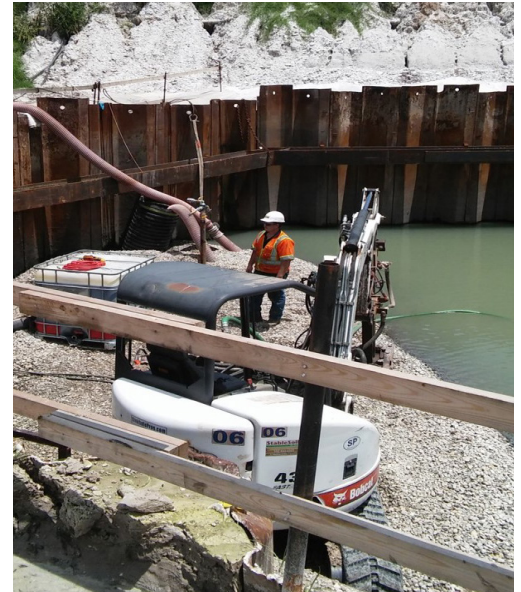




## CASE STUDY UNDERGROUND WATER CUTOFF

### Massive Underground Leak in Aquifer Shut Down

In the summer of 2017, a major water treatment plant contractor was working on a water treatment plant expansion in the Tampa area (the contractor wants details kept confidential). The massive new structure would extend 30' deep and would be supported by a series of piles installed down to bedrock. The contractor drove sheet pile in a rectangular configuration to create a coffer dam and excavated the soil down to a depth of 30' below grade. They set up dewatering pumps outside the perimeter of the box. During installation of the first test pile, the contractor perforated the aquifer causing a fracture. This was 30 feet below the bottom of the excavated coffer dam, a total of 60' below grade. Water poured into the excavation pit at an alarming rate estimated to be 500 gallons per minute. The excavation quickly became a large swimming pool and the project ground to a halt.



### Powerful Polymers

The contractor called our customer Stable Soils of Florida and they in turn called us. After a site visit, we determined the best course of action would be to attack the leak with a highly expansive and fast reacting polyurethane injection resin. AP Fill 700 was selected because of its excellent expansion and speed. When dealing with a 500 gallon per minute leak, you must be prepared to punch it in the mouth. That means using high volume pumps to get as much material as you can down to the leak in a short period of time.

### Physical Properties - Cured

AP FILL 700		
Tensile Strength	(ASTM D-1623)	45 psi (3,102 mb)
Tensile Elongation	(ASTM D-1623)	2.9%
Shrinkage	(ASTM D-1042/D-756)	Negligible
Compressive Strength (with fine sand)	(ASTM C-39)	2,050 psi (141,343 mb)
Pre-activated mix viscosity	110 -130 cP	

Properties will vary depending on application conditions.

### Painless Procedure

We figured we would have one good shot at getting this stopped. Huge pumps were brought in to empty out the water. At this point the sand was close to liquifaction and it presented a “quicksand” like safety hazard. The contractor built a platform out of gravel inside the coffer dam. The gravel platform served to add stable ground for the technicians and their equipment. The crane operator lowered a small drilling unit into the pit and a two-inch drill pipe was installed next to the test pile down to a depth of 31 feet.

Two 250-gallon totes of fully catalyzed AP Fill 700 were each connected to high volume pumps which were in turn connected to the pipe. An assembly of pipe fittings and valves connected the totes, pumps, and pipe together in an assembly that looked like an oil field “Christmas tree”.

The object was to put as much polyurethane as possible down to the leak in the shortest time possible. Our theory was that the 30’ of overburden would serve as a backstop for the rapidly reacting and expanding resin, forcing it to go into the fracture and ultimately sealing it off. The contractor pumped all 500 gallons down the drill pipe in less than 10 minutes. A third tote was lowered into place in case the first two didn’t work.

### Rapid Result

After the first two totes were empty, the Project Manager turned off the dewatering pumps so that we could see if the water would resume rising in the coffer dam. As the minutes ticked by everyone began to breath easier. The water did not rise and the repair was a success saving the contractor and their customer a ton of money in potential redesign costs and lost time.

### About Alchatek

Alchatek is an international leader in the manufacture and supply of chemical grouts and construction products for Geotechnical, Leak Seal, and Seawall Repair applications. Providing solutions from its headquarters in Tucker, Georgia and its manufacturing facility in Reno, Nevada, Alchatek specializes in advanced construction technologies for sealing leaks, stabilizing soils, lifting concrete, and protecting infrastructure and seawall structures. To best serve its customers, Alchatek is organized onto three divisions:

**The Leak Seal Division** combines a full system offering of polymer chemical grouts and equipment with perhaps the most experienced technical team in the industry. It specializes in preventing water ingress through concrete infrastructure including parking garages, culverts, basements and foundations, and sewer manholes.

**The Geotechnical Division** offers a complete line of single component products for soil stabilization as well as two component polyurethane foams for concrete lifting, void filling, and stabilization of infrastructure. This includes lifting sunken structures such as warehouse floors, back into place.

**Seawall Repair Network®** is the only national network of certified contractors in the repair, preservation, and protection of Seawalls waterfront barriers. Its proprietary methods and materials are environmentally friendly and safe for use in all marine environments and provide a non-destructive solution for seawall repair at 80% less than the cost of replacement.

Tech Support:  
404-618-0438  
[www.Alchatek.com](http://www.Alchatek.com)

This information is provided in good faith, but without guarantee. The application, use and processing of the products are beyond our control and therefore your entire responsibility. Should Alchatek nevertheless be held liable for any damage, such liability will be limited to the value of the goods delivered by us. We are committed to providing high-quality goods at all times. This version supersedes all previous versions. Revision Date: April 26, 2023 4:54 PM