



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Matthew J. Strickler
Secretary of Natural and Historic Resources

David K. Paylor
Director
(804) 698-4000

August 11, 2021

Mr. Graham Bryant, M.Sc., P.E.
Hydroworks LLC
257 Cox Street
Roselle, NJ 07203

Transmitted electronically gbryant@hydroworks.com

Re: Assignment of Percent Removal Efficiencies for Total Phosphorus for **Hydrofilter**

Dear Mr. Bryant:

The Department of Environmental Quality (Department or DEQ) received the Manufactured Treatment Device Registration Form and supporting documentation for the **Hydrofilter** on May 28, 2021. In accordance with § 62.1-44.15:28 of the Stormwater Management Act, 9VAC25-870-65 D of the Virginia Stormwater Management Program Regulation, and Guidance Memo No. 14-2009, 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 Hydrofilter has been reviewed.

Section 65 D 2 of the VSMP Regulation, which became effective on November 25, 2020, states that any MTD approved for use after July 1, 2020, must meet the requirements of § 62.1-44.15:28 A 9 of the Stormwater Management Act. Hydroworks, LLC has obtained certification from the New Jersey Department of Environment Protection for this product. The certification letter is attached to this letter.

The **Hydrofilter** approved for use in Virginia to meet the VSMP water quality design requirements. The percent total phosphorous pollutant removal efficiency has been assigned a value of **40%**. This information will be posted on the Virginia Stormwater BMP Clearinghouse website. This device 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 "Erin Ervin Belt".

Erin Ervin Belt
Office of Stormwater Management

RE: Hydrofilter
August 4, 2021
Page 2 of 2

Appendix A
Certification letters from
New Jersey Department of Environmental Protection



State of New Jersey

Division of Water Quality
Bureau of Nonpoint Pollution Control
401 East State Street

P.O. Box 420 Mail Code 401-02B
Trenton, New Jersey 08625-0420
Phone: 609-633-7021 / Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

December 17, 2020

Graham Bryant, M.Sc., P.E.
President
Hydroworks, LLC
257 Cox Street
Roselle, NJ 07203

Re: MTD Lab Certification
Hydroworks HydroFilter
On-line Installation Approved

TSS Removal Rate 80%

Dear Mr. Bryant:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Hydroworks, LLC has requested a Laboratory Certification for the HydroFilter filtration device.

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated December 2020) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the HydroFilter stormwater treatment unit by Hydroworks at a TSS removal rate of 80% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is calculated based on a verified loading rate of 2.0 gpm/ft² of effective filtration treatment area.
2. The HydroFilter stormwater treatment unit shall be installed using the same configuration reviewed by NJCAT, and sized in accordance with the criteria specified in item 7 below.
3. This device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the HydroFilter. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at <https://hydroworks.com/hfmaintenance.pdf> for any changes to the maintenance requirements.
6. For an MTD to be considered “green infrastructure” (GI) in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) treat by infiltration into subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil; or (3) store stormwater for reuse.

While the HydroFilter can be designed upstream of an infiltration facility, such as a subsurface infiltration basin, the HydroFilter itself does not provide infiltration of the water quality design storm and does not incorporate any vegetation, soil, or storage of stormwater for reuse. As such, it does not meet the definition of green infrastructure at N.J.A.C. 7:8-1.2. However, like any NJDEP certified filtration MTD, if it is utilized as the required 80% TSS removal pre-treatment for a subsurface infiltration basin designed in accordance with Chapter 9.5 of the New Jersey Stormwater BMP Manual, the overall system will meet the definition of GI, since the subsurface infiltration basin does meet the GI definition.

