



# COMMONWEALTH of VIRGINIA

Department of Health  
P O BOX 2448  
Richmond, VA 23218

M. Norman Oliver, MD, MA  
State Health Commissioner

TTY 7-1-1 OR  
1-800-828-1120

April 15, 2020

Colin Bishop, Chief Executive Officer

[colin.bishop@anuainternational.com](mailto:colin.bishop@anuainternational.com)

Anua

P.O. Box 77457

Greensboro, NC 27417

VIA ELECTRONIC AND REGULAR MAIL

RE: Treatment Level 3 Approval of Anua Puraflo Peat Fiber Biofilter

Dear Mr. Bishop:

We have completed our review of your request for listing of Anua's Puraflo Peat Fiber Biofilter wastewater treatment units as "Generally Approved" under the Virginia Department of Health's (VDH's) GMP #2016-03 and in accordance with the Treatment Level 3 (TL-3) general approval requirements in the *Regulations for Alternative Onsite Sewage Systems* (12 VAC5-613, *AOSS Regulations*).

The complete submittal for review consists of the following:

1. An application for TL-3 listing.
2. A letter from Joel Pinnix, PE, dated August 26, 2019, certifying that the subject unit is capable of consistently meeting the TL3 effluent criteria.
3. A letter from Joel Pinnix, PE, dated August 26, 2019, stating the Operations and Maintenance Manual accurately reflects the servicing and maintenance needs of the referenced treatment unit.
4. Letter dated December 7, 2018, from Colin Bishop (CEO - Anua) outlining historical approvals for Puraflo.
5. Puraflo Peat Fiber Biofilter Virginia TL-3 Package dated March 18, 2020 and containing the following components
  - a. Chain of Custody Forms
  - b. Sampling and Analytical Methods
  - c. Laboratory Analytical Reports and Field Notes
  - d. List of Key Participants
  - e. Puraflo Peat Biofilter – Virginia Demonstration Project Report, December 1999 (original project report supporting initial approval)
6. Report: "NERCC Individual Alternative Wastewater Treatment Systems: Pollutant Removal in 2003 and Long-Term Performance", (Northeast Regional Correctional Center, Duluth - MN). Nov 2004. Authors: Richard Axler, Barbara McCarthy, and Jerald Henneck. Natural Resources Research Institute, University of Minnesota - Duluth.
7. Spreadsheet of data from MN study referenced in #5.

Mr. Colin Bishop

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8. Article: "Performance of Peat Filters in the Treatment of Domestic Wastewater in Minnesota".  
Authors: S.D.M. Geerts, B. McCarthy, R. Axler, J. Henneck, S.H. Christopherson, J. Crosby, and M. Guite. ASAE On-Site Wastewater Treatment – Proceedings of Ninth National Symposium on Individual and Small Community Sewage Systems.
9. Data from test results entered into VDH statistical spreadsheet.
10. Puraflo Engineering and Technical Specifications.
11. Puraflo Biofilter Reference Manual.
12. Puraflo Peat Biofilter Maintenance Manual.
13. Drawings:
  - a. Module Grid Detail
  - b. Sample Chamber Detail
  - c. Assembled Module Detail
  - d. Type A (open bottom pad installation) and Type B (sealed bottom with piped outlet installation) Installations

The submittal was reviewed in accordance with GMP 2016-03. Twenty sites were included in the final evaluation, 19 from Virginia and one from Minnesota. A variance authorizing the use of out of state data was issued on July 25, 2019. The effluent testing results indicate a predicted mean BOD<sub>5</sub> of 5.82 mg/l and TSS of 7.38 mg/l using the statistical protocol established in GMP 2016-03. See the attached memo dated April 9, 2020 for discussion of the review.

Puraflo Peat Fiber Biofilters are packaged as individual modules with each module rated at 125gpd. Septic tanks are required ahead of the system, sized in accordance with 12VAC5-610, but with a minimum 1,000 gallon volume required. The modules are timed dosed in accordance with the manufacturer's instructions.

Based on our review, VDH approves the above listed Puraflo Peat Fiber Biofilter wastewater treatment units for listing as "Generally Approved" under GMP #2016-03 and as "Generally Approved" for TL-3 effluent treatment in accordance with the AOSS Regulations.

If you have any questions, please contact Marcia Degen at [Marcia.Degen@vdh.virginia.gov](mailto:Marcia.Degen@vdh.virginia.gov) or by phone at (804) 387-1883.

Sincerely,

DocuSigned by:  
  
4D8214BCF9F942E...

