Attachment 1

Manufactured Treatment Device (MTD) Registration

1. **Manufactured Treatment Device Name:**

   Aqua-Filter™ Stormwater Filtration System

2. **Company Name:** AquaShield™, Inc.
   Mailing Address: 2733 Kanasita Drive, Suite 111
   City: Chattanooga
   State: Tennessee
   Zip: 37343

3. **Contact Name (to whom questions should be addressed):** Mark B. Miller
   Mailing Address: 2733 Kanasita Drive, Suite 111
   City: Chattanooga
   State: Tennessee
   Zip: 37343
   Phone number: (423) 870-8888
   Fax number: (423) 826-2112
   E-mail address: mmiller@aquashieldinc.com
   Web address: www.aquashieldinc.com

4. **Technology**
   Specific size/capacity of MTD assessed (include units):

   The Aqua-Filter™ system utilizes a treatment train approach consisting of a pretreatment hydrodynamic separator (swirl chamber) followed by a filtration chamber. The sizes of the pretreatment hydrodynamic separator (swirl chamber) range from 2.5 feet to 13 feet in diameter.

   The maximum single filtration chamber is currently limited to 216 ft^2 of media (18 "rows" of media x 12 ft^2/row). Customization of the Aqua-Filter™ allows for multiple filtration chambers, with 18 rows being the current maximum number of rows in a single chamber.

   Range of drainage areas served by MTD (acres):

   The customization of the Aqua-Filter™ design allows for a wide range of drainage areas to be treated; hence, there is no absolute range of drainage areas served by the device. The maximum drainage area is ultimately limited by the practicality of utilizing an Aqua-Filter™ system to meet the water quality flow rate for a given site. See sizing criteria below.

Include sizing chart or describe sizing criteria:

The Aqua-Filter™ system utilizes a treatment train approach consisting of a pretreatment hydrodynamic separator (swirl chamber) followed by a filtration chamber. Both the swirl chamber and the filtration chamber are sized to meet the water quality treatment flow rate (WQTFR).

The Aqua-Filter™ is designated AF-Y.X where AF-Y designates the swirl chamber and X designates the number of filter rows or filter media area. The first step of sizing is to size the swirl chamber according to the site's water quality flow (Q) using a sizing chart. The second step is to size the filtration chamber to the site's Q. Based on the NJCAT-verified perlite filter loading rate of 16.5 gpm/ft^2 (0.44 cfs/row of filter media), the number of rows can be calculated such that Q / 0.44 cfs/row. One row of filter media has 12 ft^2 of filter media.

Intended application: on-line or offline:

The Aqua-Filter™ system is designed to be installed in an offline configuration.

Media used (if applicable):

Perlite is most common media type used for the Aqua-Filter™ to target suspended sediment and Total Phosphorus removal. Other filter media blends are available for other pollutants of concern that can include zeolite, leaf compost, granular activated carbon (GAC), bone char and PathShield™ Antimicrobial Filter Media (EPA and VA registered antimicrobial pesticide per FIFRA).

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

See attached Limited Warranty.

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)

A treatment train mechanism is used for Total Phosphorus and sediment removal by the Aqua-Filter™ system. The upstream pretreatment hydrodynamic separation chamber provides sedimentation/settling and the capture of floatables, while the downstream component provides polishing filtration.

X Sedimentation/settling (pretreatment hydrodynamic separator)
☐ Infiltration
X Filtration (based on perlite for TP removal)
☐ 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 Aqua-Filter™ NJCAT Field Test Verification Report for an AF-5.3 dated November 2013 is attached and is available on the NJCAT website at: http://www.njcat.org/uploads/newDocs/AquaFilterNJCATFieldVerification1113.pdf

From the Aqua-Filter™ field test verification report Section 5, Performance Verification on page 27, the performance summary is copied below:

