NORTH CAROLINA DEPARTMENT
OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

INNOVATIVE WASTEWATER SYSTEM APPROVAL

INNOVATIVE WASTEWATER SYSTEM NO: IWWS-98-1-R3

ISSUED TO: Bord Na Mona
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FOR: Puraflo® Peat Biofilter System

APPROVAL DATE: May 15, 1998
August 16, 1999
April 3, 2001 (minor revision November 5, 2001)
April 8, 2003 (revised siting, design, installation and monitoring criteria)

In accordance with 15A NCAC 18A.1969, an application by Bord Na Mona, Greensboro, NC, for approval of subsurface wastewater systems utilizing the Puraflo® Peat Biofilter has been reviewed and the system has been found to meet the standards of an innovative system when all of the following conditions are met:

A. GENERAL

1. Scope of this Innovative Wastewater System Approval

   a. Treatment performance standard, siting and sizing specifications for the Puraflo® Peat Biofilter and associated subsurface wastewater systems to meet the treatment performance standard.

   b. Design and installation of the Puraflo® Peat Biofilter and associated subsurface wastewater systems

   c. Operation, maintenance and monitoring requirements for the Puraflo® Peat Biofilter and associated subsurface wastewater systems to ensure the treatment performance standard shall continue to be met.

2. This Innovative System Approval is applicable to domestic sewage systems (non-industrial wastewater) utilizing specialized fibrous peat treatment media used exclusively in the Puraflo® Peat Biofilter that have a design flow not exceeding 3000 gallons per day, except as noted. Influent waste strength to the Puraflo® Peat Biofilter shall not exceed domestic septic tank quality effluent, with an average biochemical oxygen demand (BOD_5) of less than 300 mg/L, total suspended solids (TSS) less than 200 mg/L, ammonium-nitrogen (NH_4-N) less than 60 mg/L, and grease plus oil less than 30 mg/L.

   Use of Puraflo® Peat Biofilters in systems that have a design flow exceeding 3000 gallons per day or with a higher influent waste strength may be proposed for consideration by the State on a case-by-case basis.

B. **TREATMENT PERFORMANCE STANDARDS (TS-I):** Tertiary treatment without nitrogen reduction.

The Puraflo® Peat Biofilter shall be designed, installed and operated to meet the following standards:

1. Biochemical Oxygen Demand, 5-day (BOD_5) < 15 mg/L
2. Total Suspended Solids (TSS) < 15 mg/L
3. Ammonium-nitrogen (NH_4-N) <10 mg/L
4. Fecal coliform bacteria densities < 10,000 colonies/100 ml (MPN)

Standards are arithmetic means, except fecal coliforms is a geometric mean.

C. APPROVED PURAFLO® PEAT BIOFILTER SYSTEMS

1. Type A: Puraflo® Peat Biofilter utilizing a (bed) subsurface gravity final treatment and pad disposal system.

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2. Type B: Puraflo® Peat Biofilter used as a stand alone pretreatment system in conjunction with other gravity or pressure dosed subsurface final treatment and disposal systems.

3. Other types of Puraflo® Peat Biofilter systems that are designed and operated to meet Performance Standard TS-I may be subsequently proposed for consideration by the State and as appropriate shall be appended to this approval.

D. SITING CRITERIA

1. Type A Puraflo® Peat Biofilter systems that have a design flow not exceeding 1500 gallons per day may be used:

a. on sites classified as Suitable or Provisionally Suitable and where the soil is classified based on texture as Soil Group I or II, in accordance with 15A NCAC 18A .1900 et seq., and at least 24-inches of Group I or II Soil shall be present beneath the gravel bed bottom, and/or

b. on sites where at least the first 36 inches below the naturally occurring soil surface consist of Soil Group I (sand or loamy sand), and no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface. The requirement for 36 inches of Soil Group I may be reduced to 18 inches when hydraulic analysis by a licensed soil scientist demonstrates that effluent will not come to the ground surface and the required separation to soil wetness can be maintained. The site shall have a uniform slope not exceeding two (2) percent, unless hydraulic analysis by a licensed soil scientist demonstrates that effluent will not come to the ground surface and the required separation to soil wetness can be maintained. In no case shall slope exceed ten (10) percent. Fill material, if needed, shall be sand or loamy sand, containing not more than 10-percent debris, and/or

c. on existing fill sites which meet the requirements of 15A NCAC 18A .1957(b)(2)(A, B and C), and only when the design flow shall not exceed 480 gallons per day.

