SOLMAX

GEOTUBE®

Dewatering technology for municipal sludge

Municipal sludge dewatering

Domestic wastewater and sludge

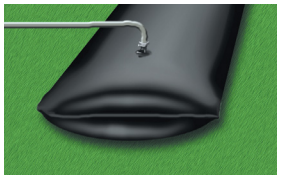
Domestic wastewater is harmful to the environment due to the presence of high oxygen-demanding material, nutrients, suspended solids, pathogenic organisms, organic compounds and other contaminants.

Sludge is produced in large amounts in the process of wastewater treatment and is typically subject to dewatering prior to disposal. Dewatering serves these purposes:

- Reduces volume, saving money on storage and transportation.
- Eliminates free liquids before landfill disposal.
- Reduces fuel requirements if the residuals are to be incinerated or dried.

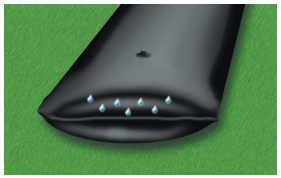
GEOTUBE® dewatering technology

GEOTUBE® dewatering technology involves the use of our **GEOTUBE®** dewatering unit that functions as follows:



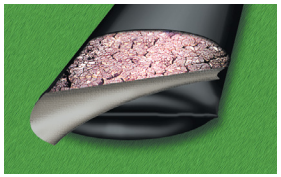
Filling

Sludge is pumped into the **GEOTUBE®** dewatering unit. Environmentally safe polymers are added which make the solids bind together and water separate.



Dewatering

Water drains out of the **GEOTUBE®** dewatering unit.



Consolidation

Over time, this allows further drying of biosolids to take place.

Features and benefits

GEOTUBE® dewatering technology has become the method of choice for wastewater treatment facilities around the world.

- The **GEOTUBE®** dewatering technology is simple. Unlike mechanical systems, there are no mechanical or moving parts that can be subject to breakdowns and wear and tear.
- Does not require capital investment (this makes the system easy to adopt, especially when the plant needs to handle seasonal spikes).
- At plants that use drying beds for sludge dewatering, the use of **GEOTUBE®** dewatering units on these drying beds can increase the sludge dewatering capacity of existing drying beds manyfold.
- Able to achieve solids capture in excess of 98% and very high contaminant capture rates (see Table 1).
- The effluent is filtered water often of a quality that can be reused or returned for processing or to native waterways without additional treatment.
- Dramatically reduces odor problems.
- Operates relatively noise free, unlike mechanical systems.
- Does not require start-up and shutdown time.

Item	Capture rate in GEOTUBE® dewatering unit (%)
Suspended solids	99.6
Phosphorus	98.2
Nitrogen	82.3
E.coli	99.9
Arsenic	100
Lead	98.8
Mercury	99.9

