



November 8, 2012

Rebecca Stack  
Low Impact Development Specialist  
Watershed Protection Division DDOE  
1200 First Street, NE, 5th Floor  
Washington DC 20002

Re: Filterra's comments on the Draft Stormwater Management Guidebook

Ms. Stack:

Filterra appreciates the opportunity to provide comments to the District Department of Environment (DDOE) regarding the Draft Stormwater Management Guidebook. This resource will provide important guidance and direction to the development and engineering communities in addition to other stakeholder groups as the new Stormwater Rule and MS4 Permit for the District are implemented.

On behalf of Filterra Bioretention Systems, I am pleased to provide the following comments on the Draft Guidebook. Due to the complexity and volume of the guidebook, our comments are identified by chapter headings.

Filterra looks forward to our continued interactions with the DDOE. Should you have any questions or concerns regarding our comments, I am happy to make myself and other Filterra staff available to discuss our public comments.

Respectfully submitted,

A handwritten signature in black ink that reads "Chris French". The signature is written in a cursive, flowing style.

Chris French  
Stormwater Regulatory Manager  
Filterra Bioretention Systems

## **Filterra's comments regarding DDOE's Draft Stormwater Management Guidebook**

### **General Comment**

Filterra recommends DDOE approach and meet with representatives from the Stormwater Equipment Manufacturer's Association (SWEMA) in order to discuss Chapter 3.12 and Appendix T. Over the past few years, SWEMA has worked cooperatively with NJDEP and NJCAT to develop a new laboratory and field testing protocol for manufactured stormwater systems. SWEMA could share its member's collective experiences in New Jersey and provide lessons learned to DDOE as it seeks to finalize the guidebook.

### **Section 3.4. Permeable Pavement Systems**

1. Definitions. It should be noted concrete grid pavers not the same as Permeable Interlocking Concrete Pavement (PICP). Additionally, plastic grid pavers are different as well. Each of these should be classified by DDOE as a separate category.
2. Section 3.4.1 calls for the contributing drainage area to be as close to 100% impervious as possible. This is a laudable goal, but eliminates the potential treatment drainage areas that may not be impervious. One could rationalize this by stating the system is more prone to clogging of runoff comes from pervious areas. However, this can be well addressed by the District enforcing its proposed maintenance requirements for permeable pavement. As a result, greater landscape treatment can be obtained through the use of permeable pavement systems. Peer reviewed scientific studies have shown the effectiveness of both permeable pavement and street sweeping in eliminating pollutants of concerns.
3. Filterra concurs with Section 3.4.1 Soils, which requires verification of soil permeability by using the on-site soil investigation methods provided in Appendix P. All permeable pavement practices should require on-site soil investigations in order to determine the practicality of utilizing this BMP and determine whether underdrains should and can be used.
4. Section states, *"If an underdrain design is used, low-grade longitudinal slopes on the bottom and the underdrain (i.e. 0.5%) are required to ensure the system drains"*. It is unclear why an underdrain slope is required. Underdrains work hydraulically based on head conditions and not slope.

DDOE might also consider the necessary inspection process required to verify underdrains are installed as specified.

5. Table 3.4.2 - Reservoir Layer. PICP is incorrectly spelled. Please correct "PCIP" to "PICP".
6. Section 3.4.5 discusses a landscaping criteria. Filterra concurs with the use of bioretention and micro-bioretention systems in a treatment train configuration. If designed properly, it is feasible that such systems could wholly treat the Q10 and Q25 storms for both quality and quantity.

### **Chapter 3.5. Bioretention**

1. Section 3.5.4. DDOE should consider including a process in the Bioretention chapter that would allow for alternative bioretention media mixtures to be utilized. This is especially important for the use of high flow bioretention media mixtures, which can be utilized in small scale/urban bioretention practices; also known as micro-bioretention. Some high flow media blends – such as the Filterra bioretention media - have been shown to provide pollution removal performance equivalent to traditional bioretention media blends. In fact, Herrera Consultants and Geosyntec Consultants conducted a 3<sup>rd</sup> party analysis in 2010 comparing the Filterra Bioretention system to traditional biofilters (including rain gardens, bioretention cells, etc) listed in the International Stormwater BMP Database. This research is currently pending publication in a peer reviewed scientific journal.

