State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Science, Research and Technology
Bureau of Sustainable Communities & Innovative Technologies
PO Box 409
Trenton, NJ 08625-0409
Tel: 609-292-9692
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JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

March 20, 2006

Derek Berg
Research and Development Specialist
Stormwater 360™, Inc.
200 Enterprise Drive
Scarborough, ME 04074

RE: Conditional Interim Certification of VortSentry® Stormwater Treatment System by Stormwater 360™, Inc.

Dear Mr. Berg:

In accordance with the Energy and Environmental Technology Verification (EETV) Act at N.J.S.A. 13:1D-134, the New Jersey Department of Environmental Protection (NJDEP) is pleased to issue a **Conditional Interim Certification** for the VortSentry® Stormwater Treatment System by Stormwater 360™, Inc. This Conditional Interim Certification is being issued pursuant to this program's receipt and review of the New Jersey Corporation for Advanced Technology (NJCAT) verification report for the VortSentry® Stormwater Treatment System, which was dated December 2005. **This certification letter must be used in conjunction with the enclosed Interim Certification Findings document**.

The VortSentry® Stormwater Treatment System, Model VS40, sized at a loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3) of treatment volume, has been shown to have a 69% total suspended solids (TSS) removal efficiency, measured as suspended solids concentration (SSC) (as per the NJDEP methodology for calculation of treatment efficiency) for F-95 silica sand with an average d_{50} particle size of 120 microns, an average influent concentration of 209 mg/L and 50% initial sediment loading in laboratory studies using simulated stormwater.

Based on the demonstrated laboratory performance, the NJDEP feels confident that the VortSentry® Stormwater Treatment System Model VS40 sized at a loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3) of treatment volume has the capability of achieving, in field applications, a TSS removal efficiency of 50%. Therefore, NJDEP certifies that the VortSentry® Stormwater Treatment System, Model VS40 is capable of achieving a TSS removal efficiency of 50%, while operating at the designed loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3). In addition, the various models of the VortSentry® Stormwater Treatment System, that are also capable of achieving TSS removal efficiencies of 50% from stormwater runoff at the respective maximum designed flow rates, are given in **Table 1** of the enclosed **Conditional Interim Certification Findings**

document and shall be permitted accordingly. The following conditions shall apply to the Conditional Interim Certification:

1. The VortSentry® Stormwater Treatment System should be the first component if used as part of a treatment train (i.e., utilized in front of best management practices such as detention, retention, and infiltration basins, etc., as defined in the NJ Stormwater Best Management Practices Manual). Use of this device in series with other manufactured treatment devices can only be approved by the Land Use Regulation Program and/or the Division of Watershed Management.
2. The VortSentry® Stormwater Treatment 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).
3. A Quality Assurance Project Plan supporting 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.
4. 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, shall be submitted to the NJDEP and NJCAT by September 30, 2007.
5. The appropriate devices satisfying site selection and sizing criteria must be consistent with the specifications as described in **Table 1** of the enclosed **Conditional Interim Certification Findings** document.

Please note that this approval letter shall expire on February 28, 2008, unless extended by NJDEP. For final certification of the VortSentry® Stormwater Treatment System, verified data must be generated from a full-scale field demonstration utilizing the TARP Tier II Protocol and additional NJDEP field testing requirements. If you have any questions about this Conditional Interim Certification, please contact Ravi Patraju of my staff at (609) 292-0125.

Sincerely,

Martin Rosen
Chief - Bureau of Sustainable Communities
and Innovative Technologies, DSRT

Enclosure

c: Mark Mauriello, Acting Assistant Commissioner, Land Use Management
Jill Lipoti, Acting Assistant Commissioner, Environmental Regulation
Larry Baier, Director, Division of Watershed Management
Tom Micai, Director, Land Use Regulation Program
Eileen Murphy, Director, Division of Science, Research, and Technology
Narinder Ahuja, Director, Division of Water Quality
Rhea Brekke, Executive Director, New Jersey Corporation for Advanced Technology

April 6, 2008

Addendum to the VortSentry® Stormwater Treatment System
Conditional Interim Certification

Based on the submitted information from CONTECH and NJCAT demonstrating progress in securing a test site for conducting field testing of the VortSentry® Stormwater Treatment System, the NJDEP is approving the request for an extension of the Conditional Interim Certification until **February 29, 2009**. CONTECH Stormwater Solutions must submit quarterly updates showing progress of the field test to the NJDEP and NJCAT.

