



COMMONWEALTH of VIRGINIA

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August 28, 2014

Mr. Brian Rustia
Baysaver Technologies, LLC
1030 Deer Hollow Drive
Mount Airy, MD 21771

Re: Assignment of Percent Removal Efficiencies for Total Phosphorus

Dear Mr. Rustia,

Thank you for your submittal of the Manufactured Treatment Device (MTD) Registration Form and supporting documentation for the BayFilter™ Stormwater Cartridge System. The MTD information provided (Appendix A) was reviewed for the purpose of assigning a pollutant removal efficiency for total phosphorus (TP). This review was performed in accordance with the Guidance Memo Number 14-2009 titled "Interim Use of Stormwater Manufactured Treatment Devices (MTDs) to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria, Part IIB Water Quality Design Requirements". The review process included the analysis of the documents submitted and any other publically available reports.

The documents submitted provided descriptive information about the BayFilter™ Stormwater Cartridge System, the maintenance plan, and several performance studies. The data provided within the contents of the submitted performance studies included drainage area size and land cover, storm event and runoff parameters, event mean concentrations (EMC) of selected nutrients and sediment, and performance results. The performance data received was analyzed by calculating the removal efficiencies for each storm event sampled for TP and then computing the mean of the removal efficiencies for that study period. This method of analysis was applied to all data received in order to achieve a consistent analytical process to aid in the assigning of removal efficiencies. A summary of the results is provided in Appendix B.

Consistent with Guidance Memo Number 14-2009, BayFilter™ Stormwater Cartridge System is receiving an EMC percent TP removal efficiency of 50%. As stated in the guidance memo, this information will be posted on the Virginia Stormwater Clearinghouse website. This MTD and the assigned removal efficiency can be manually added into Virginia Runoff Reduction spreadsheet to demonstrate compliance with Runoff Reduction Method.

If you have any questions regarding this information, please contact Robert E. Cooper, P.E. at (804) 698-4033 or e-mail at Robert.Cooper@deq.virginia.gov.

Sincerely;

A handwritten signature in blue ink that reads "Fred K. Cunningham".

Fred K. Cunningham
Director
Office of Water Permits

Appendix A-Documents

- 1) Technical Evaluation Report-BayFilter™ EMC and BaySeparator™ Systems
Grandview Place Apartments, Vancouver, Washington and
Woodinville Sammamish River Outfall, Woodinville, Washington-June 13, 2014
- 2) Efficiency Assessment of BaySeparator and BayFilter Systems in the Richard
Montgomery High School-January 06, 2009
- 3) Evaluation of MASWRC Sample Collection, Sample Analysis, and Data Analysis
- 4) Environmental Technology Verification Report, Stormwater Source Area Treatment
Device
- 5) NJCAT Technology Verification BayFilter™

Appendix B-Study Results

Efficiency Assessment of BaySeparator and BayFilter Systems in the Richard Montgomery High School

Storm Date	BaySep in (mg/l)	BaySep out (mg/l)	BayFil out (mg/l)	*BaySep Δ (%)	*BayFil Δ (%)	*System Δ (%)
4/11/2008	0.46	0.34	0.27	26.1	20.6	41.3
4/20/2008	0.28	0.28	0.1	0	64.3	64.3
4/26/2008	0.47	0.44	0.01	6.4	97.7	97.8
4/28/2008	0.16	0.08	0.04	50	50	75
5/31/2008	0.29	0.27	0.12	6.9	55.6	58.6
6/3/2008	0.41	0.35	0.26	14.6	25.7	36.6
6/4/2008	0.56	0.25	0.11	55.4	56	80.4
6/16/2008	0.16	0.18	0.07	-12.5	61.1	56.3
6/23/2008	0.3	0.23	0.11	23.3	52.2	63.3
6/27/2008	0.42	0.41	0.07	2.4	82.9	83.3
7/9/2008	0.45	0.46	0.14	-2.2	69.6	68.9
7/13/2008	0.49	0.18	0.06	63.3	66.7	87.8
7/23/2008	0.28	0.15	0.07	46.4	53.3	75
8/2/2008	1.35	0.63	0.13	53.3	79.4	90.4
8/14/2008	0.82	0.55	0.3	32.9	45.5	63.4
8/28/2008	0.29	0.36	0.17	-24.1	52.8	41.4
10/25/2008	0.34	0.35	0.21	-2.9	40	38.2
11/13/2008	0.15	0.22	0.16	-46.7	27.3	-6.7
11/30/2008	0.04	n/a	0.05	n/a	n/a	-25
12/11/2008	0.27	0.21	0.11	22.2	47.6	59.3
			Mean	16.57	55.17	57.48

*Efficiency = 100 x (1-Effluent EMC/Influent EMC)

Data from Grandview Place Apartments, Vancouver, Washington and Woodinville Sammamish River Outfall, Woodinville, Washington Report

Storm Date	Influent (mg/l)	Effluent (mg/l)	Removal Efficiency (%)
04/05/11	0.032	0.017	47
04/15/11	0.055	0.017	69.09
04/26/11	0.072	0.019	73.61
05/26/11	0.376	0.067	82.18
06/20/11	0.046	0.032	30.43
07/18/11	0.051	0.03	41.18
09/26/11	0.116	0.052	55.17
11/01/11	0.096	0.04	58.33
11/13/13	0.16	0.043	73.13
11/13/13	0.14	0.063	55.00
11/18/13	0.18	0.054	70.00
12/13/13	0.44	0.14	68.18
12/17/13	0.25	0.068	72.80
12/23/13	0.19	0.026	86.32
02/25/14	0.15	0.021	86.00
04/24/14	0.18	0.045	75.00
05/12/14	0.17	0.038	77.65
05/27/14	0.31	0.045	85.48
		Mean	67.03

*Efficiency = 100 x (1-Effluent EMC/Influent EMC)