



DEWATERING CONTAMINATED SEDIMENT FROM SEAPLANE LAGOON

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Objective

A portion of the seaplane lagoon at a Naval Air Station in California was to be dredged to remove contaminated sediment. This area had been contaminated by hazardous materials (PCB's, heavy metals, and pesticides) being disposed of into storm water drains that discharged into the lagoon. A section of the seaplane lagoon underneath a roadway could not be reached using mechanical excavators and needed to be removed using a specially designed dredge that could extend underneath the elevated roadway. The dredged material needed to be captured and dewatered before it could be disposed at a landfill. WaterSolve, LLC, was tasked to evaluate the material, recommend an appropriate chemical conditioning program, and test the effectiveness of dewatering using Geotube® containers. WaterSolve, LLC, was later tasked to supply the products, equipment, and the necessary manpower for chemical conditioning during on-site operations.



During low tides, the dredge crew systematically maneuvered a hydraulic dredge between the pillars underneath this elevated roadway to remove the contaminated sediment.

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 suggested approximately 2,500 cubic yards of contaminated sediment needed to be removed and dewatered. The containment area was designed to fit four 75' circumference by 100' long GT500 Geotube® containers. Two 75' circumference by 68' long GT500 Geotube® containers that could be stacked on top if necessary.



The Geotube® containers are releasing clear filtrate water as they are filled with chemically conditioned material.

WaterSolve's Conditioning Chemical

In June of 2011, WaterSolve, LLC received samples of the seaplane lagoon sediment. A dewatering performance trial was performed to determine the most effective chemical conditioning program. Dewatering polymers were evaluated based on water release rate, water clarity, and flocculent appearance. A chemical conditioning program consisting of Solve 9330 performed the best during the trial and was recommended for the project.

The Result

WaterSolve LLC was contracted to dewater the seaplane lagoon residuals into Geotube® containers. A concrete containment area was prepared on the site with Geotube® Filtration Fabric placed underneath the Geotube® containers to allow maximum dewatering. A polymer make-down unit and mixing manifold were plumbed into the 6" dredge line to inject the flocculent Solve 9330. A sample port was placed prior to the Geotube® containers to provide visual observation of the treated residual and to determine if the polymer feed rate needed to be adjusted. A specially designed dredge maneuvered underneath the roadway and delivered the contaminated sediment to the Geotube® containers using water jets and a booster pump. The pumping rate of the dredge during operations was 500 to 700 gallons per minute. Dredging was performed during low tides in order for the dredge to reach the contaminated material underneath the roadway. The water released from the Geotube® containers was collected in a sump and was pumped to a large holding tank. This water was monitored for contaminants and treated if necessary before returning to the bay. The WaterSolve technician checked the sample port regularly and adjusted the feed rate of the Solve 9330 for optimum dewatering performance. During the dredging operations, the Geotube® containers each reached maximum fill height several times and the project was complete after survey results indicated appropriate sediment removal.



The in situ sediment sample compared to a chemically conditioned sample.



A polymer make-down unit and mixing manifold delivering Solve 9330 into the 6" pipe line.



The first two Geotube® containers are near maximum capacity. The second two are rolled out and ready to be filled.