

# GeoMat™ Leaching Systems

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High performance, low profile,  
wastewater infiltration  
and reuse systems.

NSF Standard 40 Certified with 6" of Sand

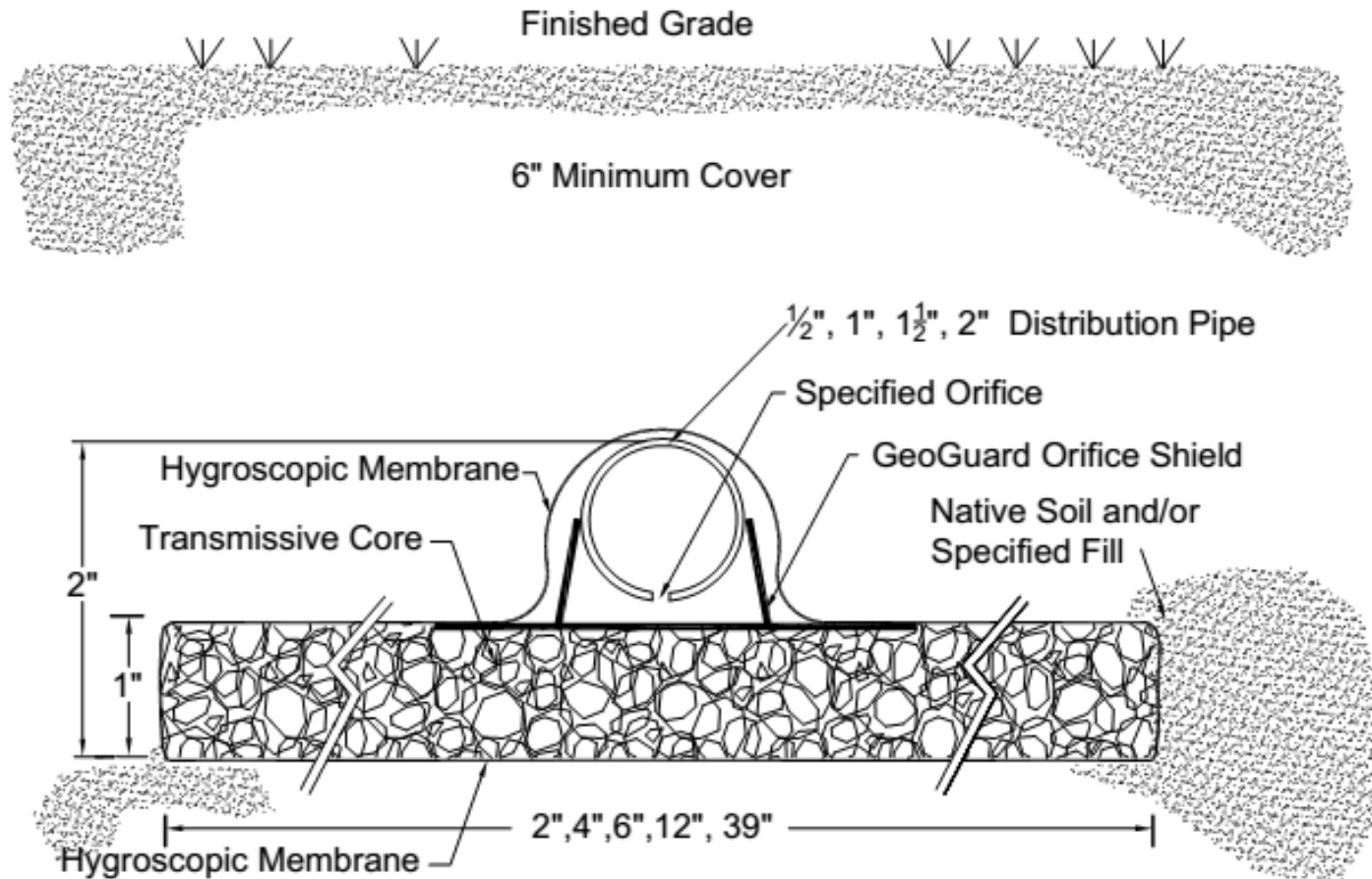


Patents: [www.geomatrixsystems.com](http://www.geomatrixsystems.com)

