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Ecoflo® Peat-Based Biofilter
Pennsylvania Designer Guide

Disclaimer: *While this document is intended to provide valuable information and guidance as to the design of a sewage treatment and disposal system employing an Ecoflo® Peat Based Biofilter, it is not intended to be a complete resource. Neither Premier Tech Environment nor Falling Spring Technologies is responsible for or shall be held liable for claims arising from the use or application of the information contained in this document.*

Additional reference materials:

PA Code, Title 25, Chapters 71,72 and 73
DEP Alternate and Experimental Systems Guidance (January 2000)
SEO Technical Manual
Premier Tech Environment Installation Guide for Ecoflo® units with submersible collecting bottoms

General Information

- Where marked by an asterisk (*) the system may be permitted by an SEO, **without DEP review**, who has attended the DEP sponsored training on " Permitting Alternate and Experimental Systems".

- An Ecoflo® peat based biofilter is simply a component of a typical sewage system as described in the PA Code. Its primary advantage is that it provides a superior quality effluent that more effectively treats sewage and protects the environment from unnecessary levels of contaminants.

- An Ecoflo® peat based biofilter can be used in on-lot absorption, spray irrigation, drip irrigation and Small Flow Treatment Facility (SFTF) applications and can be converted from one configuration to another with relative ease.

- The lid of the Ecoflo® peat based biofilter **must** remain 1-2" above the FINAL site grade to allow for adequate ventilation of the filter.

- There must be an unobstructed flowpath between the filter and the house plumbing ventilation system (no whole house traps).

- Dosing of the absorption area should follow the requirements of Chapter 73.

- A Zabel A-300 (or equivalent) effluent filter **must** be installed at the outlet of the septic tank or between the septic tank and the Ecoflo® unit.

Feeding an Ecoflo® peat based biofilter

An Ecoflo® peat based biofilter can be fed by gravity or by timer-dosed pumping. The designer must determine if there is sufficient grade on the site to permit gravity flow. Gravity flow is a viable option if the filter can be placed down grade of the septic tank and **is preferred** due to the cost savings realized by the elimination of a lift pump and tank prior to the Ecoflo® filter. Typically, the only time that lifting of the septic tank effluent to the Ecoflo® unit is required is on flat or upward sloping sites where the Ecoflo® unit cannot be located so as to permit gravity flow. **EXTREMELY IMPORTANT:** The inlet to the Ecoflo® unit is a maximum of 10" below FINAL grade – the septic tank outlet is normally deeper than that so the Ecoflo® must be located down grade to account for this. There is no absolute distance that the Ecoflo® unit must be located from the septic tank so be creative in siting so as to allow for gravity flow if at all possible. If there is a question as to whether gravity flow is possible, consider designing with a lift pump and tank and labeling them "optional".

When it is necessary to lift septic tank effluent to the Ecoflo® unit, it is required that the pumping events be evenly timed throughout the course of the day in roughly 10 gallon (but not more than 16 gallon) increments (see Appendix B). As an example, if a 500-gallon/day system were being designed, 10.4 gallons of effluent should be delivered to the Ecoflo® unit every 30 minutes. This can be accomplished by using a TPA-300 Timed Dosing Unit available from Falling Spring Technologies or by using a timer similar to an Intermatic® model CT-1000 percentage cycle timer. With either timer, in-field adjustments with a ball valve and/or the timer will be required to provide the desired volume to the Ecoflo® unit. When selecting a lift pump for this application, remember that this **is not** a pressurized situation and therefore a relatively small pump will perform adequately – in fact a large pump may be damaged by the need to impose an artificially high head by closing the ball valve. Also, when sizing the pump tank for this application, use your best judgment as to the need for storage in the event of site activities or a power outage. As shown in appendix B, a 4" pressure equalizing line **must** be installed from the Ecoflo® unit back to the lift pump tank when distances between the lift pump tank and Ecoflo® unit are less than 100 feet. At greater distances, local venting of the Ecoflo® will be necessary and should be evaluated based on the potential for odor at the Ecoflo® unit. It is desirable to keep the lift pump tank and Ecoflo® unit within 100 feet of each other because of this concern.

When pumping to the Ecoflo®, at the end of a pump cycle, all water must drain to the Ecoflo® or back to the pump tank to eliminate freezing concerns- **NO CHECK VALVES** between the pump and Ecoflo® unit.

If installing a gravity flow system where the inlet pipe to the Ecoflo® is at a grade greater than 10%, an energy dissipator (a reverse d-box or 2-90^0 elbows) must be used to reduce the velocity of the water entering the Ecoflo®.

Reductions in Absorption area sizing

When a system employing an Ecoflo® peat based biofilter is proposed for a new dwelling, in the perc rate range of 3-60 min/in, up to a 40% reduction in absorption area sizing is permissible. However, please recognize that first, you must verify that 100% of the required absorption area is available and also recognize that in most cases there is little cost savings to be realized by decreasing the size of an at-grade absorption bed. Additionally, by keeping the absorption area at full size, you have the added protection of the extra absorption surface. Where size reductions become **EXTREMELY** attractive is in BTG repair situations where site and soil conditions conspire to severely limit the available absorption area. In these situations, best judgment and the guidance provided by Premier Tech Environment (see appendix C) should dictate the system design criteria.

Number of Ecoflo® units required

In a single-family residence application, one Ecoflo® unit will treat the flow from a home with 4 bedrooms or less. For homes with 5 or 6 bedrooms, 2 Ecoflo® units will be required. For applications involving more than 6 bedrooms or in the case of commercial or institutional application, please contact Falling Spring Technologies to determine the appropriate number of required Ecoflo® units.

System Configuration Options

Alternate Systems

With disposal in an at-grade bed (LZ ≥ 20", perc rate 3-180 min/in, slope ≤ 12%) *

Use an Ecoflo® peat based biofilter as shown in figure 1

Use in a spray or drip irrigation system *

A single Ecoflo® peat based biofilter can be used in place of an intermittent sand filter in a spray or drip irrigation system.

Experimental Systems

With disposal in an at-grade bed
(LZ ≥20", perc rate range 3-120 min/in, slope >12%, but ≤15%)

Use an Ecoflo® peat based biofilter as shown in figure 1 but classify as experimental

Best Technical Guidance Repairs Only

With disposal in an at-grade bed
(LZ ≥ 10" to mottles, ≥ 16" to rock, perc rate range 3-180 min/in)

Use an Ecoflo® peat based biofilter as shown in figure 2 and classify as BTG

With disposal in an at-grade bed
(LZ is 17" to 20", perc rate range 3-180 min/in, slope ≤12%) *

Use an Ecoflo® peat based biofilter as shown in figure 4 and classify as BTG

With Ecoflo® open bottom shell placed on top of absorption area
(LZ ≥ 10" to mottles, ≥ 16" to rock, perc rate range 3-180 min/in)

Use an Ecoflo® peat based biofilter as shown in figure 3 and classify as BTG

Other BTG Options

Substantial reductions in absorption area sizing in soils with perc rates up to 75 min/in

Please refer to appendix C. Use in any approved configuration necessary to meet specific site conditions.

Special circumstances

Because of the quality of effluent, there are significant opportunities to mitigate a public health hazard by utilizing an Ecoflo® filter even under less than optimal situations. Please contact Falling Spring Technologies to discuss the specific application. Combinations with other technologies (i.e. leaching chambers) may also be possible depending on the specific application.