



**Center for Environmental Systems
Stevens Institute of Technology
One Castle Point
Hoboken, NJ 07030-0000**

April 10, 2021

Gabriel Mahon, Chief
NJDEP
Bureau of Non-Point Pollution Control
Bureau of Water Quality
401 E. State Street
Mail Code 401-02B, PO Box 420
Trenton, NJ 08625-0420

Dear Mr. Mahon,

Based on my review, evaluation and assessment of the testing conducted on a full-scale, commercially available Hydroworks HydroDome (HD) stormwater separator at the Alden Research laboratory, Inc. in Holden, MA, the test protocol requirements contained in the “New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device” (NJDEP HDS Protocol, January 2013) were met consistent with the NJDEP Approval Process. Specifically:

Test Sediment Feed

The sediment used for removal efficiency tests was prepared by Alden to meet the NJDEP test sediment PSD for sediment removal efficiency testing. The sediment was silica based, with a specific gravity of 2.65. Sediment test batches of approximately 35 lbs were prepared in individual 5-gallon buckets, which were arbitrarily selected for each removal efficiency test. A well-mixed sample was collected from each test batch and analyzed for PSD by GeoTesting Express, Inc. Acton, Massachusetts. GeoTesting is an AALA ISO/IEC 17025 accredited independent laboratory. The average of the samples was used for compliance to the protocol

specifications. The d_{50} of the sediment was 62 μm , significantly less than the NJDEP specification of $<75 \mu\text{m}$.

Scour Test Sediment

A commercially-available AGSCO NJDEP50-1000 certified sediment mix was utilized for the scour test. Three samples of the batch mix were analyzed in accordance with ASTM D422-63 (2007), by CTLGroup, an ISO/IEC 17025 accredited independent laboratory, and provided with the sediment shipment. The specified less-than (%-finer) values of the sample average were within the specifications as defined by the protocol. The D_{50} of the 3-sample average was 202 microns.

Removal Efficiency Testing

Removal efficiency testing followed the effluent grab sampling test method outlined in Section 5 of the NJDEP Protocol. The weighted sediment removal efficiency of the HydroDome (model HD 3) Separator (MTFR 381.5 gpm, 0.85 cfs) was 58.5%.

Scour Testing

Scour testing of the HydroDome separator was conducted in accordance with Section 4 of the NJDEP Protocol at a target flow rate greater than 200% of the HD 3 MTFR to qualify the MTD for online installation. The average test flow rate was 241% of the 0.85 cfs MTFR. The average unadjusted effluent concentration for this test was 2.1 mg/L (background concentration 2.2 mg/L), essentially indicating no sediment scour, qualifying the HydroDome for on-line installation.

Sincerely,



Richard S. Magee, Sc.D., P.E., BCEE