"A 26-month field test of an Aqua-Filter™ Model AF-5.3 has been completed at an urban shopping center in Silver Spring, Maryland. Analytical results and performance analysis from 21 storm events and over 15 inches of rainfall demonstrated that 18 of the storms achieved greater than 80% TSS removal efficiency for the fine-grained clay-loam textured sediment influent. Average TSS removal efficiency is 91.9% for the 21 storms. The SSC average removal efficiency is 93.3% for 20 storms. Both TSS and SSC removal efficiencies are calculated to be greater than 95% by the sum of loads method. These field results validate the finding in the NJCAT technology verification addendum report titled "*Aqua-Swirl™ Concentrator and Aqua-Filter™ Stormwater Filtration System"* that the Aqua-Filter™ Model AF-5.3 at a filter loading rate of 16.5 gpm/ft^2 would provide a TSS removal rate of >80%."

The NJDEP Field Test Certification letter for the Aqua-Filter™ is attached and available on the NJDEP website at: http://www.njstormwater.org/treatment.htm. NJDEP certifies the use of the Aqua-Filter™ at a TSS removal rate of 80%. From the NJDEP Field Test Certification letter: "The peak inflow WQTFR for the filtration chamber is limited to the verified peak filter loading rate of 16.5 gpm/ft^2 (0.037 cfs/ft^2) of filter area. The maximum inflow impervious drainage area per square foot of filter area is limited to 0.033 acres/ft^2 based on the verified field test." The AF-5.3 field test drainage area was 1.19 acres.

Specific size/Capacity of MTD assessed:

The AF-5.3 uses a 5-foot diameter pretreatment hydrodynamic separator and a three row filtration chamber (36 ft^2 of perlite filter media).

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.**

Attached is the NJDEP Field Certification letter for the Aqua-Filter™ dated June 13, 2014. This certification is based on the NJCAT verification of the AF-5.3 field test. The letter is available on the NJDEP website at: http://www.njstormwater.org/treatment.htm. Testing was performed in accordance with the *2006 New Jersey Tier II Stormwater Test Requirements – Amendments to TARP Tier II Protocol*.

Was an established testing protocol followed?

No

X Yes, **(1) Provide name of testing protocol followed, (2) list any protocol deviations:**

Testing was performed in accordance with the *2006 New Jersey Tier II Stormwater Test Requirements – Amendments to TARP Tier II Protocol*. The testing program falls under the NJDEP directive "Transition for Manufactured Treatment Devices" dated July 15, 2011. The Aqua-Filter™ qualified under Category C, *Manufactured Treatment Devices Seeking Final Certification – In Process* which are MTDs that have commenced field testing on or before August 1, 2011.There were no deviations to the above-cited testing protocol.

NJCAT-verified independent laboratory testing followed acceptable laboratory practices in place at the time using the NJDEP- specified fine-grained test sediment SIL-CO-SIL 106 manufactured by US Silica. The now superseded NJDEP Laboratory Test Certification (September 2011) was issued based on the protocol that was followed.

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

For lab tests:

i. **Summarize the specific settings for each test run (flow rates, run times, loading rates) and performance for each run:**

The NJCAT verified laboratory test of an Aqua-Filter™ filtration cartridge for TSS removal (2005 and August 2007 Addendum) is available at the NJCAT website http://www.njcat.org/verification-process/technology-verification-database.html. **It is not attached hereto due only to its large file size.**

Initial laboratory testing (2005 report) demonstrated 80% TSS removal efficiency at a surface area loading rate of 5 gpm/ft^2. From the 2007 Addendum report: "The Aqua-Filter Stormwater Filtration System, a stand-alone two component structure, when sized with an Aqua-Swirl pretreatment device at no more than 50 gpm/ft^2 as previously certified by NJDEP, followed by a Filter Chamber

containing Aqua-Filter cartridges filled with a coarse perlite media sized at no more than 16.5 gpm/ft^2, has been shown to have a calculated 84.6% TSS removal efficiency utilizing the New Jersey Stormwater Best Management Practices Manual approach for calculating treatment train removal efficiency."

