



WEAO: The 5th Residuals and Biosolids Conference

The Geotube Technology

Bonnechere Valley Townships Choice for Septage and Biosolids Management

Presented By Matthew Green



Bishop Water Technologies

Tuesday, September 15



Bonnechere Valley Township

- Rural Township, located in Renfrew County
- Contains approx. 2,230 homes, over 600 of which use septic tanks
- The Township has owns and operates a biosolids and septage management facility which utilizes Geotube technology

What is Geotube[®] Dewatering Technology?



- Geotube[®] units are constructed of a specially-engineered textile designed for dewatering.
- High flow rate allows residual materials to dewater, while containing solids.

How Geotube[®] Dewatering Technology Works



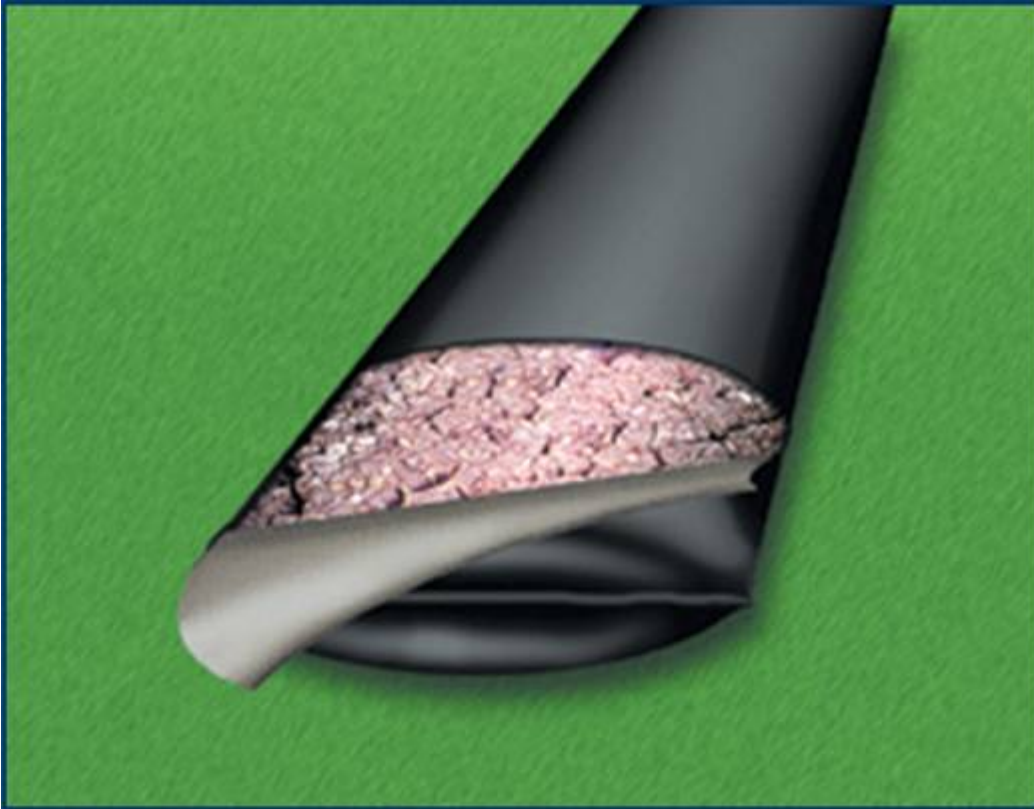
The Geotube[®] unit is pumped with sludge material.

How Geotube[®] Dewatering Technology Works



As the liquid escapes from the tube, solid particles are trapped inside. The pumping process is repeated until the tube is full.

How Geotube[®] Dewatering Technology Works



Eventually, the solids can be handled as dry material, increasing options for transportation and disposal.

Geotube[®] Benefits



- Effective dewatering and high volume containment
- Low capital/operating cost
- No complicated mechanics
- Simple to operate

Bonnechere Valley Township

Geotube Pilot Project



During 2005 a pilot project took place at the Eganville STP to assess the Geotube technology

Bonnechere Valley Township

Geotube Pilot Project



Geotube designed to fit in a roll off box processed over 20,000 gallons of raw septage

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Geotube Pilot Project



Filtrate was collected...



And pumped to the head works of the STP.