d. For systems exceeding 1000 gallons per day and up to 1500 gallons per day (not applicable to existing fill sites), the following site conditions shall also be met:

(1) The site is limited to Group I soils for at least 54-inches below the naturally occurring soil surface, no soil wetness condition exists within the first 24 inches below the naturally occurring soil surface, and a vertical separation of 24 inches to any soil wetness condition shall be maintained, unless a site-specific groundwater mounding analysis is performed and demonstrates a 12-inch separation (18-inch minimum for a fill system) shall be maintained; and

(2) Two or more equally sized bed systems shall be utilized, with the modules divided uniformly between each contiguous bed. When two beds are used, the minimum separation between beds shall be 20 feet, and when three or more beds are used, the minimum separation between beds shall be 10 feet; and

(3) A 25-foot horizontal separation shall be maintained to the property line, unless a site-specific nitrogen migration analysis indicates that a nitrate concentration at the property line not exceeding 10 mg/L can otherwise be maintained; and

(4) A pre-approved hydraulic distribution system is utilized to assure uniform distribution of effluent between each peat module (see Appendix A).

All applicable vertical separation requirements shall be met except that the gravel bed bottom may have a minimum separation distance of only 12 inches from any soil wetness condition for systems installed on sites which meet Sections D.1.a or b, above, 18 inches for systems installed on sites which meet Section D.1.c, and 24 inches for systems installed which meet Section D.1.d requirements (unless groundwater mounding analysis substantiates a lesser separation), above. The vertical separation requirement may be met by adding additional Group I soil, but shall not be met with the use of a groundwater lowering system. The system shall be considered to be a fill system only if the gravel bed bottom is installed less than six inches below the naturally occurring soil surface. [Note: for fill systems, the requirements in Rule .1957(b)) for the side slope of the fill shall be met, as determined beginning at a point six-inches above the top edge of the gravel bed].

2. Type B Puraflo® Peat Biofilter Systems may be used on sites classified as Suitable or Provisionally Suitable for conventional, modified, alternative or innovative systems in accordance with 15A NCAC 18A .1900 et seq. The following modifications to siting criteria and vertical separation distance requirements shall be acceptable for Type B systems:

a. Minimum initial vertical separation siting criteria and minimum vertical separation distances for trench bottoms specified in Rules .1955(m), .1956, and .1957 may be reduced for systems with a design flow of up to 1000 gallons per day as follows:
X by a maximum of 25 percent for gravity dosed drainfields, and
X by a maximum of 50 percent for pressure dosed drainfields (LPP or DRIP distribution),

when all of the following conditions are met:

(1) the initial vertical separation siting criteria shall **not** be reduced to less than 12 inches from the soil surface to rock or any unsuitable soil horizon,

(2) the trench bottom vertical separation distance shall **not** be reduced to less than 12 inches to rock or tidal water, or to less than nine inches from any other soil wetness condition,

(3) the site shall be evaluated by a Licensed Soil Scientist (see Section I, below), and

(4) with the exception of horizontal setback reductions from Drainage Systems, **no other reductions in horizontal setbacks or increases in Long Term Acceptance Rates (LTAR)**, as provided for in Sections D.3 and E.2 or 3, below, shall be used when any reductions in initial vertical separation siting criteria or trench bottom vertical separation distances are utilized. Furthermore, no reduction in trench bottom area shall be allowed for chambered or polystyrene aggregate systems when any of these reductions are utilized. These reductions are also not applicable to a PPBPS system sized in accordance with Rule .1956(3)(a)(ii).

b. Drainage Systems: When a Type B Puraflo® Peat Biofilter System is to be utilized, drainage may be used on sites with Group III Soil Texture, and soils with Provisionally Suitable (or Suitable) structure are allowed within the vertical separation zone. A groundwater lowering system may also be used to meet the siting criteria or vertical separation requirements for soil wetness conditions for fill systems specified in Rule .1957(b)(1). Site evaluation by a Licensed Soil Scientist shall be required, and the drainage system shall be designed by a person with demonstrated knowledge of drainage systems (see Section I, below).

c. Saprolite Systems: When a Type B Puraflo® Peat Biofilter System is to be utilized, saprolite with sandy clay loam texture may be used. The maximum LTAR for sandy clay loam saprolite texture shall be 0.2 gpd/ft^2 for conventional gravity trenches and 0.10 gpd/ft^2 for LPP trenches. Trenches in saprolite may be installed up to **five** feet deep. Site evaluation by a Licensed Soil Scientist or Professional Geologist shall

be required (see Section I, below). The horizontal setback reductions found in Table 1 may be used, except that the 100 foot setback for wells and WS-I streams must be maintained with any saprolite system.