*Lance Gregory, Division Director*  
Division of Onsite Sewage and Water Services,  
Environmental Engineering & Marina Programs

Cc: Marcia Degen, Technical Services Manager  
Attachment - Memo

**Virginia Department of Health**  
**Office of Environmental Health Services**  
*Technical Services – Wastewater Engineering*

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To: Lance Gregory, Division Director, Onsite Sewage and Water, Environmental Engineering, and Marina Program

From: Marcia J. Degen, Ph.D., P.E., Technical Services Manager

Date: April 9, 2020

RE: Anua International

***Listing of Puraflo Peat Fiber Biofilter Treatment Units (P125TL3 “XX”) for Treatment Level 3  
General Approval under GMP 2016-03***

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On May 6, 2016, VDH issued GMP 2016-3 to replace GMP 147. Both policies contain protocols for demonstrating compliance with a 10 mg/l BOD<sub>5</sub> and 10 mg/l TSS standard. GMP 2016-3 implemented requirements of the AOSS Regulations to create a process for demonstrating compliance with Treatment Level 3 (TL3), a 10 mg/l BOD<sub>5</sub> and 10 mg/l TSS standard (12VAC5-613-70). Anua conducted studies under an experimental protocol and received general approval prior to GMP 147 (GMP 69, GMP 79, GMP 93, and GMP 112). A final compilation of study results was submitted in 1999 and that study is listed as the basis for the unit’s approval under GMP 147 and GMP 2016-03. Puraflo units were generally approved pursuant to GMP 2016-03 and the AOSS Regulations (12VAC5-613). Because the existing approval pre-dates the AOSS Regulations, the current approval expired on December 7, 2016, pursuant to 12VAC5-613-30.L. Anua requested and received a variance to extend the original approval to December 7, 2018.

An application was filed for TL3 General Approval under GMP 2016-03 on December 7, 2018. Subsequent to review, the data was found to be deficient in the number of testing sites meeting the policy criteria. A second variance was requested to use out of state data to supplement the Virginia testing data and approved on July 25, 2019. A revised application was submitted on September 13, 2019. Another revised application was submitted March 18, 2020, in response to VDH comments.

The following documents were reviewed:

1. An application for TL-3 listing.
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13. Drawings:
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The documents were compared to the requirements for TL-3 General Approval under GMP 2016-03, recognizing that this unit had been previously approved by VDH under GMP-147. A total of 23 sites were involved in the Virginia study but 4 sites were eliminated from the analysis due to insufficient data sets and/or operating in recirculating mode. Anua supplied a new data set from Minnesota to bring the total data set up to the required minimum 20 sites.

The following comments are noted. GMP 2016-03 requires that flow and O&M be reported; that influent be tested; and that 4 data sets be collected from each site, one in each quarter.

- The number of occupants was not recorded nor was flow estimated during the study. The design flow was reported. Anua provided estimates of usage based on historical records. Flow information was not required in the original study overseen by VDH and while helpful, is not critical to assessing the effluent quality. The information provided is adequate in this case.
- O&M is addressed in the field notes. Additionally the pump tank operation and condition were evaluated at each visit.
- Influent was sampled and analyzed at least once on all but 2 sites. No abnormalities were noted regarding the sites.
- 7 sites had no data collected during the fourth quarter of the year (October through December). After reviewing the data sets, however, it was determined 5 of the sites had multiple data points in the first quarter (January through March) so performance during cold weather is well documented. Two sites (Site 19 and 21) had only one data set in the cold weather time frame (first quarter). Many sites had 7 to 12 data points and cold weather data is well represented. As a result VDH determined that the extra data points during the winter at the majority of sites are sufficient and the intent of the policy (assess cold weather performance) is met.

The data from the Virginia sites and the one Minnesota site were evaluated using the VDH statistical methods outlined in GMP 2016-03. The method returned the following results demonstrating compliance with the required protocol.

	<u>BOD5</u>	<u>TSS</u>
Count (n) =	20	20
Degrees of Freedom (n-1) =	19	19
Mean =	1.45	1.61
Std Dev =	0.54	0.69
Std Error =	0.12	0.15
Upper 99% T (1-tailed)	2.54	2.54
Upper99% T Conf Int =	1.76	2.00
UNTRANSFORMED Upper 99% T Conf Int =	5.82	7.38

Recommendation: Staff recommends the Anua’s Puraflo Peat Biofilter be listed as Generally Approved for TL-3 under GMP 2016-03.