



Design, Installation and Maintenance Manual

Eco-Pure Peat Moss Biofilter • Septic and Pump Tanks



Simply Natural, Naturally Simple



January 2010
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Disclaimer

This document is intended to be a guide to designers, installers and owners of the Eco-Pure Peat Moss Biofilter system and should be used only to supplement your state and/or local regulations.

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.

All systems incorporating the Eco-Pure Peat Moss Biofilter must be designed by a state registered Professional Engineer or an approved system designer.

The Eco-Pure Peat Moss Biofilter must be installed per the manufacturer's Installation Guide, January, 2010. Only factory trained personnel may install the Eco-Pure Peat Moss Biofilter.

Routine inspection and maintenance must take place at least once per year. Maintenance must be performed per the Eco-Pure Maintenance Manual, January, 2010. Only factory trained service providers may perform maintenance.

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Introduction

The Eco-Pure Peat Moss Biofilter was developed in Fort Myers, Florida in 1998 for use on the environmentally sensitive Sanibel-Captiva Islands. The system was designed based on the research conducted by Joan Brooks, PhD at the University of Maine during the 1980's and 1990's.

Throughout her professional career, Dr. Brooks dedicated herself to study the use of sphagnum peat moss as a wastewater treatment media. In addition, Dr. Brooks researched the influence of fungi in the wastewater treatment process.



In her paper Pollution Abatement with Peat Onsite Wastewater Treatment Systems, Dr. Brooks concludes:

“On adverse sites, where the use of conventional subsurface soil adsorption systems does not provide acceptable levels of treatment, sphagnum peat moss may be used as an economical method of onsite wastewater treatment. The peat system, when properly designed and constructed, is relatively simple to install, requires minimal energy and maintenance, and provides a high quality effluent without additional disinfection”.

The benefits of the Eco-Pure Peat Moss Biofilter are:

- The Eco-Pure Peat Moss Biofilter can cost 30% - 40% less than other advanced secondary treatment systems
- No moving parts in the wastewater treatment process
- The system was designed to be completely passive; no electricity needed
- Ease of Installation
- Low Cost of Operation
- Low Cost of Maintenance
- Ease of Maintenance
- Can discharge into the following:
 - Pad / mound system
 - Gravity leach field
 - Pressure dosed leach field
 - Drip Irrigation System
 - Surface or water body (if allowed, check local regulations)
- Low profile, great for high water table
- The lowest operating and maintenance costs of any system available
 - No Electricity Needed for System
 - No Costly Blowers to Replace
 - No Sludge Build Up to Deal With
 - No Dosing Pumps Needed



Virgin Sphagnum Peat Moss



Easy To Set Watertight Module



Peat Moss Pillows



Leveling the Peat Moss

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.

This document is intended to be a guide to designers, installers and owners of the Eco-Pure Peat Moss Biofilter system and should be used only to supplement your state and/or local regulations.

System Overview

The Eco-Pure Peat Moss Biofilter was developed throughout 1998-1999 by Ed Festa, a premier installation contractor on Florida's West Coast and Dr. Joan Brooks, PhD., the nations leading authority on peat moss based wastewater treatment. It was designed to provide a "user friendly" system that would provide outstanding wastewater treatment with low cost and simple installation and maintenance.



The Eco-Pure Peat Moss Biofilter was designed for extreme site conditions and to meet the most stringent performance requirements. The system utilizes a specific blend of sphagnum peat moss for the treatment of septic tank effluent. Sphagnum peat moss provides an excellent environment for naturally occurring organisms that remove contaminants and provide a very high level of wastewater treatment. The wastewater treatment occurs by a combination of physical, biological and chemical processes. Due to its unique process, The Eco-Pure Peat Moss Biofilter is patented.

The raw wastewater first enters a septic tank where pre-treatment of the wastewater occurs. Please note that a septic tank effluent filter is required for every Eco-Pure system. From the septic tank, the effluent enters the Eco-Pure Peat Moss Biofilter via gravity flow or through the use of pump tank containing a small incremental horsepower effluent dosing pump, typically 1/3 to 1/2 HP.

The dimensions of the plastic module are 7 feet wide x 10 feet long x 4 feet high. Planet Care, Inc. manufactures the module at its Pulaski, Virginia, facility using the rotational molding process. Planet Care uses only the highest quality plastic resin for the module and this assures uniformity and structural integrity of the module. In addition, the plastic resin contains the highest form of protection against harmful ultra-violet (UV) light.

The wastewater enters the Eco-Pure Peat Moss Biofilter at the top of the module and is evenly distributed over the sphagnum peat moss bed through a polyethylene distribution plate, placed directly on top of the peat moss.

The retention time of the septic tank effluent within the sphagnum peat moss is essential to the performance of the Eco-Pure Peat Moss Biofilter. Depending on the daily influent flows, detention times can range from 8 to 24 hours.

Each module is capable of treating peak flows from a four bedroom home generating typical residential strength wastewater. Properly installed, operated and maintained, test results have shown the effluent discharged from the Eco-Pure Peat Moss Biofilter exceeds the following USEPA Advanced Secondary Wastewater Standards:

Parameter	Annual Average	Grab Sample
BOD5	= or < 10 mg/L	= or < 20 mg/L
Total Suspended Solids	= or < 10 mg/L	= or < 20 mg/L
Total Nitrogen	= or < 20 mg/L	= or < 40 mg/L
Total Phosphorus	= or < 10 mg/L	= or < 20 mg/L
Fecal Coliform Bacteria	99.99% eradication	

A predetermined amount of sphagnum peat moss is placed within the proprietary module. This amount was determined through the extensive research and development of the system and is controlled by the use of pre-packaged peat “pillows”. The pillows are mesh, polypropylene, non-degradable bags filled with sphagnum peat moss. The pillows are filled to the appropriate amount at the Planet Care manufacturing facility.

Each module contains forty one (41) pillows. Properly placed, the pillows will fit together with minimal void space. The pillows are placed in two rows, perpendicular to each other, one on top of the other. In order to fill in the voids, the placement of ten (10) bales of loose peat moss is required. The peat moss pillows and bags are placed on a pallet and shrink wrapped for easy shipment and transport. One module contains one pallet of peat.



The treated effluent is collected at the bottom of the module in the pre-installed 4” diameter collection pipe. This 4” pipe sits in the channels manufactured in each module. The treated effluent is discharged at the bottom of the module.

The 4” pipe also serves as a vent pipe for the Eco-Pure Peat Moss Biofilter and is very important to the performance of the system. The vent pipe runs to the top of the module and is connected to the vents located on each side of the cover.

The cover cannot be buried to allow for air movement throughout the peat moss bed. Many of the organisms responsible for treating the wastewater cannot exist in an anaerobic environment, therefore blocking the air vent can be detrimental to the system.

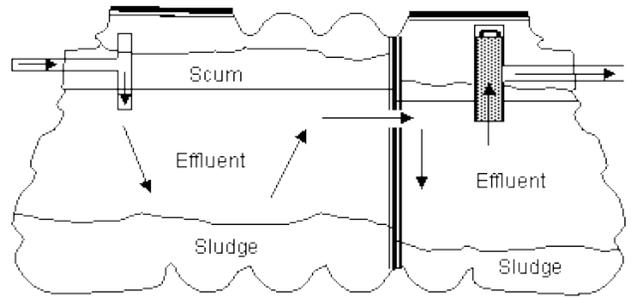


System Components

Septic Tank

The septic tank is a watertight box with an inlet and outlet pipe. Wastewater flows from the home to the septic tank through the sewer pipe.

The septic tank treats the wastewater naturally by holding it in the tank long enough for solids and liquids to separate. The wastewater forms three layers inside the tank. Solids lighter than water (such as greases and oils) float to the top forming a layer of scum. Solids heavier than water settle at the bottom of the tank forming a layer of sludge. This leaves a middle layer of partially clarified wastewater.



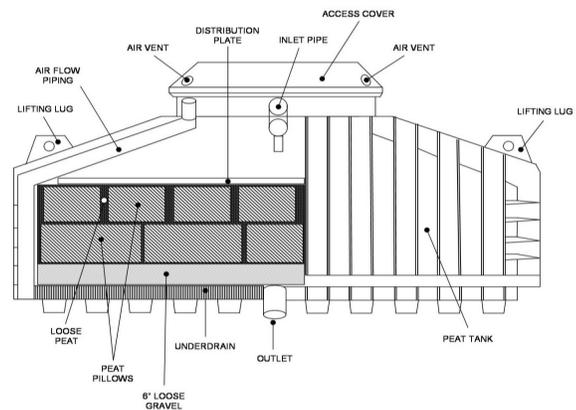
The layers of sludge and scum remain in the septic tank where bacteria found naturally in the wastewater work to break the solids down. The sludge and scum that cannot be broken down are retained in the tank until the tank is pumped. The layer of clarified liquid flows from the septic tank to the Eco-Pure Peat Moss Biofilter.

Some regions allow the installation of mid-seam pre-cast concrete septic tanks. When using such tank with an Eco-Pure system the following must be adhered to:

- Planet Care, Inc. requires that an extruded Butyl adhesive tape, six-inches (6") wide be placed around the exterior seam of all mid-seamed pre-cast concrete septic tanks.
- Planet Care, Inc. requires that a one-inch (1") diameter, all weather preformed sealant made of butyl rubber material in flexible rope form be placed in the seam of all mid-seamed pre-cast concrete septic tanks.

Eco-Pure Peat Moss Biofilter

The Eco-Pure Peat Moss Biofilter is an wastewater treatment system that utilizes a specially blended sphagnum peat moss for the treatment of septic tank effluent. Sphagnum peat moss provides an excellent environment for naturally occurring organisms that provide a high level of wastewater treatment. The treatment occurs by a combination of physical, biological and chemical processes. Due to its unique process, The Eco-Pure Peat Moss Biofilter is patented.



From the septic tank, the effluent enters the Eco-Pure Peat Moss Biofilter either by gravity or through the use of pump tank containing a small incremental horsepower effluent dosing pump.

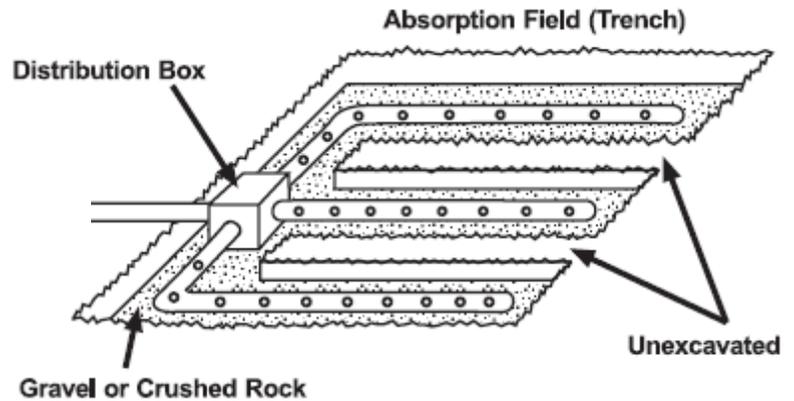
The dimensions of the polyethylene module are 7 feet wide x 10 feet long x 4 feet high. Each module is capable of treating peak flows of up to 650 gallons of wastewater per day from a four bedroom home.

The wastewater enters the Eco-Pure Peat Moss Biofilter at the top of the module and is evenly distributed over the sphagnum peat moss bed through a polyethylene distribution plate, placed directly on top of the peat moss. The treated effluent is collected at the bottom of the module in a 4" diameter collection pipe. This 4" pipe sits in the channels manufactured in each module. The treated effluent is discharged at the bottom of the module to a subsurface leach field.

System Components continued

Sub-Surface Absorption Field

Subsurface leach field systems are the most commonly used systems for the treatment and dispersal of onsite wastewater. Infiltrative surfaces are located in permeable, unsaturated natural soil or imported fill material so wastewater can infiltrate and percolate through the underlying soil to the ground water. As the wastewater infiltrates and percolates through the soil, it is treated through a variety of physical, chemical, and biochemical processes and reactions.



Many different designs and configurations are used, but all incorporate soil infiltrative surfaces that are located in buried excavations. The primary infiltrative surface is the bottom of the excavation, but the sidewalls also are used for infiltration. Perforated pipe is installed to distribute the wastewater over the infiltration surface. A porous medium, typically gravel or crushed rock, is placed in the excavation below and around the distribution piping to support the pipe and spread the localized flow from the distribution pipes across the excavation cavity. Other gravel less or “aggregate-free” system components or a drip irrigation system may be substituted.

Pump Tanks (if necessary)

Although the Eco-Pure Peat Moss Biofilter was designed to allow for gravity flow due to site conditions and/or design requirements, pumps may be needed to transport the septic tank effluent to the Eco-Pure Peat Moss Biofilter and from the Eco-Pure Peat Moss Biofilter to the absorption field.

A pumping system is required if a drip irrigation system is being used to dispose of the treated effluent.

Please consult with Planet Care for details.



Eco-Pure 600 Gallon Pump Tank

Sphagnum Peat Moss Media

Throughout her professional career, Dr. Brooks dedicated herself to study the use of sphagnum peat moss as a wastewater treatment media. In addition, Dr. Brooks researched the influence of fungus on the process of wastewater treatment.

In her paper Pollution Abatement with Peat Onsite Wastewater Treatment Systems, Dr. Brooks concludes:

“On adverse sites, where the use of conventional subsurface soil adsorption systems does not provide acceptable levels of treatment, sphagnum peat moss may be used as an economical method of onsite wastewater treatment. The peat system, when properly designed and constructed, is relatively simple to install, requires minimal energy and maintenance, and provides a high quality effluent without additional disinfection”.



Peat Moss Bog

Disinfection capabilities may be the most beneficial aspect in using sphagnum peat moss as a wastewater treatment media. Throughout her research Dr. Brooks has identified dozens of species of fungi existing in sphagnum peat moss. Most notably recurring was the recovery of the penicillium fungus. Penicillium is the pre-cursor of the penicillin anti-biotic.

Throughout her research career utilizing sphagnum peat moss as a treatment media, Dr. Brooks consistently documented BOD5 reductions of > 90%, Total Suspended Solids reductions of > 85% and Fecal Coliform reductions of > 99%.

The following research papers by Dr. Joan Brooks provide a better understanding of the use of sphagnum peat moss for wastewater treatment:

- Pollution Abatement with Peat Onsite Wastewater Treatment Systems, Joan L. Brooks, Ph.D., Department of Civil Engineering, University of Maine
- Fungi Isolated From the Sphagnum Peat Moss Wastewater Treatment System, Joan L. Brooks, Ph.D., Department of Civil Engineering, University of Maine, Larry M. Zibilske, Department of Soil Science, University of Maine
- The Utilization of Peat in Onsite Wastewater Disposal Systems: Interim Project Report , Joan L. Brooks, Ph.D., et.al. Department of Civil Engineering, University of Maine
- An Update on the Use of Peat Filters for On-Site Wastewater Treatment, John A. McKee, M.Sc., P.Eng. and Michael Connolly, H.B.Sc.



Harvesting Peat Moss

Scientific and Engineering Principles

In the abstract to her paper, Dr. Brook writes, “Treatment of the septic tank effluent (with sphagnum peat moss) is attributed to physical filtration, adsorption and microbiological activity”.

Sphagnum peat moss provides an excellent, balanced environment for organisms that provide outstanding treatment of septic tank effluent. The treated effluent from the Eco-Pure Peat Moss Biofilter is recognized as meeting the Advanced Secondary Effluent Standard. As noted above, treatment occurs by a combination of physical, biological and chemical processes.



Filtration of Septic Tank Effluent

The physical structure of the moderately decomposed peat moss (von Post 2-4) could account for physical filtration of septic tank effluent (Brooks, 1998). This will account for the low total suspended solids (TSS) in the effluent from the Eco-Pure Peat Moss Biofilter.

Sphagnum Peat Moss pH

The initial pH of the peat moss used in the Eco-Pure Peat Moss Biofilter can be below 4.0, which is acidic. Bacteria contained in septic tank effluent cannot exist in this acidic environment.

In the book Wastewater Engineering, Treatment and Reuse, Fourth Edition, 2003, Metcalf & Eddy, it is written, “The concentration range suitable for the existence of most biological life is quite narrow and critical (typically 6 to 9)”.

In addition, in his book, Evapotranspiration, Nutrient Uptake, Soil Infiltration of Effluent Water, 1985, Dr. Alfred Bernhart, P.E., writes, “Acidity in domestic effluent water, such as pH 6.5 (or lower) is detrimental for microbial activity”.

In a septic tank wastewater tends to be alkaline, and becomes increasingly so as the bacterial enzymes dominate amino acids forming ammonia. (Brooks, 1998)

The pH of the Eco-Pure Peat Moss Biofilter effluent ranges from 6.25 to 6.75. In the book Wastewater Engineering, Treatment and Reuse, Fourth Edition, 2003, Metcalf & Eddy, it is written, “For treated effluents discharged to the environment the allowable pH range usually varies from 6.5 to 8.5”.

Fungi

Fungi play a crucial role in the Eco-Pure Peat Moss Biofilter. Throughout her research Dr. Brooks’ identified the penicillium as one of the most prominently occurring fungi in sphagnum peat moss. Penicillium fungi is the source for penicillin, the first antibiotic.

Discovered by Alexander Fleming a Scottish born microbiologist in 1928, the name Penicillium comes from the resemblance of the fungus to a paintbrush (penicillus is the Latin word for paintbrush). Penicillin works against bacteria, by disrupting bacterial cell wall synthesis. Penicillium fungi produce substances that are toxic to bacteria, causes them to burst (cell lysis).



Penicillium Fungi

The cool, aerobic, acidic environment of the peat system may favor the growth of fungi over that of bacteria. Dr. Brooks found the ratio of fungi to bacterial activity in sphagnum peat to be, 8 to 1 in winter months and 6 to 2.5 in summer months.

In the 1984 paper for the Journal of Environmental Health entitled, Use of Peat for On-site Wastewater Treatment: II. Field Studies, Dr. Brooks, et al. found a 99.999% reduction of indicator organisms was achieved without additional disinfection in field studies.

The fungi present in the sphagnum peat moss are ubiquitous in nature and neither their population levels nor their presence are unique to the peat wastewater treatment system (Brooks, 1988).

Denitrification Capabilities

Nitrosomonas bacteria and Nitrobacter bacteria responsible for nitrification-denitrification reactions may not be present in peat environments. If they are present they may be inert.

Research shows reduction of nitrogen in peat moss due to extensive synthesis of fungal mycelia, the vegetative part (body) of the fungus (S.E. Waksman and E.R. Purvis, The Microbiological Population of Peat, Soil Science 34, no. 2 (1932).

In literature cited by Dr. Brooks, Chemical Activities of Fungi, (New York Academic Press, 1949), J.W. Foster, states that all naturally occurring forms of nitrogen can be utilized by various fungi. In addition, V.W. Cochrane, writes, Organic and inorganic forms of nitrogen were taken up rapidly during the growth phase of fungi; Physiology of Fungi, (New York John Wiley & Sons, 1958).

Dr. Brooks concludes that all fungi present in sphagnum utilize all forms of nitrogen contained in septic tank effluent: organic nitrogen, 90-95% reduction, ammonia nitrogen, 95-99% reduction, and nitrate nitrogen.

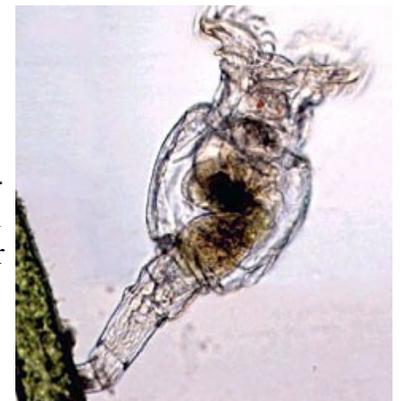
Dr. Brook's research states that Aureobasidium pullulans fungi, frequently recovered from peat bogs, can utilize both ammonium-N and nitrate-N and adapts readily to low temperatures. Botrytis can grow on a wide range of nitrogen sources and produces an antibacterial metabolite. Trichoderma polysporium, a widely distributed soil fungus, utilizes amino-N followed by ammonium, urea and nitrate. Cladosporium fungi, can utilize nitrites and nitrates as nitrogen sources and vegetative growth can occur at temperatures as low as -10° c.

