



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control  
Division of Water Quality

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[http://www.state.nj.us/dep/dwq/bnpc\\_home.htm](http://www.state.nj.us/dep/dwq/bnpc_home.htm)

CHRIS CHRISTIE  
*Governor*

KIM GUADAGNO  
*Lt. Governor*

BOB MARTIN  
*Commissioner*

August 12, 2015

Jay Holtz, PE  
Director of Engineering  
Oldcastle Stormwater Solutions  
7921 Southpark Plaza, Suite 200  
Littleton, CO 80120

Re: MTD Lab Certification for the Dual Vortex Separator  
By Oldcastle Stormwater Solutions

### **TSS Removal Rate 50%**

Dear Mr. Holtz;

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Oldcastle Stormwater Solutions has requested a Laboratory Certification for the Dual Vortex Separator (DVS).

The projects falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

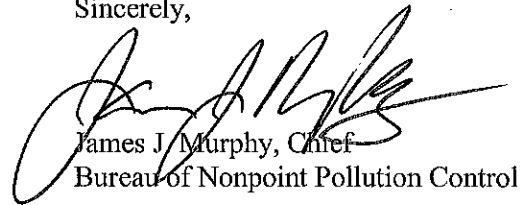
**The NJDEP certifies the use of the Dual Vortex Separator (DVS) by Oldcastle Stormwater Solutions at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix.**

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the

Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,



James J. Murphy, Chief  
Bureau of Nonpoint Pollution Control

C: Chron File  
Richard Magee, NJCAT  
Madhu Guru, DLUR  
Ravi Patraju, NJDEP  
Titus Magnanao, BNPC

# **DUAL VORTEX**<sup>®</sup> *Separator*

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## INSPECTION AND MAINTENANCE GUIDE

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## ***Description***

The Dual Vortex Separator (DVS) is a hydrodynamic stormwater treatment device used to remove pollutants from urban runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter stormwater and pollute downstream receiving waters. The DVS is designed to capture and retain sediment as well as floating trash, debris, and oils. The concentration of metals and other constituents associated with the sediment or floating pollutants may also be reduced.

## ***Function***

Stormwater runoff enters the DVS unit through an inlet pipe. Influent flow is split evenly between two vortex tubes by a V-shaped weir. The shape and diameter of the vortex tubes promotes circular motion of the incoming stormwater at increased velocities to enhance particle settling through centrifugal force. The system is also designed with an extended flow path to maximize hydraulic residence time which allows increased time to settle out solids. Settled pollutants are collected in an isolated storage area at the bottom of the structure, while floating trash, debris, and petroleum hydrocarbons are retained behind baffles that contain the vortex chambers. During peak runoff events, flow in excess of design treatment flow overtops the bypass weir and exits the system without entering the treatment chambers to interrupt the treatment process or re-entrain captured pollutants. Treatment and bypass flows exit the system through an outlet pipe that is plumbed at the same elevation as the inlet pipe.

## ***Configuration***

The internal components of the DVS system are fabricated from stainless steel and mounted in a manhole or vault structure. The system is typically delivered as a complete unit for installation by the contractor. Installation includes excavation, preparation of the base rock, setting the unit, plumbing the inlet and outlet piping, backfill, and placement of the finished surface at grade. Access to the installed system is allowed through ductile iron casting or hatch covers. The number of access points provided is dependent on the size and configuration of the system.

## ***Maintenance Overview***

State and Local regulations require all stormwater management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity and increase the potential for scouring of pollutants during periods of high flow.



## ***Inspection Equipment***

The following equipment is helpful when conducting DVS inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Measuring stick or sludge sampler
- Long-handled net (optional)
- Replacement sorbent pads

## ***Inspection Procedures***

Inspection is essential to consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.