Note that the Laboratory Test Certification of 2011 is now superseded by the above-cited Field Test Certification of 2014.

ii. **If a synthetic sediment product was used, include information about the particle size distribution of the test material:**

SIL-CO-SIL 106 is manufactured by US Silica and has a range from approximately 1 to 125 microns (µm) and a reported median (d_{50}) of 22 µm. Specific gravity for the sediment is reported to be 2.65. This test sediment was specified by NJDEP for filter devices at the time Aqua-Filter™ filtration cartridge laboratory testing was performed.

iii. **If less than full-scale setup was tested, describe the ratio of that tested to the full-scale MTD:**

It is important to keep in mind that the Aqua-Filter™ filtration chamber is sized based on surface area of media, not necessarily rows since other filtration configurations can be used (e.g., round housing vs. rectangular rows). A 4 ft^2 and 1 foot thick filter cartridge containing perlite filter media was used for the laboratory test. The filtration chamber most commonly utilizes, but is not limited to "rows," one row containing 12 ft^2 of media. The test cartridge to row ratio is 4 ft^2 to 12 ft^2, or 1:3. Media thickness was 1:1. It is considered that the test ratio does not strictly represent that a downscaled setup was used since filtration is not governed by particle settling properties such as those of hydrodynamic separators where scaling is a critical element for testing parameters.

The NJCAT-verified Aqua-Filter™ field test used a full scale model AF-5.3.

For field tests:

Refer to attached NJCAT verification report dated November 2013 for the Aqua-Filter™ Model AF-5.3 field test.

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

Field test site address: Burnt Mills Shopping Center
10731 Columbia Pike
Silver Spring, MD 20901

A total of 21 TARP-qualifying storms and 15.83 inches of rainfall were sampled over 26 months between March 2011 and May 2013. The required minimum number of storm is 15 and at least 15 inches of rain are to be sampled. A TARP-qualifying storm is ≥0.1 inch. Available information indicates that the area receives approximately 42 inches of annual rainfall. Three storms exceeded 75% of the design treatment capacity of 16.5 gpm/ft^2, one of which exceeded 100% of the design treatment capacity. An average of 80% storm flow volume was sampled, TARP requires at least 60%.

According to the NRCS document 210-VI-TR-55, Second Edition, June 1986, the field test site is located in the Type II rainfall distribution region. This same rainfall distribution type covers all of Virginia except the extreme southeastern coastal area. It is considered that the AF-5.3 rainfall conditions would be consistent with rainfall patterns for the greatest majority of Virginia (~95%).

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):**

The AF-5.3 field test drainage area is approximately 1.19 acres with an estimated 100% impervious area. An asphalt covered parking lot represents ± 85% of the drainage area, roof runoff ± 15%. A precise determination of roof runoff contribution could not be ascertained but probably does not exceed 20%.

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

Aqua-Filter™ system uses a treatment train approach that includes a pretreatment hydrodynamic separator followed by a filtration chamber. Note that the pretreatment device uses an Aqua-Swirl® AS-5 stormwater treatment system. That unit also received NJCAT field test verification for over 80% TSS removal efficiency on an annual basis for clay loam influent sediment. The AS-5 verification report is available at http://www.njcat.org/verification-process/technology-verification-database.html.

The AF-5.3 is installed in an offline configuration using an upstream divergence structure and a downstream convergence structure. It does not appear that bypass conditions occurred during the testing period. It is known that the perlite media can convey flow rates greater than the verified performance loading rate of 16.5 gpm/ft^2. No special or adverse circumstances were encountered during the testing program.