Rotifera

Dr. Brooks states that there are the existence of rotifera within the sphagnum peat moss treatment system.

Rotifera are the lowest forms of multi-cell animals. They range in size from 0.5 - 1 millimeter long. They attach to soil particles with their two-toed foot and catch their food by the fast sucking, rotating movements of the small hairs around their mouths.

Rotifera feed on bacteria and each can eat 5 million bacteria per day. They can survive if only a few bacteria are present, feeding on solid particles, such as fats (Bernhart, 1985).



Dr. Bernhart writes that rotifera need free dissolved oxygen, for vigorous activity 3 mg/l or more, they can sluggishly get by with 1.5 mg/l. Aerobic conditions are needed for reproduction. This aerobic environment is provided by passive air movement through the Eco-Pure Peat Moss Biofilter.

Nematoda

Excessive growth of fungi within sphagnum peat moss is controlled by the existence of Nematoda; the most numerous multi-cellular animals on earth. Dr. Bernhart provides a detailed discussion of Nematoda in the aforementioned book.

Nematoda are small non-segmented round worms, 2-3 millimeter long and 0.1 to 0.2 millimeter in diameter. They exist only in the presence of free oxygen, high dissolved oxygen (DO) and fully aerobic conditions (D.O. > 3.0 mg/L) are needed for reproduction. Nematoda multiply sexually, and only if they can attach themselves to some large particle, such as sand (or peat) grains. They do not reproduce if suspended in water, thus the hydraulic loading of the Eco-Pure Peat Moss Biofilter is critical for performance. Each nematode eats 15 million bacteria per day and also eats inert solid material.



Enchytraeids, pot worms

Also existing in the sphagnum peat moss system are Enchytraeids or pot worms. Pot worms are very small, little white worms, 1/4" to 1" long.

Research conducted by soil scientists have shown pot worm densities of 250,000 individuals per square meter. The highest populations are found in acid soils, such as sphagnum peat moss.

Pot worms feed on bacteria and fungi. They eat dead organic matter and small feces. In addition, pot worms are predators of some nematodes. The population of enchytraeids helps keep the environment of the Eco-Pure Peat Moss Biofilter in balance. Enchytraeids do not exist in anaerobic environments.



Oligochaetes, earth worms

During her research and often cited in the literature review of her doctoral thesis, Dr. Brooks' noted the existence of oligochaetes or earth worms within sphagnum peat moss.

Earth worms can range from a few millimeters to several feet long. There are 2,700 different kinds of earth worms in existence. They are ecologically important in their roles of turning over and aerating the soil. They break down organic matter, dead plants, feces, and decaying animals. Earth worms do not exist in anaerobic conditions.

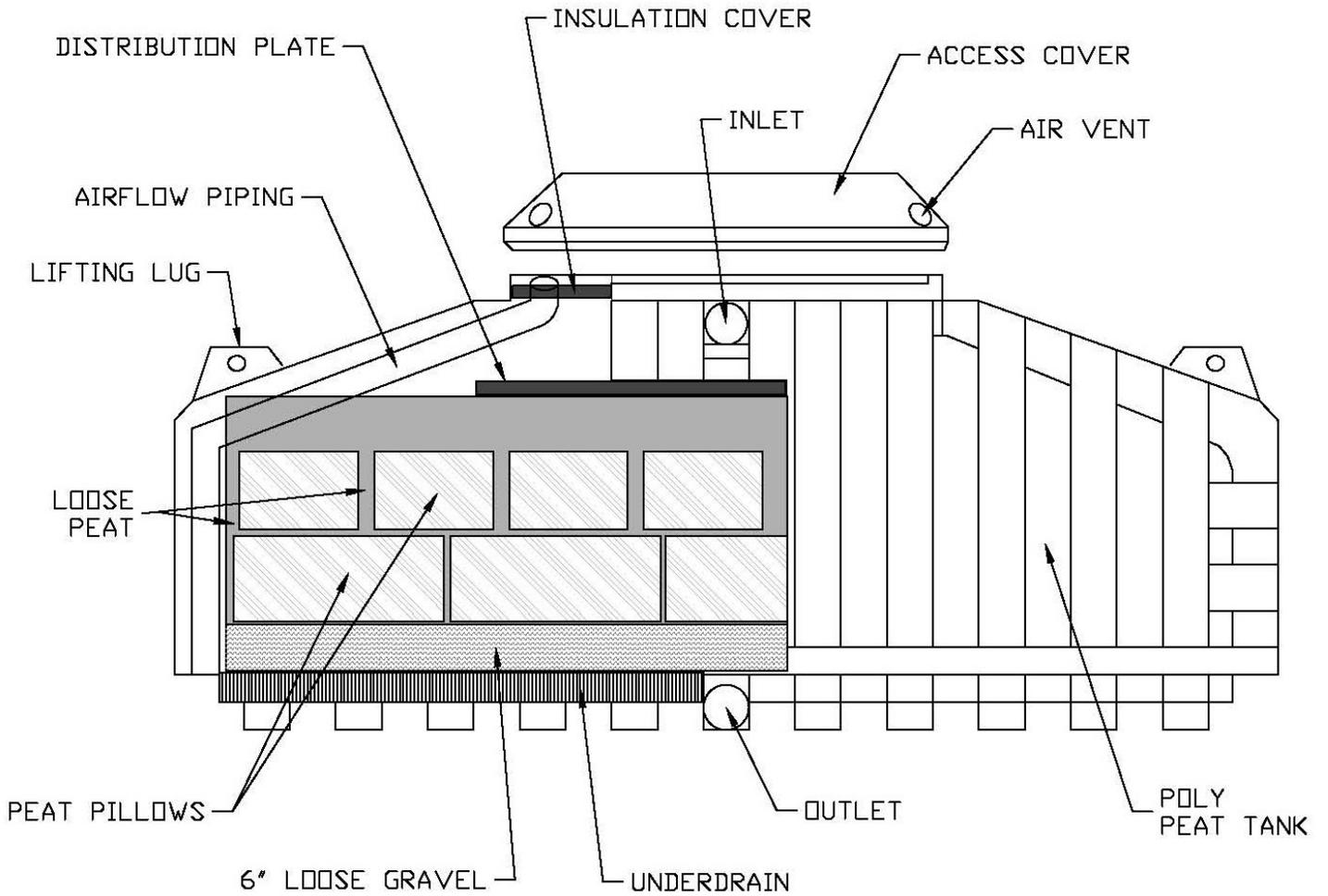


Aerobic Environment of Sphagnum Peat Moss

As mentioned repeatedly above, organisms that live in sphagnum peat moss cannot survive in anaerobic conditions. The environment within the Eco-Pure Peat Moss Biofilter is aerobic. The effluent from a septic tank that enters the Eco-Pure Peat Moss Biofilter is anaerobic. Eco-Pure test data conducted at the Massachusetts Alternative Septic System Test Center show's the dissolved oxygen level of the septic tank effluent to have an average of .11 mg/L. Due to the aerobic condition of the Eco-Pure Peat Moss Biofilter, the effluent's average dissolved oxygen is 5.12 ml/L. This prohibits the growth of anaerobes.

Research has documented that anaerobic bacteria from septic tank effluent replace the aerobic bacteria in soil pores clogging the soil with a slime layer. This limits the soil to properly treat and absorb the septic tank effluent often resulting in surface ponding and failure.

Eco-Pure Peat Moss Biofilter Cross Section Drawing



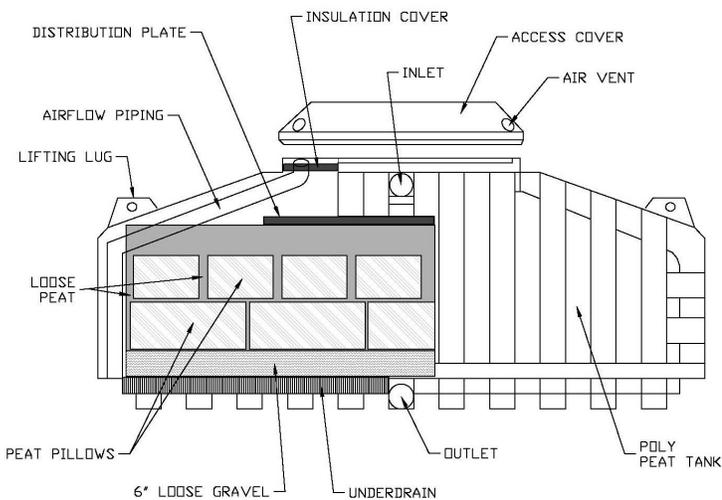
Eco-Pure Peat Biofilter Technical Information

Part Number

PBF4

Eco-Pure Peat Moss Biofilter Component Materials

- 1 - Eco-Pure module and cover
- 1 - Insulation cover (white)
- 41 - Sphagnum peat moss pillows (polypropylene bags, orange or green)
- 10 - Loose bags of sphagnum peat moss (3.8 cubic feet bags)
- 1 - Distribution plate
- 1 - 4" x 2" Inlet pipe assembly
- 1 - 4" Black corrugated discharge pipe and air vent pipe



Installation Procedures

The Eco-Pure Peat Moss Biofilter must be installed per the manufacturer's Installation Guide, January, 2010. Only factory trained personnel may install the Eco-Pure Peat Moss Biofilter.

Maintenance Procedures

Routine inspection and maintenance must take place at least once per year. Maintenance must be performed per the Eco-Pure Maintenance Manual, January, 2010. Only factory trained personnel may perform maintenance.

Dimensions		
Length	Width	Height
120"	84"	50"

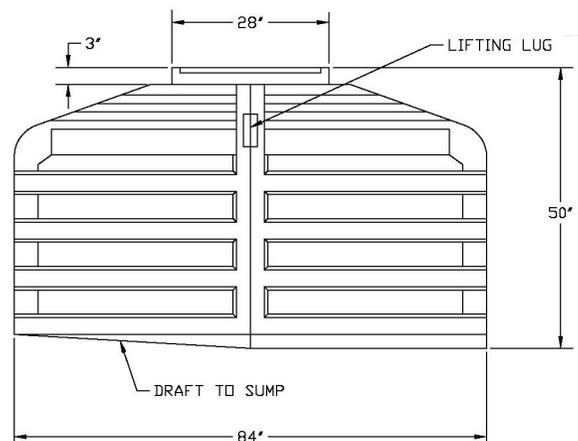
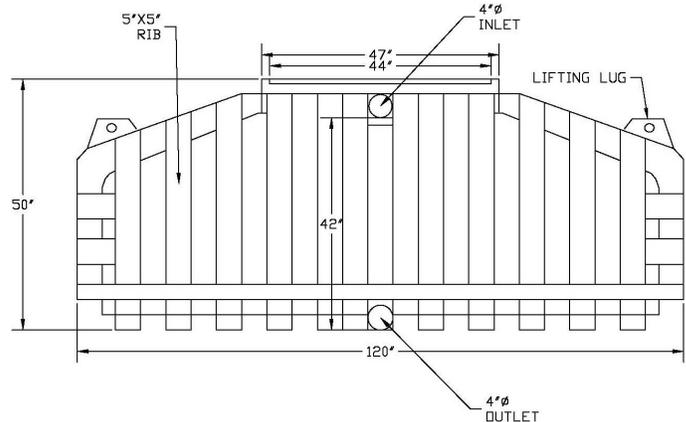
Treatment Capacity	
Parameter	Capacity
GPD ⁽¹⁾	650 maximum peak flow
BOD ₅ ⁽²⁾	240 mg/L
TSS ⁽²⁾	176 mg/L

(1) One module for up to a 4 bedroom home

(2) Wastewater described as residential strength waste

Hydraulic Loading Rates	
Gallons Per Day	GPD/ft. ² /day
300	4.29
450	6.43
650	9.29

Maximum Biochemical Loading Rates (BOD ₅ Influent = 240 mg/L)		
Gallons Per Day	lbs./BOD/Day	Lbs./BOD/ft. ² /day
300	.601	.008583
450	1.001	.012878
650	1.302	.017166



Operating Procedures and Specifications

Operating Procedures

To ensure proper performance of the Eco-Pure Peat Moss Biofilter the system must be operated in accordance with the Owner's Manual.

Eco-Pure Peat Moss Biofilter Specifications

1. Eco-Pure Module and Cover

Each Eco-Pure Peat Moss Biofilter module shall be constructed of polyethylene and manufactured using the rotational molding process. The module has been vacuum tested, water tested and certified by the Florida Department of Health as a Category 3 Tank. The empty weight is 550 lbs. The dimensions of the module shall be 120" x 84" x 50" (L x W x H). The inlet elevation is 42". The outlet is at the bottom of the module or 0". The module shall be drafted at the bottom towards the center of the module and shall contain a 4" black slotted corrugated pipe which acts as the discharge manifold and air vent. The module shall have a green cover (lid). The cover is 52" x 25" (L x W) and must be exposed for accessibility. The module must be placed on a minimum of 6" of stone.

2. Insulation Cover

The insulation cover shall be a hard backed Styrofoam sheet 24" x 43" x 2" (W x L x H). The insulation cover shall rest on top of the 1-1/2" PVC support pipes in the module man-way, below the cover / lid.

3. Sphagnum Peat Moss

Each Eco-Pure Peat Moss Biofilter shall have the following amount of proprietary sphagnum peat moss:

a. Peat Moss Pillows

The pillows shall be mesh, polypropylene, non-degradable bags filled with proprietary sphagnum peat moss. The pillows shall be filled to the appropriate amount at Planet Care's facility. Each module shall contain forty-one (41) pillows. Each pillow weighs between 35 - 40 lbs. The pillows shall be placed in two rows, perpendicular to each other, one on top of the other.

b. Peat Moss Bags

In order to fill in any potential void spaces between the pillows, each module shall contain ten (10) loose peat moss bags. Three (3) bags shall be placed, spread and leveled over the first row of peat pillows. Seven (7) bags shall be placed, spread and leveled over the top row of peat pillows. The peat moss pillows and bags are placed on a pallet and shrink wrapped. One module contains one pallet of peat.

4. Inlet Pipe

Each Eco-Pure Peat Moss Biofilter shall contain a 4" PVC inlet pipe reduced to 2", with a 90 degree fitting. The inlet pipe shall be connected to the gravity or pressure fed sewer pipe entering the Eco-Pure module using the provided rubber coupling. The bottom of the inlet pipe shall be elevated 6" above the distribution plate.

5. Distribution Plate

Each Eco-Pure Peat Moss Biofilter shall contain a distribution plate constructed of polyethylene and manufactured using the rotational molding process. The color of the distribution plate shall be white.

The dimensions of the distribution plate shall be 66-1/2" x 20-1/2" (L x W). The distribution plate rests directly on top of the leveled sphagnum peat moss.

The distribution plate shall be corrugated and shall contain thirty-nine (39), 1/2" discharge holes placed 6" apart. Thirteen (13) discharge holes are placed in each of the distribution plate's three (3) troughs.

6. Discharge Piping and Air Vent

The discharge piping and air vent shall be 4" slotted pipe placed in the sump channel located in the bottom of the module. This discharge piping shall be bedded in 1" - 2" diameter non-reactive, clean river rock. The discharge piping shall run beneath the peat bed and shall be connected at the top of the module allowing for passive movement of air throughout the entire peat bed.

Regulatory Agency Inspection Guide

All systems incorporating the Eco-Pure Peat Moss Biofilter must be designed by a state registered Professional Engineer or a state approved system designer.

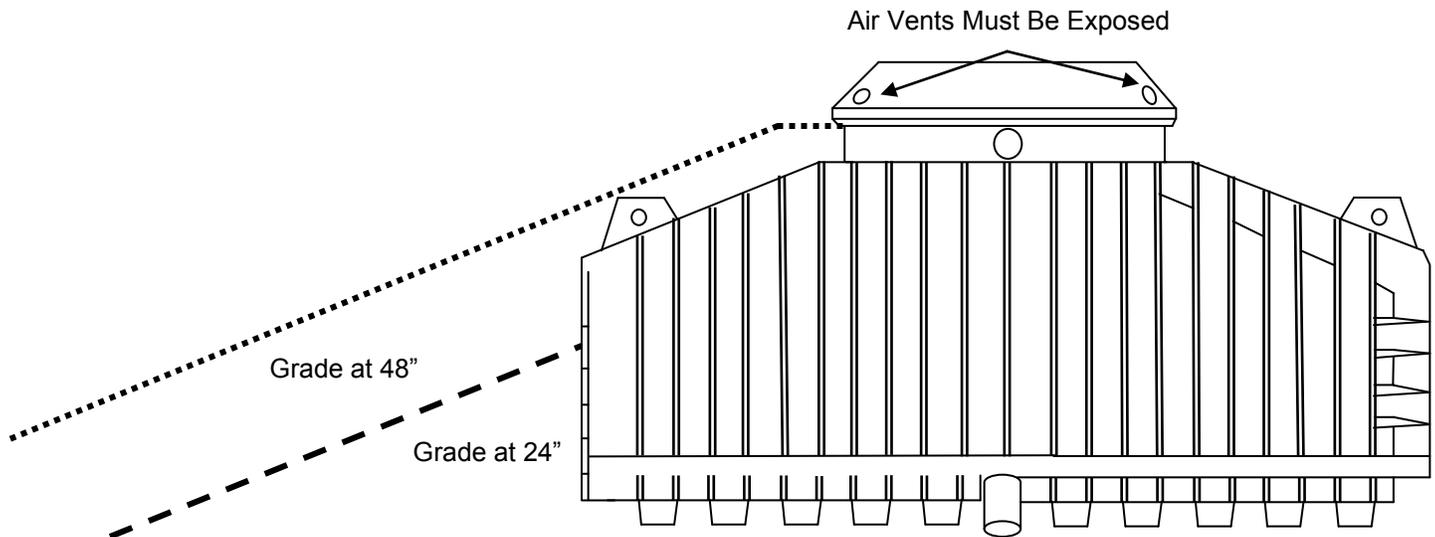
Inspection Recommendations:

1. Assure that the proper soil conditions have been met.
2. The Eco-Pure module has been installed level and has clean material (pea gravel or sand) been used to backfill the module (s). All backfill must be free of large stones.
3. No heavy equipment should be placed upon the module (s).
4. The forty-one (41) sphagnum peat moss pillows been installed properly. The top of the loose peat moss should be approximately 6" - 12" under the inlet and must be level.
5. The distribution plate placed on top of the peat moss must be level. The septic tank effluent entering the peat module should flow (wick) over the entire area of the peat moss.
6. If a dosing pump is used, make sure the flow has been restricted by a ball valve to simulate gravity flow. Each dose should consist of no more than twenty-five (25) gallons. This can be done by using a vertical float pump switch or a time dose control panel. Consult Planet Care for details.
7. If a pump is used to dose the peat filter, an air vent pipe from the peat module to the pump chamber or septic tank should be installed for the venting of gases.
8. When discharging to a subsurface leach field or a mound system directly below the Eco-Pure Peat Moss Biofilter, the distribution pipe should be PVC, perforated sewer and drain pipe set on six (6) inches of stone. This distribution pipe should surround the peat module and be covered with a permeable cloth to prevent soil intrusion.
9. The insulation cover should be placed upon the PVC reinforcement pipes in the opening of the module.
10. The 4" vent pipes must be placed towards the air vents on the modules cover to allow for air circulation.
11. The green cover must not be covered and the air vents located on each side of the cover must be exposed.

Module Backfill Details

Due to the structural integrity of the Eco-Pure Peat Moss Biofilter, the module does not need to be completely backfilled. Below are backfilling guidelines.

