

<b>application</b>	<b>Municipal WWTP Digester Cleanout</b>
<b>location</b>	<b>Cambridge, OH</b>
<b>product</b>	<b>Geotube® Containers</b>

### THE CHALLENGE

Cambridge, OH is a small town of 13,000 residents. Tim Wheatley, Superintendent of the Water Pollution Control Center operates a 3 MGD activated sludge plant at about 80% of its capacity. The plant recently switched from anaerobic digesters to an aerobic digester. They had been dewatering their sludge on four vacuum assisted drying beds housed in a large shed. Alternatively, the sludge was hauled to the local landfill where it was mixed with sawdust to pass the paint filter test before being placed in the landfill.

The Cambridge WWTP sends 15,000 – 20,000 gallons of raw sludge and another 15,000 gallons of WAS to the digesters each day. In late 2003, they were preparing to clean out their two anaerobic digesters to make improvements. However, they didn't have enough storage for all the sludge being generated. The vacuum assisted drying beds aren't used through the coldest winter months, because it is nearly impossible to get the frozen sludge off the beds. Too many solids were building up in the plant and an alternative

method for containment and dewatering was sought.

### THE SOLUTION

Assistant Plant Operator, Paul Fields evaluated the options available to him with emphasis on the coldest winter months and storage being the greater issue.

Option 1: Use existing vacuum-assisted drying beds and store as much as possible on site. The problem with this option is that it results in poor operation of the plant when they cannot remove enough solids.

Option 2: Liquid haul to the landfill where the sludge is dewatered. This option costs about the same as land application, but when the ground is frozen during the coldest months of winter, land application isn't an option.

Option 3: Contain and dewater sludge using Geotube® containers.

The Cambridge WWTP determined that Geotube® Containment and Dewatering Technology would provide the most cost effective and efficient

method to handle the high volume of sludge in the shortest amount of time.

The first 60' circumference Geotube® container was deployed in an area adjacent to the drying bed shed in late December of 2003. 312,000 gallons of heavy sludge at between 4% and 6% solids was chemically conditioned and pumped into the Geotube® container. In May, forty-five days after the last fill cycle, the fabric tube was cut open and solids removed. Cake solids at the time of removal were about 20% and easily handled with a front-end loader. The dewatered sludge was then taken to a nearby landfill.

In the meantime, three additional Geotube® containers were put into service in the drying shed; one 60' circumference x 60' long and two 30' circumference x 60' long. The 30' circumference tubes were placed on the drying beds and allowed to dewater without vacuum assistance.

Upon completion of the digesters cleanout, Fields began pumping sludge into the Geotube® containers from the aerobic digester, which had recently been brought on line. This sludge at



312,000 gallons of heavy sludge were pumped into this Geotube® container. After 45 days, the solids were removed and taken to the landfill.



Using Geotube® containers allowed the plant operator to "pour and store at the same time".

2.5% to 3% TS, dewatered even better than the heavier anaerobically digested sludge.

## PERFORMANCE

Fields documented the volume of sludge pumped into each Geotube® container. In the first three months of 2004, between 500,000 and 600,000 gallons of sludge were contained and dewatered using Geotube® technology. This was in addition to the 312,000 gallons from the anaerobic digester for a total of over 900,000 gallons.

Cambridge City Engineer and Utilities Director, Paul Sherry cited the following benefits of containing and dewatering their wastewater treatment sludge Geotube® Technology:

**Savings in dollars.** The City saved on average 10 man-hours for each bed they didn't have to pour. A bed is poured 4 times per week on average. Each man-hour costs the City \$15.

**Speed of operation.** Geotube® containers took one load each day; a drying bed required 3 days to dewater. Dewatering in the drying beds alone is a very slow process.

**Operational benefits.** Geotube® containment and dewatering allows the operator to get the solids out of the system much more quickly. With lower solids, the plant operator has greater flexibility.

**Limited liability.** Using Geotube® to contain the sludge as well as to dewater it reduced the potential of an EPA permit violation.

**Convenience.** When dewatering was complete, the fabric was cut back and solids were hauled to the landfill. After dewatering on the drying beds, the solids are removed to a storage area. Then they are handled for a second time when they are loaded onto trucks for disposal in the landfill.

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Geotube® containers took one load each day, whereas a drying bed required 3 days to dewater.



Three Geotube® containers were placed in the drying shed.



By March 2004, Cambridge WWTP had treated over 900,000 gallons using Geotube® containers.

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