Filterra recommends bioretention media supplier's be required to provide 3rd party test analysis of their blended media utilized for any and all bioretention, infiltration, and rain garden uses in the District. This level of quality assurance will help eliminate one common cause of bioretention system failure – the use of improperly blended bioretention media. Filterra would be please to speak to DDOE staff about our media QA/QC processes and how we ensure that all media batches released to the marketplace meets our quality control standards. We would also be pleased to share the results of our media performance in the field as part of a “performance over time” study.

2. DDOE should allow limited irrigation during the establishment period for bioretention systems. Experience has shown limited irrigation can make a significant difference in plant survival; resulting in increased pollution removal due to biological processes. This is especially true during periods of drought or limited rainfall. Plant failure during dry periods has been identified as a variable in bioretention success.
3. Section 3.5.3. DDOE should give some credence towards the mulch layer in bioretention systems acting as a pretreatment measure. Peer reviewed bioretention research has recognized the role mulch plays in protecting the bioretention media and preventing premature occlusion.
4. DDOE might consider requiring newly constructed bioretention systems to have infiltration tests conducted once installed in order to confirm or deny the system will function as designed. An infiltrometer could be used for this purpose and can provide proper installation and design specification verification. As referenced in Chapter 3.5, the Center for Watershed Protection conducted a study in Virginia's James River Basin that concluded improper design and installation of bioretention systems have contributed towards premature failure.
5. Section 3.5.1, Required Space states, “The bioretention surface area will usually be approximately 3% to 6% of the contributing drainage area (CDA)...”. Small-scale, micro-bioretention systems can usually function adequately with smaller surface areas provided they have high hydraulic conductivity associated with the bioretention media. Alternative bioretention mixtures - such as high flow bioretention media – can allow for smaller surface areas to be utilized in rain garden and bioretention systems. Filterra would be pleased to provide DDOE with 3<sup>rd</sup> party research supporting this position. As noted above, 3<sup>rd</sup> party verification of bioretention media blends – including hydraulic conductivity – should be required for all approved media vendors and reported to DDOE for all raingarden/bioretention projects in the District.
6. Section 3.5.4 – Geotextile. Current research of field installations throughout the United States have show that the tradition use of geotextile fabric in raingardens and bioretention system sometime contributes to premature BMP failure. Fine sediments have been shown to migrate into bioretention cells only to accumulate at and clog the

geotextile fabric layer. Many bioretention designs now exclude the use of geotextile fabric as a result. DDOE might consider if the risk of system failure related to the use of geotextile is worth the benefit of including it in the bioretention specification.

### **Chapter 3.12 Proprietary Practices**

1. Section 3.12.2 provides definitions of on-line and off-line systems. These definitions appear to be limited and could result in the misclassification of a proprietary practice if misinterpreted.

Filtterra recommends DDOE consider utilizing the following definitions the New Jersey Department of Environmental Protection and the New Jersey Corporation for Advanced Technology (NJCAT) are using in their revised filter testing protocol for proprietary practices. This revised document should be approved and become publicly available by the end of 2012.

- Online: All conveyed flows are routed through the filtration MTD without the use of an external bypass or other upstream diversion and have the potential to pass through the treatment components of the MTD and/or otherwise come into contact with previously captured pollutants.
- Offline: Only the maximum treatment flow rate is routed into the filtration MTD and all flows in excess of the maximum treatment flow rate are diverted around the MTD via an upstream bypass or diversion. Diverted flows do not have the potential to pass through the treatment components or come into contact with the previously captured pollutants

Also, Filtterra notes the draft on-line definition states that most or all runoff from storms larger than the stormwater quality design storm bypass the devices through an upstream diversion. This is not the case in all proprietary practices. For example, the standard Filtterra Bioretention System provides bypass through the use of a downstream drop inlet or catch basin. It is recommended that this portion of the draft definition be revised or eliminated in favor of the definitions provided above.

### **Appendix T. Proprietary Practices Approval Process**

1. Section T.0. The last sentence states, "*Assigned values will be based on annual performance of percent reductions observed for the 1.7 inch design storm event.*" We also note that Table T.1 refers to the "Runoff volume from a 1.2' Storm".