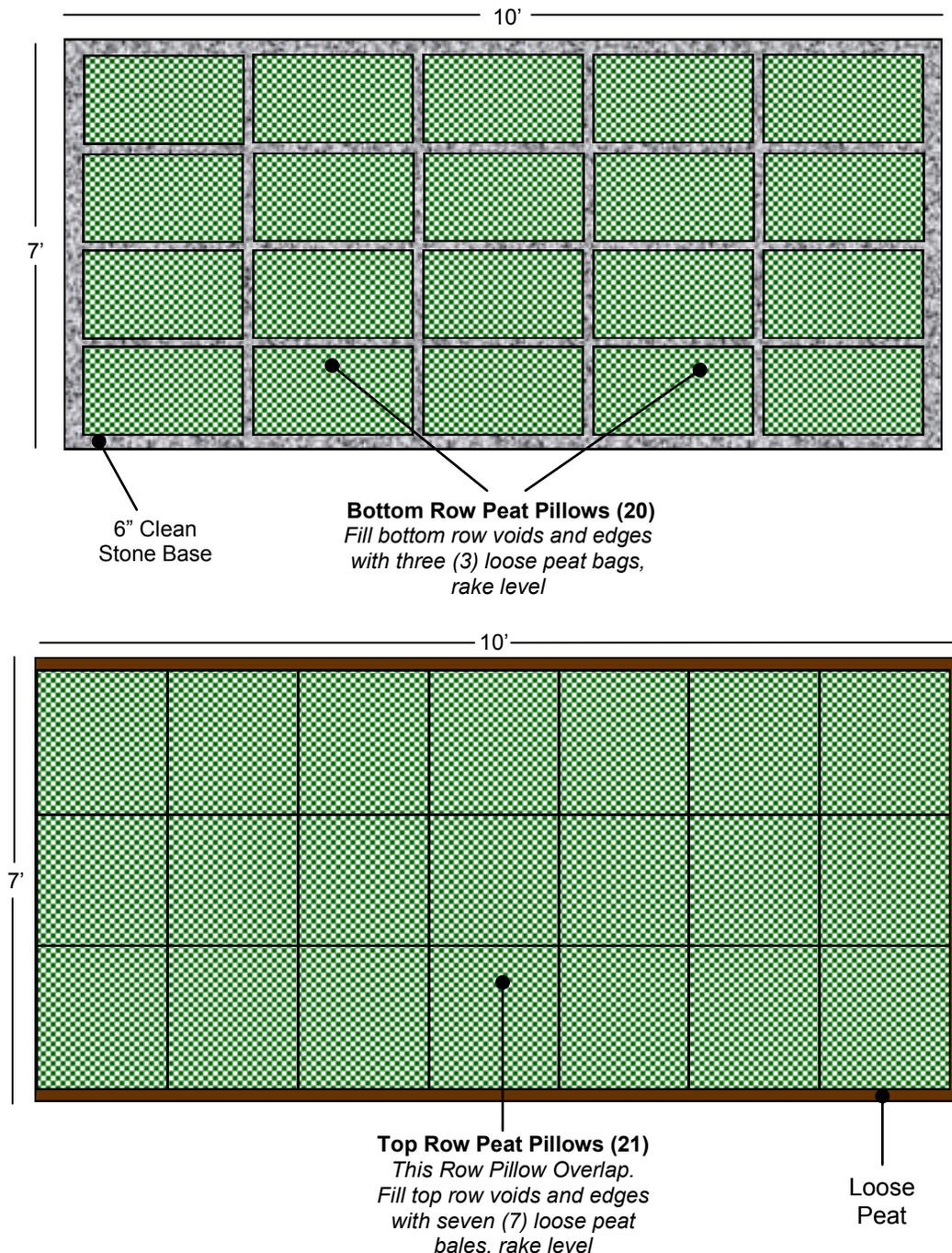
- The module may sit on native soil
 - 6" of clean sand or pea-gravel recommended for base
- The module cover (lid) must be exposed
- The module may be backfill to 24" - 48"
- Backfill grade away from module, clean backfill only, sod or seed immediately to limit erosion



Peat Moss Installation

To control the amount of sphagnum peat moss installed in each module, Planet Care utilizes pre-packaged, peat “pillows” in the Eco-Pure Peat Moss Biofilter. The pillows are mesh, polypropylene, non-degradable bags filled with sphagnum peat moss. The pillows are filled to the appropriate amount at the Planet Care facility.

Each module contains 41 pillows. Depending on the moisture content of the peat, the pillows weigh between 35 - 40 lbs. Properly placed, the pillows will fit together without any void space. The pillows are placed in two rows, perpendicular to each other, one on top of the other. In order to fill in any potential voids, the placement of ten (10) loose peat moss bales is required. The peat moss pillows and bags are placed on a pallet and shrink wrapped.



Distribution Plate Details

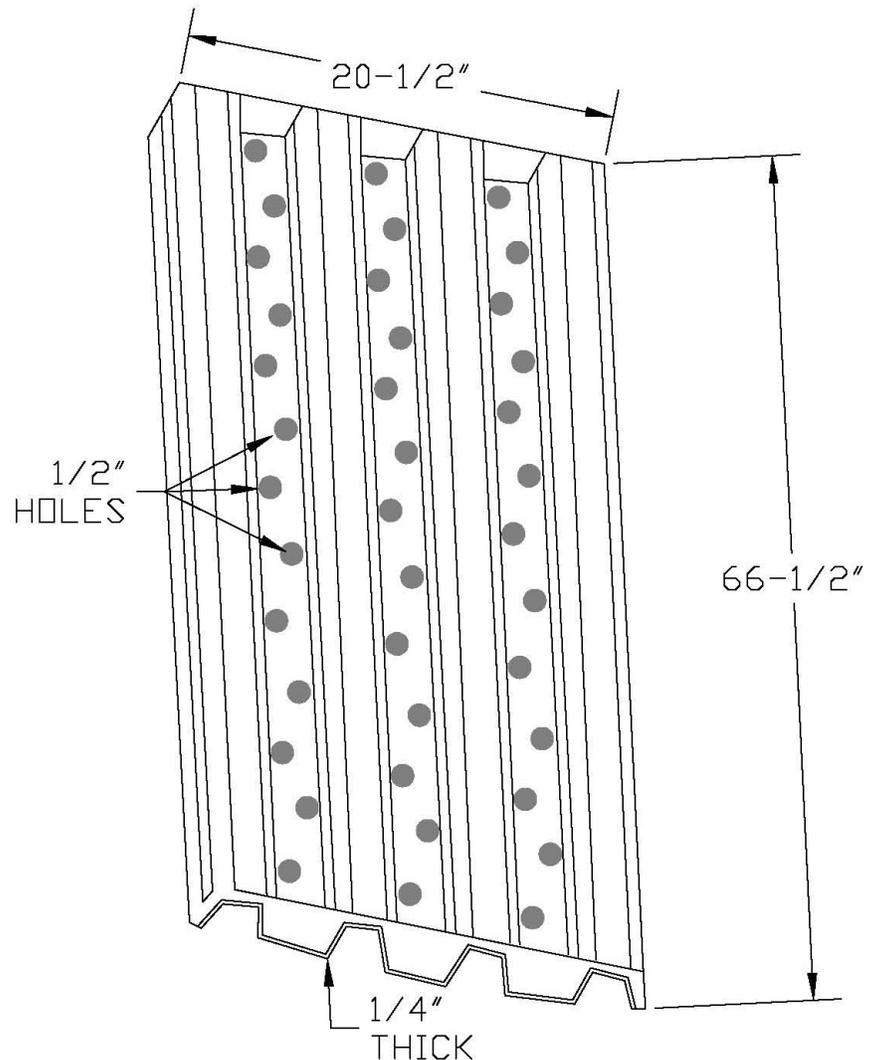
The Eco-Pure Peat Moss Biofilter utilizes an innovative technique of distributing the pretreated septic tank effluent throughout the sphagnum peat moss bed.

The septic tank effluent enters the top of the module via gravity or can be pumped using a small horsepower sump/effluent pump. (Please note that special considerations are required when using a pump to dose the system. Please refer to the Installation Manual for details.)

The pretreated effluent is evenly distributed over the entire peat bed through the distribution plate. It is critical to assure equal distribution of the pretreated effluent throughout the entire peat bed. This allows for proper retention time and therefore proper wastewater treatment.

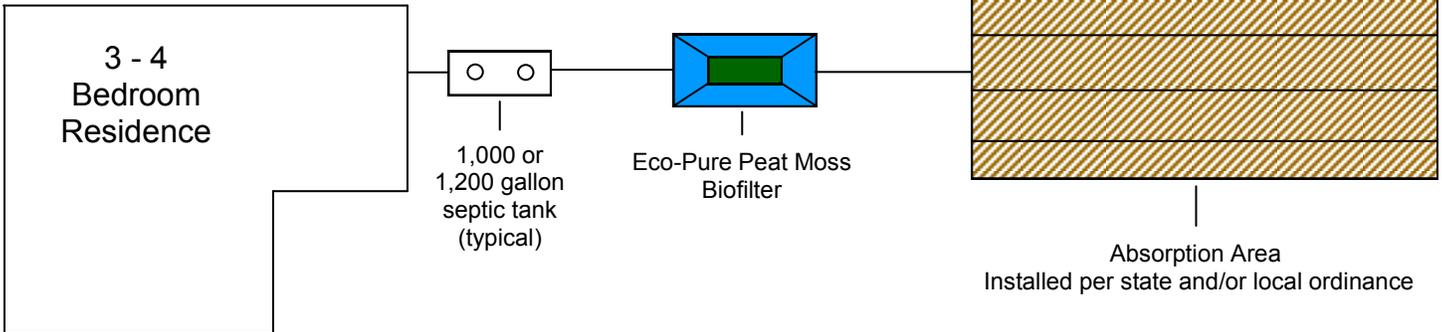
There are 39, 1/2" diameter holes located in the distribution plate located 6 inches apart. The effluent will fill the troughs equally and weep through the 1/2" holes. Also critical is the leveling of the distribution plate.

- Material - Polyethylene
- Length - 66-1/2"
- Width - 20-1/2"
- 1/4" Thick
- Discharge Hole Configuration
 - 39 - 1/2" discharge holes
 - 13 per trough
 - 6" spacing