d. For systems exceeding 1000 gallons per day and up to 3000 gallons per day, the following site conditions shall be met:

(1) A 25-foot horizontal separation shall be maintained between the ground absorption system and the property line, unless a site-specific nitrogen migration analysis indicates that a nitrate concentration at the property line not exceeding 10 mg/L can otherwise be maintained; and

(2) A pre-approved hydraulic distribution system is utilized to assure uniform distribution of effluent between each peat module.

(3) For systems exceeding 1500 gallons per day and up to 3000 gallons per day, the following additional conditions shall be met:

i. The system shall be designed by a professional engineer.
ii. A minimum of duplex pumps shall be required for the system, or other pre-approved alternative uniform distribution system; and
iii. A hydraulic analysis is required prior to approval to assure the required separation to soil wetness can be maintained.

3. Minimum horizontal setbacks shall be as specified in Rule .1950, .1951 and .1956(6)(g), as applicable, except as provided for in Section D.3.a or b, below. For Type A peat systems, horizontal setbacks from the peat modules shall be measured from the nearest edge of the gravel support bed, except for Type A fill systems. For Type A fill systems, horizontal setbacks shall be measured from a point five feet (5') from the nearest edge of the gravel bed sidewall, or from the projected toe of the side slope of the fill that is required to meet soil and site limitations, whichever is greater.

a. For systems with a design flow of up to 1000 gallons per day, see Table 1, below, for applicable minimum horizontal setback requirements

Table 1. Minimum horizontal setbacks for ground absorption systems when a Puraflo® Peat Biofilter System meeting TS-I is used.*

Land feature or component	Existing Rules .1950 (a)	Puraflo® Systems
	---------- feet----------	
(1) Private water supply source, except uncased well or spring.	100	70 (100 feet for saprolite)
(2) Public water supply source	100	100
(3) Streams classified as WS-1	100	70 (100 feet for saprolite)
(4) Waters classified as S.A.	100	70 (from mean high water mark)
(5) Other coastal waters	50	35 (from mean high water mark)
(6) Other stream, canal, marsh or other surface waters	50	35
(7) Class I or Class II reservoir	100	70 (from normal pool elevation)
(8) Permanent storm water retention pond	50	35 (from flood pool elevation)
(9) Other lake or pond	50	35 (from normal pool elevation)
(10) Building foundation	5	5
(11) Basement	15	15
(12) Property line	10	10
(13) Top of slope of embankments or cuts of 2 feet or more vertical height	15	15
(14) Water line	10	10

(15) Drainage systems*:		
(A) Interceptor drains, etc.		
(i) upslope	10	7
(ii) sideslope	15	10
(iii) downslope	25	20
(B) Groundwater lowering ditches and devices	25	20
(16) Swimming pool	15	15
(17) Other nitrification field (except repair area)	20	10

***- Note: With the exception of the Drainage Systems horizontal setback reductions, the reductions in horizontal setbacks in Table 1, above, for Puraflo® systems shall not be allowed when reductions in initial conditions or vertical separation distances are used in accordance with Section D.2.a, above; when any increase in Long Term Acceptance Rate (LTAR) is used in accordance with Sections E.2 or E.3, below; or when a Type A system is to be installed on an existing fill site which meets Section D.1.c, above. Also, reductions to Rule .1950(a) setback requirements do not apply to systems with a design flow in excess of 1000 gallons per day.**

b. For Systems with a design flow in excess of 1000 gallons per day, a 25-foot horizontal separation shall be maintained to the property line, unless a site-specific nitrogen migration analysis indicates that a nitrate concentration at the property line not exceeding 10 mg/L can otherwise be maintained.

E. SIZING CRITERIA

1. The system sizing criteria shall normally be based upon the Long Term Acceptance Rate (LTAR) specified in the appropriate section of the Rules for the type of ground absorption system to be used, except that for Type A Puraflo® Peat Biofilter Systems to be installed in fill material (Section***s*** D.1.b ***and c***, above), the LTAR shall not exceed 1.0 gpd/ft^2, and for any Type A system, the bed bottom surface area shall **not** be required to be increased by 50 percent as per Rule .1955(d).

