



## State of New Jersey

Department of Environmental Protection

Division of Science, Research and Technology

Office of Innovative Technology & Market Development

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James E. McGreevey  
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Commissioner

September 20, 2002

James H. Lenhart, P.E., V.P. of Engineering and Research  
Stormwater Management, Inc. (SMI)  
12021-B NE Airport Way  
Portland, OR 97220

Re: Interim Certification for SMI - StormFilter

Dear Mr. Lenhart:

In accordance with the Energy and Environmental Technology Verification (EETV) Act at N.J.S.A. 13:1D-144, the Office of Innovative Technology & Market Development (OITMD) is pleased to issue a conditional interim certification for Stormwater Management, Inc., (SMI)-StormFilter, a self-contained manufactured stormwater filtering system. This conditional interim certification is being issued based on the New Jersey Corporation for Advanced Technologies' (NJCAT) initial verification report entitled "NJCAT Technology Verification, Stormwater Management, Inc., June 2002.

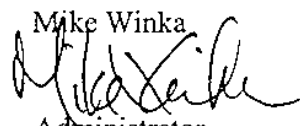
Based on NJCAT's initial verification report and the recommendations made in the attached Conditional Interim Certification - Findings, OITMD finds that the SMI StormFilter system, with influent concentrations of 300 mg/l or less and where TSS particle sizes are expected to be similar to those tested, should be able to meet the basic treatment goal of 80% removal of Total Suspended Solids (TSS) as recommended by the 1993 issued United States Environmental Protection Agency (EPA) 6217(g) Coastal Zone management measures guidance.

However, since the majority of the performance data that formed the basis of the findings in the initial NJCAT verification was collected in the lab, it would not currently meet the provisions of the Technology Acceptance and Reciprocity Partnership (TARP) Stormwater Best Management Practice Demonstration Tier II Protocol, which is required for final NJCAT verification, NJDEP certification and interstate reciprocity.

Therefore, the following conditions based on the recommendations made by the stormwater management technology Project Management Team (PMT) will apply to this interim certification:

1. The Conditional Interim Certification Findings, which highlights the NJCAT verified claims and StormFilter's limitations shall always be included with this approval letter.
2. The StormFilter system will only be approved for use as part of a stormwater system treatment train. The StormFilter can be used as a stand-alone structure if it is proven that no other conventional water quality features can be incorporated into the design.
3. StormFilter systems shall be designed in accordance with New Jersey's water quality standards and SMI's *Product Design Manual Version 3.0 (April 2002)*, or current edition, unless otherwise specified. The design, pretreatment, land use application, and maintenance criteria in SMI's Design Manual must be closely followed.
4. A Quality Assurance Project Plan supporting Stormwater Best Management Practice Demonstration Tier II Protocol shall be submitted to OITMD and/or NJCAT within six (6) months from the date of state's interim approval letter.
5. Field evaluation data that is consistent with the Tier II protocol shall be submitted to OITMD and NJCAT by August 2004.
6. The approval letter shall expire by December 2004 unless extended by NJDEP.
7. OITMD reserves the right to revoke this interim approval if it deems that one or more of the above conditions are not being met by SMI.

OITMD will issue a final approval for certification of the SMI- StormFilter system based on the verified data generated by a full scale field demonstration utilizing the TARP Tier II Stormwater Protocol.

Mike Winka  
  
Administrator  
OITMD

Enclosure

- c: Sam Wolfe, Assistant Commissioner, Environmental Regulation  
Narinder Ahuja, Director, Division of Water Quality  
Ernest Hahn, Assistant Commissioner, Land Use Management  
Mark Mauriello, Director Land Use regulations  
Debra Hammond, Acting Director, Watershed Management Program  
Jeanne Herb, Assistant Commissioner, Office of Policy, Planning, and Science  
Martin Rosen, Director, Division of Science, Research, and Technology  
Rhea Brekke, Executive Director, New Jersey Corporation for Advanced Technology  
TARP State Contacts



## Conditional Interim Certification Findings

**NJDEP Stormwater  
Management  
Technology Project  
Management Team  
(PMT):**

Manny Patel, Office of Innovative Technology & Market Develop  
Brian McLendon, Division of Water Quality  
Madhu Guru, Land Use Regulation, Compliance & Enforcement  
Sandra Blick, Division of Watershed Management

**Treatment Technology:** StormFilter developed by Stormwater Management, Inc. (SMI)

**Applicant Information:** Stormwater Management, Inc. (SMI)  
12021-B NE Airport Way, Portland, OR 97220  
800-548-4667  
[www.stormwaterinc.com](http://www.stormwaterinc.com)  
[www.njcat.org](http://www.njcat.org)  
[www.state.nj.us/dep/dsr/](http://www.state.nj.us/dep/dsr/)

**Description:** Stormwater Management Inc. (SMI) has developed an innovative stormwater treatment system called StormFilter. The StormFilter is a passive, flow through, storm water filtration system, improving the quality of stormwater runoff by removing non point source pollutants, including total suspended solids (TSS), oil and grease, soluble metals, nutrients, organics, and trash and debris.