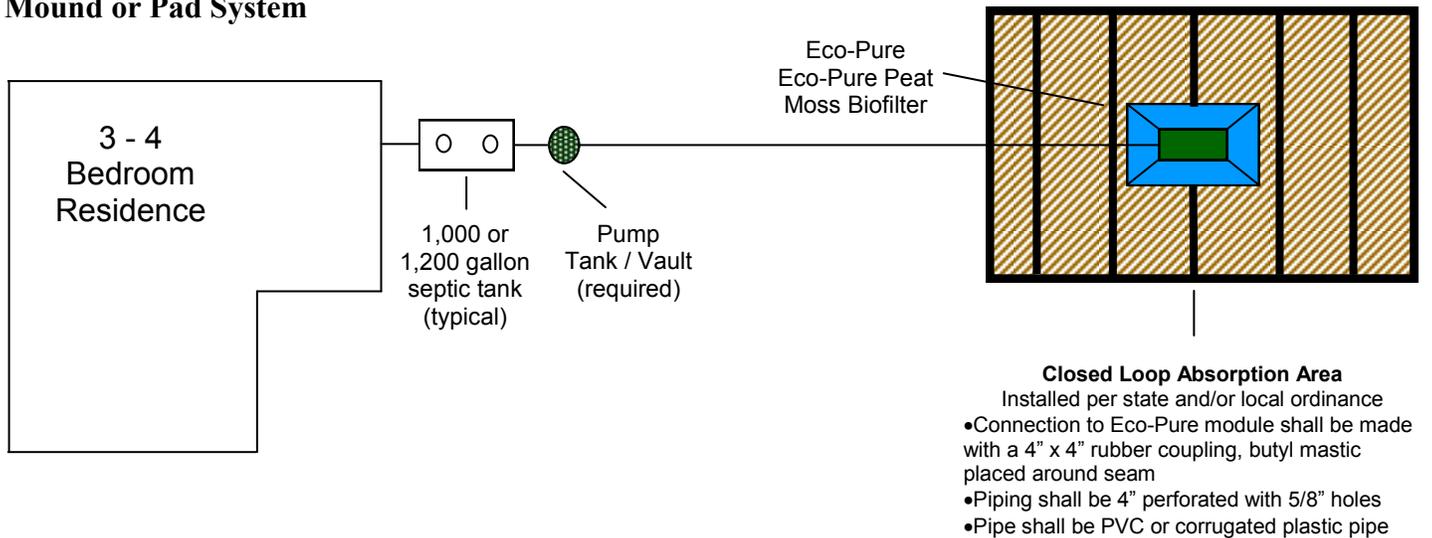


Typical System Layouts

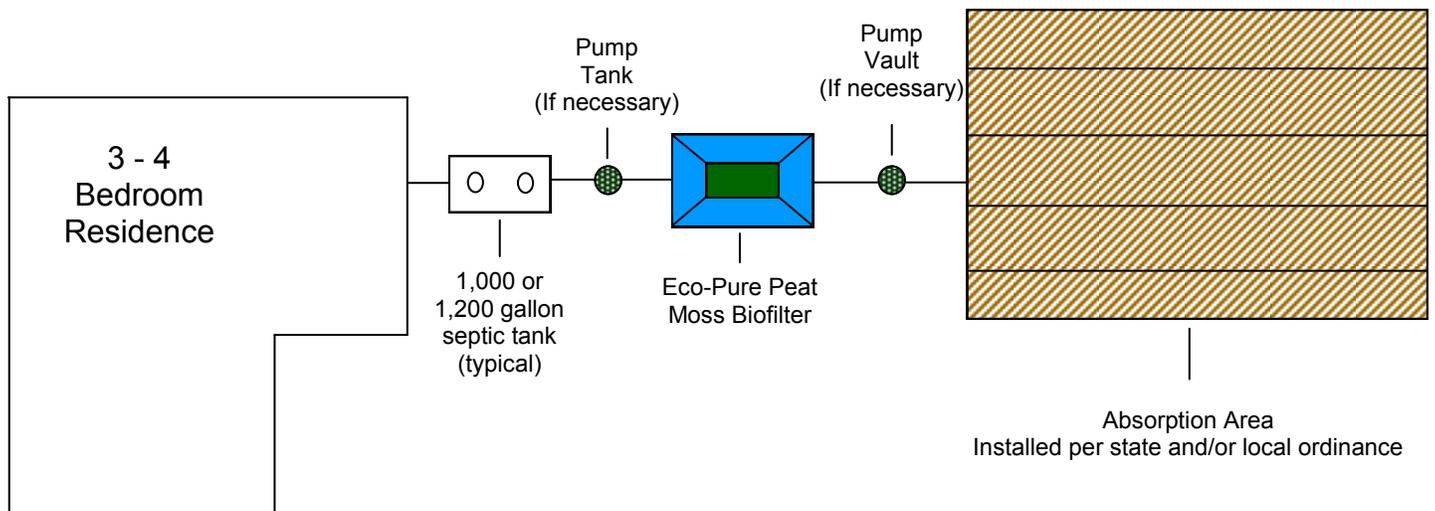
Gravity System



Mound or Pad System

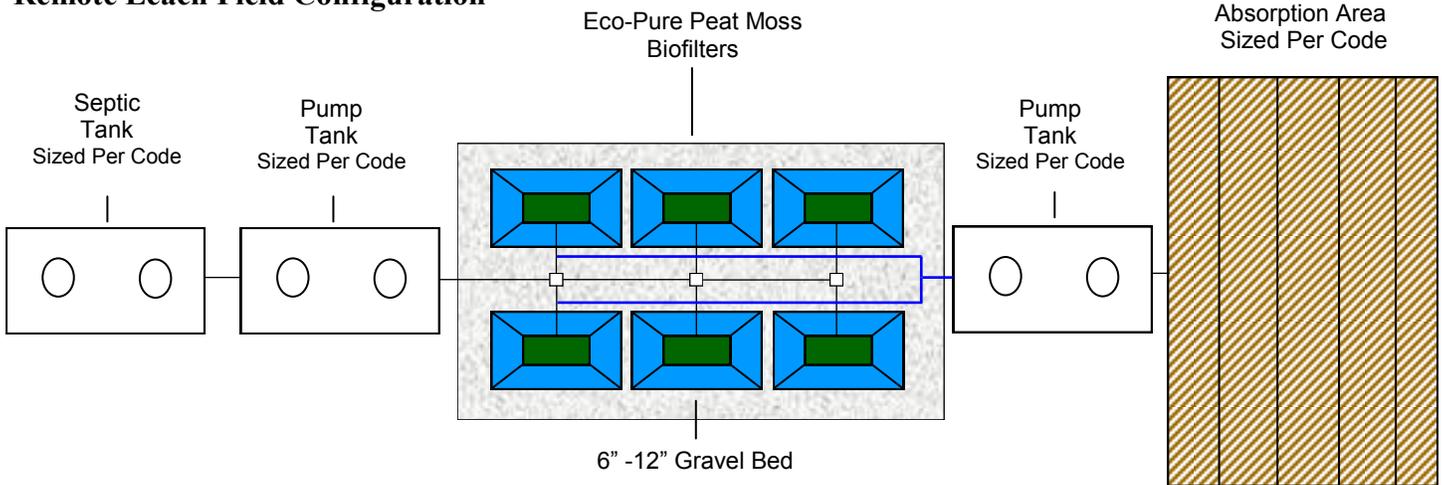


Pump Dosed System

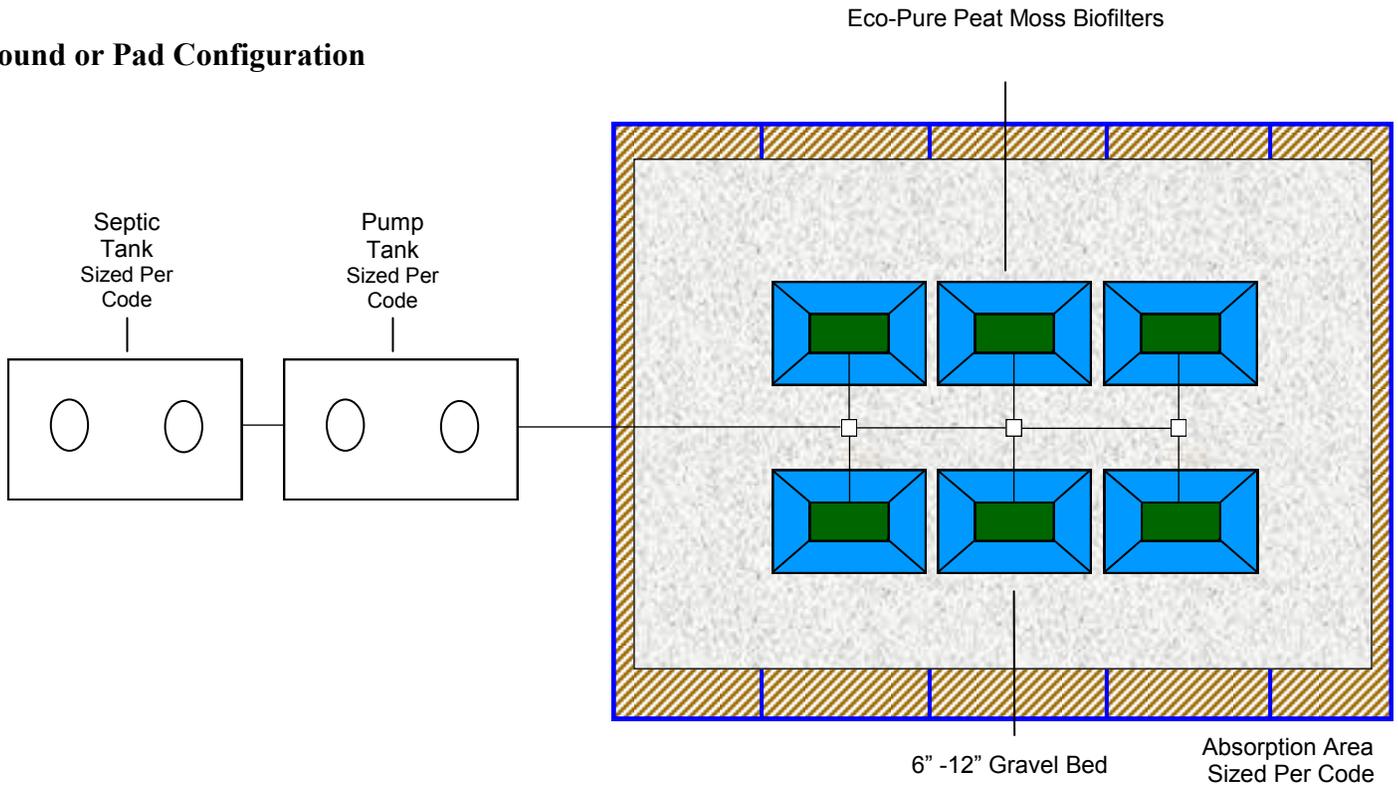


Multi Module System Layouts

Remote Leach Field Configuration



Mound or Pad Configuration



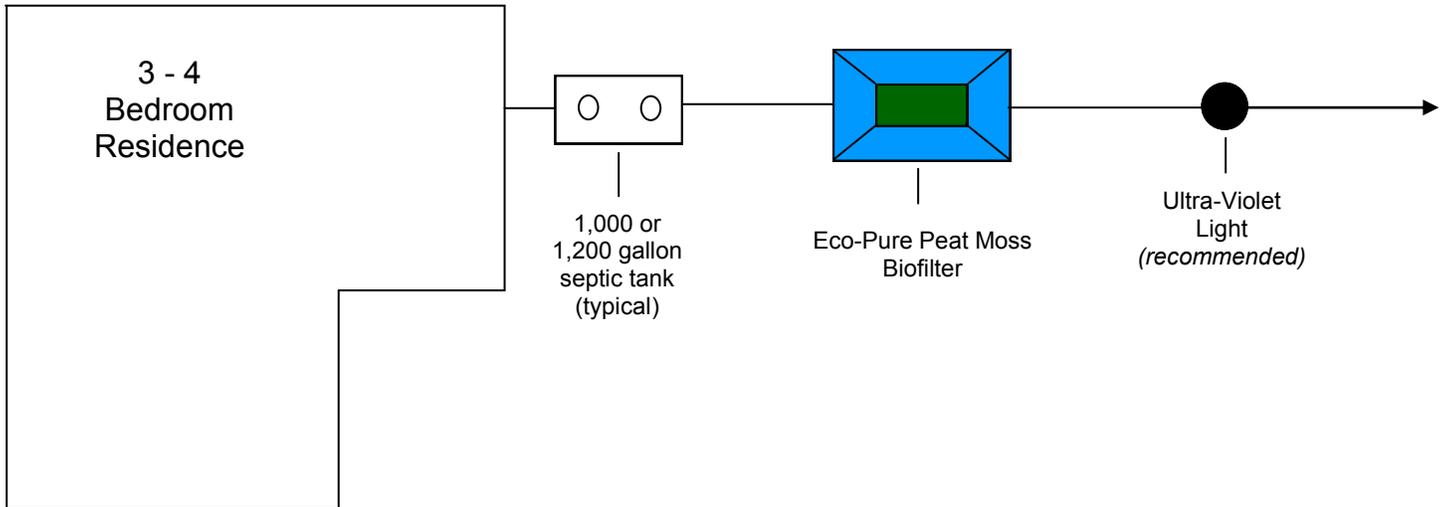
Notes:

1. Number of Eco-Pure Peat Filters will vary depending on flow rate (gpd) and biological loading rate (BOD5, TSS, FOG, COD, etc.)
2. Customized flow divider for ease of installation
3. Time dosing of Eco-Pure Peat Filters will be required
4. Time dosing of absorption area may be required depending on code

- Black Line = 2" Pressure Line
- Blue Line = 4" Gravity Discharge Line
- Custom Made Flow Equalization Manifolds

Surface Discharge System Layout

Some state and / or local regulatory agencies allow the Eco-Pure Peat Moss Biofilter effluent to discharge to ground surface. Although the Eco-Pure Peat Moss Biofilter has demonstrated to ability to kill > 99 % of fecal coliform bacteria, Planet Care recommends the use of the an ultra violet light to assure public health and safety.



Installation Guide

Eco-Pure Peat Moss Biofilter Part List

- 1 — Eco-Pure Module
- 1 — Eco-Pure module cover (green)
- 1 — Insulation cover (white)
- 41 — Peat moss pillows (green or orange bags)
- 10 — Loose bags of peat (3.8 Cubic Foot Each)
- 1 — Distribution Plate
- 1 — 2” Distribution pipe assembly
- 2 — 4” rubber couplings
- 1 — Installation Manual
- 1 — Owners Manual
- 1 — Maintenance Agreement



Items Needed For Installation

- 2 cubic yards of 1/2 - 1” clean river rock (placed inside of module)
- 8 cubic yards of clean sand (module backfill material)
- Backhoe for digging and backfilling
- Forks on loader or forklift to unload peat moss pallet
- Truck and trailer for transport of peat module and peat moss pallet
- Lifting straps with large hooks for placing Eco-Pure module
- Nut drivers
- PVC pipe saw
- PVC Cleaner and Cement
- Assortment of PVC fittings (1-1/2”, 2” and 4”)
- Septic Tank Filter
- Garden Hose
- If dosing unit:
 - effluent pump
 - ball valve
 - control panel or vertical float pump switch
 - pump vault or tank
 - 2” hole saw

When Dosing the Eco-Pure Peat Moss Biofilter

- Simulate gravity flow by installing a ball valve
 - Close ball valve approximately 3/4
- Maximum pump volume is 25 gallons per cycle event
- Installation of a 2” vent is recommended from the peat module tank to the septic tank

Eco-Pure Peat Moss Biofilter Installation Guide

1. Install septic tank allowing enough fall to the Eco-Pure module to gravity feed. Install a septic tank filter in outlet baffle.
2. Remove the contents from the Eco-Pure module. Make sure 4" drain pipe is in drain area.
3. Push back vent pipe so the 90° fittings are between the opening of the tank and the support pipes.
4. Replace the green cover to prohibit soil intrusion into the module.
5. Excavate an area approximately 10' by 12' and approximately 42" deep for the Eco-Pure module.
6. Fill excavated area with 6" - 12" clean sand.
7. Place Eco-Pure module into the center of the excavation. Lift module by the lifting rings only. Make sure module is level.
8. Cut 1" off discharge hub. Connect the supplied rubber fitting to the Eco-Pure outlet. Connect discharge piping to rubber fitting.
9. Make sure all fittings are water-tight and bed discharge piping. Eco-Pure recommends a small amount of butyl mastic around all pipe connections.
10. Backfill the Eco-Pure module with clean sand to the lifting rings, approximately 14 cubic yards.
11. Place and level 2 cubic yards of non-reactive rock into bottom of module. **Do not use reactive stone inside of module (limestone).**
12. Wash rock so that it is free of dust and fine particles. This allows for proper drainage of the module.
13. Remove peat from shipping pallet. There will be 10 peat bags (white bags) and 41 peat pillows (green or orange sacks).
14. Fluff all peat pillows by gently rolling them on the ground before placing them into module.
15. Place 20 peat pillows on bottom of module on top of stone. Start at ends of module and work towards the center of the module.
16. Make sure peat pillows are placed against walls of module. **Do not cram pillows.**
17. Place 3 (3.8 cubic foot) bags of loose peat over entire bottom row of peat pillows. Fill in all voids between peat pillows.
18. Break up any clumps. Rake loose peat level. **Pay special attention that the voids against walls of module are filled in with loose peat.**
19. Place the remaining 21 peat pillows on top of bottom row. Place pillows in the opposite direction of bottom layer.
20. Once again, start at ends of module and work toward center.
21. Place the remaining 7 (3.8 cubic foot) bags of loose peat over entire top row of peat pillows. Fill in all voids between peat pillows. **Use all 7 bags.**
22. Break up any clumps. Rake loose peat level. **Pay special attention that the voids against walls of module are filled in with loose peat.**
23. **Completely level the peat bed.** This can be done by using a 3' x 1" x 2" wood stake or a 3' x 1/2" PVC pipe used as a screed. **This is very important.**
24. Wet the peat bed thoroughly by gently spraying it with a garden hose. This prohibits the peat from "floating" upon system start-up.
25. Gently lay the distribution plate on the peat bed. Center the inlet of the manifold with the inlet of the module.
26. Level the distribution plate. **The distribution plate must be level.**
27. Install the 4" x 2" inlet pipe to Eco-Pure Module. **Test with clean water to assure even distribution.**
28. Place the insulation cover on the support pipes.
29. Place the green cover on the module. Use the 2 stainless steel screws to fasten the cover.
30. **Backfill the Eco-Pure module with clean, rock free material or clean sand. Do not leave voids in backfill.**
31. **Hand rake backfill around module only. Do not use heavy equipment near the module.**

Eco-Pure Peat Moss Biofilter Maintenance Guide

To assure years of trouble free operation and proper wastewater treatment, Planet Care requires one annual routine maintenance visit. This guide demonstrates a typical routine maintenance visit.

Items Needed To Perform Routine Maintenance

- Screw drivers / cordless drill
- Rake
- Level
- Garden Hose
- Screed to level peat (3' x 1" x 2" wood stake)
- Rubber Gloves
- Apparatus to obtain effluent sample



Note to Maintenance Entities

Be sure to fill out enclosed Maintenance Report and fax it to Planet Care at 813-643-6014. Also be sure to enter this information into the Carmody Data Systems-Eco-Pure web site.

Routine Maintenance Procedures

1. If using a dosing pump to dose the Eco-Pure Peat Filter module (s) disconnect power.
2. Remove the green cover on the module. Loosen the stainless steel screws to remove the cover. This will expose the white insulation cover.
3. The insulation cover sits upon support pipes. Remove the white insulation by carefully sliding it out of the peat module.
4. Remove the 4" x 2" PVC inlet pipe. Use screwdriver or cordless drill to loosen stainless steel snake clamp and slide off pipe.
5. Remove the distribution plate.
6. Rake peat moss bed to break up any bio-mass (if present). A child garden rake works best for this procedure.
7. Re-level the entire peat bed. Use the 3' x 1" x 2" wood stake or 3' x 1/2" PVC pipe to completely level peat bed. This step is absolutely vital.
8. Rinse the inlet pipe. Use the garden hose to rinse the 4" inlet pipe.
9. Replace the distribution plate.
10. It is strongly recommended to do a water test to verify that the distribution plate is level.
11. Run hose over plate to determine that equal distribution of the water taking place.
12. Use a level to assure that distribution plate is level.
13. Replace the 4" x 2" PVC inlet pipe. Use screwdriver or cordless drill to tighten stainless steel snake clamp and slide off pipe.
14. Obtain effluent sample from pump tank or other sampling device.
15. Inspect effluent. Effluent should be odor free.
16. It may have a tea color for the first year of service and a slight color thereafter. This is due to peat "washing" and is completely normal.
17. Routine maintenance completion.
18. Examine area for any unusual settling.
19. Make sure that all surface and runoff water is diverted away from system.
20. Cover and screw down all covers.
21. Be sure to fill out the Eco-Pure Peat Moss Biofilter Maintenance Report.

Eco-Pure Peat Moss Biofilter Routine Maintenance Report

Date _____ Type of Installation _____

Maintenance Company _____

Address _____
Street Number City State Zip

Phone _____ Fax _____

Owner Information

Owner _____

Address _____
Street Number City State Zip

Phone _____

Installation Address _____

Installer Information

Installer _____

Address _____
Street Number City State Zip

Phone _____ Fax _____

Maintenance Information

Model _____ Serial Number _____

Description of absorption field _____

Installation Date _____ Inspection Date _____

Contract Date _____ Expiration Date _____

Sample Needed _____ Sample Date _____

Peat Moss Condition: Good Fair Poor Biomat: Yes No

Ponding of Peat Moss: Yes No Reason for ponding _____

Clean Septic Tank Filter: Yes No Septic Tank Pumping: Yes No

Vegetation Change: Yes No System Accessible: Yes No

Signed _____

System Evaluation Form

The form below should be used when diagnosing or troubleshooting a Eco-Pure Peat Moss Biofilter System.

Date of Evaluation:

Owner Name:

Address: City: State: Zip:

Phone:

System Designer: System Installer:

System Maintenance Provider:

Number of People in Home: Adults: Children: Male: Female:

Laundry Habits:

Loads per Day:

Loads per Week:

Consecutive Loads:

Brand of Laundry Detergent Used: Liquid or Powder

Bleach Used: Yes / No Use How Many Cups:

Garbage Disposal Used: Yes / No Times per Day: Times per Week:

Dishwasher Used: Yes / No Times per Day: Times per Week:

Water Softener Used: Yes / No Back Flushes to:

Number of Toilet Paper Rolls Used Per Week: Brand:

Any Long Term Drugs Used / Antibiotics: Yes / No

First Time Septic System User: Yes / No__

Hobbies in Home (Painting/Auto Mechanic/Photography): Yes / No

Do you have a Maintenance Contract: Yes / No

Do You Have City or Well Water? Will You Provide Water Bills: Yes / No

What Types of Floor Cleaners Do You Use?

How Many Meals are Prepared at Home: Per Day: Per Week:

Do You Entertain Often: Yes / No

Troubleshooting Guide

Problem	Possible Cause	Solution
<p>The Eco-Pure Peat Moss Biofilter is flooded, not performing properly, or is emitting odors</p>	Peat filter not installed properly	Verify that peat system was installed per the Eco-Pure Peat Moss Biofilter Installation Guide
		Verify that peat filter module and the distribution plate are level
	Hydraulic Overload from Owner	Make sure all toilet flush valves and all faucets for leaks and drips
		Water usage exceeds system design capacity
	Water Infiltration Into System	Make sure septic and pump tanks are water tight
		Make sure that all surface water runoff and downspout runoff is diverted away for system
		Make sure the peat filter cover is above grade
	Dosing Pump Failure	Make sure that the pump is working properly
		Make sure the electrical breaker for the pump is on
		Make sure pump float switch is functioning properly
		Make sure all electrical connections are correct
	Dosing volume too high	Verify that pump float switch is set at appropriate level
		Verify that ball valve is installed and properly adjusted to control dose flow rate
	Absorption Area Failing	Make sure absorption area was installed properly and is functioning
Verify that all pipe connections are watertight		
No Maintenance to System	Call for system maintenance	

Eco-Pure Septic and Pump Tanks

All of the Eco-Pure tanks have passed the stringent vacuum test as required by the Florida Department of Health. Please contact the factory for details.

Specifications

Each tank shall be constructed of polyethylene and manufactured using the rotational molding process. The tank has been vacuum tested, water tested and certified by the Florida Department of Health as a Category 3 Tank. The inlet elevation shall be 45”.

The outlet elevation will be 43”. The 4” diameter inlet

and outlet pipes shall be connected to the tank using watertight 4” rubber grommets. Tank must be backfilled with clean sand and filled with water.



Installation Instructions

1. Excavate hole to proper dimensions (length, height, width, etc.). We recommend a 2 foot over dig on each side of the tank for easy, and satisfactory backfilling.
2. **Make sure that the bottom of hole is level and free of large rocks or other objects that may puncture the tank.**
3. Place 6 to 8 inches of pea gravel or clean, fine material in hole if installing the tank in heavy, clay soils.
4. Place tank in the hole.
5. Make sure tank is level using a laser or a 4 foot level.
6. Begin to fill the tank with water.
7. **Begin to backfill the tank in 6 inch lifts. Make sure that the backfill material is free from any large rocks or other materials that may damage or puncture tank. If installing in heavy or clay soils backfill with pea gravel or clean, fine material.**
8. Fill the tank with water to the outlet.
9. Complete backfill in 6 inch lifts.
10. Install inlet and outlet tee's as required by state and/or local codes.
11. Connect the inlet and outlet pipes.
12. Install the risers and lids. Secure covers using provided fasteners.

Warranty

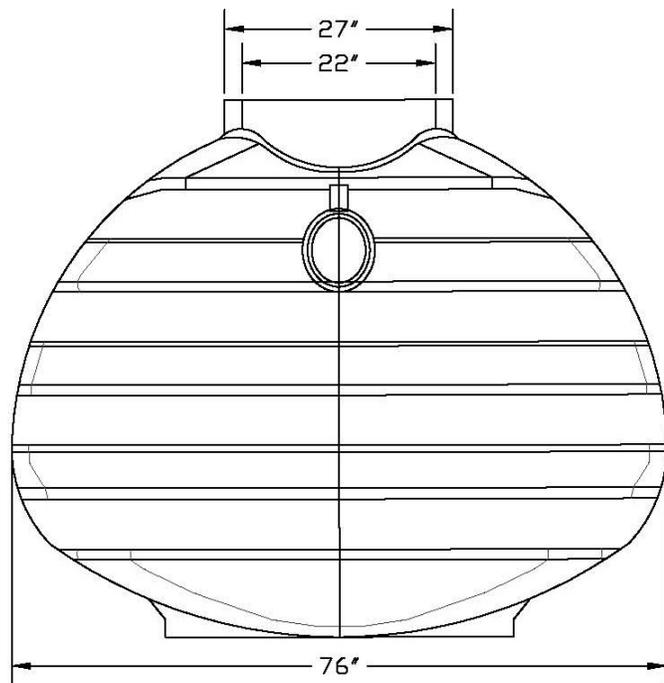
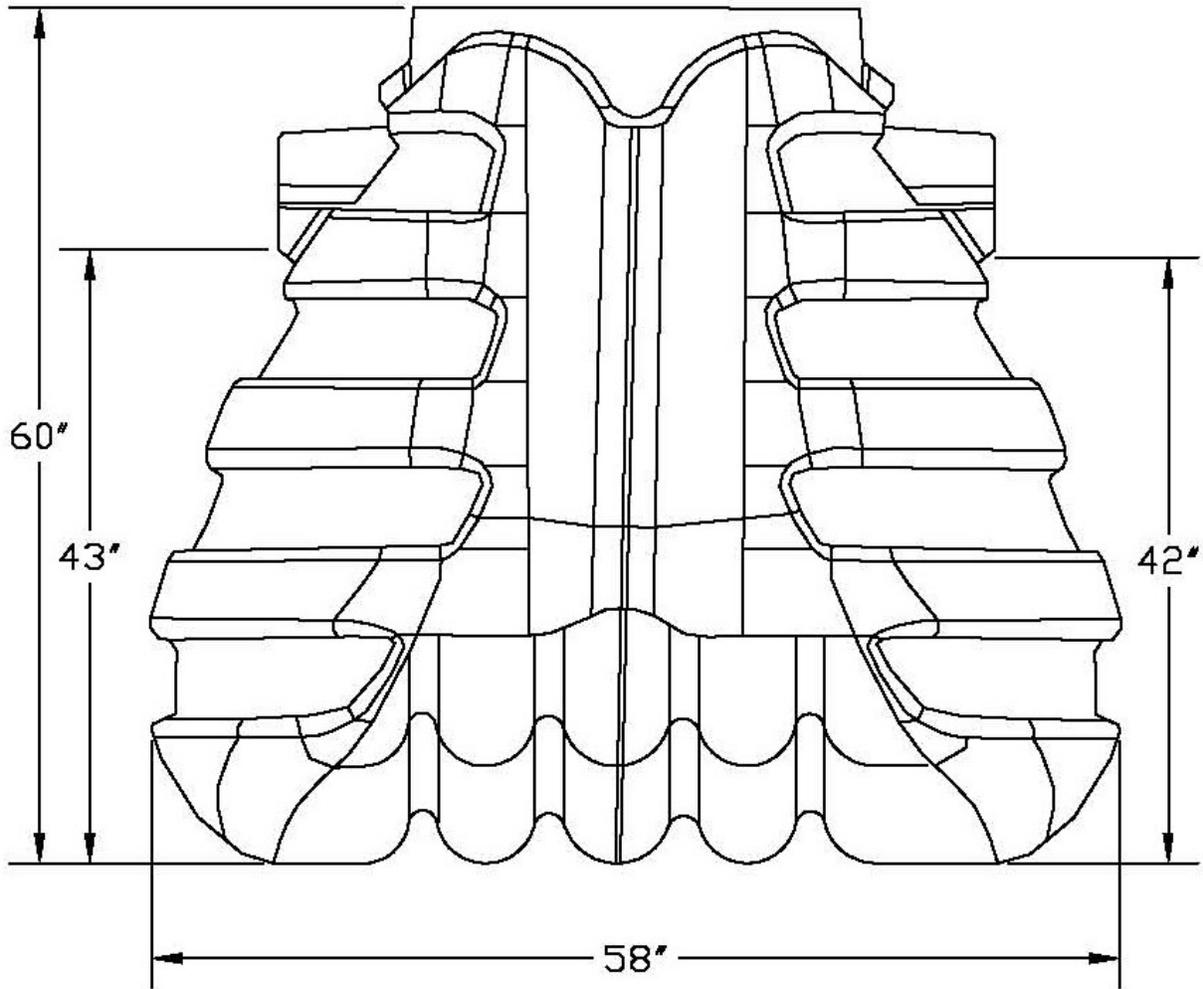
Planet Care, Inc. warrants the Eco-Pure Pump and Septic Tanks against material defects and workmanship for a period of five years from the date of installation. This warranty is only valid for the purchaser of the product.