2. For Type A Puraflo® Peat Biofilter Systems, the minimum number of square feet of bottom area determined by dividing the design daily sewage flow by the LTAR may be reduced by up to 25 percent, as long as horizontal separation distances specified in Rule .1950 or .1951, if applicable, are met (unreduced). However, no such reduction in bottom area shall be allowed for Type A systems in existing fill (Section D.1.c, above).

3. For Type B Puraflo® Peat Biofilter Systems, the LTAR may be increased by up to a factor of two when all of of the following conditions are met:

a. initial vertical separation siting criteria or vertical separation distances for trench bottoms specified in Rules .1955(m), .1956 or .1957 are met (unreduced),

b. sandy clay loam saprolite is <u>not</u> proposed to be used,

c. horizontal separation distances specified in Rule .1950 or .1951, if applicable, are met (unreduced),

d. for systems to be installed in fill, a pressure dosed drainfield (LPP or DRIP distribution) is to be used,

e. for systems to be installed on sites with Group III or IV soils within three feet of the trench bottom on sites requiring drainage of Group II or III soils, the site has been evaluated by a Licensed Scientist (see Section I, below), and

f. for ground absorption systems utilizing modified, gravelless or other types of nitrification trenches separately approved in accordance with Rules .1956 or .1969, no reductions in linear footage of nitrification trench or system area shall be applied when the LTAR has been increased in accordance with this section.

F. DESIGN CRITERIA

1. Pretreatment:

   a. A septic tank as required in Rule .1952 shall be provided. An access riser with access manhole extending at least to finished grade shall be provided over the outlet and be designed and maintained to prevent surface/water inflow.

   b. A septic tank effluent filter at the septic tank outlet, screened pump vault in the pump tank, or equivalent effluent filtration device, as specified by Bord Na Mona, shall be provided.

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2. Dosing System - Pump Tank:

   a. Requirements for pump dosing systems in Rule .1952(c), except as provided for herein, shall be met.

   b. A State-approved pump tank shall be provided with a liquid capacity at least equal to the required septic tank liquid capacity.

   c. Dosing onto the peat biofilter media shall be regulated by a control panel with programmable two stage timer, elapsed time meter, event counter and alarm system. Dosing frequencies shall range from 8 to 24 doses per day.

   d. The system shall be designed to deliver a net dosing volume of 5 to 15 gallons per peat biofilter module per dosing cycle, at a pumping rate of 7 to 12 gpm per module. Drainback volumes shall be factored in the design where applicable (e.g. by increasing dosing volume accordingly).

3. Components Common to all Puraflo® Peat Biofilter Systems:

   a. The Puraflo® Peat Biofilter is a pre-engineered proprietary treatment system. The containment modules are made of pre-assembled, UV-protected polyethylene material, with approximate dimensions of 7.08 feet long by 4.58 feet wide by 2.5 feet deep. The modules are fitted with UV-protected, removable polyethylene lids, which contain ventilation and drain holes. Each module in the system is installed at the exact same elevation, with effluent flow uniformly split between the separate modules. The system designer shall specify the elevations required for all relevant system components, and set relative to a site specific vertical benchmark.

      The fibrous peat treatment media is residues of Eriophorum (Cotton Grass) plants, extracted from raised bog peats (other natural residues and peat fines are also present).The following statement should be included on all permits and authorizations to construct: **AThe estimated life of the peat media is currently 15 years. The media may need to be replaced, in part or in full, in order to maintain specified treatment standards**.≅

      The peat biofilter media shall be designed in accordance with the following parameters:

      Media thickness in inches:..... 24
      Maximum hydraulic loading rate in gpd per square foot:..... 4.9
      Minimum number of Peat Biofilter Modules per bedroom:..... 1
      Minimum number of Peat Modules per 150 gallons per day for non-residential systems…….1

   b. Distribution to the peat biofilter modules is achieved by a pressure manifold. The supply line from the pump tank connects to the pressure manifold. Flexible pipe with orifice plates (constrictions) connect the pressure manifold to pre-installed distribution grids within each peat biofilter module. The orifice plates convert the pressure head in the pressure manifold to the same velocity head as it enters each of the module

distribution grids (modules must be installed at the same elevation), splitting the flow equally amongst the modules. The distribution grid inside the module distributes the effluent uniformly over the module surface. The distribution grid is covered with a layer of fibrous peat media.

c. The treated effluent exits from the base of the module under gravity through weep-holes or solid piping depending on the type of Puraflo® Peat Biofilter system utilized. Modules are color coded to indicate different hook-up and effluent exit arrangements. The system designer shall specify which modules are needed for a specific design.

d. Ventilation: The lids on the peat biofilter modules contain vent holes which accommodate the passive diffusion of oxygen into the modules. These vent holes shall not be covered.