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

Stormwater Manufactured Treatment Device:

VortSentry® Stormwater Treatment System by Stormwater 360™, Inc.

Applicant Information:

Derek Berg
Research and Development Specialist
Stormwater 360™, Inc.
200 Enterprise Drive
Scarborough, ME 04074
207-885-9830

Technology Description:

The VortSentry® Stormwater Treatment System is a hydrodynamic separator designed to enhance gravitational separation of floating and settling materials from stormwater flows (See Figure 1). Stormwater flows enter the unit tangentially to the treatment chamber, which promotes a gentle swirling motion. As stormwater circles the treatment chamber, pollutants migrate toward the center of the unit where velocities are the lowest. Over time a conical pile tends to accumulate in the bottom of the treatment chamber containing sediment and associated metals, nutrients, hydrocarbons and other pollutants. Floating debris, oil and grease form a floating layer trapped in front of the treatment chamber baffle. These accumulated pollutants can be accessed through manholes conveniently located over the treatment chamber. Maintenance is typically performed through the manhole over the treatment chamber.

The VortSentry® System is a compact, below grade system that is fabricated near the job site from concrete and marine grade aluminum. There are six standard precast models available, ranging from three to eight feet in diameter. In some regions VortSentry® systems are available in diameters up to 12 feet, but this is dependent on the capabilities of local precasters. Standard VortSentry® model sizes and dimensions are provided in **Table 1**.