The following will be excluded from warranty coverage: any damage caused by an Act of God such as floods, earthquakes etc., damage caused the users or third parties such as any modification or installation practice not authorized by Planet Care, Inc., any damage by heavy vehicles such as cars, trucks etc.

This warranty does not cover direct or indirect consequential damage due in part or in full of Planet Care, Inc., it's materials, or their workmanship.

500 Gallon Septic / 600 Gallon Pump Tank Details

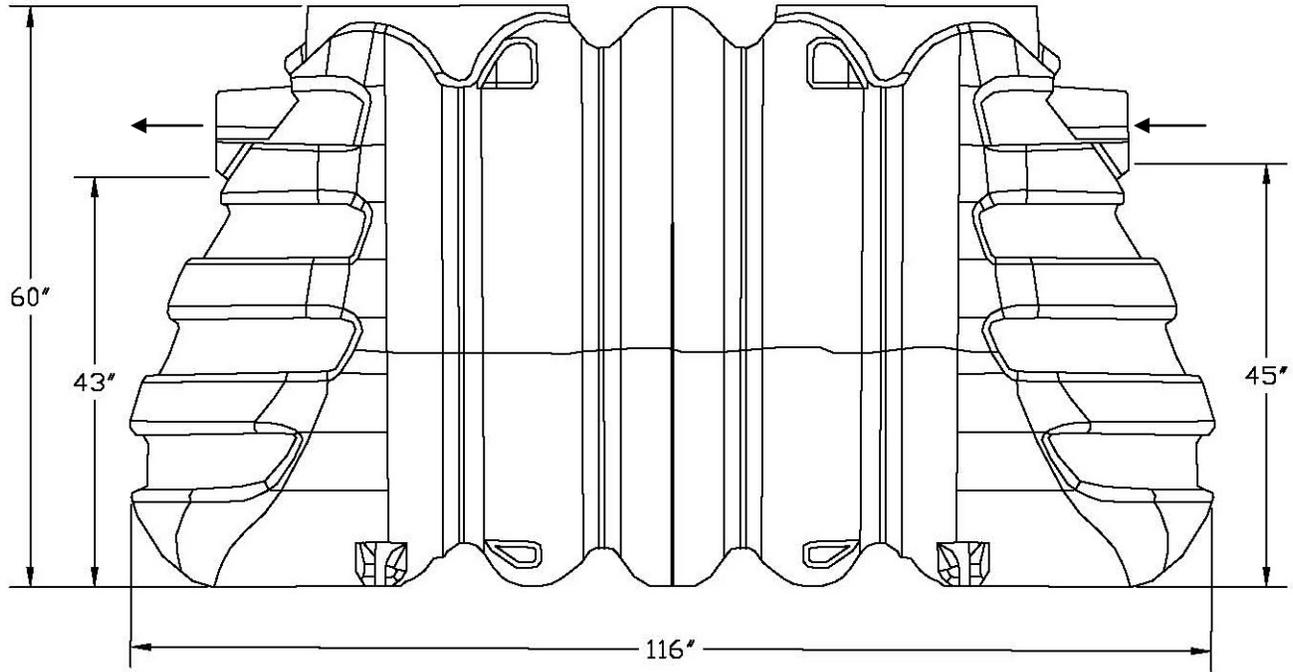
Please refer to state and/or local codes for pump tank requirements. Consult with factory representatives for regulatory approvals.



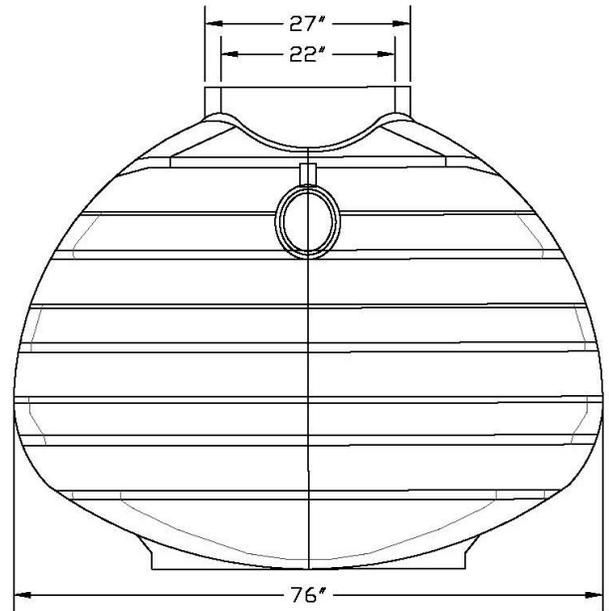
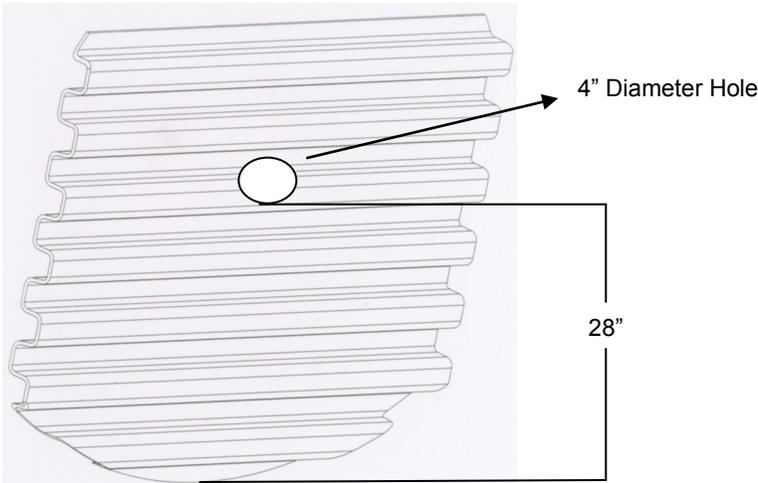
500 Gallon Pump Tank Storage Capacity	
Total Volume	676 gallons
Volume Below Inlet	585 gallons
Volume Per Inch	13.60 gallons

1,050 Gallon Septic Tank Details

Please refer to state and/or local codes for septic tank requirements. Consult with factory representatives for regulatory approvals.



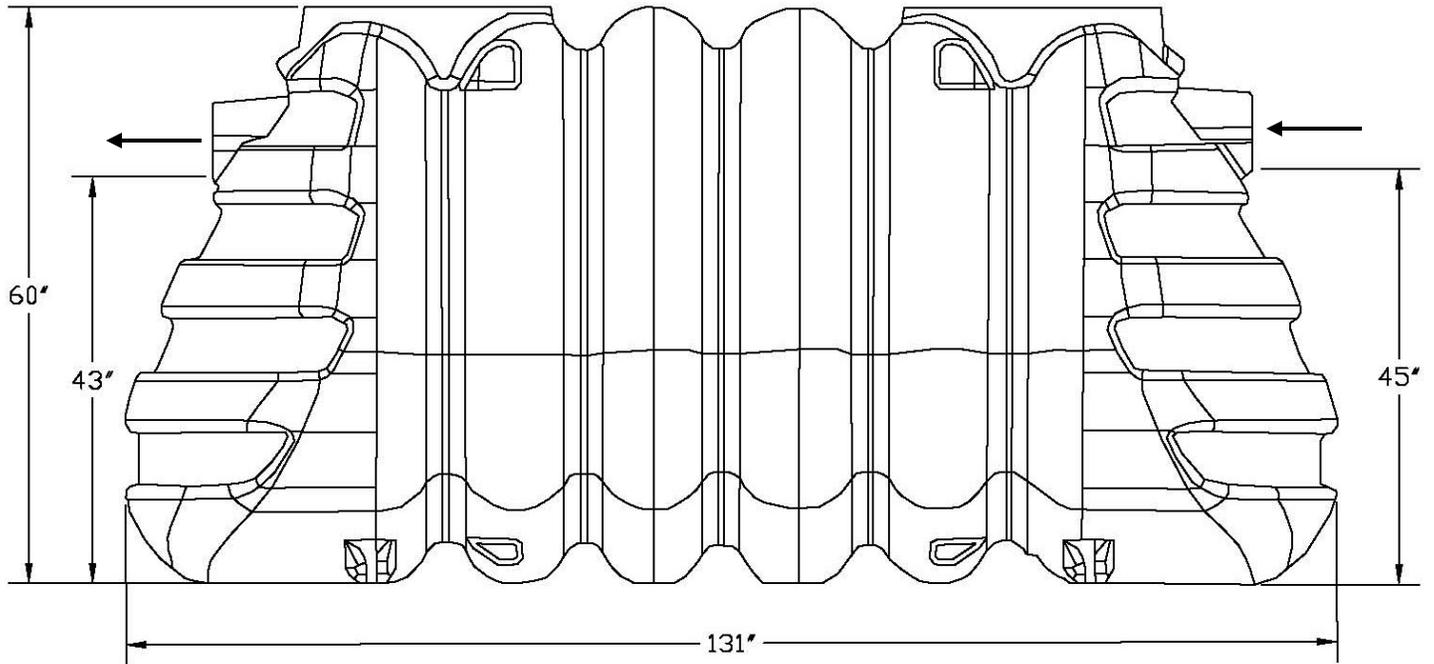
Baffle



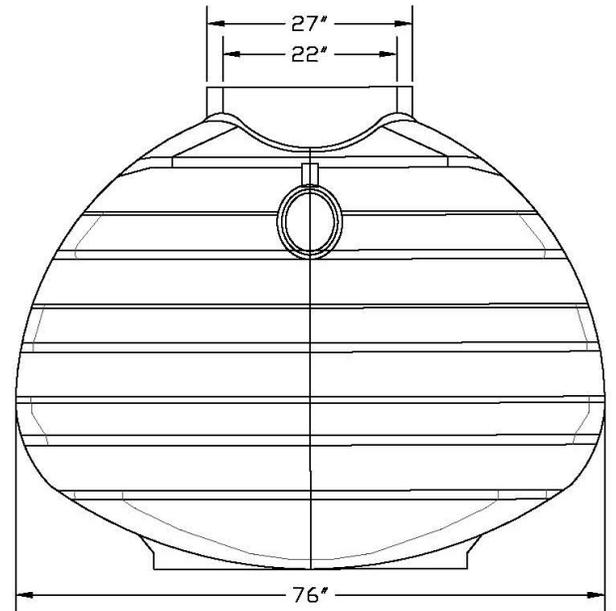
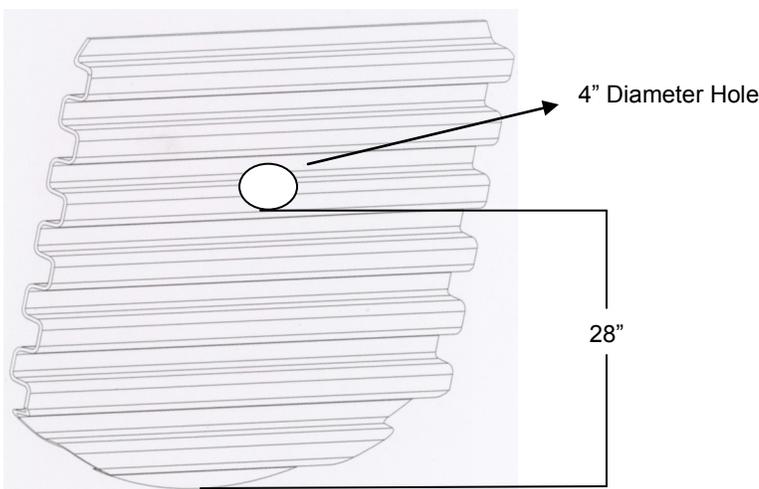
1,050 Gallon Septic Specifications	
Total Volume	1,290 gallons
Volume Below Inlet	1,110 gallons
Volume Per Inch	25.82 gallons
Air Space in Gallons / %	180 gallons / 16%
Inlet Compartment Volume	740 gallons
Outlet Compartment Volume	370 gallons

1,250 Gallon Septic Tank Details

Please refer to state and/or local codes for septic tank requirements. Consult with factory representatives for regulatory approvals.



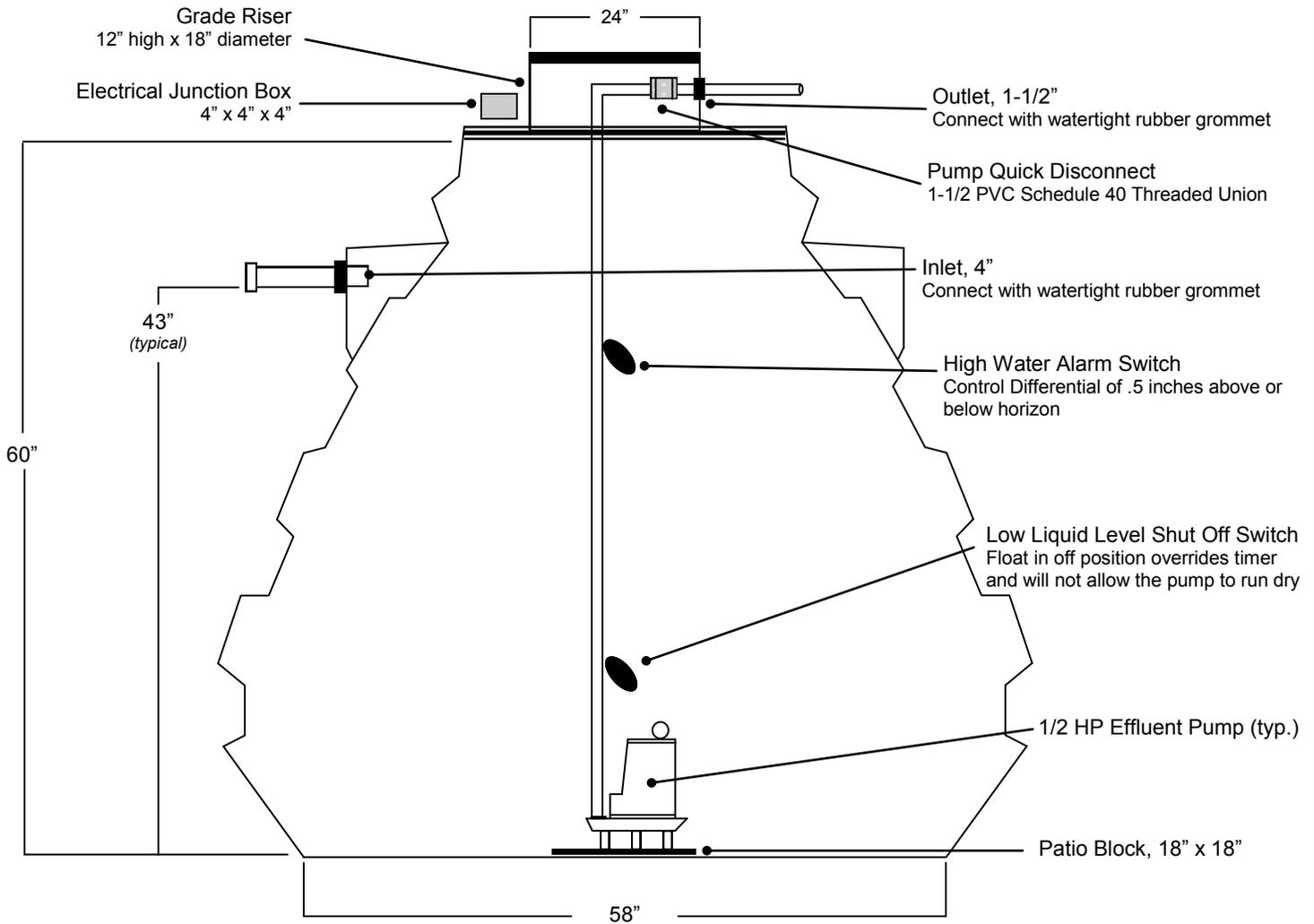
Baffle



1,250 Gallon Septic Specifications	
Total Volume	1,460 gallons
Volume Below Inlet	1,250 gallons
Volume Per Inch	29.07 gallons
Air Space in Gallons / %	210 gallons / 17%
Inlet Compartment Volume	880 gallons
Outlet Compartment Volume	370 gallons

600 Gallon Pump Tank Details

Below is the Eco-Pure 600 Gallon Pump Tank with suggested configuration for a dosing system. Please refer to state and/or local codes for pump tank requirements. Consult with factory representatives for regulatory approvals.



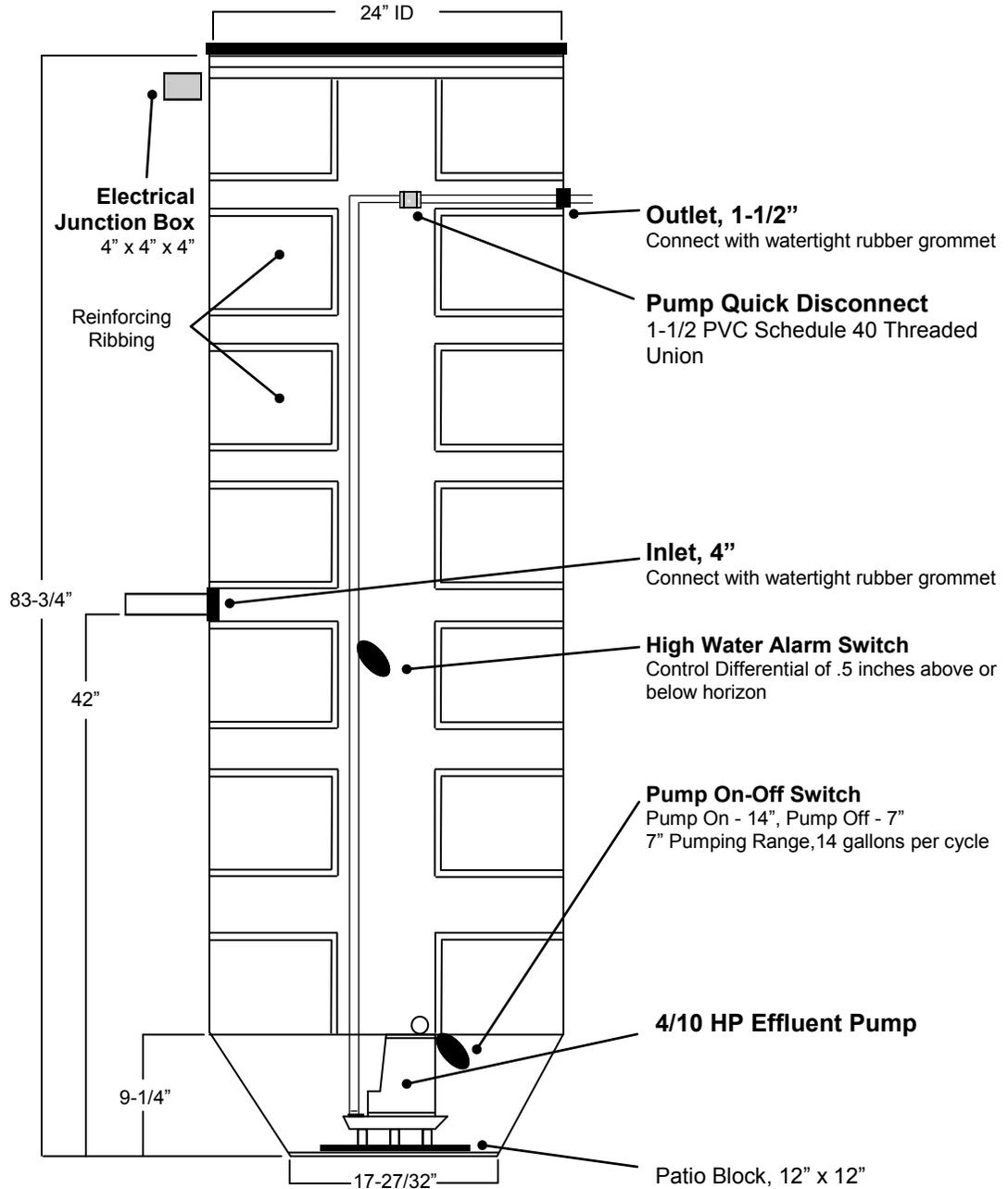
Pump Tank Dimensions (Inches)				
Gallons	Circumference	Height	Manhole ID	Inlet
600	212"	60	22	42"

600 Gallon Pump Tank Storage Capacity	
Total Volume	676 gallons
Volume Below Inlet	585 gallons
Volume Per Inch	13.60 gallons



Pump Vault Details

Based on site topography a 24 x 84 pump vault may be used to collect the effluent from the Eco-Pure Peat Moss Biofilter. The pump vault shown below is with suggested configuration for a dosing system. Please refer to state and/or local codes for pump tank requirements. Consult with factory representatives for regulatory approvals and suggested pump vault suppliers.