4. Components Specific to Type A Puraflo® Peat Biofilter Systems.

a. Each module shall be centered on contiguous level rock beds each with a width of 5 to 12 feet, and length of 8 to 15 feet, and minimum depth of 8 inches. Rock used shall be in accordance with Rule .1955(h).

b. Effluent after passing through the peat media is distributed over the rock bed through multiple weep-holes installed at the base of each module, with the exception of the modules connected to the sampling chamber (see below).

c. For effluent sampling, the bottom half of one or two adjoining modules in each installation shall not contain weep-holes, but shall include an underdrain collection pipe connected to a specially designed sample collection chamber to be installed immediately adjacent to the module(s) on the rock pad. Holes in the side of the sample chamber allow seepage of uncollected effluent into the underlying rock pad.

5. Components Specific to Type B Puraflo® Peat Biofilter Systems.

a. Modules shall be installed contiguous to each other on a level gravel bed. Gravel shall be clean, crushed No. 5 or No. 57 stone or fine sand with a minimum depth of six inches. Alternative bedding designs may be specified by the designer which provide for the modules to be adequately supported and level.

b. Effluent after passing through the peat media is piped from the base of sealed (no weep-holes) modules either directly from each module to equal lengths of subsurface trenches (one trench segment per module) or piped together prior to being conveyed by gravity or pumped to a conventional, modified, alternative or innovative system in accordance with Rules .1900 et seq. Subsurface trenches shall be set back horizontally at least two feet from the gravel bed beneath the modules.

c. For effluent sampling, locate a sampling access port in the discharge pipe between the underdrain exit point from at least one of the peat modules, and the drainfield. A 4-way cross or similar device can be used where the module discharge pipe and the vertical sampling port intersect to facilitate collection of effluent samples. The vertical sampling access port must come above the ground surface, be constructed of 4-inch diameter Schedule 40 PVC pipe, be vented to the atmosphere, and contain a removable cap to allow sampling of Biofilter effluent flowing to the drainfield. The cap shall be removable and constructed to prevent the entrance of rainwater, surface water, rodents, insects, etc.

Alternately, a distribution box or drop box may be used for the sampling access point, located in the effluent discharge line from at least one of the peat modules prior to the drainfield. The box must be constructed to facilitate at-grade access.

G. INSTALLATION AND TESTING PROCEDURES

1. An on-site preconstruction conference shall be required to be attended by the Puraflo® Peat Biofilter system designer, installer, local health department, licensed soil scientist (as applicable), and property owner or owner=s

representative prior to beginning construction of the Puraflo® Peat Biofilter and associated ground absorption system.

2. The septic tank, pump tank and peat biofilter modules shall be located to prevent surface/subsurface water inflow/infiltration, and shall meet the horizontal setback requirements of Rule .1950(a) or .1951, as applicable.

3. Peat biofilter modules shall be installed level on a rock bed (see Sections F.4. and F.5., above). Elevation shall be high enough to meet constraints established for the site by the final treatment and disposal system.

4. For Type A Puraflo® Peat Biofilter Systems, the bed shall be constructed as an elongated berm, with the long axis parallel to the ground elevation contours of the slope. The bottom of the bed shall be excavated level (± 1/4") in all directions. The gravel bed shall be immediately installed without allowing machinery to traverse the excavated/exposed bed bottom. Exposed portions of the rock bed (portions not under the modules) shall be covered by a geotextile fabric prior to back filling capable of preventing the downward movement of silt-sized particles while allowing the movement of moisture and gases.

5. For Type B Puraflo® Peat Biofilter Systems, the gravel or sand bed shall be installed level (± 1/4") in all directions, with configuration and specified color-coded modules installed as directed by the system designer for each site. The gravel or sand bed must extend a least six inches beyond the ends of the modules in all directions.

6. Backfill shall be installed over the gravel bed along the sides of the modules, with the module tops remaining at least six inches above finished grade. Minimum backfill depth shall be six inches. Backfill shall be installed with a side slope not to exceed a rise to run ratio of 1:3, unless a dry stacked interlocking block retaining wall is constructed adjacent to the gravel bed. Any other type of retaining wall shall be designed by a professional engineer and approved by the local health department. (Note: use of a retaining wall for supporting backfill does not supercede side slope requirements for fill systems, which still must be met, where applicable).

