

## Conditional Interim Certification Findings

### NJDEP Technology Certification Program:

Bureau of Sustainable Communities & Innovative Technologies  
Division of Science, Research & Technology  
401 E State Street, P.O. Box 409  
Trenton, NJ 08625  
(609) 292-9692

### Manufactured Treatment Device:

Media Filtration System (MFS) by CDS Technologies, Inc.

### Applicant Information:

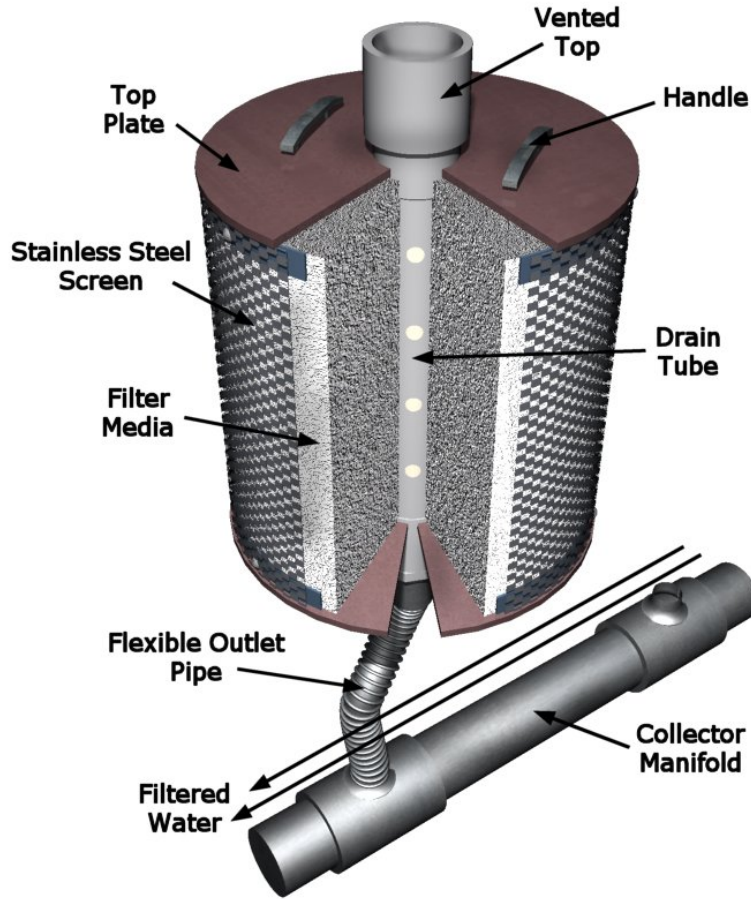
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### Technology Description:

As described in the verification report from the New Jersey Corporation for Advanced Technology (NJCAT), the Media Filtration System (MFS), developed by CDS Technologies, Inc., is a water quality treatment technology designed to remove fine particles and pollutants from storm water runoff. The MFS provides filtration by means of a cartridge filter (with perlite as the filter media), as shown in Figure 1. The MFS is also equipped with an adjustable float control to provide the optimal operating head on the cartridge system.

The cartridges within the MFS are placed 18-inches above a vault floor to provide storage space for larger sized sediments that settle through gravity, and which also prevents blockage of the filter cartridges. Multiple cartridges can be installed in concrete drop inlets, manholes or vault structures, as shown in Figure 2.

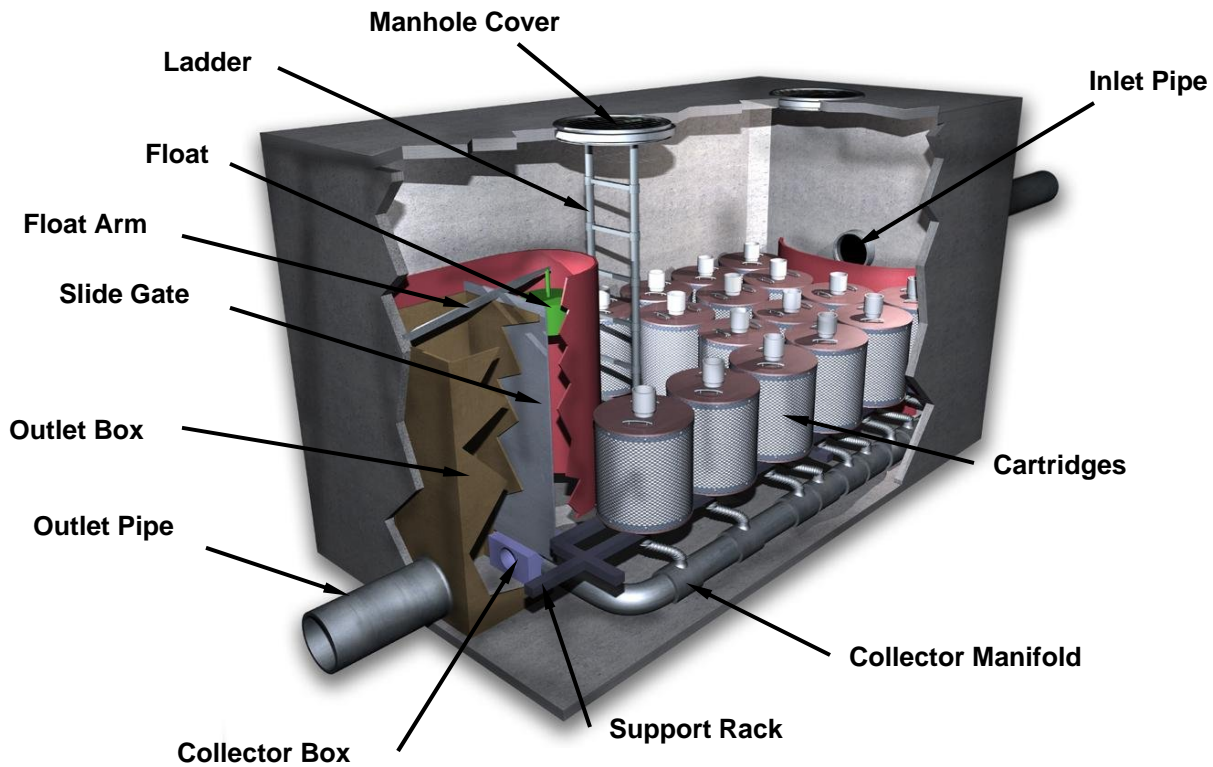
Storm water runoff entering the system is diverted by a weir and flows to the portion of the vault beneath the cartridges where coarser solids will settle and be trapped. As the water level rises, with the slide gate in the closed position, the runoff is filtered through the media-filled cartridges. Filtered water then enters a perforated drain tube located in the center of the cartridge and flows to the collector manifold through a flexible pipe equipped with a “quick connect” coupling. The manifold is plumbed to a float-controlled slide gate that sets the overall operational control of the Media Filtration System to achieve a balanced, matching inflow and driving head level.