Pump Vault Storage Capacity	
Total Volume	168 gallons
Volume Per Inch	2 gallons
Volume Below Inlet (typical)	84 gallons

Eco-Pure Peat Moss Biofilter Warranty

1. For the purpose of this warranty DEALER means person who installs system, CUSTOMER means the user of the ECO-PURE system, SYSTEM means the ECO-PURE PEAT BIOFILTER and components except the septic tank or pump tank not supplied by PLANET CARE. Transfer of OWNERSHIP means new owner, MANUFACTURER means PLANET CARE, INC.

2. WARRANTY

PLANET CARE, INC. warrants that the components supplied by the manufacturer will function properly for a period of three years from the date of purchase with the exception of pumps, floats, or any other items covered by another manufacturer's warranties. The warranty of PLANET CARE, INC. is limited to this text.

3. For this warranty to be valid the customer must notify PLANET CARE, INC. in writing as to the nature of any problem with the system or call 813-643-6094. This notice must be sent by registered mail to PLANET CARE, INC. or to the dealer with a copy to PLANET CARE, INC. Upon receipt of notice PLANET CARE, INC. or the dealer will correct the problem within the terms of this warranty.

4. EXCLUSIONS

The following will be excluded from warranty coverage: Any damage caused by an Act of God without limitation such as floods, earthquakes, hurricane, landslide, tornado or blizzards. Any damages caused by the users or third parties such as any modification or installation or correction to the system not authorized by PLANET CARE, INC.

Any modifications with regard to installation by a dealer which is not authorized by the manufacture. Any damage by not allowing maintenance to be performed in accordance with the maintenance agreement. Any damage be heavy vehicles such as cars, trucks and heavy equipment. Any change of use which does not comply with original design of intended use or excessive waste strength which is beyond residential waste strength.

5. OTHER EXCLUSIONS

It is expressly understood that the customer shall not make any attempt to maintain or repair any part of the system before notifying the dealer or PLANET CARE, INC. in accordance with Section 3 until a reasonable time for a site visit is given and any problems can be solved, otherwise the warranty shall be null and void.

6. LIMITS OF DAMAGES

PLANET CARE, INC. in no way shall be liable for any other damages that the customer may incur and compensation and indemnification shall be limited to the other provisions of this warranty.

7. TRANSFER OF OWNERSHIP

All provisions of this warranty shall remain in effect upon transfer of ownership with the express understanding that the new owner submits in writing by registered mail to PLANET CARE, INC. that the intended use shall not change, that the waste strength is not increased by either over use or misuse and that there shall be no change of use.

The new owner will notify PLANET CARE, INC. that they have read the Owner's Manual and agree to comply with all the provisions therein.

8. WARRANTY PRIORITY

This warranty supersedes any written or verbal contracts entered into by the customer or dealer or any agent for the sale or installation of the ECO-PURE PEAT BIOFILTER and it is expressly understood in case of any contradictions whatsoever that the terms of this agreement shall prevail.

9. INDEMNITY

Liability under this warranty to correct defects shall be limited to correction or replacement of components in accordance to other provisions of this warranty agreement upon written notification.

10. INSPECTIONS

The customer shall allow the dealer of PLANET CARE, INC. to carry our all necessary inspections as required in this warranty during normal business hours.

If any other request for inspection beyond the annual maintenance and inspection are requested and no problems exist, a fee shall be paid to PLANET CARE, INC. by the customer.

Appendix A

Eco-Pure Peat Moss Biofilter

Simply Natural, Naturally Simple



The Eco-Pure Peat Moss Biofilter was designed for extreme site conditions and sensitive environments. The system utilizes a specific blend of sphagnum peat moss for the treatment of septic tank effluent.

Sphagnum peat moss provides a well-balanced eco-system of naturally occurring organisms that digest the harmful pollutants contained in the wastewater stream. The system replicates the same process that occurs in nature.

During installation, pre-packaged sphagnum peat moss pillows are placed within our proprietary polyethylene module. One Eco-Pure module can treat the wastewater from up to a four bedroom home. The modules can be linked together for larger wastewater flows.

The unique properties of sphagnum peat moss allow our system to operate without expensive air blowers or compressors. In addition, the system was designed to be gravity-fed. Depending on site conditions, dosing pumps may not be necessary. This provides additional cost savings compared to other systems.

Extensive university research, independent third-party testing and real world experience have demonstrated that the Eco-Pure Peat Moss Biofilter will protect the most sensitive environments.



900 Gallon Per Day System

Applications

- Single Family Homes
- Multi-Family Homes
- Apartment Complexes
- Churches
- Office Buildings
- Restaurants
- Seasonal Use Homes
- Water-Front Homes
- Small Lots
- High Groundwater

Part Number: PBF4

Features and Benefits

- Can cost 30% less than other treatment systems
- The system can be completely passive
 - No Electricity Needed
 - No Moving Parts
 - No Dosing Pumps Needed
- Ease of Installation
- Lowest Cost of Operation
 - No Costly Blowers to Replace
 - No Excess Sludge Removal
- Low Cost of Maintenance
- Ease of Maintenance
- Can discharge into the following:
 - Pad / mound system
 - Gravity leach field
 - Pressure dosed leach field
 - Drip Irrigation System
 - Surface or water body (*check local code*)
- Low profile, great for high water table
 - Will not float
- Great For Seasonal Use Homes
 - No ramp up time
 - No shut down procedures

Design Procedures

The Eco-Pure Peat Moss Biofilter must be designed per the Eco-Pure Design, Installation and Maintenance Guide, January, 2010. All systems incorporating the Eco-Pure Peat Moss Biofilter must be designed by a state registered Professional Engineer or a state approved system designer.

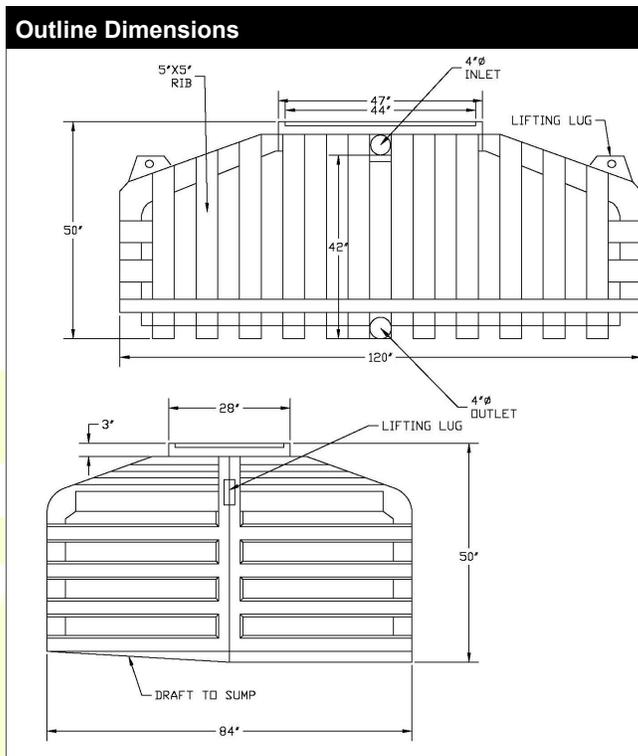
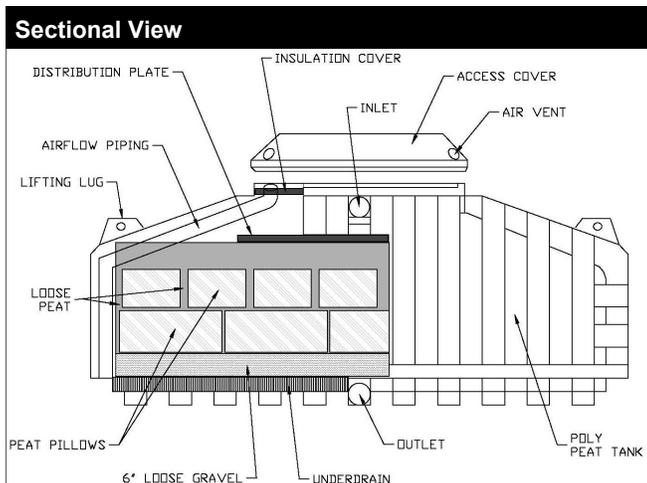
Installation Procedures

The Eco-Pure Peat Moss Biofilter must be installed per the manufacturer's Installation Guide, January, 2010. Only factory trained personnel may install the Eco-Pure Peat Moss Biofilter.

Maintenance Procedures

Routine inspection and maintenance must take place at least once per year. Maintenance must be performed per the Eco-Pure Maintenance Manual, January, 2010. Only factory trained personnel may perform maintenance.

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.



Ordering Information	
Part Number	PBF4

Dimensions		
Length	Width	Height
120"	84"	50"

Treatment Capacity	
Parameter	Capacity
GPD ⁽¹⁾	650 maximum peak flow
BOD ₅ ⁽²⁾	240 mg/L
TSS ⁽²⁾	176 mg/L

(1) One module for up to a 4 bedroom home
 (2) Wastewater described as residential strength waste

Hydraulic Loading Rates	
Gallons Per Day	GPD/ft. ² /day
300	4.29
450	6.43
650	9.29

Maximum Biochemical Loading Rates (BOD ₅ Influent = 240 mg/L)		
Gallons Per Day	lbs./BOD/Day	Lbs./BOD/ft. ² /day
300	.601	.008583
450	1.001	.012878
650	1.302	.017166

Eco-Pure Peat Moss Biofilter Component Materials	
Quantity	Description
1	Polyethylene Module and Cover
1	Insulation Cover
41	Sphagnum Peat Moss Pillows
10	Sphagnum Peat Moss Bags
1	Polyethylene Distribution Plate
1	4" x 2" Inlet Pipe Assembly
1	4" Discharge Pipe and Vent Pipe

In order to provide the best product possible, specifications and requirements are subject to change.

Patent #: US 6,620,321 B2

PBF4SS (3/10)



Made In The USA



Eco-Pure Septic and Pump Tanks



In 2004, Eco-Pure, Inc. introduced their line of polyethylene septic and pump tanks. Eco-Pure realized that there was a need for a watertight, lightweight and very reliable alternative to pre-cast concrete septic tanks.

All of the Eco-Pure tanks have passed the stringent vacuum test as required by the Florida Department of Health. Please contact the factory for details.



Specifications

Each tank shall be constructed of polyethylene and manufactured using the rotational molding process. The tank has been vacuum tested, water tested and certified by the Florida Department of Health as a Category 3 Tank. The inlet elevation shall be 45". The outlet elevation will be 43". The 4" diameter inlet and outlet pipes shall be connected to the tank using watertight 4" rubber grommets. Tank must be backfilled with clean sand and filled with water.



Applications

- Single Family Homes
- Multi-Family Homes
- Apartment Complexes
- Churches
- Office Buildings
- Restaurants
- High Groundwater

Features

- Ultra Wide, Strong Reinforcing Ribs
- Load Deflecting Shape
- Wide, Anti-Flotation Ribbing
- Integral EZ Set Leveling Cradles
- Reinforced Man Ways, No "Egging"
- Ultra Safe Turn-to-Lock Cover
 - Domed or Flat Available
- Ultra Strong, Turn-To-Lock Risers
- UV Stabilized Resin protection

Design Procedures

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.

Installation Procedures

1. Excavate hole to proper dimensions (length, height, width, etc.). We recommend a 2 foot over dig on each side of the tank for easy, and satisfactory backfilling.
2. Make sure that the bottom of hole is level and free of large rocks or other objects that may puncture the tank.
3. Place 6 to 8 inches of pea gravel or clean, fine material in hole if installing the tank in heavy, clay soils.
4. Place tank in the hole.
5. Make sure tank is level using a laser or a 4 foot level.
6. Begin to fill the tank with water.
7. Begin to backfill the tank in 6 inch lifts. Make sure that the backfill material is free from any large rocks or other materials that may damage or puncture tank. **If installing in heavy or clay soils backfill with pea gravel or clean, fine material.**
8. Fill the tank with water to the outlet.
9. Complete backfill.
10. Connect the inlet and outlet pipes.
11. Install the risers and lids. Secure covers using provided fasteners.

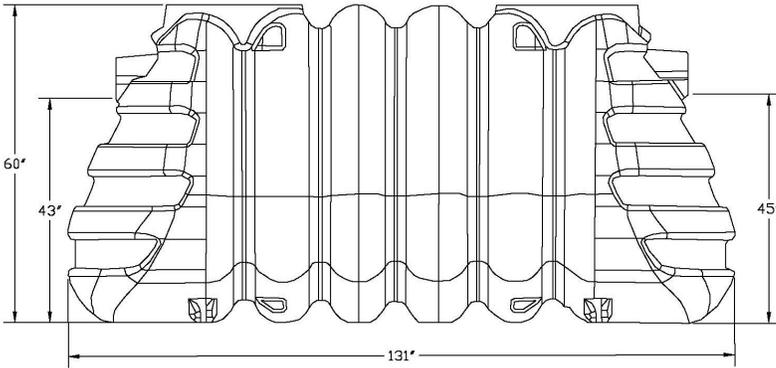
Warranty

Planet Care, Inc. warrants the Pump and Septic Tanks against material defects and workmanship for a period of five years from the date of installation. This warranty is only valid for the purchaser of the product. The following will be excluded from warranty coverage: any damage caused by an Act of God such as floods, earthquakes etc., damage caused the users or third parties such as any modification or installation practice not authorized by Planet Care, Inc., any damage by heavy vehicles such as cars, trucks, etc. This warranty does not cover direct or indirect consequential damage due in part or in full of Planet Care, Inc., it's materials, or their workmanship.

Eco-Pure Septic and Pump Tanks

1,250 Gallon Septic Tank

Outline Dimensions



Ordering Information

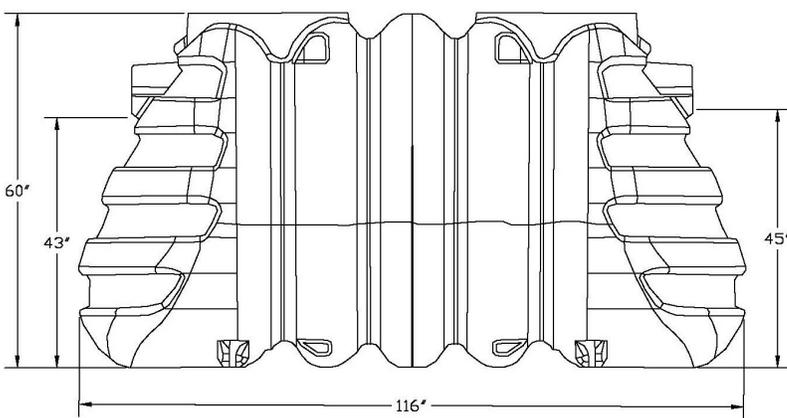
Part Number	EPST1250
-------------	----------

1,250 Gallon Septic Tank Specifications

Total Volume	1,460 gallons
Volume Below Inlet	1,250 gallons
Volume Per Inch	29.07 gallons
Air Space in Gallons / %	210 gallons / 17%
Inlet Compartment Volume	880 gallons
Outlet Compartment Volume	370 gallons

1,050 Gallon Septic Tank

Outline Dimensions



Ordering Information

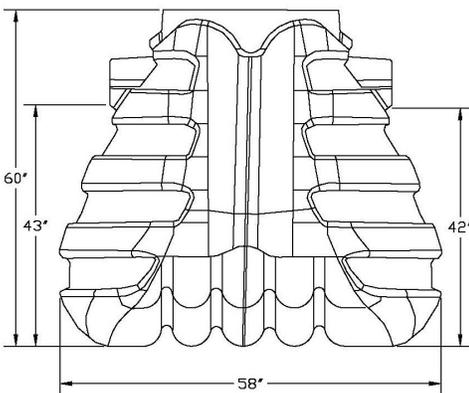
Part Number	EPST1050
-------------	----------

1,050 Gallon Septic Tank Specifications

Total Volume	1,290 gallons
Volume Below Inlet	1,110 gallons
Volume Per Inch	25.82 gallons
Air Space in Gallons / %	180 gallons / 16%
Inlet Compartment Volume	740 gallons
Outlet Compartment Volume	370 gallons

500 Gallon Septic / 600 Gallon Pump Tank

Outline Dimensions



Ordering Information

Part Number	EPPT600
-------------	---------

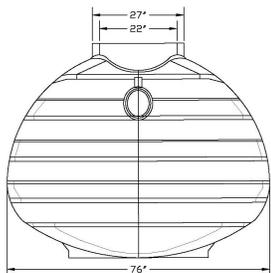
500 Gallon Septic / 600 Gallon Pump Tank Storage Capacity

Total Volume	676 gallons
Volume Below Inlet	585 gallons
Volume Per Inch	13.60 gallons

Pump Tank Dimensions (Inches)

Circumference	Height	Manhole ID	Inlet
212"	60	22	42"

Width Dimensions (All Tanks)