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# GeoMat System



GeoMat Leaching System  
Cross section – not to scale

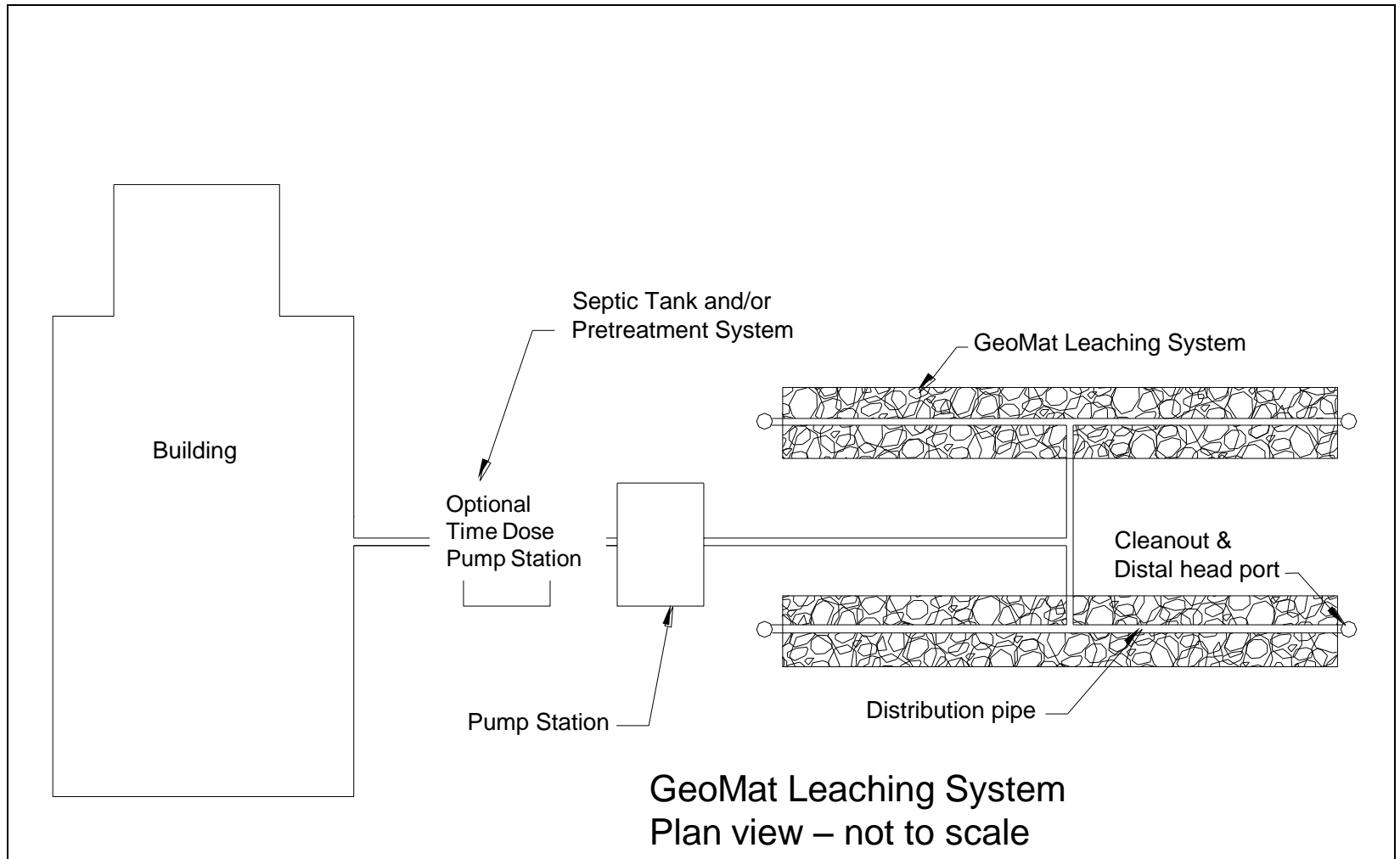
# GeoMat Systems



- Maximizes water transfer to soil & evapotranspiration
- Eliminates point loading
- Micro dosed water applied to Hygroscopic membrane
- Capillary action of soil moves water away from system
- LPD orifices serviceable
- STE and pretreated



# GeoMat System





# HyAir™ pump system and conventional pump system



HyAir system delivers micro doses with complete accuracy



Time dose pump system with filter, backwashes after every dose

# Design flexibility



Conforms to contours, bends around obstacles and provides uniform application on steep slopes.



# GeoMat variations





# Pretreated prior to GeoMat



Anne Arundel County  
May 2008





# GeoMat enhanced distribution vs. traditional drip

Uniform  
and  
even



Plant growth is ultimate evidence.



Uniform but  
uneven

# 5 years at MASSTC





# 54% annual average total nitrogen removal without factoring in evapotranspiration



BARNSTABLE COUNTY  
DEPARTMENT OF HEALTH AND THE ENVIRONMENT  
SUPERIOR COURTHOUSE  
POST OFFICE BOX 427  
BARNSTABLE, MASSACHUSETTS 02630



March 18, 2016

David Potts  
Geomatrix LLC  
114 Mill Rock Road East  
Old Saybrook, CT

Dave:

You have asked for a short report regarding the GeoMat™ as tested at the Massachusetts Alternative Septic System Test Center, and in particular the performance of the product to treat for Total Nitrogen in its installed setting.