Is the 1.7 inch design storm requirement a typo or artifact from a previous draft that was not updated? While Filtterra suspects this is the case, we have to express concern with the notion proprietary practices might be held to a higher design standard than non-proprietary BMPs that are designed for the 1.2 inch design storm. Filtterra feels that all BMP should be treated equally and have the same design storm criteria.

Filtterra respectfully requests DDOE clarify which design storm is applicable to the proprietary practices. If this is a typo, we request this be corrected this issue matter so there is equality between all stormwater BMPs.

2. Appendix T, Section T.1. DDOE states, "*DDOE prefers monitoring information conform to the Technology Acceptance Reciprocity Partnership (TARP) Tier II Protocol. Applicants that do not conform to the TARP Tier II Protocol must use standard ASTM sampling methods (Section T.3).*"

Filtterra understands DDOE's preference for monitoring information to conform to the criteria established under TARP. However, conformance to the 2003 TARP monitoring protocols alone would be limiting given the abundance of stormwater testing protocols available nationally and recent advances in stormwater monitoring.

Filtterra recommends DDOE give consideration to the use of TARP as well as other established technology testing protocols such as the State of Washington Department of Ecology's Technology Assessment Protocol - Ecology (TAPE). The TAPE program - widely considered the industry's most rigorous field testing protocol - has been updated four times since its creation. As a result, TAPE incorporates the breadth of current stormwater BMP monitoring protocols. Additionally, other stormwater monitoring protocols from Geosyntec Consultants and Wright Water Engineers via the International Stormwater BMP Database, the New Jersey Corporation for Advanced Technology (NJCAT), and others are available for consideration.

DDOE might consider amending the requirement for using ASTM sampling methods to include other water quality sampling methods such as EPA methods, USGS methods and Standard Methods for the Examination of Water and Wastewater. While there is some general overlap between various sampling methods, this would allow more flexibility in a monitoring program and provide DDOE potential flexibility in utilizing such data for meeting local and regional TMDL implementation and MS4 requirements.

3. Section T.1 states, "*A minimum of 3 sites and/or 3 years of annual performance data are required for each supporting study (see T.1.1).*" Filtterra recognizes the need for reliable field studies to understand and verify proprietary and non-proprietary BMPs for multiple uses (MS4 permit requirements, TMDLs, etc.). However, we would like to note that research related to non-proprietary systems varies due to their site specific designs, field conditions, and variation in monitoring protocols and techniques. It would make sense that future monitoring of non-proprietary systems in the District would have to follow the same protocols established for manufactured systems. This would promote equity and allow performance data to be compared equally.
4. Section T.1 states, "*Inflow and outflow monitoring must be continuous and include flows that bypass the BMP.*" Filtterra recommends DDOE define the term "continuous" and the conditions it applies to. This statement is currently broad and could be interpreted to mean that monitoring should also occur in dry weather conditions.
5. DDOE might consider providing a conditional approval level between the minimum criteria in section T.1 and the laboratory criteria in Section T.1.2. Similar to the laboratory testing section, conditional approval can limit the number of proprietary BMP installations. A tiered approval program of this nature would mimic other established stormwater evaluation programs in the United States and provide an incentive for manufacturers to obtain a higher level of increase field monitoring.
6. For clarification purposes, DDOE should consider adding a statement to Appendix T noting previously installed proprietary practices would not count towards any installation limits DDOE might establish for either preliminary or conditional approval of a manufacturer's BMP. The installation limitations should apply to projects subject to the new Stormwater Rule and the Stormwater Management Guidebook once they are final and codified.
7. Filtterra would like to use this opportunity to inform DDOE that the NJCAT filter laboratory and field protocols are currently being updated and are expected to be publicly available once approved by the New Jersey Department of Environmental Protection (NJDEP) in the 2012 fourth quarter. As noted above, SWEMA has had a very active role in working with NJDEP and NJCAT cooperatively in establishing these new protocols. To learn

more about this effort, I recommend contacting SWEMA's Managing Director; Laurie L. Honnigford. Ms. Honnigford can be reached at (651)-554-1895 and [laurie@stormwaterassociation.com](mailto:laurie@stormwaterassociation.com)

8. There appear to be some typos in Appendix T. Sections T.1 and T.1.1 refer to Appendix X sections when it appears they should refer to Appendix T sections.