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

A total of 21 TARP-qualifying storms were sampled. Refer to Table 2 on page 15 of the NJCAT verification report for a summary of the sampling events. A total of 15.83 inches of rain was sampled. The TARP protocol requires at least 15 inches of rain be sampled. Storm durations ranged from 2 hours 19 minutes up to 64 hours 8 minutes. Storm sizes ranged from 0.11 to 1.6 inches, averaging 0.75 inches. A TARP-qualifying storm is ≥ 0.1 inch.

v. **Describe whether or not monitoring examined seasonal variation in MTD performance:**

The field test spanned 26 months that commenced in March 2011 and ended in May 2013. It is considered that seasonal variations were effectively monitored during the field testing program.

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

Refer to pages 22-25 and Table 9 of the NJCAT verification report for a discussion of particle size distribution (PSD) for the AF-5.3 field test. Serial filtration was used to determine PSD and particles greater than 1,000 µm were excluded from all analyses. The PSD distribution from three storms (as required by TARP protocol) indicates that 100% of the particles are finer than 1,000 µm, 95.82% are finer than 500 µm, 87.41% are finer than 250 µm, 70.39% are finer than 125 µm, 63.13% are finer than 63 µm and no particles are finer than 1.5 µm. The AF-5.3 field test PSD is finer grained than the PSD specified by the NJDEP January 2013 laboratory protocol for filtration MTDs.

9. MTD History:

How long has this specific model/design been on the market?

The Aqua-Filter™ has been commercially available for 16 years, since 1998. The Aqua-Filter™ is a well established product within the stormwater community.

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:

The Aqua-Filter™ has been installed at hundreds of locations nationwide and internationally. AquaShield™ can provide additional information on installation locations on a confidential basis. Three example Virginia locations are listed below:

(1) Aqua-Filter™ Model AF-3.2, River Oaks Subdivision, Dumfries
(2) Aqua-Filter™ Model AF-10.12, River Oaks Subdivision, Dumfries
(3) Aqua-Filter™ Model AF-3.2, New River Valley Shopping Center, Christiansburg

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:

In addition to the AF-5.3 test site, three example installation locations near Virginia are listed below. AquaShield™ can provide additional information about installation locations on a confidential basis.

(1) Aqua-Filter™ Filter Model AF-4.2, St. Marks Orthodox Church, 7124 River Road, Bethesda, MD, Montgomery County Department of Permit Services
(2) Aqua-Filter™ Model AF-5.3, Grandview Town Homes, 2602 Blue Ridge Avenue, Wheaton, MD, Montgomery County Department of Permit Services
(3) Aqua-Filter™ Model AF-4.6, Marten's Volkswagen,5415 Butler Road, Bethesda, MD, Montgomery County Department of Permit Services

10. Maintenance:

What is the generic inspection and maintenance plan/procedure? (attach necessary documents):

See attached Aqua-Filter™ Inspection & Maintenance Manual. We recommend at least quarterly inspections during the first year of installation to determine site runoff conditions and predict maintenance cycles. We also recommend at least annual inspections and maintenance of both the hydrodynamic pretreatment chamber and the filtration chamber. Inspections of both chambers are performed from the surface without the need for entry. The single swirl chamber allows for easy and quick inspections for

floatables and accumulated sediment at the base of the chamber. The perlite filter media turns from white to dark brown to black when the media is spent.

Maintenance events typically require a vacuum truck to remove captured materials from both chambers. Confined space entry is needed for the filtration chamber to remove and replace the filter containers. The vacuum truck suction arm can be used to assist with the extraction of filter containers.

Is there a maintenance track record/history that can be documented?

X No, no track record.
Yes, track record exists; (provide maintenance track record, location, and sizing of three to five MTDs installed in Virginia [preferred] or elsewhere):

AquaShield™ does not maintain a track record system for its systems, nor does it operate its own fleet of maintenance equipment. Instead, AquaShield™ recommends that end users/owners contract with independent local maintenance providers. We can assist with that service at no cost upon request. AquaShield™ also has a nationwide service agreement with a maintenance provider. We do not keep maintenance track records of services provided by other independent contractors.