7. All tankage, including risers, shall be demonstrated to be watertight by a 24-hour hydrostatic leakage test conducted at the installation site prior to system startup. A water level change of ∀2-inch or more over 24 hours, or visual observation of leakage shall be cause for failure of the watertightness test.

8. Pump delivery rate shall be measured and determined to be in accordance with design parameters. The initial settings shall be made to pump timer controls and pump activation elevations in the Biofilter dosing tank based upon these field measurements prior to system start-up. The system=s Operator in Responsible Charge (ORC) shall be present during these determinations.

9. Specified site preparation steps and construction specifications for the ground absorption system shall be strictly adhered to, including specified depth of trenches in relation to site limiting conditions.

H. OPERATION AND MAINTENANCE

1. System classification, management and inspection shall be in accordance with Rule .1961. Puraflo® Peat Biofilters shall be classified at a minimum as a Type Va system according to Table V(a) of Rule .1961(b).

2. System Inspections: Both the local health department and the Operator-in-Responsible Charge (ORC) must conduct monitoring inspections of Puraflo® Peat Biofilter Systems at a minimum frequency as specified in Table V of Rule .1961(b) and the Operation Permit.

3. At each Puraflo® Peat Biofilter inspection the ORC shall, at a minimum, observe and monitor:

a. wastewater level in the tanks,
b. the septic tank outlet filter or screened pump vault for clogging,
c. watertightness of tanks, risers and pipe connections at tanks,
d. operation of pumps, floats, valves, electrical controls and alarms,
e. pumping frequency from pump impulse counters and elapsed run time meters,
h. the peat modules and the earthern mound and/or landscape retaining wall for any structural damage,

accessibility, adequate ventilation, excess odors, insect infestations,

g. vegetative growth over the drainfield,
h. the drainfield area for surfacing the effluent, and
i. a sample of peat biofilter effluent collected from the sampling point to check for effluent clarity and odor (note: peat biofilter effluent may have a brackish to straw color from the humic and fulvic acids naturally present in the peat media).

4. At least twice per year the ORC shall, at a minimum, measure and report to the health department:

   a. sludge and scum levels in the septic tank,
   b. sludge level and grease presence in the pump tank,
   c. pump delivery rate (drawdown test), and
   d. dosing volume and measure or calculate average pump run time.

5. The ORC shall also conduct other additional observations, measurements, monitoring, and maintenance activities as specified in the Operation Permit and as recommended by the manufacturer. If determined by the operator to be necessary, the peat modules shall be uncovered and peat surface inspected, with no disturbance to the system. Reasons may include, but are not limited to observation of roots growing into the module which need removing, to determine if unauthorized traffic over the module has resulted in damage to the distribution grid, to investigate possible damage due to owner abuse or insect infestation, or to investigate reasons for effluent sample exceedences or evidence of non-uniform distribution of effluent within or between modules. Any modifications to the peat surface or adjustments needed to the distribution grid shall be made only as prescribed by the manufacturer.

6. Effluent Sampling and Analysis:

   a. Puraflo® Peat Biofilter effluent samples shall be collected at least yearly by the ORC.

      (1) For Type A Systems, samples shall be collected from the sampling chamber.

      (2) For Type B Systems, samples shall be collected from the 4-way cross, P-trap, distribution box or similar device provided for effluent sampling.

      (3) The sampling location shall be purged of accumulated effluent and allowed to refill prior to collecting a sample.

   b. Sample collection frequency shall be specified by the local health department in the Operation Permit, and can be modified, as needed, by the local health department.

   c. The ORC shall certify that sample collection protocols established by the manufacturer (see Appendix B) have been followed. Documentation shall be provided that normal chain-of-custody standards have been adhered to, and all samples shall be obtained, preserved, and analyzed in accordance with 40 CFR 136. Samples shall be analyzed by a state certified wastewater laboratory for the treatment performance standards specified in Section B. Results from all samples analyzed shall be reported by the certified wastewater laboratory directly to the ORC and simultaneously to the Health Department.

   d. The effluent samples shall only be collected during periods of occupancy of the facility served when the system is being continuously utilized. For coastal resort communities, annual sampling shall take place between June 1 and July 31 of each year. Re-sampling, if needed, shall be completed prior to the end of the Labor Day weekend.