**Figure 1. Configuration of a Media Cartridge Unit**

The float is designed to begin opening the slide gate as the water level reaches the top of the cartridges allowing uniform and maximum exposure of the media to each and every cartridge filter. When storm water runoff flow recedes, the float-controlled slide gate will close until the next triggering runoff event. The remaining water is slowly released after filtration via leakage around the slide gate until the vault is drained to the outlet pipe's invert level - optional complete drain-down of entire vault designs are available. This operation of the slide gate assures that the media is not exposed to hydraulic forces, which can destabilize and induce channelization through the media.

Based on the demonstrated performance of the MFS, the maximum practical cartridge height was determined to be 22 inches with a head of 27 inches (i.e. 5 inches above the cartridge). Each 22-inch tall cartridge has a diameter of 18 inches and a surface area of 8.64 ft<sup>2</sup>. The spent cartridge, when wet, is expected to weigh 160-pounds, which is manageable with commonly available mechanical hoisting equipment.



**Figure 2. Schematic of a Media Filtration System - Configured In Vault**

NJCAT Verified Claim:

“The 22-inches tall CDS cartridge in combination with the CDS Media Filtration System under-forebay, sized at a treatment rate of no more than 20 gpm/cartridge, using a coarse perlite media and an event mean concentration in the range of 100 – 200 mg/L, has been shown to have a 82.7% TSS removal efficiency, measured as suspended solids concentration (SSC), for Sil-Co-Sil 106, a manufactured silica product with an average ( $d_{50}$ ) particle size of 22 microns, in laboratory studies using simulated storm water.”

Technology Limitations/Concerns:

- Lack of maintenance may cause the Media Filtration System’s filtration media to become occluded with sediments, thus reducing the TSS removal efficiency of the system. Therefore, inspections of accumulated pollutants must be performed as recommended by the manufacturer.
- Oil and grease in storm water runoff, largely associated with the attachment to sediments, trash and debris may reduce the life of the filter cartridge.
- The Media Filtration System design will cause ponding of water, which can become a breeding site for mosquitoes if the optional drain-down design is not available. Also, if the cartridges become occluded due to inadequate maintenance, additional standing water will result.

NJDEP Conditional Interim Certification:

Based on the demonstrated and NJCAT verified laboratory performance, NJDEP has confidence that the Media Filtration System has the capability of achieving, in field applications, a TSS removal efficiency of 80% at a reduced flow rate to that defined in the verified claim. Therefore, **NJDEP certifies that the 22-inch tall filtration cartridge of the Media Filtration System, using a coarse perlite media and operating at a treatment rate of no more than 17.5 gpm/cartridge, is capable of achieving a TSS removal efficiency of 80%.** This certified treatment rate translates to a specific flow rate of 2 gpm/ft<sup>2</sup> of cartridge media, which is consistent with prior approvals given to other vendors with a similar filtration cartridge type. In addition, the following conditions shall apply to the conditional interim certification:

1. Since the Media Filtration System was verified through laboratory performance data using a surrogate material, this device must be used with a pre-treatment device as part of a treatment train. The NJDEP has decided to adopt this conservative approach as a safety factor. However, upon the availability of acceptable **verified** field data, the NJDEP would consider revising this Conditional Interim Certification to make the Media Filtration System a stand-alone device. Presently, the selected pre-treatment device to be used with the respective Media Filtration System can only be approved by the Land Use Regulation Program and/or the Division of Watershed Management.
2. The maximum TSS removal rate for any treatment train, comprising a pre-treatment device and the Media Filtration System, shall be 80%.
3. This Conditional Interim Certification is only applicable to the 22-inch tall filter cartridge.
4. The Media Filtration System shall be designed in accordance with New Jersey's water quality design storm, as required in the Stormwater Management Rules (N.J.A.C. 7:8).
5. A Quality Assurance Project Plan satisfying the Technology Acceptance and Reciprocity Partnership (TARP) Tier II Protocol for Stormwater Best Management Practice Demonstration (July, 2003), and New Jersey Tier II Stormwater Test Requirements, shall be submitted to the NJDEP and NJCAT within six (6) months from the date of the Conditional Interim Certification letter.
6. Field evaluation data that are consistent with the TARP Tier II Protocol and New Jersey Tier II Stormwater Test Requirements, which are available from NJCAT or [www.state.nj.us/dep/dsr/bscit/Documents.htm](http://www.state.nj.us/dep/dsr/bscit/Documents.htm), shall be submitted to the NJDEP and NJCAT by February 28, 2008.