Bonnechere Valley Township

Geotube Pilot Project



Filled Geotube unit transported to farmers field for storage



Bonnechere Valley Township

Geotube Pilot Project: Filtrate Results

Parameter mg/l	Raw Septage	Geotube Filtrate	% Reduction
BOD	4482	671	85 %
COD	14228	4500	68 %
TSS	8672	158	98 %
TKN	475	167	64 %
TP	119	18	84 %
E-coli	37000	22960	38 %

Bonnechere Valley Township

Geotube Pilot Project: Dewatered Septage Analysis of Metals

Metals mg/kg	Dewatered Septage Solids	MOE Biosolids Limits
Arsenic (As)	1.3	170
Cadmium (Cd)	0.5	34
Cobalt (Co)	1	340
Chromium (Cr)	3.5	2800
Copper (Cu)	143	1700
Lead (Pb)	6.5	1100
Mercury (Hg)	0.67	11
Molybdenum (Mo)	2.4	94
Nickel (Ni)	3.5	420
Selenium (Se)	7.5	34
Zinc (Zn)	219	4200

Dewatered septage solids easily meet the MOE Biosolids Limits for all metal parameters.

Bonnechere Valley Township

Basic Components

- Septage/Biosolids Receiving Area
- Sludge Storage Tank
- Process Control building
- Dewatering Pads/Filtrate Storage Tank
- Winter Operations Processing Building (Greenhouse)

Septage/Biosolids Receiving Area and Sludge Storage Tank



Septage is received from local haulers and is unloaded by gravity into a 10,000 gallon holding tank.

Septage/Biosolids Receiving Area and Sludge Storage Tank



Sludge from the Wastewater Treatment Plant is pumped from the plant's digester into the 10,000 gallon underground holding tank.

Process Control Building



- Pump Controls
- Polymer and Polymer Equipment
- Odour Control System
- Mixing Chamber



Drainage Pads/Storage tank



- 3 pads measuring 30' x 50'
- Each pad designed for 2 units
- Filtrate directed to a flows a trough and directed by gravity to an underground 10,000 gal filtrate storage tank.

Winter Operations Building



- Greenhouse structure
- Covers one dewatering pad/2 Geotubes
- Keeps the area above 0⁰



Processing Septage/Biosolids

- Septage and biosolids are processed separately
- Septage is re-circulated inside the holding tank
- Concentrated polymer is made down
- Polymer injection pump is set to a rate of 10-15 lpm
- Sludge is pumped from the holding tank
- Samples of flocculated sludge are collected

Bonnechere Valley Township (Eganville)



Once the Geotube[®] units have dewatered retained solid will be land applied to approved fields



Results

Dewatered Septage Analysis of Metals

	UNITS	DATE	MOE Biosolid Limits
		19-Nov-08	
Cadmium (Cd)	mg/kg	<0.5	34
Calcium (Ca)	mg/kg	2410	-
Chromium (Cr)	mg/kg	2.5	2800
Cobalt (Co)	mg/kg	<1	340
Copper (Cu)	mg/kg	62.2	1700
Lead (Pb)	mg/kg	<3	1100
Mercury (Hg)	mg/kg	<0.1	11
Molybdenum (Mo)	mg/kg	<1	94
Nickel (Ni)	mg/kg	2.5	420
Zinc (Zc)	mg/kg	130	4200

The above information was provided by Bonnechere Valley Township. Analysis performed by MOE Laboratories

Results

Dewatered Biosolid Analysis of Metals

	UNITS	DATE	MOE Biosolid Limits
		19-Nov-08	
Arsenic (As)	mg/kg	2	170
Cadmium (Cd)	mg/kg	0.6	34
Chromium (Cr)	mg/kg	14	340
Cobalt (Co)	mg/kg	2	2800
Copper (Cu)	mg/kg	407	1700
Lead (Pb)	mg/kg	24	1100
Mercury (Hg)	mg/kg	1.31	11
Molybdenum (Mo)	mg/kg	3	94
Nickel (Ni)	mg/kg	9	420
Zinc (Zc)	mg/kg	400	4200

The above information was provided by Bonnechere Valley Township. Analysis performed by MOE Laboratories

Benefits to Bonnechere Valley Township

- Odorless solution to biosolids and septage management
- Increased storage capacity eliminates winter hauling
- Gives haulers a local disposal site
- Analysis to date shows dewatered septage to be within the Ontario biosolids limits
- The opportunity to generate revenue from neighboring municipalities
- Low capital and operating costs



Thank You

Bishop Water Technologies

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