   e. When the initial annual sample does not meet treatment standards specified in Section B, the system shall be re-sampled within 60 days and analyzed at least for the parameter(s) exceeding treatment standards. The ORC shall flag any non-compliant sample results in their reports to the local health department. Water use by the facility between the initial and re-sampling dates shall be estimated either

by successive water meter readings, effluent dosing pump cycle counts or elapsed time clock readings, or counts of any tipping distribution device, as applicable.

f. Sample non-compliance shall trigger the issuance of a Notice of Violation by the Health Department to the Owner under the following circumstances:

(1) fecal coliform bacteria is in excess of standard requirements, even after re-sampling, during a monitoring season; or

(2) More than one parameter (BOD_5, TSS, or NH-4) is in excess of standard requirements, even after re-sampling, during a monitoring season; or

(3) If BOD, TSS or NH-4 is in excess of standard requirements, even after re-sampling during a monitoring season, or in successive monitoring seasons, even after resampling. However, if a single parameter (BOD_5, TSS or NH-4) is excess of standard requirements by less the 30-percent in the samples taken or retaken during a monitoring season, no NOV shall be issued.

Copies of Notices of Violation shall also be sent to the ORC and the Manufacturer. It is the responsibility of the Owner and ORC to diagnose the reason(s) for violation(s). The manufacturer shall provide appropriate assistance in the aforementioned diagnoses upon the request of the Owner/ORC. The Owner shall respond to the Health Department within 60 days (or sooner, if so specified by the Health Department) of steps being taken to alleviate likely problems. The Health Department shall require system maintenance or repair as it determines to be needed.

7. Notification and Performance of Maintenance and Repairs

a. The ORC shall alert the system owner in a timely fashion of needed maintenance or repair activities including, but not limited to, landscaping, tank sealing, tank pumping, pipe or control system repairs, media replacement, and adjustments to any other system component. The ORC shall notify the system owner and local health department whenever the pump delivery rate efficiency or average pump run time are not within 25% of initial measurements conducted prior to system startup.

b. The ORC shall keep the septic tank outlet effluent filter or screened pump vault cleaned and in proper operating condition, as per manufacturer=s recommendations. .

c. System troubleshooting and needed maintenance must be provided to maintain the pump delivery rate and average pump run time within 25% of initial measurements conducted prior to system startup.

d. The septic tank will be pumped as needed upon recommendation of the ORC. However, at a minimum the septic tank will be pumped whenever the solids level exceeds 25% of the tank=s total liquid working capacity or the scum layer is more than 4 inches thick.

e. The ORC shall notify the local Health Department and system owner in writing whenever repairs are required, including the need to replace the media. (Note: media replacement shall require the issuance of a repair permit by the Health Department). All maintenance activities shall also be logged and recorded in the ORC reports provided to the local health department. Waste media shall be disposed in accordance with requirements of the Division of Waste Management for this specific waste.

8. Reporting

a. After each required ORC system inspection, the ORC shall provide a completed written report to the system owner and the local health department within 30 days. At a minimum this report must specify:

(1) the date and time of inspection,
(2) system operating conditions observed according to H.3, above,
(3) system operating conditions measured according to H.4, and H.5, above,

(4) results from any laboratory analysis of any effluent samples,
(5) maintenance activities performed since the last inspection report,
(6) an assessment of overall system performance, and
(7) a determination of whether the system is malfunctioning, and the specific nature of the malfunction.

b. After each required health department system inspection, the local health department shall provide a completed inspection report to the system owner, Bord na Mona Environmental Products U.S. and the State within 30 days. The local health department shall also provide an annual summary each January to the State including:

(1) the name of the environmental health specialist in the health department with primary responsibility for the Puraflo® Peat Biofilter program in the county/district,
(2) the number of improvement permits, construction authorizations, and operation permits issued for Puraflo® Peat Biofilter systems the prior year in the county/district,
(3) the total cumulative number of Puraflo® Peat Biofilter systems installed under this Approval in the county/district,
(4) the percentage of ORC reports due to the health department that have been received from the ORC=s,
(5) an assessment of overall performance of Puraflo® Peat Biofilter systems in the county/district, and
(6) the percentage of Puraflo® Peat Biofilter systems which malfunctioned during the prior year, the nature of the malfunctions, and any remedies implemented or needed.