By way of review, you will recall that the GeoMat™ product has been installed at a number of locations at the Test Center and for various purposes. This report covers the percolate from a system installed in 2011 and that was part of a study on the removal of pharmaceuticals and personal care product for further experiments in non-proprietary nitrogen removal strategies. In this configuration there is 18" of a loamy sand material beneath the GeoMat™ and all of the percolate is collected. There are six cells which drain to a common location. The hydraulic loading rate to the system is approximately 0.5 gal/sq. ft. /day. The system was continuously operated during the period noted and continues to this date.

Total nitrogen concentrations were calculated by the following means:

**Total Nitrogen (TN) = Total Kjeldahl Nitrogen(TKN) + nitrate-nitrogen + nitrite-nitrogen**

Influent nitrogen values were sometimes taken on different days. Percolate samples were taken from the common drain of the six test cells. Samples were assayed by laboratories certified by Massachusetts DEP for those assays.

Removal rate was calculated as follows:

$$1 - \text{Average Percolate TN} / \text{Average Influent TN}$$

The summary statistics are as follows:

	Influent TN	Percolate TN
Average TN (mg/L)	49.4	22.7
Std. Deviation	5.6	6.1
Observations	67	46
95% Confidence Interval	1.3	1.8
Upper CI $\alpha.05$	50.7	24.5
Lower CI $\alpha.05$	48.0	21.0
Maximum TN (mg/L)	69.1	37.3
Minimum TN (mg/L)	37.1	7.5
Geometric Mean TN (mg/L)	49.1	21.9
Removal Rate		54.0%

The removal rate does not represent the effect of any evapotranspiration which occurred and is thus a conservative measure of the reduction. The raw data table and a graphic representation of the data are presented below.

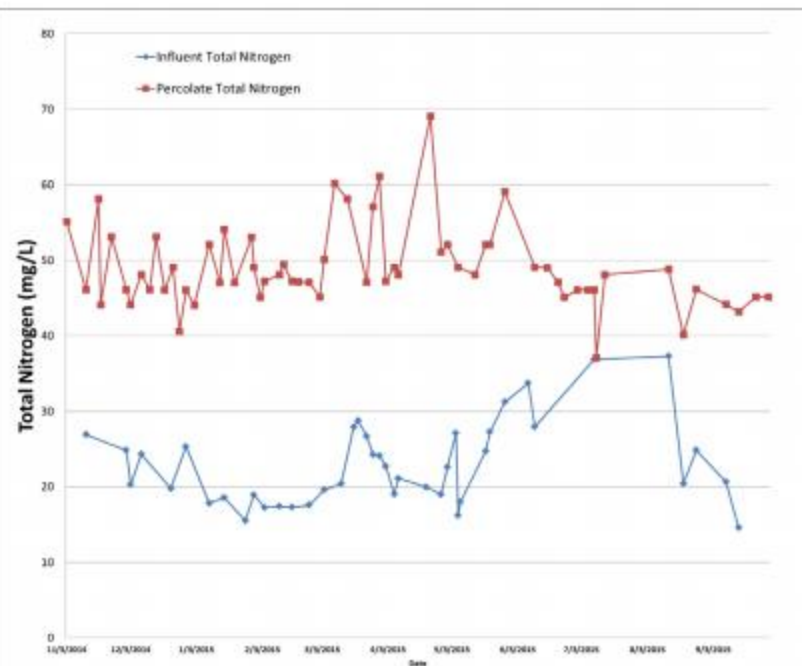
If you need any further information for comparative purposes, or if I can be of further assistance, please let me know.

Sincerely,

George Heufelder, M.S., R.S.  
Director  
Barnstable County Department of Health and Environment



