

Karstic Remediation - Aquastowing

30,000 GPM leaking through karst
Stopped by Sub-Technical Inc.



Quarry Karst Leak, N.Y. 30,000 GPM

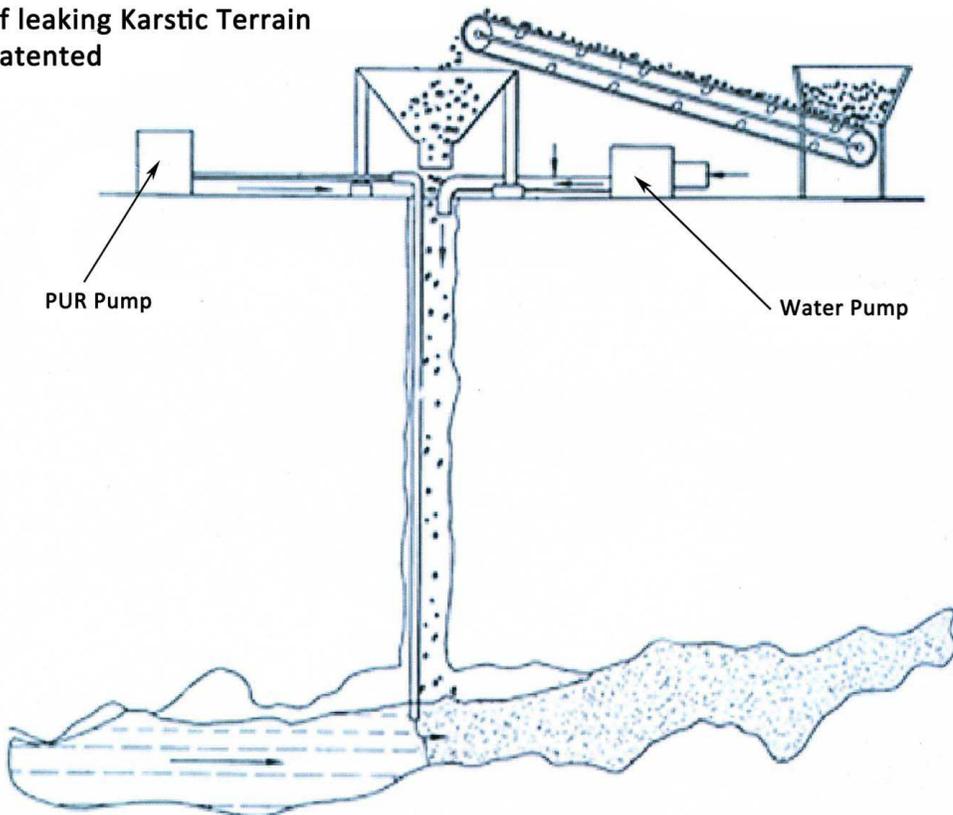
Before



Quarry Karst Leak N.Y. 0 GPM

After

Composite System for remediation
of leaking Karstic Terrain
Patented



The Hudson River was leaking through a karstic feature into this open pit mine causing massive flooding and considerable expense to the mine as it had to be pumped in order to continue operation.

Sub-Technical's crew used their patented Karst Remediation Technique to stop these leaks.

Emergency Services Available 24/7:

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Aquastowing

A unique and effective way to remedy many problems associated with karstic features.

- “Aquastowing” is a patented process that was developed to allow the remote placement of grouts into a karstic feature with the intent of stopping water flow through and stabilizing the void space of that feature.
- Traditionally, this process has been attempted using cement grout. The truth however is that on most occasions the placement of cement grout into a flowing karstic feature is minimally effective due to washout, loss of material, and shrinkage.
- Sub-Technical Inc. has avoided issues relating to washout, loss of material, and shrinkage by incorporating their HyperFlex polyurethane grout into the Aquastowing process
- HyperFlex is a single component moisture activated polyurethane foam grout that has excellent water-stopping properties, and has two distinctions that make it unique in the marketplace. The first is that Hyperflex is pre-catalyzed (Advantage: the hassle and mess of adding catalyst to the material on-site has been eliminated); The second distinction is that Hyperflex has an NSF-61 approval for contact with potable water (Advantage: NSF-61 approval allows for installation of this product in environmentally fragile areas such as streams, fish hatcheries, and of course potable water).
- The Aquastowing process is setup by gaining access to the karst (via drilling into the feature) and by placing a gravel feed and a HyperFlex injection line (attached to a PUR pump) into the hole. To start the Aquastowing process, the gravel feed and HyperFlex are simultaneously fed down the hole.
- Once the gravel and HyperFlex hits the leak-path, the water then pushes the mass into the fastest flowing areas of the feature. While this is occurring the Hyperflex foam reaction has started and the foam gravel mixture begins expanding to the point that it both fills the void and stops the water flow.
- In this instance, the gravel is acting as a void filler in the foam matrix (think of Hamburger Helper), and helps to economize the process.
- Due to the Hydrophobic nature of Hyperflex, shrinkage is not an issue.

Points to Remember

- Although in one sense HyperFlex is being used for water control, the increase in ground stability should not be overlooked. Think about it: A dense mass of foam and gravel is being placed into a void space. Structural stability in the given area will greatly increase.
- Electricity is expensive! We have saved customers as much as \$1,000,000/yr. in pumping costs.
- Whether dealing with water infiltration from karst, or ground instability from potential sinkholes, Sub-Technical’s use of their Aquastowing technique provides a proven solution.