Attachment 1

Manufactured Treatment Device (MTD) Registration

1. **Manufactured Treatment Device Name:** The Stormwater Management StormFilter® (StormFilter)

2. **Company Name:** Contech Engineered Solutions LLC

   Corporate headquarters

   Mailing Address: 9025 Centre Pointe Drive
   City: West Chester
   State: Ohio Zip: 45069

3. **Contact Name** (to whom questions should be addressed):
   For technical matters: Derek Berg

   Mailing Address: 71 US Route 1, Suite F
   City: Scarborough
   State: Maine Zip: 04074
   Phone number: 207-885-6174
   Fax number: 207-885-9825
   E-mail address: dberg@conteches.com
   Web address: http://www.conteches.com/

   For Project Specific Questions Please Contact Contech's Baltimore Maryland Office:
   605 Global Way, Suite 113
   Linthicum, MD 21090
   Ph.: 410-740-8490

4. **Technology**
   Specific size/capacity of MTD assessed (include units): *The StormFilter monitored during the Lake Stevens TAPE study consisted of a 6' x 12' concrete vault housing ten 18-inch tall StormFilter cartridges.*

   Range of drainage areas served by MTD (acres): *The StormFilter can treat a wide range of drainage areas. Media cartridges are housed in vaults or manholes and the appropriate number of cartridges is selected based on the water quality volume/flow for the site.*

   Include sizing chart or describe sizing criteria: *The StormFilter has been evaluated using a number of different media and varying hydraulic loading rates. This application is specifically for the StormFilter using ZPG media at a hydraulic loading rate of 1gpm/ft^2 of filter surface area. This equates to 5gpm for a 12" tall cartridge, 7.5gpm for an 18" tall cartridge and 11.25gpm for a 27" tall cartridge. Taller cartridge heights reduce the*

system footprint but require sufficient drop across the system. Appropriate cartridge height is selected during the design process based on available drop onsite. The number of cartridges required for a specific site is determined based on the water quality flow to be treated or the release rate from an upstream detention facility. When installed downstream of a detention facility the expected mass that will reach the filter is also evaluated to ensure sufficient longevity.

Intended application: on-line or offline: *Typically offline*

Media used (if applicable): *ZPG (zeolite, perlite, granular activated carbon)*

5. Warranty Information (describe, or provide web address):

http://www.conteches.com/products/stormwater-management/treatment/stormwater-management-stormfilter.aspx#1993310-technical-info

6. Treatment Type

☐ Hydrodynamic Structure
X Filtering Structure
☐ Manufactured Bioretention System
Provide Infiltration Rate (in/hr):
☐ Other (describe):

7. Water Quality Treatment Mechanisms (check all that apply)

X Sedimentation/settling
☐ Infiltration
X Filtration (specify filter media)
X Adsorption/cation exchange
☐ Chelating/precipitation
☐ Chemical treatment
☐ Biological uptake
☐ Other (describe):

8. Performance Testing and Certification (check all that apply):

Performance Claim (include removal efficiencies for treated pollutants, flow criteria, drainage area): *The StormFilter operating at a surface area specific loading rate of 1gpm/ft^2 of filter media surface area with ZPG filter media demonstrated 88% TSS removal, 80% total zinc removal, and 59% total phosphorus removal during a yearlong independent field study conducted in accordance with the TAPE protocol.*

Specific size/Capacity of MTD assessed: *The StormFilter monitored during the Lake Stevens TAPE study consisted of a 6' x 12' concrete vault housing ten 18-inch tall StormFilter cartridges.*

Has the MTD been "approved" by an established granting agency, e.g. New Jersey Department of Environmental Protection (NJDEP) , Washington State Department of Ecology, etc.

☐ **No**

X **Yes**; For each approval, indicate (1) the granting agency, (2) use level if awarded (3) the protocol version under which performance testing occurred (if applicable), and (4) the date of award, and attach award letter.

Note that the StormFilter has been approved by numerous agencies based on testing of different media types and hydraulic loading rate. This submission is specific to ZPG media at 1gpm/ft^2 of filter surface area.

WADOE, General use Level Designation (GULD), TAPE, GULD originally issued 2005 and updated 2013. Link to letter:
http://www.ecy.wa.gov/programs/wq/stormwater/newtech/use_designations/STORMFILTERzpg1GPMCONTECHguld.pdf

Was an established testing protocol followed?

