residual from the creek to the Geotube® pad. He trained the workers to adjust the dose of polymer based on visual observation of the pail samples taken from a port in the Geotube® containment pad. The residual contained a lot of sand and the dose was only 0.2-gallon per hour of the Solve 137.



The Geotube® containers are placed in containment pad on a gravel base. The 8” HDP pipeline delivers the residual to the tubes.



A polymer make-down unit dilutes the polymer and injects it into the dredge pipeline.



This water treatment plant removed any remaining contaminants from the filtrate water before returning it to the creek.



A 6’ hydraulic pump was placed on a raft in the creek. Two 4” hoses were used to suck the residual from the creek into the pump.