The StormFilter is typically comprised of a vault that houses rechargeable, media-filled filter cartridges. Stormwater from storm drains is percolated through media-filled cartridges, which removes particulates and adsorbs materials such as dissolved metals and hydrocarbons. Surface scum, floating oil and grease are also removed. After passing through the filter media, the storm water flows into a collection pipe or discharges to an open channel drainage way. Inherent in the design of the StormFilter is the ability to control the individual cartridge flow rate with an orifice disk placed at the base of the cartridge. The maximum flow rate through each cartridge can be adjusted to between 5 and 15 gpm.

**NJCAT Verified Claims:**

**Claim 1** - The StormFilter cartridge at 15 gallons per minute (gpm) using a coarse perlite media has been shown to have a TSS removal efficiency of 79% with 95% confidence limits of 78% and 80%, respectively for a sandy loam comprised of 55% sand, 40% silt, 5% clay (USDA) in laboratory studies using simulated storm water.

**Claim 2** - The StormFilter cartridge at 7.5 gallons per minute (gpm) using a combination of fine and coarse perlite media has been shown to have a TSS removal efficiency of 71% with 95% confidence limits of 68% and 75%, respectively for a silt loam comprised of 15% sand, 65% silt, 20% clay (USDA) in laboratory studies using simulated storm water.

**Claim 3** - The StormFilter cartridge at 15 gpm using CSF<sup>®</sup> leaf media has a TSS removal efficiency of 73% with 95% confidence limits of 68% and 79%, respectively when evaluating field and laboratory data.

**Technology Limitations:**

- StormFilter is best utilized for the removal of suspended solids in storm water. The StormFilter uses filter cartridges housed in concrete vaults to produce a self-contained storm water filtering system. The design life of the structure is typically 50 years. Cartridge life is guaranteed as long as the maintenance contract is upheld. Typical life of a cartridge has been budgeted at 20 years. Each cartridge is designed

to treat a peak flow of 5 to 15 gpm. Since storm water flows by gravity, the StormFilter typically requires 2.3 feet of head differential between the invert of the inlet and the invert of the outlet.

- Backwater can be a problem if downstream hydraulic calculations are not performed properly. Backwater will reduce the hydraulic potential across the filter reducing flow rate through the cartridge. Backwater may also saturate media for long periods of time.
- Baseflows should be bypassed to ensure proper functioning of the cartridges and the filtration media. If baseflows occur, the filtration media may become exhausted prematurely. This will affect the life of the cartridges and maintenance may be required more often. Low flow bypasses can be installed retroactively.
- Excessive solids loading, hydrocarbon loading, and/or debris should be addressed during the design phase to assess if pretreatment is needed. Heavy solids loading without pretreatment can cause clogging of the cartridges. Maintenance frequency increases if this occurs.
- The StormFilter design incorporates some ponding of water which can be a breeding site for mosquitoes. Also, if the cartridges plug due to inadequate maintenance, additional standing water will result.
- Inspections should be performed during mid-season to determine sediment loading on the system. This involves mobilization to the site, documentation of media and vault conditions and measurements of accumulated sediments. Other inspections are performed during the year if a field crew is in the area of the filter and as time permits.

**NJDEP Stormwater Management Technology PMT Recommended Interim Certification Conditions:**

Based on NJCAT's verification report entitled "NJCAT Technology Verification, Stormwater Management, Inc., June 2002 the Stormwater Management Technology PMT finds that the StormFilter system, with influent concentrations of 300 mg/l or less and where TSS particle sizes are expected to be similar to those tested, would probably be able to meet the basic treatment goal of 80% removal of Total Suspended Solids (TSS). However, since majority of the performance data was collected in the lab and does not meet Stormwater Best Management Practice Demonstration Tier II Protocol, the following conditions will apply to the interim certification:

1. The StormFilter system will only be approved as part of a treatment train for most projects but allowed as a stand alone structure on some projects if it is proven that no other conventional water quality feature can be incorporated into the design.
2. StormFilter systems shall be designed in accordance with New Jersey's water quality standards and SMI's *Product Design Manual Version 3.0 (April 2002)*, or current edition, unless otherwise specified.
3. A Quality Assurance Project Plan supporting Stormwater Best Management Practice Demonstration Tier II Protocol shall be submitted to OITMD and/or NJCAT within six (6) months from the date of state's interim approval letter.
4. Field evaluation data that is consistent with the Tier II protocol shall be submitted to OITMD and NJCAT by August 2004.
5. The approval letter shall expire by December 2004 unless extended by OITMD.