Made In The USA

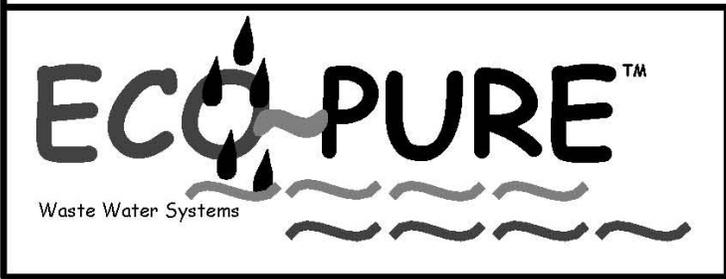
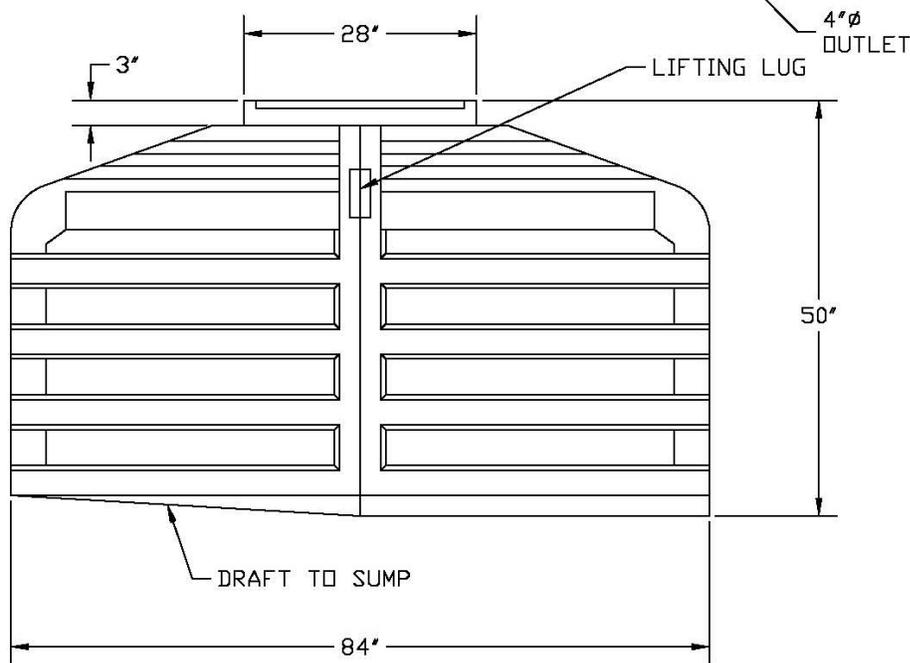
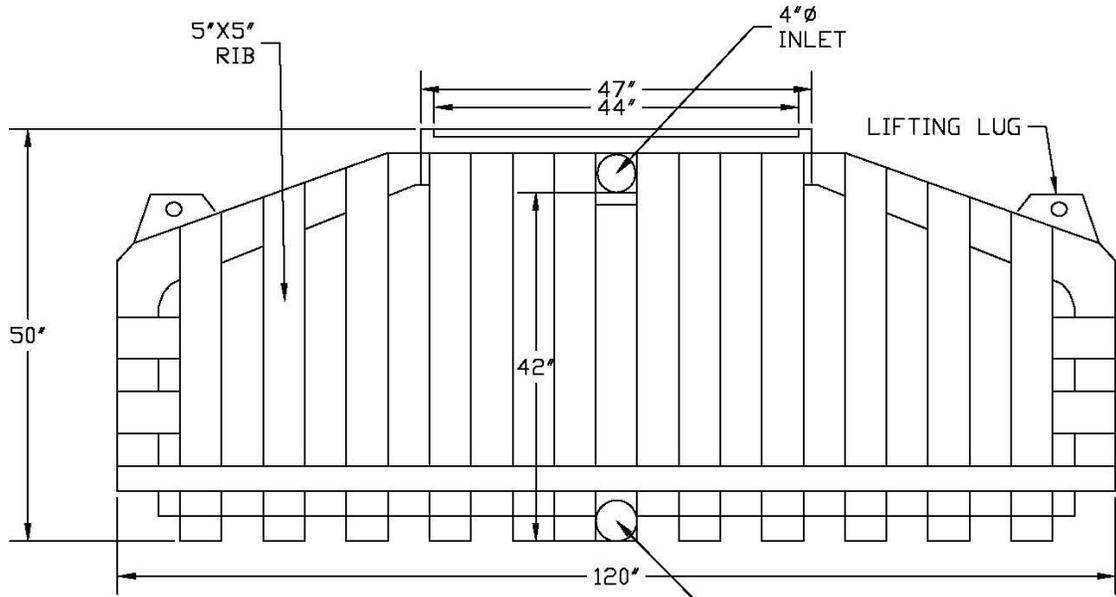


In order to provide the best product possible, specifications and requirements are subject to change.

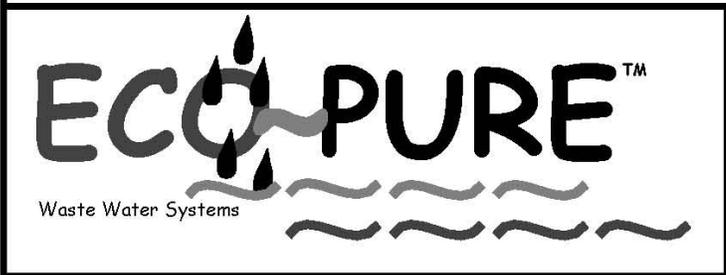
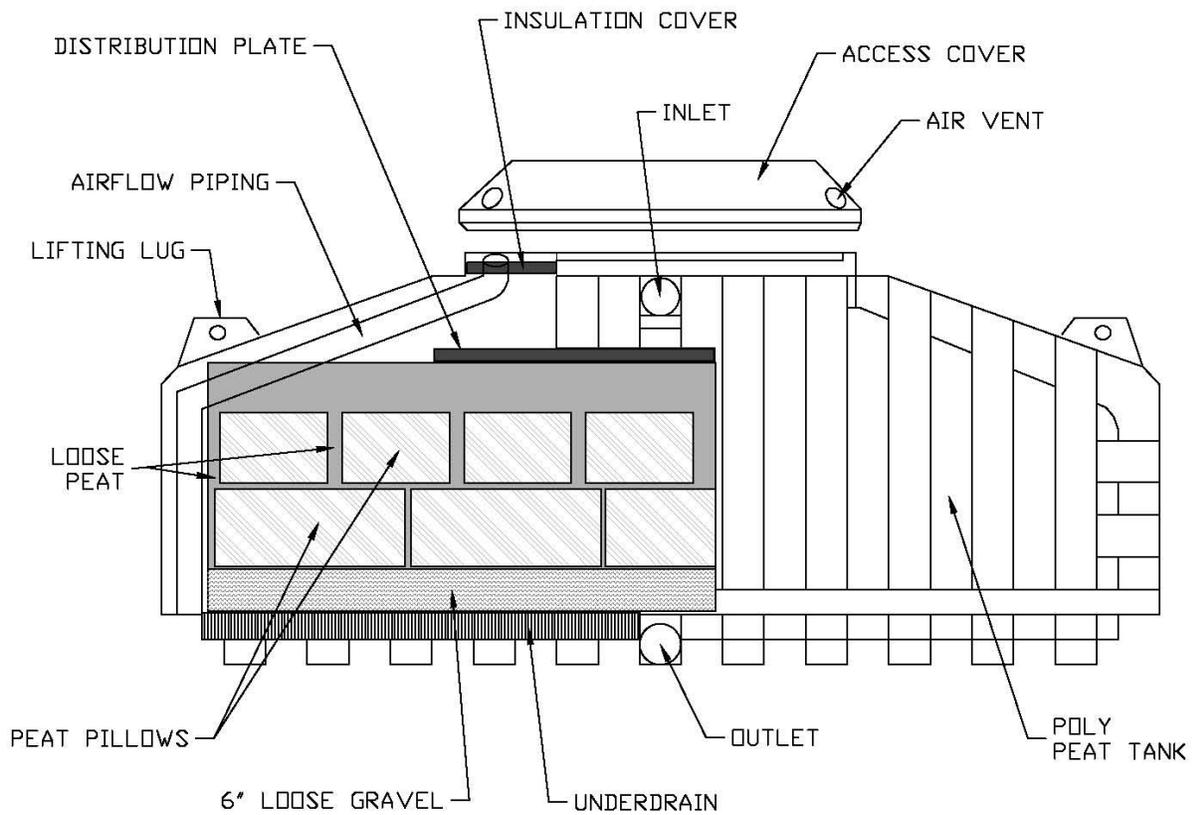
Patent #: US D492,000S

EPPSSTPT (3/10)

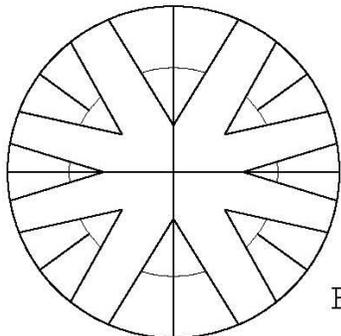
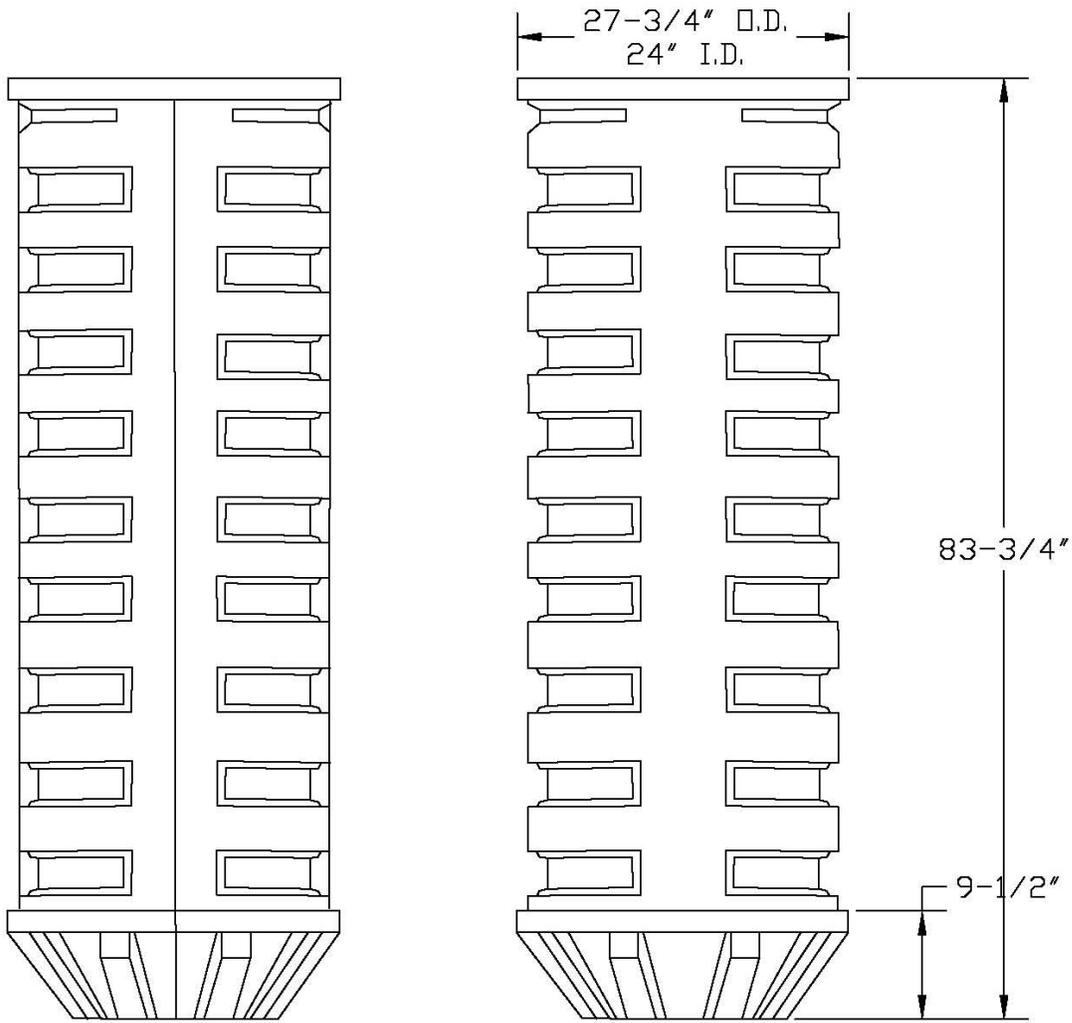
Appendix B



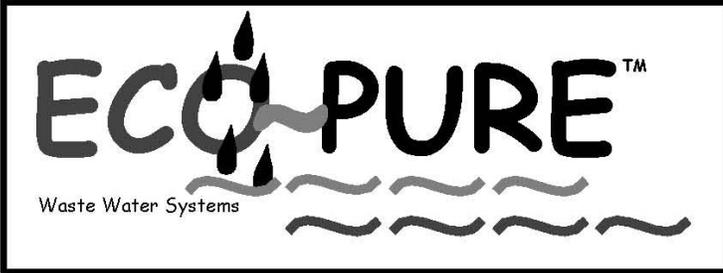
PEAT MOSS
 BIOFILTER
 POLYETHYLENE
 TANK



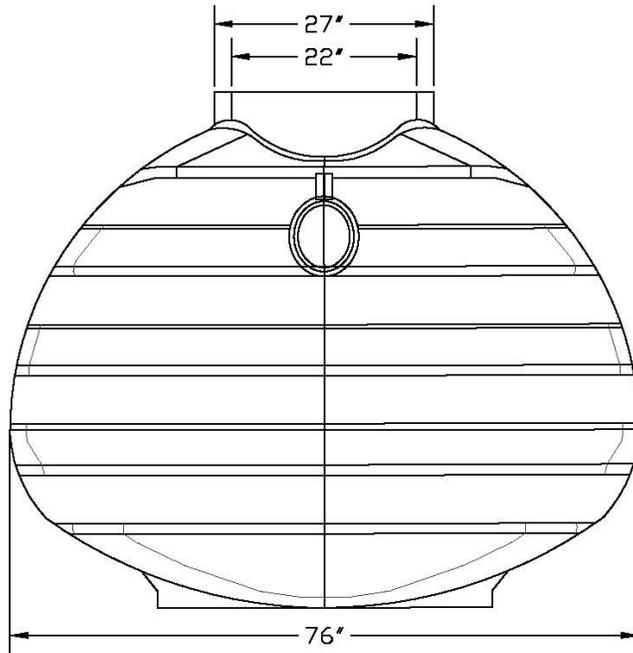
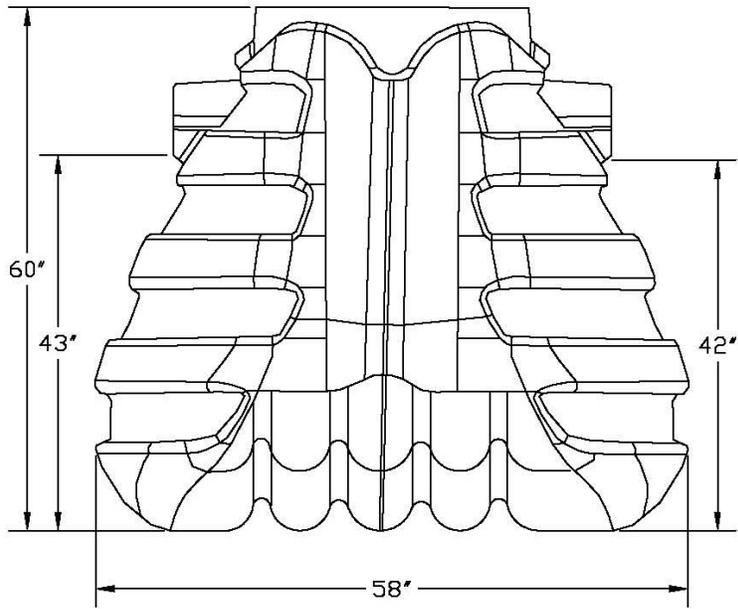
PEAT MOSS
BIOFILTER
SECTION VIEW



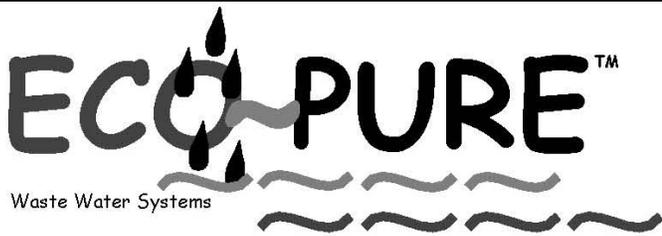
BOTTOM VIEW

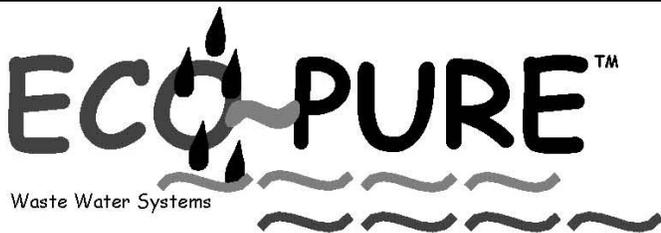
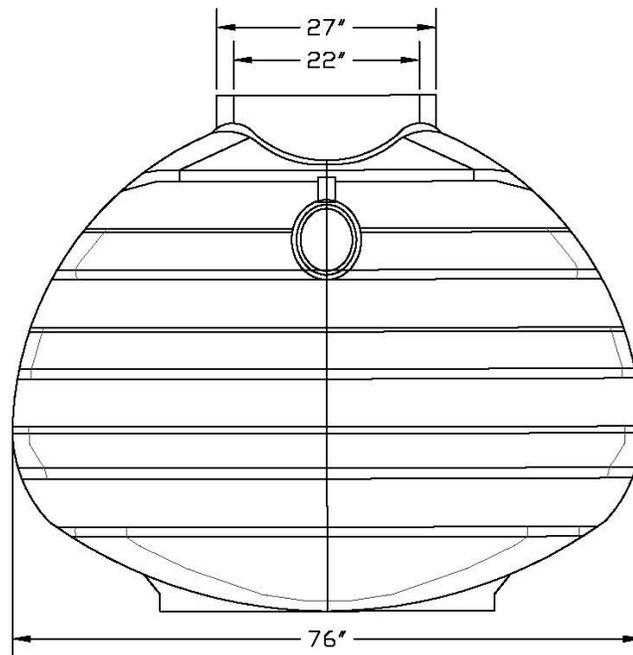
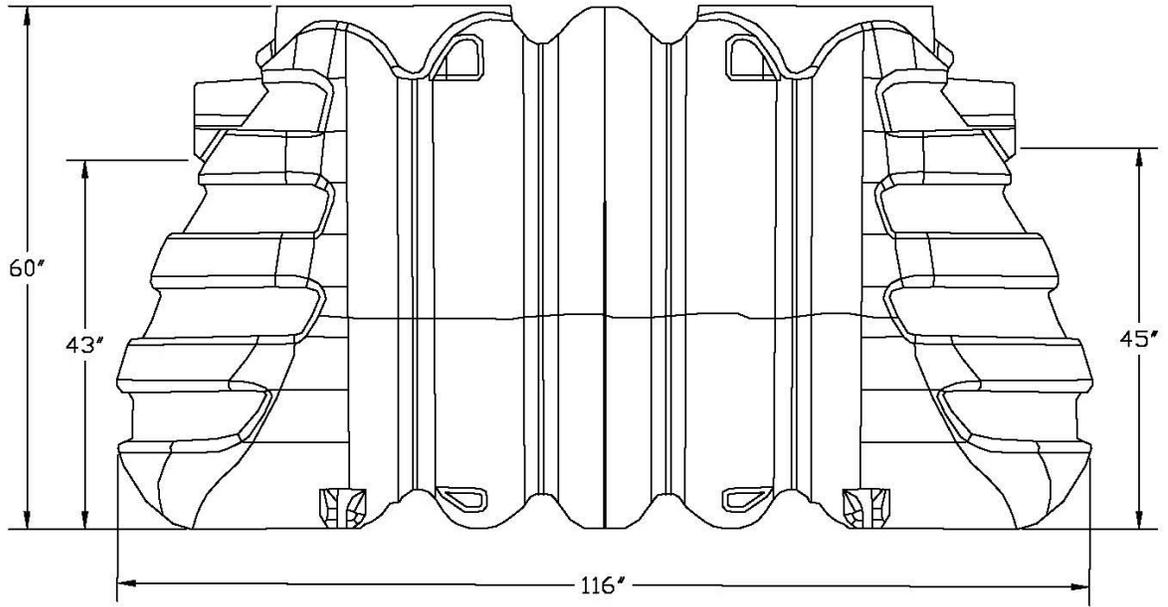


