

## Geotube® Dewatering Units 4000 feet Underground at Northern Mining Operation

### *The Challenge...*

A mining operation in Northern Ontario is producing more mine water than they can effectively manage. The waste stream is produced through cleaning of mechanical equipment during the mining process. The water which is used for this process collects sediments which increase the volume of the wastewater in the mine and also make it difficult to remove from the mine. Although there is an intricate system in place which uses a series of sumps to manage the diversion and storage of the waste stream, the fines eventually buildup over time, decreasing onsite storage capacity.

### *The Solution...*

Bishop Water were contacted by representatives of the mine to determine the effectiveness of the Geotube® technology at dewatering the waste stream to remove and store the fines which could potentially be reintroduced into the refining process. Samples of the waste stream were collected and provided to the Bishop Water lab where a number of polymer and other chemicals were tested to determine which would be the most efficient at flocculating the material prior to dewatering. Bishop Water's polymer product Solve 216B was found to flocculate the material most effectively at a dosage of approximately 200ppm. Trial dewatering showed excellent results. Plant Operators were impressed with the dewatering and the clarity of the filtrate produced through the process and in 2011 began using the Geotube® units for the management of waste stream.

Geo-Dredging and Dewatering Solutions Inc. an Ontario based company who specializes in managing Geotube® projects was retained to perform the work.



*Geotube® unit deployed 4000 ft. underground at mine operation in Northern Ontario*

### *The Construction...*

While every dewatering project has its own specific challenges, creating a dewatering cell 4000 feet underground for the Geotube® to be deployed on posed a unique challenge, however because the Geotube® units were to be deployed in a tunnel, the creation of the dewatering cell was more straight forward than originally thought. An impermeable membrane was laid in the tunnel and then covered with a non-woven geo-synthetic in order to protect it. Geotube® Filtration Fabric was then deployed over the dewatering cell to promote drainage from the bottom of the bag. Deploying the Geotube® in the subsurface tunnel had one major advantage, no beams were required to be constructed and there is no opportunity for the Geotube® to move from its original lay down area.

In order to flocculate the waste stream, Geo-dredging and Dewatering Solutions mobilized their Vepas 100 Chemical Injection System and mixing chamber. Both of which are light and compact and were easily deployed into the mine.

# The Performance...

Two 30' circumference x 50' long Geotube® units have been deployed at the mine site to date. Pumping of the mine water is performed periodically, when required, by Geo-Dredging and Dewatering Solutions Inc. The mine water is pumped from the sumps at a rate of approximately 400 litres per minute. To date the project has been a success.

The retained solids analysis shows the dewatered material to range from 56% to 82.5% solids. Plant Operators are pleased with the dewatering effectiveness of the Geotube® technology and its ability to retain valuable minerals.

Once the Geotube® units have been filled they will be opened and the retained solids will be refined in order to recover these minerals.

The Geotube® technology is the most diverse technology available. The success of the Geotube® units at dewatering mine water along the low cost of the project and quick subsurface deployment makes the Geotube technology the ideal solution for dewatering sump mine water.

## How the Geotube® works...



Step 1: Filling



Step 2: Dewatering



Step 3: Consolidation

Dewatering with Geotube® technology is a three-step process.

In the confinement stage, the Geotube® container is filled with dredged waste materials. The Geotube® containers unique fabric confines the fine grains of the material.

In the dewatering phase, excess water simply drains from the Geotube® container. The decanted water is often of a quality that can be reused or returned for processing or native waterways without additional treatment.

In the final phase, consolidation, the solids continue to densify due to desiccation as residual water vapor escape through the fabric. Volume reduction can be as high as 90 percent.



*Bishop Water Vepas 100 Chemical Injection Unit and custom fabricated mixing chamber in Northern Ontario*