# 54% annual average total nitrogen removal without factoring in evapotranspiration



Date	Influent Total Nitrogen	Date	Percolate Total Nitrogen	Date	Influent Total Nitrogen	Date	Percolate Total Nitrogen
10/3/2004	27	10/3/2004		10/3/2004		10/3/2004	
10/10/2004	25	10/10/2004		10/10/2004		10/10/2004	
10/17/2004	24	10/17/2004		10/17/2004		10/17/2004	
10/24/2004	20	10/24/2004	26.9	10/24/2004	52.1	10/24/2004	5.5
10/31/2004	24	10/31/2004		10/31/2004	52.1	10/31/2004	12.5
11/7/2004	20	11/7/2004		11/7/2004	52.1	11/7/2004	4.5
11/14/2004	25	11/14/2004		11/14/2004	52.1	11/14/2004	
11/21/2004	18	11/21/2004		11/21/2004	52.1	11/21/2004	
11/28/2004	18	11/28/2004		11/28/2004	52.1	11/28/2004	
12/5/2004	18	12/5/2004	24.8	12/5/2004	52.1	12/5/2004	26.4
12/12/2004	17	12/12/2004	25.3	12/12/2004	52.1	12/12/2004	
12/19/2004	17	12/19/2004		12/19/2004	52.1	12/19/2004	30.9
12/26/2004	17	12/26/2004	24.3	12/26/2004	52.1	12/26/2004	26.1
1/2/2005	17	1/2/2005		1/2/2005	52.1	1/2/2005	22.8
1/9/2005	17	1/9/2005		1/9/2005	52.1	1/9/2005	26.8
1/16/2005	17	1/16/2005		1/16/2005	52.1	1/16/2005	26.7
1/23/2005	17	1/23/2005	29.8	1/23/2005	52.1	1/23/2005	24.8
1/30/2005	17	1/30/2005		1/30/2005	52.1	1/30/2005	26.1
2/6/2005	20	2/6/2005	29.8	2/6/2005	52.1	2/6/2005	22.7
2/13/2005	28	2/13/2005		2/13/2005	52.1	2/13/2005	19.8
2/20/2005	24	2/20/2005	25.3	2/20/2005	52.1	2/20/2005	21.1
2/27/2005	20	2/27/2005		2/27/2005	52.1	2/27/2005	30.9
3/6/2005	33	3/6/2005	17.8	3/6/2005	52.1	3/6/2005	26.8
3/13/2005	28	3/13/2005		3/13/2005	52.1	3/13/2005	22.1
3/20/2005	37	3/20/2005	26.8	3/20/2005	52.1	3/20/2005	26.7
3/27/2005	37	3/27/2005		3/27/2005	52.1	3/27/2005	22.8
4/3/2005	28	4/3/2005	17.3	4/3/2005	52.1	4/3/2005	21.1
4/10/2005	24	4/10/2005		4/10/2005	52.1	4/10/2005	26.7
4/17/2005	33	4/17/2005	17.8	4/17/2005	52.1	4/17/2005	26.9
4/24/2005	28	4/24/2005		4/24/2005	52.1	4/24/2005	26.9
5/1/2005	37	5/1/2005		5/1/2005	52.1	5/1/2005	26.9
5/8/2005	20	5/8/2005		5/8/2005	52.1	5/8/2005	26.9
5/15/2005	24	5/15/2005		5/15/2005	52.1	5/15/2005	26.9
5/22/2005	20	5/22/2005		5/22/2005	52.1	5/22/2005	26.9
5/29/2005	15	5/29/2005		5/29/2005	52.1	5/29/2005	26.9
6/5/2005	15	6/5/2005		6/5/2005	52.1	6/5/2005	26.9
6/12/2005	15	6/12/2005		6/12/2005	52.1	6/12/2005	26.9
6/19/2005	15	6/19/2005		6/19/2005	52.1	6/19/2005	26.9
6/26/2005	15	6/26/2005		6/26/2005	52.1	6/26/2005	26.9
7/3/2005	15	7/3/2005		7/3/2005	52.1	7/3/2005	26.9
7/10/2005	15	7/10/2005		7/10/2005	52.1	7/10/2005	26.9
7/17/2005	15	7/17/2005		7/17/2005	52.1	7/17/2005	26.9
7/24/2005	15	7/24/2005		7/24/2005	52.1	7/24/2005	26.9
7/31/2005	15	7/31/2005		7/31/2005	52.1	7/31/2005	26.9
8/7/2005	15	8/7/2005		8/7/2005	52.1	8/7/2005	26.9
8/14/2005	15	8/14/2005		8/14/2005	52.1	8/14/2005	26.9
8/21/2005	15	8/21/2005		8/21/2005	52.1	8/21/2005	26.9
8/28/2005	15	8/28/2005		8/28/2005	52.1	8/28/2005	26.9
9/4/2005	15	9/4/2005		9/4/2005	52.1	9/4/2005	26.9
9/11/2005	15	9/11/2005		9/11/2005	52.1	9/11/2005	26.9

All grass clippings remained on test plot

# GeoMat Leaching System



- Low capital and operational costs
- Simple and fast to install
- Uniform & even application of water & nutrients
- Low mechanical complexity
- Serviceable LPD system
- Thank you for the opportunity to present