



## Dewatering Iron Backwash Residuals from WTP

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For protection from the weather, WaterSolve's Chemical Control and Tracking System Trailer was used to house the polymer and the polymer make-down unit during the cold weather operations.

### Objective

Located in New York, a Water Treatment Plant was responsible for handling iron waste from multiple facilities in the area. In order to process the iron waste, the water plant had to backwash 25,000-50,000 gallons of residual to settling ponds located on site. These settling ponds became saturated with iron backwash residual, so much that the ponds had become ineffective. In order to improve the performance of the settling pond, the state of New York had contracted WaterSolve, LLC to use Geotube® dewatering containers. Residual in the settling ponds would be processed through the Geotube® containers. Following treatment, the filtrate would be tested to satisfy permit compliance and subsequently discharged. After project completion, the water plant was to be decommissioned following the completion of construction of a new plant at another site.

### Conditioning Chemical

A representative sample of pond sediment was tested by a technician in the WaterSolve lab. Dewatering polymers were evaluated based on water release rate, water clarity, and flocculent appearance. In addition, dosing rate(s) were determined during bench-top testing and recommendations provided to the facility during this phase of the program. As shown below, Solve 137 and Solve 50B were the recommended polymers for dewatering this residual into the Geotube® containers. WaterSolve, LLC was tasked to provide the Geotube® containers, chemistry, chemical feed equipment, and technical assistance to filter and collect the suspended solids in the backwash sludge lagoon at the Water Treatment Plant.



Bench top testing showed a combination of Solve 50B and Solve 137 to be effective in treating the iron backwash residuals.





Iron residuals were pumped from the settling ponds to the Geotube® containers. After being treated the filtrate was then discharged into a nearby river.

### **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. The Geotube® containers were to be used to capture treated solids while releasing the residual filtrate to the secondary pond. From the secondary pond, the filtrate had to meet strict limits on total iron and total aluminum before it could be discharged into a near-by river. A Geotube® estimator indicated approximately 425,000 gallons of the 1.5% dry wt. solids drying down to 10% would be dewatered and stored in a four 30' circumference by 50' long Geotube® containers. The remaining backwash sludge would be removed via vacuum trucks and settling ponds would be operational until the water plant was ready to be decommissioned.

### **The Result**

A Geotube® containment pad was constructed adjacent to the lagoon and a liner was placed in the containment area to collect filtrate water exiting the Geotube® containers and direct it to the other lagoon. Three of the Geotube® containers were deployed within this containment. A 6" hydraulic pump was placed in the lagoon with a telescoping forklift and it transferred the residual to the Geotube® containers through a 4" hose. A chemical feed system injected polymer into the mixing manifold prior to the tubes to flocculate the residual. Chemical feed pumps metered the polymer into the 4" feed line. A sample port provided visual observation of the flocculation and adjustments were made to the chemistry as needed. During operations, the water level was dropped in the main settling pond where only the backwash sludge was remaining. Some of this backwash sludge was used to fill the fourth Geotube® container which would later be pumped out via vacuum truck along the remaining sludge in the main settling pond. Following completion of the main settling pond, water from the secondary pond was pumped through the Geotube® containers and recycled to lower the iron and aluminum concentrations in the water. To ensure the residual met discharge limits per permit specifications, bag filters provided additional treatment. Following chemical treatment and being processed through the bag filters, the filtrate was discharged.



On left is Iron backwash sludge being pumped from the main settling pond. On right is a close up picture of the hydraulic pump.