☐ **No**

X **Yes**, (1) Provide name of testing protocol followed, (2) list any protocol deviations: *Testing complied with TAPPE field protocol.*

Provide the information below and provide a performance report (attach report):

For field tests: *See attached Lake Stevens Field Monitoring Report for all details requested below.*

i. Provide the address, average annual rainfall and characterized rainfall pattern, and the average annual number of storms for the field-test location: *See Report*

ii. Provide the total contributing drainage area for the test site, percent of impervious area in the drainage area, and percentages of land uses within the drainage area (acres): *See site description in report.*

iii. Describe pretreatment, bypass conditions, or other special circumstances at the test site: *Full site description in test report.*

iv. Provide the number of storms monitored and describe the monitored storm events (amount of precipitation, duration, etc.): *13 events monitored. Full details in report.*

v. Describe whether or not monitoring examined seasonal variation in MTD performance: *Study spans multiple seasons*

vi. If particle size distribution was determined for monitored runoff and/or sediment collected by the MTD, provide this information: *See test report*

9. MTD History:

How long has this specific model/design been on the market? *>15years*

List no more than three locations where the assessed model size(s) has/have been installed in Virginia. If applicable, provide permitting authority. If known, provide latitude & longitude:

1. *Digital Loudoun, Loudoun County, VA – 3 SFs total installed, LARGE box culvert, 8'x11' peak diversion w/ curb inlet top, 8'x20' peak diversion*
2. *Army Navy Country Club, Arlington, VA – 8'x16' offline vault*
3. *Fairfield Inn & Suites, Chincoteague Island, VA – 8'x12' and 6'x12' linear grate vaults*

List no more than three locations where the assessed model size(s) has/have been installed outside of Virginia. If applicable, provide permitting authority. If known, provide latitude & longitude:

1. *H Street - Street Car, Washington, DC – (2) box culvert vaults*
2. *Mid Pike Plaza – Rockville, MD – 8 manhole SFs*
3. *Maya Angelou Public Charter School, Washington, DC – box culvert SF*

10. Maintenance:

What is the generic inspection and maintenance plan/procedure? (attach necessary documents): *See attached or download: http://www.conteches.com/products/stormwater-management/treatment/stormwater-management-stormfilter.aspx#1993310-technical-info*

Is there a maintenance track record/history that can be documented?
☐ No, no track record.
X Yes, track record exists; (provide maintenance track record, location, and sizing of three to five MTDs installed in Virginia [preferred] or elsewhere): *Maintenance records typically live with the owners of specific sites. There are numerous StormFilters in place in Virginia that have been in use for more than 10 years and have been successfully maintained multiple times.*

Recognizing that maintenance is an integral function of the MTD, provide the following: amount of runoff treated, the water quality of the runoff, and what is the expected maintenance frequency for this MTD in Virginia, per year? *The StormFilter is designed with a target maintenance frequency of at least 12 months. Occasionally maintenance is required more frequently when sites produce heavy pollutants loads. Regular inspection is the best way to establish the site specific maintenance frequency.*

Total life expectancy of MTD when properly operated in Virginia and, if relevant, life expectancy of media: *With regular maintenance the StormFilter is expected to remain functional for the life of the concrete housing. The refillable media cartridges typically must be swapped out every 1-2 years.*

For media or amendments functioning based on cation exchange or adsorption, how long will the media last before breakthrough (indicator capacity is nearly reached) occurs? *ZPG media has been shown to occlude due to solids accumulation (1-2 years) prior to exhaustion of media's reactive capacity.*

For media or amendments functioning based on cation exchange or adsorption, how has the longevity of the media or amendments been quantified prior to breakthrough (attach necessary performance data or documents)? N/A

Is the maintenance procedure and/or are materials/components proprietary?
X Yes, proprietary: *Cartridges and specific gradations of media are proprietary.*
☐ No, not proprietary

Maintenance complexity (check all that apply):
X Confined space training required for maintenance
X Liquid pumping and transportation
Specify method:
X Solids removal and disposal
Specify method:
Other noteworthy maintenance parameter (describe):

11. Comments

Include any additional explanations or comments:

12. Certification

Signed by the company president or responsible officer of the organization:

"I certify that all information submitted is to the best of my knowledge and belief true, accurate, and complete."

Signature: _____

Name: Derek Berg

Title: Regional Regulatory Manager

Date: 5/19/2014

NOTE: All information submitted to the department will be made publically accessible to all interested parties. This MTD registration form will be posted on the Virginia Stormwater BMP Clearinghouse website.