It is recognized in the industry that Montgomery County, Maryland administers and operates a robust maintenance program for MTDs. AquaShield™ has a large number of systems installed in that county, and to our knowledge the Aqua-Filter™ system overall meets the maintenance criteria that has been established by the county's Department of Permit Services.

Aqua-Filter™ systems have been installed in a number of state transportation departments that perform maintenance on a routine basis. To our knowledge, there have been no instances of adverse system functionality or maintenance circumstances.

End users, owners, contractors, etc. can contact their local AquaShield™ representative or our corporate office directly to order replacement filter media. It is not necessary for AquaShield™ personnel or its representative to be present during inspections or maintenance events.

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?

Aqua-Filter™ systems are sized according to local stormwater regulations. There is no limitation to the amount of runoff the Aqua-Filter™ is capable of conveying provided that maintenance is performed as required to ensure functionality. Annual maintenance frequency is expected (and recommended) for Aqua-Filter™ systems in Virginia as supported through field testing. Site conditions will ultimately dictate maintenance frequency.

Total life expectancy of MTD when properly operated in Virginia and, if relevant, life expectancy of media:

The Aqua-Filter™ system will have a life expectancy of 50 years or more. Media life expectancy is typically one (1) year but is ultimately dependent on pollutant loading conditions. Media life cycle is supported by the AF-5.3 field testing program.

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?

Laboratory testing indicates that the Aqua-Filter™ filtration cartridge (4 ft^2) of perlite filter media can provide effective performance while capturing up to approximately 6.5 pounds of SIL-CO-SIL 106 sediment before breakthrough. Or, one row (12 ft^2) of perlite media would retain 19.5 pounds of SIL-CO-SIL 106 before breakthrough. See page 30 of the NJCAT laboratory verification report Addendum 2007 for a discussion on Sediment Retention 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)?

Sediment retention capacity is described on page 30 of the NJCAT laboratory verification report. Table 5 in the report shows the changing effluent TSS concentrations that occurred during the fifth test performed overall, with a loading rate of 16.5 gpm/ft^2 and target influent TSS concentration of 175 mg/L.

Field testing did not allow for sediment retention capacity to be quantified, other than recognizing decreasing TSS removal efficiency.

Is the maintenance procedure and/or are materials/components proprietary?
Yes, proprietary
X No, not proprietary

There are no proprietary maintenance procedures or materials used for the Aqua-Filter™ system. The perlite filter media is a commodity and is publically available.

Maintenance complexity (check all that apply):

X Confined space training required for maintenance

All inspections can be performed from the surface. Entry to the filtration chamber is needed to handle the removal and replacement of filter containers. No access is needed to clean the single chamber of the pretreatment hydrodynamic separator.

X Liquid pumping and transportation
Specify method:

Water from pretreatment hydrodynamic separator can be pumped through the filtration chamber for discharge thereby eliminating any off-site transportation. Any captured oil can be vacuumed off, but it should be kept in mind that the Aqua-Filter™ is not designed as an equivalent to an oil-water separator. Any small amount of standing water near the outlet pipe of the filtration chamber is typically not removed since it has already been filtered and will be discharged with the next storm event.

X Solids removal and disposal
Specify method:

A vacuum truck is used to remove solids from the pretreatment hydrodynamic separator after water is transferred through the filtration chamber. The vacuum truck's suction arm can also be used to lift filter containers to the surface. Spent media and solids can be disposed following all applicable local guidelines.

Other noteworthy maintenance parameter (describe):

The pretreatment hydrodynamic separator utilizes a single swirl chamber for both treatment and materials storage. There are no blind or limited access areas within the structure that would prevent complete access for inspections and maintenance. All inspections and maintenance events for this chamber can be performed from the surface.

An internal ingress/egress ladder is built into the downstream side wall of the filtration chamber and is accessed through a manhole opening. The filtration chamber also includes a manhole opening for every three rows of filter media to facilitate inspections as well as the removal and replacement of filter containers. The manholes and ladder can also facilitate any emergency actions.