Table 1: Test results from Bonnechere Valley Study in Canada

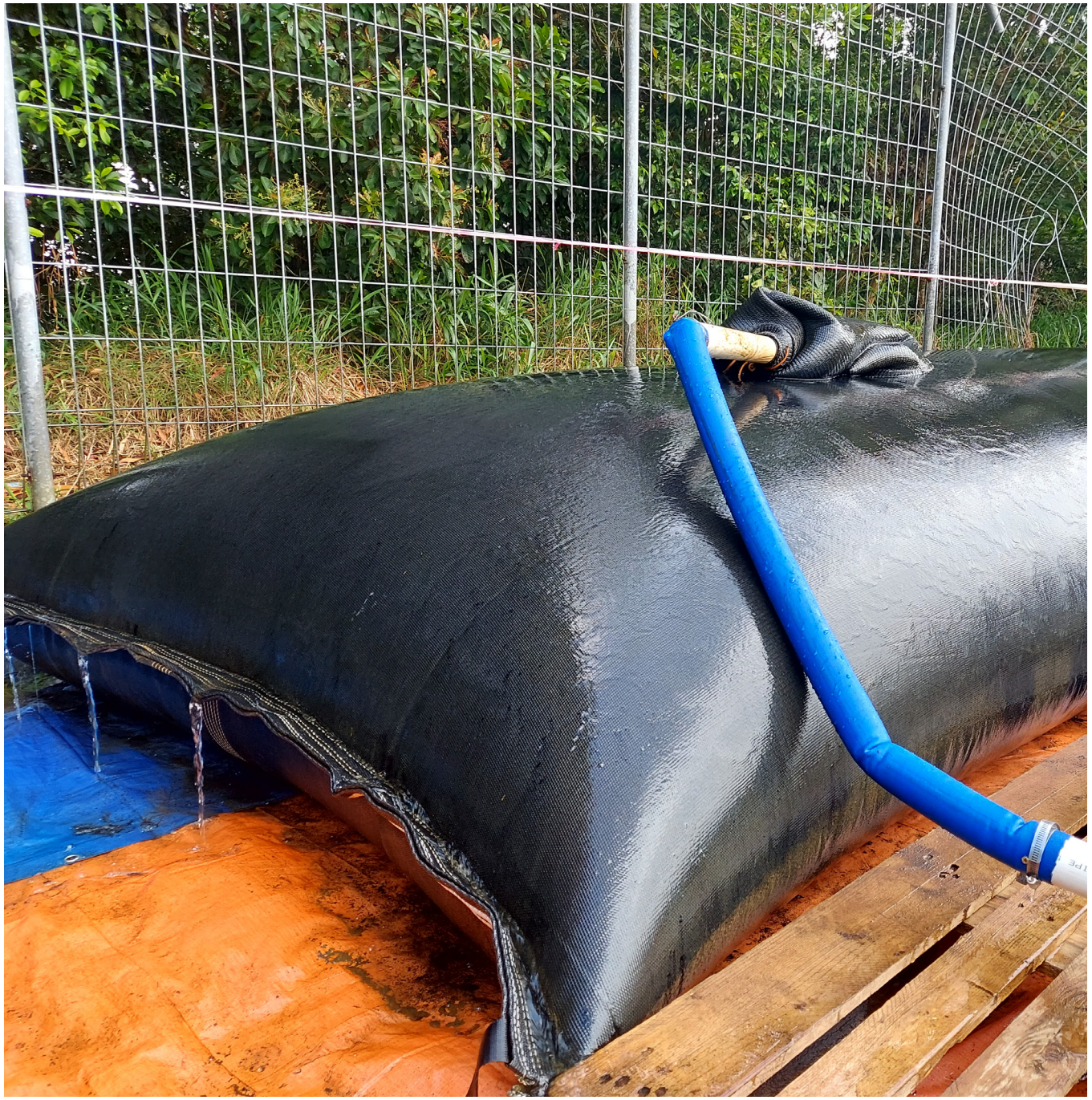
Municipal wastewater treatment plant

A common problem at small wastewater treatment plants, where sludge is dried on drying beds, is that the limited capacity of the beds can easily be exceeded. This could be due, for example, to an increase in sludge quantity resulting from an increasing population.

The **GEOTUBE®** dewatering system is increasingly being used as a means of both simplifying the sludge dewatering process and effectively increasing the volume of sludge handling capacity of the drying beds. Whereas in the past the drying beds had to be emptied at regular intervals, the time for a complete fill of the **GEOTUBE®** dewatering unit can be increased to several months. A significant saving can then be made in terms of handling and transportation.

After the sludge has been treated with a flocculant it is pumped into the **GEOTUBE®** dewatering unit where the solids remain while water seeps through the pores of the **GEOTUBE®** dewatering unit. This process can be repeated over and over again until the **GEOTUBE®** dewatering units reaches its solids containment capacity.

Larger wastewater treatment plants can also utilize the **GEOTUBE®** dewatering unit for sludge containment and dewatering as an alternative to belt-presses and/or centrifuges. It can also be used as an emergency kit if the available mechanical dewatering equipment is out of order.



Septic tank systems

Many dwellings may not have access to municipal wastewater treatment plants and generally rely on onsite treatment systems. The predominant onsite treatment system is the septic tank system which always includes a septic tank, a distribution box and an absorption field or an equivalent process for effluent treatment. The main function of the septic tank is to remove large particles and grease, which would otherwise clog the effluent treatment process. Heavy solids settle to the bottom as a sludge layer and undergo biological decomposition.

