



**Metropolitan  
St. Louis Sewer  
District**

2350 Market Street  
St. Louis, MO 63103-2555  
(314) 768-6200



June 2, 2008

Mr. John MacKinnon, P.E.  
Regulatory Specialist  
Hydro International  
94 Hutchins Drive  
Portland, ME 04102

RE: Downstream Defender<sup>®</sup>: St. Louis MSD Submission  
Highway Use Level (HUL) and Redevelopment Use Level (RUL) Approval within  
District

Dear Sir:

The Metropolitan St. Louis Sewer District (MSD) has reviewed your application regarding the Downstream Defender<sup>®</sup> for use as a Best Management Practice for stormwater management. MSD is pleased to provide Highway Use Level (HUL) and Redevelopment Use Level (RUL) approval for use of the Downstream Defender<sup>®</sup> as a stand-alone water quality BMP, subject to the following provisions.

- The Downstream Defender<sup>®</sup> is only approved for use on public highway and roadway projects and for redevelopment sites less than 5 acres. This approval is based compliance with requirements listed in MSD's Proprietary Water Quality Products and the MSD's Stormwater Management Program (Jan. 2008).
- The Downstream Defender<sup>®</sup> must be sized to capture all floatable trash and free oil, and remove 80% of total suspended solids for the OK-110 particle size distribution at the site water quality flow-rate ( $WQ_f$ ). Procedures for calculating  $WQ_f$  are provided in Appendix D.10 of the Maryland Stormwater Design Manual (2000). Table 1 provides a list of approved models and their respective instantaneous peak treatment  $WQ_f$ .

**Table 1: Downstream Defender<sup>®</sup> Approved Models and Peak  $WQ_f$**

| <b>System Model</b> | <b>Max Treatment Flow (cfs)</b> |
|---------------------|---------------------------------|
| 4 Foot Diameter     | 1.3                             |
| 6 Foot Diameter     | 4.1                             |
| 8 Foot Diameter     | 9.4                             |
| 10 Foot Diameter    | 17.7                            |

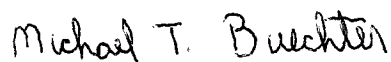
- Devices should be configured as off-line units. In most cases the BMP will be installed without the need to store the water quality volume ( $WQ_v$ ) upstream of the unit.
- All devices shall provide a minimum sediment storage capacity of 10 ft<sup>3</sup>.

- Confined space entry shall not be a requirement for routine maintenance. No special tools or attachments should be required to provide routine maintenance with a vacuum pumping truck.
- All proprietary lids and covers should be captive components. The minimum size access hole is 30 inches in diameter.
- Project specific design calculations and maintenance plans furnished by Hydro International must be included within the project's "Stormwater Management Facilities Report" prepared by the consulting engineer.
- The initial installation of the Downstream Defender<sup>®</sup> in the MSD shall include the following:
  - 1) A manufacturer's or vendor's representative must be onsite during the proprietary BMP installation to ensure the product's installation requirements are met.
  - 2) Shop drawings indicating elevations of flowlines, weirs, pipe inverts, etc. will be required prior to installation.
  - 3) The manufacturer or vendor must arrange for an as-built survey of the proprietary BMP to be performed by a Missouri-registered Professional Land Surveyor once the device has been installed, and prior to any testing or monitoring.
  - 4) The manufacturer or vendor must perform quarterly inspections of the proprietary BMP during its' first year of operation, which will include visual inspections and quantitative analysis of the service's sediment removal efficiency, especially as compared to its design efficiency. MSD requests to be invited to these inspections to further enhance familiarity and understanding of the device.
  - 5) Formal reports shall be submitted to MSD, including as-builts and at each quarterly inspection. The reports shall include summaries, quantitative analysis mentioned in item 4, photographs of the structure, inlet, internal conditions of the structure, the filters, and outfall conditions, etc. The reports shall also evaluate the performance of the owner's adherence to the approved maintenance program, and offer suggestions for any areas of improvement.

The Downstream Defender<sup>®</sup> is not approved for general use at this time.

MSD reserves the ability to withdraw or modify this approval based on subsequent information, including information indicating that this BMP does not satisfy MSD rules, requirements, or construction specifications.

Sincerely,



Michael T. Buechter, P.E.  
Principal Engineer (BMP Committee Chairman)  
Engineering/Design  
Metropolitan St. Louis Sewer District