11. Comments

Include any additional explanations or comments:

Independent field testing demonstrated that an offline Aqua-Filter™ Model AF-5.3 achieved over 65% annual Total Phosphorus (TP) removal efficiency for a clay-loam textured sediment influent at a filter surface area loading rate up to 17.5 gpm/ft^2. Field testing was performed between 2011 and 2013 at the Burnt Mills Shopping Center in Silver Spring, Maryland while simultaneously documenting TSS removal efficiency for the above-cited NJCAT verification. All field testing activities were performed following TARP Tier II Protocol. Analytical results from 13 storms and approximately 10 inches of rainfall demonstrated 68.5% annual TP removal efficiency at a perlite filter surface area loading rate up to 17.5 gpm/ft^2 (see Table 1 below).

Although the TARP field testing protocol does not include a specific provision for TP testing, results are compared in Table 1 below to the Technology Assessment Protocol – Ecology (TAPE) field test TP specifications of the Washington State Department of

Ecology (Ecology). The TAPE Technical Evaluation Reporting (TER) guidelines specify a minimum of 12 storms, each having at least 0.15 inches of rainfall. The 13 sampled storms comply with the TAPE storm number and storm size requirement with one slight exception (0.11 inches). An average influent TP concentration of 362 parts per billion (µg/L, or 0.362 mg/L) complies with the TAPE influent range of 100 to 500 µg/L (0.1 to 0.5 mg/L). A low average effluent TP concentration of 46 µg/L (0.046 mg/L) was recorded. The average TP removal efficiency of 68.5% exceeds the TAPE removal requirement of ≥50% for Ecology's General Use Level Designations (GULD) for stormwater BMPs. An average of 85% of the storm volume runoff was sampled. Influent sediment exhibited 63% of the particulate <63 µm in size (silt) as measured by the serial filtration method. Particles larger than 1,000 µm were excluded from all analyses.

One routine annual filter replacement event was performed during the field testing program, and no swirl chamber maintenance was performed. Filter media was replaced in February 2012 and subsequent to the January 16, 2012 storm event which exhibited decreased performance after approximately one year of continuous operation. No overall adverse operating conditions were observed for the Aqua-Filter™ system during the TP monitoring period.

Table 1. Summary of Total Phosphorus Removal Efficiency for Aqua-Filter™ AF-5.3

Storm #	Sample Date	Influent TP (µg/L)	Effluent TP (µg/L)	TP Removal Efficiency (%)	Peak Loading Rate (gpm/ft^2)	Storm Size (inches)	% Storm Volume Sampled
1	September 28, 2011	51.5	36.1	29.9	7.4	0.61	86
2	October 19, 2011	515.3	27.5	94.7	6.9	0.54	39
3	November 29, 2011	81.0	25.7	68.3	2.2	0.30	68
4	December 21, 2011	289.7	93.5	67.7	1.8	0.11	68
5	January 16, 2012	56.8	71.5	-25.9	3.6	0.21	83
6	July 14, 2012	860.0	46.0	94.7	11.3	0.61	70
7	January 13-15, 2013	200.0	19.0	90.5	3.2	1.43	100
8	January 30-31, 2013	190.0	120.0	36.8	15.6	1.60	100
9	February 26-27, 2013	1,100.0	24.0	97.8	3.6	0.85	99
10	March 6, 2013	700.0	12.0	98.3	2.6	1.00	99
11	March 12, 2013	210.0	20.0	90.5	2.4	0.83	100
12	April 12, 2013	290.0	30.0	89.7	17.5	0.62	88
13	May 7-8, 2013	160.0	68.0	57.5	2.6	1.17	100
Average		**361.9**	**45.6**	**68.5**	**6.2**	**0.76**	**85**
TAPE Protocol	**≥12 storms**	**100-500**	**--**	**≥50%**	**--**	**≥0.15" each**	**--**

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: Stuart C. Ellis

Title: Research & Development Manager

Date: 6/20/2014

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.