7. Sizing Requirement:

The example below demonstrates the sizing procedure for the HydroFilter:

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using the HydroFilter. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

The selection of the appropriate model of HydroFilter is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the HydroFilter in this example is 0.25 acres. Included in Table 1 below, several HydroFilter models are designed with a maximum allowable drainage area greater than 0.25 acres. Specifically, the HydroFilter model HF B8-12-1 with a maximum drainage area allowable of 0.27 acres would be the smallest model able to treat runoff without exceeding the maximum allowable drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

$i = 3.2$ in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

$c = 0.99$ (runoff coefficient for impervious)

$Q = ciA = 0.99 \times 3.2 \times 0.25 = 0.79$ cfs

Given the site runoff is 0.79 cfs and based on the MTFR's listed in Table 1 below, the HydroFilter HF B20-30-1 with an MTFR of 0.84 cfs would be the smallest model that could be used to treat the impervious area without exceeding the MTFR. If using more than one unit for treating runoff, the units should be configured such that the flowrate to each unit does not exceed the design MTFR for each unit and ensuring the entire 0.25 acre area is treated.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system models is noted below:

Table 1. HydroFilter MTFRs and Maximum Allowable Drainage Areas

Model*	Maximum Treatment Flow Rate (MTFR) (cfs)	Drainage Area (acres)
HF-B4-1-2	0.06	0.05
HF-R3-1-2	0.06	0.05
HF B4-2-2	0.11	0.09
HF R4-1-4	0.14	0.09
HF-B8-6-1	0.17	0.14
HF B4.5-2-3	0.17	0.14
HF B8-6-1	0.17	0.14
HF R5-2-3	0.17	0.14
HF B8.5-4-2	0.22	0.18
HF B5.5-2-4	0.22	0.18
HF R6-4-2	0.22	0.18
HF B8-9-1	0.25	0.20
HF R6-3-3	0.25	0.20
HF B8-5-2	0.28	0.23
HF R7-5-2	0.28	0.23
HF B8-12-1	0.33	0.27
HF R7-4-3	0.33	0.27
HF R7-3-4	0.33	0.27
HF B8-6-2	0.39	0.27
HF R8-7-2	0.39	0.32
HF B8-5-3	0.42	0.34
HF R8-5-3	0.42	0.34
HF R10-15-1	0.42	0.34
HF B8-4-4	0.45	0.36
HF B10-15-1	0.45	0.34
HF R8-4-4	0.45	0.36
HF B8-9-2	0.50	0.41
HF B12-18-1	0.50	0.41
HF R12-20-1	0.56	0.45
HF B8-7-3	0.59	0.47
HF B14-21-1	0.59	0.47
HF B10-11-2	0.61	0.50
HF R10-11-2	0.61	0.50
HF B8-5-4	0.67	0.45
HF B16-24-1	0.67	0.54
HF R10-8-3	0.67	0.54
HF B10-9-3	0.75	0.54
HF B18-27-1	0.75	0.61
HF B10-7-4	0.78	0.63
HF B12-13-2	0.78	0.59
HF R10-7-4	0.78	0.63

Table 1. HydroFilter MTFRs and Maximum Allowable Drainage Areas, cont'd

Model*	Maximum Treatment Flow Rate (MTFR) (cfs)	Drainage Area (acres)
HF B20-30-1	0.84	0.68
HF B14-16-2	0.89	0.72
HF R12-16-2	0.89	0.72
HF B12-10-3	0.92	0.68
HF B22-33-1	0.92	0.74
HF B12-8-4	1.00	0.72
HF B14-12-3	1.00	0.81
HF B16-18-2	1.00	0.81
HF B24-36-1	1.00	0.81
HF R12-9-4	1.00	0.81
HF R12-12-3	1.00	0.81
HF B14-10-4	1.12	0.90
HF B16-14-3	1.17	0.95
HF B18-20-2	1.17	0.90
HF B20-22-2	1.28	0.99
HF B16-11-4	1.34	0.99
HF B18-16-3	1.34	1.08
HF B22-25-2	1.39	1.13
HF B20-18-3	1.51	1.15
HF B18-13-4	1.45	1.17
HF B20-14-4	1.56	1.26
HF B24-27-2	1.56	1.22
HF B22-19-3	1.67	1.28
HF B22-16-4	1.78	1.44
HF B24-21-3	1.84	1.42
HF B24-17-4	2.01	1.53

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Brian Salvo of my office at (609) 633-7021.

Sincerely,

A handwritten signature in blue ink that reads "Gabriel Mahon". The signature is written in a cursive style with a large initial 'G'.

Gabriel Mahon, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP – Water & Land Management
Nancy Kempel, NJDEP– BNPC
Brian Salvo, NJDEP – BNPC
Keith Stampfel, NJDEP – DLRP
Dennis Contois, NJDEP – DLRP