DVS inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 6) to determine whether maintenance is required:

- Inspect the internal components and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Stormwater Solutions at (800) 579-8819 to determine appropriate corrective action.
- Note whether the inlet or outlet pipe is blocked or obstructed.
- Observe, quantify, and record the accumulation of floating trash and debris in the baffled chambers around the vortex tubes. The significance of accumulated floating trash and debris is a matter of judgment. A long-handled net may be used to retrieve the bulk of trash and debris at the time of inspection if full maintenance due to accumulation of oils or sediment is not yet warranted.
- Observe, quantify, and record the accumulation of oils in the baffled chambers around the vortex tubes. If sorbent pads have been used to absorb free oil and grease, observe and record their condition. Unless the sorbent pads are tethered to the internal baffles, spent pads may be netted and replaced at the time of inspection. The significance of accumulated floating oils is a matter of judgment. However, if there is evidence of an oil or fuel spill, immediate maintenance is warranted.



### ***Inspection Procedures - continued***

- Finally, observe, quantify, and record the accumulation of sediment in the sediment storage sump. A calibrated dipstick, tape measure, or sludge sampler may be used to determine the amount of accumulated sediment. The depth of sediment may be determined by calculating the difference between the measurement from the rim of the DVS to the top of the accumulated sediment and the measurement from the rim of the DVS to the bottom of the DVS structure. Finding the top of the accumulated sediment takes some practice and a light touch, but increasing resistance as the measuring device is lowered toward the bottom of the unit indicates the top of the accumulated sediment.

### ***Maintenance***

Maintenance should be scheduled if any of the following conditions are identified during the inspection:

- Internal components are broken or missing.
- Inlet or outlet piping is obstructed.
- The accumulation of floating trash and debris that cannot be retrieved with a net and/or oil in the baffled chambers around the vortex tubes is significant.

### ***Maintenance Equipment***

The following equipment is helpful when conducting DVS maintenance:

- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Confined space entry equipment, if needed
- Flashlight
- Tape measure
- Sorbent pads
- Vacuum truck

### ***Maintenance Procedures***

Maintenance should be conducted during dry weather when no flow is entering the system. All maintenance, except possibly the attachment of sorbent pads (if required), may be conducted without entering the DVS structure. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:



### ***Maintenance Procedures - continued***

- Remove floating trash, debris, and oils from the water surface using an extension on the end of the boom hose of the vacuum truck. Continue using the vacuum truck to completely dewater the structure through the vortex tubes and evacuate all accumulated sediment from the sediment sump. Some jetting may be required to fully evacuate sediment from the sump. This is easily achieved by inserting a jet hose through the vortex tube opposite the tube used for vacuum hose access.
- If sorbent pads are required and are tethered to the structure, only personnel that are OSHA Confined Space Entry trained and certified may enter the structure to remove and replace the spent pads.
- The structure does not need to be refilled with water after maintenance is complete. The system will fill with water when the next storm event occurs.
- All material removed from the DVS during maintenance must be disposed of in accordance with local regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.



## Dual Vortex Separator Inspection and Maintenance Log

DVS Model _____	Inspection Date _____
Location _____	
<b><i>Condition of Internal Components</i></b>	Notes:
<input type="checkbox"/> Good <input type="checkbox"/> Damaged <input type="checkbox"/> Missing	
<b><i>Inlet or Outlet Blockage or Obstruction</i></b>	Notes:
<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b><i>Floating Trash and Debris</i></b>	Notes:
<input type="checkbox"/> Significant <input type="checkbox"/> Not Significant	
<b><i>Floating Oils</i></b>	Notes:
<input type="checkbox"/> Significant <input type="checkbox"/> Not Significant <input type="checkbox"/> Spill	
<b><i>Sediment Depth</i></b>	Notes:
<input type="checkbox"/> Inches of Sediment: _____	
<b><i>Maintenance Requirement</i></b>	
<input type="checkbox"/> <b>Yes – Schedule Maintenance</b> <input type="checkbox"/> <b>No – Schedule Re-Inspection</b>	

