

DEWATERING IN 3 STEPS

By Kevin Bossy

Canadian city recognized for ash management system

The city of London, Ontario, Canada, operates six wastewater treatment plants (WWTP). Sludge generated at five of the city's plants is trucked to the Greenway Pollution Control Plant, where it is mixed with the Greenway sludge in holding tanks. All of this sludge then is sent to the fluidized bed incinerator. For years, ash produced through the incineration process had been discharged to a two-lagoon system, where it was stored and periodically transported offsite.

While lagoons are used by many municipalities for the management of various waste streams, they do present their own set of challenges. Maintenance and general upkeep can be labor-intensive; additionally, lagoons eventually become full and their contents must be disposed of. With limited options for final disposal of the material and the high cost associated with removing the ash and transporting it offsite, a solution was sought that not only would reduce the operational costs involved with managing the ash, but also produce an end product that could be more easily disposed of.

Bishop Water Technologies began working with the city of London in the spring of 2010 to develop a solution using Geotube dewatering technology to manage the ash waste stream. After performing extensive onsite bench testing and trial dewatering to determine the optimum chemical for conditioning the material for dewatering with the Geotube technology, the city of London requested that a pilot project be conducted in order to determine the effectiveness of the technology at dewatering and retaining the ash on a larger scale.

Pilot Project

In late 2010, Bishop Water began a pilot project using a Geotube unit measuring 30 ft in circumference by 50 ft long to dewater the ash. The Geotube unit was situated around the perimeter of the existing lagoon cells. The ash slurry was diverted, directly discharging into the lagoon cells to the unit. Existing infrastructure was used to chemically condition the material. Filtrate produced through the dewatering process was discharged by gravity to the existing lagoon cells.

Based on the success of the pilot project, the city of London determined that the Geotube units would offer significant benefits when compared with managing the waste stream using the onsite lagoon cells. The city retained RV Anderson as the lead engineering group for the project. Throughout 2011, Bishop Water Technologies worked closely with both RV Anderson and the city of London to develop a methodology and design for the installation that would allow the units to operate as effectively as possible.

Permanent Installation

Construction of a permanent installation began in the fall of 2011. Dewatering cells were

constructed of concrete in order to accommodate the required units. Jersey barriers are used to segregate the cells, with each of the cells sloping slightly to a filtrate collection basin. The dewatering cells originally were constructed to accommodate seven units measuring 75 ft in circumference by 55 ft long; however, to allow for increased capacity, it is anticipated that units 80 ft in circumference by 55 ft long eventually will be used in place of the 75-ft-circumference units currently deployed.

Exceeding Expectations

The performance of the units to date have exceeded the expectations. The simplicity of the technology allows the operators at the Greenway Pollution Control Plant to monitor the installation and operate key components of the facility remotely, meaning no additional personnel are required to operate the installation and minimal man-hours are required by existing staff.

Filtrate produced through the dewatering process is transferred to a lift station and then pumped back into the treatment process at the Greenway Pollution Control Plant for further treatment prior to discharge.

The plant was designed to provide the city with maximum onsite storage capacity. London intends to reuse the dewatered material as an aggregate for concrete, keeping the material out of the city's landfill site.

This facility not only is considered to be a major success by the city of London; the ash management system also was awarded the 2012 Technical Innovation Award by the Ontario Public Works Assn. and the American Public Works Assn. Technical Innovation Award for 2013.

How It Works

Dewatering with Geotube technology is a three-step process.

1. In the confinement stage, the container is filled with dredged waste materials. The container's fabric confines the fine grains of the material.
2. In the dewatering phase, excess water simply drains from the container. The decanted water often is of a quality that can be reused or returned for processing or to native waterways without additional treatment.
3. In the final phase—consolidation—the solids continue to densify due to desiccation as residual water vapor escapes through the fabric. Volume reduction can be as high as 90%. www

Kevin Bossy is CEO of Bishop Water. Bossy can be reached at kevin@bishopwater.ca or 613.628.5266.

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Dewatering the ash slurry at the Greenway Pollution Control Plant in London, Ontario, Canada