Sometimes, a septic tank is used to treat the domestic wastewater while the effluent may be piped to a centralized treatment plant. This sewage effluent treatment system is a hybrid of the conventional septic tank system and a municipal wastewater treatment system with the advantage that small pipes are required to transfer the effluent and are cheaper to construct.

These septic tanks need regular sludge or septage removal, usually carried out by a specialized contractor or service provider. The sludge is pumped from the septic tanks into sludge transportation tankers and taken to a centralized location with a sand drying bed facility for dewatering. The **GEOTUBE®** dewatering system is ideal for dewatering septic tank sludge. The septic tank sludge can be pumped directly into the **GEOTUBE®** dewatering unit, often without the need for polymer addition. The solids remain within while water seeps through the pores of the **GEOTUBE®** dewatering unit. This process can be repeated over and over again until the **GEOTUBE®** dewatering unit reaches its solids containment capacity.

Waste stabilization ponds

Ponds, lagoons or impoundments are used for biological treatment of wastewater. The types of ponds, collectively termed as waste stabilization ponds, include aerobic ponds, facultative ponds, anaerobic ponds, polishing ponds and aerated lagoons. They are either formed by excavation or earth perimeter bunding and can reduce BOD and SS to the same levels as mechanical treatment plants. In addition because of the longer residence time of wastewater in the lagoon, removal of pathogenic bacteria and viruses by natural die-off is greater than in an activated sludge treatment plant (residence time is usually several hours).

Sludge forms at the bottom of waste stabilization ponds and periodic desludging may be necessary. Urbanization and developments that come into close proximity with existing waste stabilization ponds often require closeout of these ponds and a municipal wastewater treatment plant may be constructed as a replacement system.

GEOTUBE® dewatering technology is ideal for onsite dewatering of waste stabilization pond sludge, be it periodic or pond closeout desludging. Sludge is dredged from the waste stabilization ponds and after the sludge has been treated with a flocculant it is pumped into the **GEOTUBE®** dewatering unit where the solids remain while water seeps through the pores of the **GEOTUBE®** dewatering unit. This process can be repeated over and over again until the **GEOTUBE®** dewatering unit reaches its solids containment capacity. Stacking of **GEOTUBE®** dewatering units can reduce the footprint area required for the **GEOTUBE®** dewatering platform.

GEOTUBE® tests and software

he **GEOTUBE®** RDT is a simple rapid test that can be used to select the ideal dewatering fabric and determine if a chemical accelerant is required and at what optimum dosage. The **GEOTUBE®** GDT is a test that will determine the final dewatered and consolidated solids concentration achievable.

The **GEOTUBE®** Simulator software will help determine the safe filling height of the Solmax **GEOTUBE®** dewatering unit while the **GEOTUBE®** estimator software will determine the quantities of **GEOTUBE®** dewatering units needed, the filling time required and the final dewatered mass and volume.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GEOTUBE® dewatering operation

The **GEOTUBE®** dewatering operation is simple and can be summarized as follows:

Step 1

Select a level strip of land to use for the dewatering platform.

Step 2

Lay a layer of geomembrane with a nonwoven protection layer (this is not necessary if a sand drying bed is used).

Step 3

Place a thin layer of drainage aggregates (this may not be necessary in some cases).

Step 4

Place the roll of **GEOTUBE®** dewatering unit on top of the dewatering platform.

Step 5

Layout the **GEOTUBE®** dewatering unit as required and set up the chemical dosing system (if necessary) and piping system.

Step 6

Pump the sludge into the **GEOTUBE®** dewatering unit.

About Solmax

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place. The company was founded in 1981, and has grown through the acquisition of GSE, TenCate Geosynthetics and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe.

Uncompromised quality

Our products are manufactured to strict international quality standards. All our products are tested and verified at our dedicated and comprehensive laboratories which maintain numerous accreditations. We offer our partners a wide scope of testing according to published standards to ensure products delivered to sites meet specified quality requirements.

Let's build infrastructure better

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