

CERTIFICATE

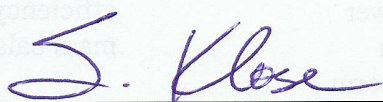
OF TECHNOLOGY ASSESSMENT

Hydroworks® Hydroguard for Stormwater Treatment (Hydroworks, LLC)

*Based on a review of the data and the information submitted in support of the technology, the ministry concludes that the **Hydroworks® Hydroguard**, by Hydroworks, LLC may be applied to the treatment of stormwater to remove debris, settleable solids and their associated pollutants, oil, and floatables over a wide range of flow rates.*

*The **Hydroworks® Hydroguard** may be applicable to spill control, pre-treatment, or end-of-pipe control for the management of stormwater at smaller sites (as part of a multi-component approach) where stormwater management options are limited. Such applications would include urban and highway sites with high imperviousness and where pollutant loads in stormwater are expected to be high.*

The NETE evaluation is not considered an approval or implied approval of the technology and it in no way removes or limits the obligation to obtain the necessary environmental approvals under the Ontario Water Resources Act or the Environmental Protection Act for an application of the technology. The ministry approval process ensures the applicability of the technology against site-specific performance and environmental requirements.



Steve Klose, Director
Standards Development Branch
Ontario Ministry of the Environment
(July 2012)

New Environmental Technology Evaluation Program
Promoting the development and application of new environmental technologies



Hydroworks® Hydroguard for Stormwater Treatment (*Hydroworks, LLC*)

Notable aspects of the technology include:

- / The Hydroworks® Hydroguard is a pre-cast concrete treatment tank incorporating baffles to create chambers to remove settleable solids and their associated pollutants, debris, oil, and floatables from stormwater runoff. The device is installed in an on-line configuration.
- / Internal copolymer polypropylene structures divide it into three chambers. The circular inner chamber which is offset compared to the influent pipe has an opening that is aligned on-centre with the influent pipe to receive low or normal flows. A middle chamber is the primary conduit for high flows. Water flows from the inner chamber to the middle chamber to an outlet chamber where it is discharged to the downstream storm sewer.
- / The Hydroworks® Hydroguard has no moving parts and no external power requirements. The tank has one storm sewer inlet and an outlet to return flows to the downstream storm sewer. Ports at grade provide access for inspection and clean-out of stored debris, floatables and sediment.
- / Stormwater flows into the tank and is conveyed into the inner chamber by momentum. The water follows the curved wall of the inner chamber creating a vortex. The water spirals down in the inner chamber and exits through a lower opening. The tank provides sedimentation of solids and filtration of debris.
- / System maintenance consists of periodically vacuuming sediment and floatables from the chambers. The manufacturer anticipates that post-construction maintenance will be required annually or once every two years subject to individual site conditions.
- / Independent third party testing was performed on a Hydroworks® Hydroguard HG6 at Alden Research Laboratory in Holden, Massachusetts in 2008. The Hydroguard HG 6 has a 100% treatment flow rate of 1.8 cfs (0.05 cubic meters per second) based on the Alden testing for the New Jersey Department of Environmental Protection's (NJDEP) test protocol particle size distribution. Using weighting factors suggested by the NJDEP, the HG 6 can achieve an annual solids removal efficiency of 60.5% (based on mass balance analysis).
- / The Ministry has not verified the performance claims. The mass balance results cannot be used to predict the ability of this technology to meet suspended solids removal required by Ontario which is based on suspended solids as measured by ASTM D5907-09.
- / The Hydroworks® Hydroguard may be applicable to spill control, pre-treatment, or end-of-pipe control for the

Appendix

Documents reviewed:

- / Hydroworks, "NETE Submission", October 14, 2011.
- / Tara Beecham, The Journal for Surface Water Quality Professionals, "Filtered Hope", Buyers Guide 2011.
- / NJCAT TECHNOLOGY VERIFICATION, Hydroworks HG 6 Separator, Hydroworks, LLC, July 2009.
- / Letter from Keith R. Lane, P.E., Director of Research and Materials, Bureau of Engineering and Highway Operations to Graham Bryant, P.E. Hydroworks, LLC, May 25, 2006.
- / Letter from Joseph A. Peluso, Jr., Executive Director, Board of State Examiners of Plumbers and Gas Fitters, Division of Professional Licensure, Commonwealth of Massachusetts to Hydroworks, LLC, June 24, 2010.
- / MASTEP Technology Review, University of Massachusetts at Amherst, Water Resources Research Center, Hydroguard HG6 Hydrodynamic Separator, January 29, 2009.
- / Letter from Richard R. Brush, Manager, Department of Permitting Services, Montgomery County, Maryland, to Graham Bryant, P.E., Hydroworks, LLC, April 4, 2011.
- / Letter from Phillip D. Pullen, P.E., Product Evaluation Committee Chairman, City of Virginia Beach, Virginia to Graham Bryant, P.E., President, Hydroworks, May 15, 2006
- / Letter from Ed Frankel, P.P., Acting Bureau Chief, Bureau of Nonpoint Pollution Control, Department of Environmental Protection, State of New Jersey, August 31, 2011.
- / Letters to Wausau Concrete Co./Hydroworks, LLC, from Jean M. MacCubbin, CST, Engineering Consultant— Plumbing Products Review, Commerce; Safety & Building Div., Department of Commerce, Wisconsin, October 7, 2010.
- / Hydroworks, Hydroworks® HG TECHNICAL MANUAL, Version 2.4.
- / Hydroworks, Hydroworks® Hydroguard Maintenance Manual, Version 1.3.
- / Hydroworks, Hydroworks® Hydroguard One Year Limited Warranty.
- / Hydroworks, HG Series Specifications & Standards, 02/10/2011.
- / James T. Mailloux and Amie N. Humphrey, Alden Research Laboratory, Inc., "Verification Testing of the Hydroguard HG6 Hydrodynamic Separator Stormwater Treatment Unit Final Report", December 23, 2008.
- / Graham Bryant, "Hydroworks Hydroguard Laboratory Performance Testing"

management of stormwater at smaller sites (as part of a multi-component approach) where stormwater management options are limited. Such applications would include urban and highway sites with high imperviousness and where pollutant loads in stormwater are expected to be high.

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 2008.

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For Research, The Journal for
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 Professionals, "Filtered Pipes",
 Buyers Guide 2011.

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 P.E. Hydroworks, LLC, May
 25, 2008.

Letter from Joseph A. Peluso,
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 and Gas Fitters, Division of
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 Massachusetts to Hydroworks,
 LLC, June 24, 2010.

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 University of Massachusetts at
 Amherst, Water Resources
 Research Center, Hydroguard
 HG6 Hydrodynamic Separator,
 January 29, 2009.

Letter from Richard B. Bush,
 Manager, Department of
 Permitting Services,
 Montgomery County, Maryland,
 to Graham Bryant, P.E.,
 Hydroworks, LLC, April 4,
 2011.

Letter from Phillip D. Pullen,
 P.E., Product Evaluation