I. RESPONSIBILITIES AND PERMITTING PROCEDURES

1. Prior to the installation of a Puraflo® Peat Biofilter system at a site, the owner or owner=s legal representative shall notify the local health department of their proposed use of such a system. The local health department shall issue an Improvement Permit or Authorization to Construct or amend a previously issued Improvement Permit or Authorization to Construct allowing for the use of the proposed Innovative System upon a finding that all provisions of this approval and all other applicable rules shall be met. Use of the proposed Innovative System and any conditions shall be described in the Improvement Permit and Authorization to Construct or amended Improvement Permit and Authorization to Construct, as well as described on the Operation Permit to be issued upon the acceptable completion of the system installation.

2. Prior to the issuance of the Improvement Permit, the site shall be evaluated by a Licensed Soil Scientist whenever the following conditions are applicable:

a. reduction in the initial requirement for 36 inches of Group I Soil or when the site slope exceeds two (2) percent, in accordance with Section D.1.b, above,

b. a ground water mounding analysis or nitrogen migration analysis is required in accordance with Section D.1.d, above,

c initial vertical separation siting criteria or vertical separation distances for trench bottoms are proposed to be reduced in accordance with Section D.2, above,

d drainage is proposed for Group III soils or a groundwater lowering system is proposed to be used in conjunction with a fill system (the drainage system shall be designed by someone with demonstrated knowledge of drainage systems),

e sandy clay loam texture saprolite is proposed to be used (this evaluation could be performed by a Professional Geologist instead of a Licensed Soil Scientist), or

f the LTAR is proposed to be increased on sites with Group III or IV soils within 3 feet of the trench bottoms or on sites where drainage of Group II or III soils is proposed, in accordance with Section E.3, above.

3. Where required, the Licensed Soil Scientist (or Professional Geologist where appropriate), shall conduct a detailed assessment of the site conditions and provide to the local health department a written, signed and sealed report that includes:

a. detailed descriptions of landscape position and soil morphological conditions to a depth of at least three feet below the trench bottom in the drainfield and repair area,

b. field estimates of the depth and thickness of the least permeable horizons,

c. recommended depth for placement of the trench bottoms and the recommended LTAR,

d. a hydraulic assessment, based on site-specific information, substantiating the projected effectiveness of subsurface system performance. This shall include documentation that indicates the treated sewage effluent at the proposed LTAR will not discharge to the surface of the ground within or adjacent to the drainfield when the system is installed and operated within design parameters, justification for any proposed drainage systems, and verification that the required separations to soil wetness can be maintained, as required in Sections D.1.b, D.1.d, D.2.b, D.2.d, and E.3.e, as applicable, and

e. other site-specific requirements for system design, installation, site preparation, modifications and final landscaping.

The local health department may request the assistance of the State in evaluating this report prior to Improvement Permit issuance.

4. Design responsibility: Prior to the issuance of an Authorization to Construct for a Puraflo® Peat Biofilter System, site-specific plans and specifications shall be submitted for review and approval by the local health department. Site specific plans and specifications shall be prepared by individuals authorized in writing by the manufacturer (which may include an authorized agent in a local health department), or by a professional engineer. Approval shall be contingent upon the specific Puraflo® Peat Biofilter System proposed being found to be in accordance with all provisions of this approval as applicable to the proposed facility and site.

5. The system shall be installed by a contractor authorized in writing by the manufacturer, who shall coordinate the installation with the designer and manufacturer=s field representative. The manufacturer=s field representative shall provide written confirmation of their acceptance of the Puraflo® Peat Biofilter installation and designer shall provide written confirmation of their acceptance of the complete system installation prior to Operation Permit issuance.

6. For sites required to be evaluated by a Licensed Soil Scientist or Professional Geologist (see Section I.2, above), the health department may specify as a condition on the Improvement Permit and Authorization to Construct that a Licensed Soil Scientist or Professional Geologist oversee critical phases of the ground absorption system installation and certify in writing that the installation was in accordance with their specified site/installation requirements prior to the Operation Permit issuance.

7. The operator requirements of Rule .1961(b) shall be met, including the requirement for a contract to have been executed between the system owner and a private Certified Operator or with a Public Management Entity with a Certified Operator. The ORC shall provide documentation of attending training sessions sponsored by the manufacturer regarding the proper operation, maintenance, inspection, monitoring and sampling procedures relevant to the Puraflo® Peat Biofilter system. The ORC shall be present during initial system setup in accordance with Section G.8, above, prior to issuance of the Operation Permit.

J. REPAIR OF SYSTEMS

The provisions of 15A NCAC 18A .1961(l) shall govern the use of Puraflo® Peat Biofilter Systems for repairs to existing malfunctioning wastewater systems.

Approved by:_____ Date:_____