24" X 84"
POLYETHYLENE
PUMP VAULT

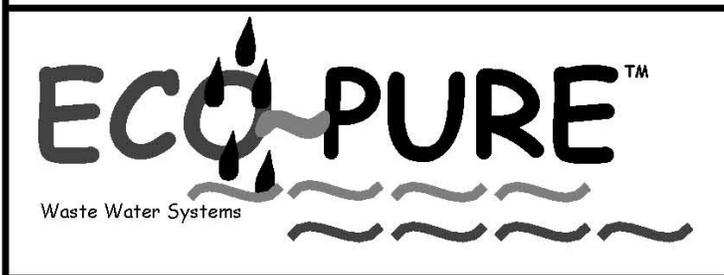
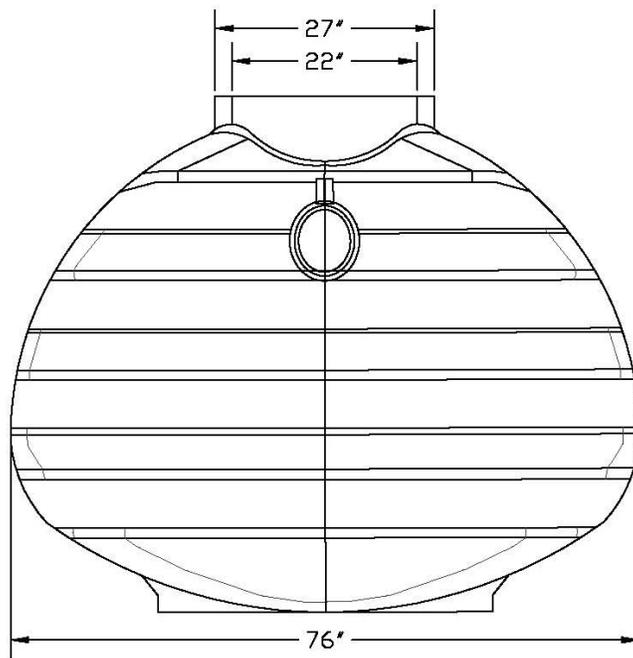
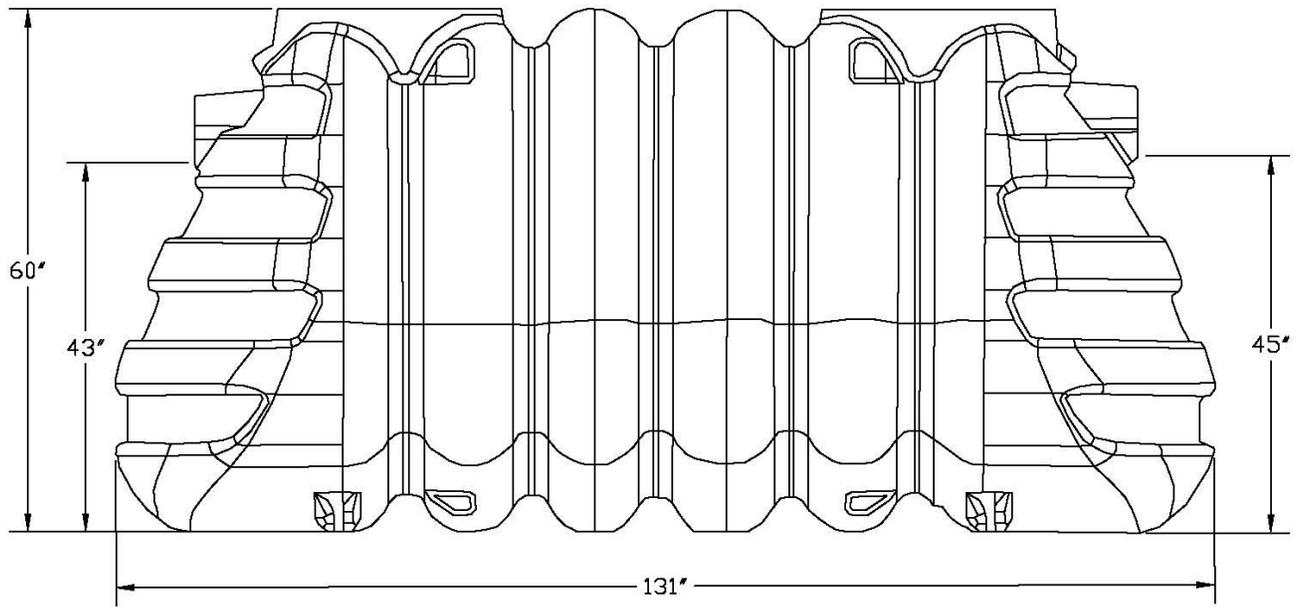


500 GALLON SEPTIC TANK
(or 600 Gal. Pump Tank)





1050 GALLON
SEPTIC TANK
(2-compartment)



1,250 GALLON
SEPTIC TANK
(2-compartment)

Appendix C



Planet
Care



Eco-Pure Peat Moss Biofilter OWNERS MANUAL

Simply Natural, Naturally Simple

Thank you for choosing the Eco-Pure Peat Moss Biofilter for treating your wastewater. This manual contains information about the use, operation, warranties and maintenance.

OPERATION

The Eco-Pure Peat Moss Biofilter consists of a watertight poly tank which holds enhanced Peat Moss which treats the wastewater from your septic tank to a very high degree before it enters the underlying ground surface.

USING THE PEAT FILTER

The efficiency of the on-site system using the Eco-Pure Peat Moss Biofilter depends on owner use.

You should not use the following in your system:

Oil and grease from cooking or machinery, paints or solvents, pesticide products, any toxic substances, any petroleum products or any non-biodegradable substances i.e.: tampons, condoms, sanitary napkins.



THINGS TO REMEMBER

DO NOT cover the Eco-Pure Peat Moss Biofilter lid, DO NOT drive heavy equipment over the system, DO NOT overload system beyond design limits, DO NOT attempt your own repairs, DO NOT cover any vents, DO NOT plant large trees on system. Always keep system accessible.

MAINTENANCE

Annual maintenance will have to be provided by an authorized service representative during normal business hours by inspecting the and cleaning the septic tank filter and to ensure proper functioning, check for ponding of the peat moss bed.

If samples are required the owner will pay for all costs involved.

A maintenance record will be forwarded to the HEALTH UNIT and the Owner.

The peat moss filter media may have to be replaced every ten years or sooner depending on abuse or higher demand than design limits.

The owner shall maintain a new maintenance agreement every year as long as they own the system.

In the unlikely event of:

- Back-up in your house, your sewer line may be clogged.
- Odors, your house vent may be blocked; if not gravity fed, pump may not be functioning.

Eco-Pure Peat Moss Biofilter Warranty

1. For the purpose of this warranty DEALER means person who installs system, CUSTOMER means the user of the Eco-Pure system, SYSTEM means the ECO-PURE PEAT MOSS BIOFILTER and components except the septic tank or pump tank not supplied by Planet Care, Inc. Transfer of OWNERSHIP means new owner, MANUFACTURER means Planet Care, Inc.

2. WARRANTY

Planet Care, Inc. warrants that the components supplied by the manufacturer will function properly for a period of three years from the date of purchase with the exception of pumps, floats, or any other items covered by another manufacturer's warranties. The warranty of Planet Care, Inc. is limited to this text.

3. For this warranty to be valid the customer must notify Planet Care, Inc. in writing as to the nature of any problem with the system or call 813-643-6094. This notice must be sent by registered mail to Planet Care, Inc. or to the dealer with a copy to Planet Care, Inc. Upon receipt of notice Planet Care, Inc. or the dealer will correct the problem within the terms of this warranty.

4. EXCLUSIONS

The following will be excluded from warranty coverage: Any damage caused by an Act of God without limitation such as floods, earthquakes, hurricane, landslide, tornado or blizzards. Any damages caused by the users or third parties such as any modification or installation or correction to the system not authorized by Planet Care, Inc.

Any modifications with regard to installation by a dealer which is not authorized by the manufacture. Any damage by not allowing maintenance to be performed in accordance with the maintenance agreement. Any damage be heavy vehicles such as cars, trucks and heavy equipment. Any change of use which does not comply with original design of intended use or excessive waste strength which is beyond residential waste strength.

5. OTHER EXCLUSIONS

It is expressly understood that the customer shall not make any attempt to maintain or repair any part of the system before notifying the dealer or Planet Care, Inc. in accordance with Section 3 until a reasonable time for a site visit is given and any problems can be solved, otherwise the warranty shall be null and void.

6. LIMITS OF DAMAGES

Planet Care, Inc. in no way shall be liable for any other damages that the customer may incur and compensation and indemnification shall be limited to the other provisions of this warranty.

7. TRANSFER OF OWNERSHIP

All provisions of this warranty shall remain in effect upon transfer of ownership with the express understanding that the new owner submits in writing by registered mail to Planet Care, Inc. that the intended use shall not change, that the waste strength is not increased by either over use or misuse and that there shall be no change of use.

The new owner will notify Planet Care, Inc. that they have read the Owner's Manual and agree to comply with all the provisions therein.

8. WARRANTY PRIORITY

This warranty supersedes any written or verbal contracts entered into by the customer or dealer or any agent for the sale or installation of the Eco-Pure Peat Moss Biofilter and it is expressly understood in case of any contradictions whatsoever that the terms of this agreement shall prevail.

9. INDEMNITY

Liability under this warranty to correct defects shall be limited to correction or replacement of components in accordance to other provisions of this warranty agreement upon written notification.

10. INSPECTIONS

The customer shall allow the dealer of Planet Care, Inc. to carry our all necessary inspections as required in this warranty during normal business hours.

If any other request for inspection beyond the annual maintenance and inspection are requested and no problems exist, a fee shall be paid to Planet Care, Inc. by the customer.

Eco-Pure Peat Moss Biofilter

Simply Natural, Naturally Simple

Installation Guide January 2010



Eco-Pure Peat Moss Biofilter Component Materials

Quantity	Description
1	Polyethylene Module and Cover
1	Insulation Cover
41	Sphagnum Peat Moss Pillows
10	Sphagnum Peat Moss Bags
1	Distribution Plate
1	4" x 2" Inlet Pipe Assembly
1	4" Discharge Pipe and Vent Pipe

Items Needed For Installation

- 2 cubic yards, 1/2 -1" clean, non-reactive stone
 - Placed inside of module
- 8 cubic yards, clean sand (module backfill material)
- Backhoe for digging and backfilling
- Forks on loader or forklift to unload peat moss pallet
- Truck and trailer for transport of peat module and peat moss pallet
- Lifting straps with large hooks for placing module
- Nut drivers
- PVC pipe saw
- PVC Cleaner and Cement
- Assortment of PVC fittings (1-1/2", 2" and 4")
- Septic Tank Filter
- Garden Hose
- If dosing unit:
 - Effluent pump
 - Ball valve
 - Control Panel or Vertical Float Switch
 - 2" hole saw



Design Procedures

The Eco-Pure Peat Moss Biofilter must be designed per the Eco-Pure Design, Installation and Maintenance Guide, January, 2010. All systems incorporating the Eco-Pure Peat Moss Biofilter must be designed by a state registered Professional Engineer or a state approved system designer.

Maintenance Procedures

Routine inspection and maintenance must take place at least once per year. Maintenance must be performed per the Eco-Pure Maintenance Manual, January, 2010. Only factory trained personnel may perform maintenance.

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.



Applications

- Single Family Homes
- Multi-Family Homes
- Apartment Complexes
- Churches
- Office Buildings
- Restaurants
- Seasonal Use Homes
- Water-Front Homes
- Small Lots
- High Groundwater

Installation Instructions

1. Install septic tank allowing enough fall to the Eco-Pure module to gravity feed. Install a septic tank filter in outlet baffle.
2. Remove the contents from the Eco-Pure module. Make sure 4" drain pipe is in drain area.
3. Push back vent pipe so the 90° fittings are between the opening of the tank and the support pipes.
4. Replace the green cover to prohibit soil intrusion into the module.
5. Excavate an area approximately 10' by 12' and approximately 42" deep for the Eco-Pure module.
6. Fill excavated area with 6" - 12" clean sand.
7. Place Eco-Pure module into the center of the excavation. Lift module by the lifting rings only. Make sure module is level.
8. Cut 1" off discharge hub. Connect the supplied rubber fitting to the Eco-Pure outlet. Connect discharge piping to rubber fitting.
9. Make sure all fittings are water-tight and bed discharge piping. Eco-Pure recommends a small amount of butyl mastic around all pipe connections.
10. Backfill the Eco-Pure module with clean sand to the lifting rings, approximately 14 cubic yards.
11. Place and level 2 cubic yards of non-reactive rock into bottom of module. **DO NOT USE LIMESTONE INSIDE OF MODULE!**
12. Wash rock so that it is free of dust and fine particles. This allows for proper drainage of the Eco-Pure module.
13. Remove peat from shipping pallet.
14. There will be 10 peat bags (3.8 Cubic Foot) and 41 peat pillows (green or orange sacks).
15. Fluff all green peat pillows by gently rolling them on the ground before placing them into module.
16. Place 20 peat pillows on bottom of module on top of stone. Start at ends of module and work toward center.
17. Make sure peat pillows are placed against walls of module. **DO NOT CRAM PILLOWS.**
18. Place 3 bags of loose peat over entire bottom row of peat pillows. Fill in all voids between peat pillows.
19. Break up any clumps. Rake loose peat level. Pay special attention that the voids against walls of module are filled in with loose peat.
20. Place the remaining 21 peat pillows on top of bottom row. Place pillows in the opposite direction of bottom layer.
21. Once again, start at ends of module and work toward center.
22. Place the remaining 7 bags of loose peat over entire top row of peat pillows.
23. Fill in all voids between peat pillows. **USE ALL 7 BAGS.**
24. Break up any clumps. Rake loose peat level. Pay special attention that the voids against walls of module are filled in with loose peat.
25. **VERY IMPORTANT!** Completely level the peat bed. This can be done by using a 3' x 1" x 2" wood stake or a 3' x 1/2" PVC pipe used as a screed.
26. Wet the peat bed thoroughly by gently spraying it with a garden hose. This prohibits the peat from "floating" upon system start-up.
27. Gently lay the distribution plate on the peat bed. Center the inlet of the manifold with the inlet of the module.
28. Level the distribution plate. **PLATE MUST BE LEVEL!**
29. Install the 4" x 2" inlet pipe to Eco-Pure Module. **TEST WITH CLEAN WATER FOR EVEN DISTRIBUTION!**
30. Place the insulation cover on the support pipes.
31. Place the green cover on the module. Use the 2 stainless steel screws to fasten the cover.
32. Backfill the Eco-Pure module with clean, rock free material or clean sand. **DO NOT LEAVE VOIDS IN BACKFILL!**
33. Hand rake backfill around module only. **DO NOT USE HEAVY EQUIPMENT NEAR MODULE!**



When Dosing the Eco-Pure Peat Biofilter

- Simulate gravity flow by installing a ball valve
- Close ball valve approximately 3/4
- **Maximum pump volume is 20 gallons per cycle event**
- Installation of a 2" vent is recommended from the peat module tank to the septic tank

In order to provide the best product possible, specifications and requirements are subject to change.



Patent #: US 6,620,321 B2
PBF4IG (1/10)

Eco-Pure Peat Moss Biofilter

Simply Natural, Naturally Simple

Maintenance Guide January 2010



Eco-Pure Peat Moss Biofilter Component Materials

Quantity	Description
1	Polyethylene Module and Cover
1	Insulation Cover
41	Sphagnum Peat Moss Pillows
10	Sphagnum Peat Moss Bales
1	Distribution Plate
1	4" x 2" Inlet Pipe Assembly
1	4" Discharge Pipe and Vent Pipe

Applications

- Single Family Homes
- Multi-Family Homes
- Apartment Complexes
- Churches
- Office Buildings
- Restaurants
- Seasonal Use Homes
- Water-Front Homes
- Small Lots
- High Groundwater



To assure years of trouble free operation and proper wastewater treatment, Planet Care requires one annual routine maintenance visit.

This guide demonstrates a typical routine maintenance visit.

Note to Maintenance Entities

Be sure to fill out enclosed Maintenance Report and fax it to Planet Care at the number below.

Also be sure to enter this information into the Carmody Data Systems Eco-Pure data system web site.

Items Needed For Installation

- Screw drivers / cordless drill
- Rake
- Level
- Garden Hose
- Screed to level peat (3' x 1" x 2" wood stake)
- Rubber Gloves
- Apparatus to obtain effluent sample

Design Procedures

The Eco-Pure Peat Moss Biofilter must be designed per the Eco-Pure Design, Installation and Maintenance Guide, January, 2010. All systems incorporating the Eco-Pure Peat Moss Biofilter must be designed by a state registered Professional Engineer or a state approved system designer.

Installation Procedures

The Eco-Pure Peat Moss Biofilter must be installed per the manufacturer's Installation Guide, January, 2010. Only factory trained personnel may install the Eco-Pure Peat Moss Biofilter Filter.

Please refer to your state and/or local onsite wastewater treatment and disposal regulations for details pertaining to your systems design, installation and maintenance requirements.

Routine Maintenance Instructions

1. If using a dosing pump to dose the Eco-Pure Peat Filter module (s) disconnect power.
2. Remove the green cover on the module. Loosen the stainless steel screws to remove the cover. This will expose the white insulation cover.
3. The insulation cover sits upon support pipes. Remove the white insulation by carefully sliding it out of the peat module.
4. Remove the 4" x 2" PVC inlet pipe. Use screwdriver or cordless drill to loosen stainless steel snake clamp and slide off pipe. Remove the distribution plate.
5. Rake peat moss bed to break up any bio-mass (if present). A child garden rake works best for this procedure.
6. Re-level the entire peat bed. Use the 3' x 1" x 2" wood stake or 3' x 1/2" PVC pipe to completely level peat bed. This step is absolutely vital.
7. Rinse the inlet pipe. Use a garden hose to rinse the 4" inlet pipe.
8. Replace the distribution plate. It is strongly recommended to do a water test to verify that the distribution plate is level. Run hose over plate to determine that equal distribution of the water is taking place.
9. Replace the 4" x 2" PVC inlet pipe. Use screwdriver or cordless drill to tighten stainless steel snake clamp and slide off pipe.
10. Obtain effluent sample from pump tank or other sampling device.
11. Inspect effluent. Effluent should be odor free. It may have a tea color for the first year of service and a slight color thereafter. This is due to peat "washing" and is completely normal.
12. Routine maintenance completion. Examine area for any unusual settling. Make sure that all surface and runoff water is diverted away from system. Cover and screw down all covers. Be sure to fill out enclosed Maintenance Report.
13. Maintenance Completion. Examine area for any unusual settling. Verify that surface water is diverted away from the Eco-Pure module (s). Make sure power is reconnected. Cover all valve boxes.



In order to provide the best product possible, specifications and requirements are subject to change.



Patent #: US 6,620321 B2

PBF4MG (1/10)



Planet Care



Eco-Pure Peat Moss Biofilter

Simply Natural, Naturally Simple

Maintenance Report

Date _____ Type of Installation _____

Maintenance Company _____

Address _____
Number Street City State Zip Code

Phone _____ Fax _____

Owner Information

Owner _____

Address _____
Number Street City State Zip Code

Phone _____

Installation Address _____
Number Street City State Zip Code

Installer Information

Installer _____

Address _____
Number Street City State Zip Code

Phone _____ Fax _____

Maintenance Information

Model _____ Serial Number _____

Description of absorption field _____

Installation Date _____ Inspection Date _____

Contract Date _____ Expiration Date _____

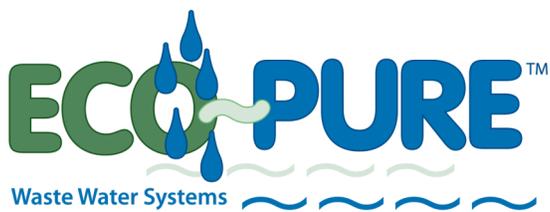
Sample Needed _____ Sample Date _____

Peat Moss Condition: Good Fair Poor Biomat: Yes No

Ponding of Peat Moss: Yes No Reason for ponding _____

Clean Septic Tank Filter: Yes No Septic Tank Needs Pumping: Yes No

Copy to: Customer
Copy to: Planet Care, Inc.
Copy to: Maintenance Provider



Phone: (813) 643-6094
Fax: (813) 643-6014
4102 Bob White Blvd.
Pulaski, Virginia 24301
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