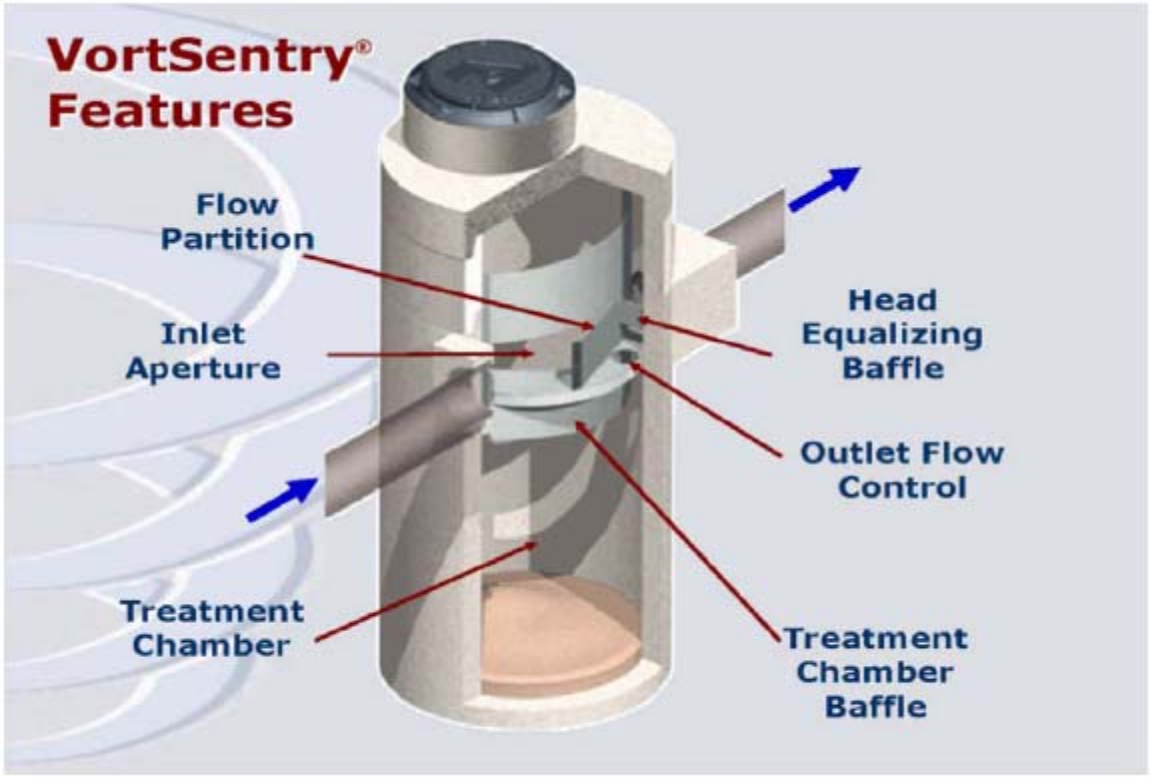

Figure 1. VortSentry® Features

Model Number	Diameter (ft)	Treatment Volume (ft^3)	Treatment Flow Rate		Operating Rate	
			(cfs)	(gpm)	(cfs/ft^3)	(gpm/ft^3)
VS30	3	21	0.46	207	0.022	9.8
VS40	4	50	1.1	494	0.022	9.8
VS50	5	98	2.15	965	0.022	9.8
VS60	6	170	3.71	1,665	0.022	9.8
VS70	7	269	5.90	2,648	0.022	9.8
VS80	8	402	8.80	3,950	0.022	9.8
VS100	10	785	17.19	7,715	0.022	9.8
VS120	12	1,357	29.70	13,330	0.022	9.8

Table 1. VortSentry Treatment Flows Assuming Volumetric Scaling

New Jersey Corporation for Advanced Technology (NJCAT) Verified Claim:

The VortSentry® Stormwater Treatment System, Model VS40, sized at a loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3) of treatment volume, has been shown to have a 69% total suspended solids (TSS) removal efficiency, measured as suspended solids concentration (SSC) (as per the NJDEP methodology for calculation of treatment efficiency) for F-95 silica sand with an average d_{50} particle size of 120 microns, an average influent

concentration of 209 mg/L and 50% initial sediment loading in laboratory studies using simulated stormwater.

Technology Limitations/Concerns:

- Lack of maintenance may cause the system to operate at a reduced efficiency, and over time the system could become totally filled with sediment.
- Heavy loads of sediment would require an increased maintenance frequency.
- The VortSentry® Stormwater Treatment System design allows for the accumulation of standing water in the lower chamber, which can be a breeding site for mosquitoes.

NJDEP Conditional Interim Certification:

Based on the demonstrated laboratory performance, the NJDEP feels confident that the VortSentry® Stormwater Treatment System Model VS40 sized at a loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3) of treatment volume has the capability of achieving, in field applications, a TSS removal efficiency of 50%. Therefore, NJDEP certifies that the VortSentry® Stormwater Treatment System, Model VS40 is capable of achieving a TSS removal efficiency of 50%, while operating at the designed loading rate of 9.8 gpm/ft^3 (0.022 cfs/ft^3). In addition, the various models of the VortSentry® Stormwater Treatment System, that are also capable of achieving TSS removal efficiencies of 50% from stormwater runoff at the respective maximum designed flow rates, are given in **Table 1** and shall be permitted accordingly. The following conditions shall apply to the Conditional Interim Certification:

1. The VortSentry® Stormwater Treatment System should be the first component if used as part of a treatment train (i.e., utilized in front of best management practices such as detention, retention, and infiltration basins, etc., as defined in the NJ Stormwater Best Management Practices Manual). Use of this device in series with other manufactured treatment devices can only be approved by the Land Use Regulation Program and/or the Division of Watershed Management.
2. The VortSentry® Stormwater Treatment 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).
3. A Quality Assurance Project Plan supporting 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.
4. 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, shall be submitted to the NJDEP and NJCAT by August 31, 2007.
5. The appropriate devices satisfying site selection and sizing criteria must be consistent with the specifications as described in **Table 1**.