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April 15, 2014

Mr. Ray Cody
Project Manager
EPA Region 1
5 Post Office Square- Suite 100
Boston, MA 02109

RE: MASHAPAUG POND BMP SITE, SUMMARY OF DESIGN

Dear Mr. Cody

This letter represents a summary of the design process for the Mashapaug Pond proposed Best Management Practice (BMP) site at the intersection of Niantic Avenue and Swanton Street in Providence, Rhode Island.

Background

The City of Providence is partnering with the Environmental Protection Agency (EPA) and the Rhode Island Department of Environmental Management (RIDEM) for a Green Infrastructure (GI) Education and Outreach Project located near Mashapaug Pond. In part, this project seeks to cultivate community and practitioner appreciation and support for GI as an effective approach for stormwater management.

Mashapaug Pond is located near the southern border of Providence within the Pawtuxet River basin. It is currently listed as impaired on the state's 303(d) list for several water quality parameters, including phosphorus and low dissolved oxygen. A Total Maximum Daily Load (TMDL) covering these impairments was prepared in September 2007 by the RIDEM. To improve water quality, a combination of upland and end of pipe control structures were recommended to treat and reduce runoff volumes.

In response to the TMDL, a Water Quality Management Plan (WQMP) was prepared for the Roger Williams Park Ponds that in part recommends stormwater best management practices (BMPs) capable of treating stormwater and improving water quality. One potential stormwater BMP retrofit project identified in the WQMP (referred to as Upper Watershed #3 (UW-3)) is located at the JT Owens Little League Field. This site is directly south of the Huntington Industrial Park which was recently selected for green infrastructure improvements.

Construction will entail installing a diversion structure into the existing storm sewer line located near the Niantic Avenue and Swanson Street intersection and an infiltration

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BMP retrofit located at the southern / far edge of the Little League ball fields. The BMP retrofit will treat runoff from the 5.9 acre UW-3 sub-catchment (approx. 2.6 acres impervious cover consisting of roadways, driveways and rooftops) that would ordinarily discharge untreated to Mashapaug Pond. Onsite investigations indicated soils that may be generally characterized as hydrologic soil group (HSG) A/B soil with infiltration rates of approximately 6 to 12 inches per hour, considered suitable for infiltration. Depth to groundwater was estimated at 14 feet below the ground surface based on the water elevation at nearby Mashapaug Pond.

BMP Retrofit Design and Construction

Design and construction of a stormwater BMP retrofit, consisting of an infiltration basin and sediment forebay has been proposed for an area outside the Little League outfield fence to provide stormwater treatment and help improve water quality within Mashapaug Pond as required by the TMDL. The BMP was designed according to the Rhode Island Stormwater Manual and modeled using Autodesk Storm and Sanitary Analysis to store and infiltrate the water quality volume (calculated as 1 inch of runoff over the impervious area) while maintaining a minimum 2 feet of separation to groundwater based on field investigations. A 6 inch high diversion weir will be constructed to divert runoff generated from up to 2 inches of rainfall depth into the BMP to maximize treatment potential. Excess runoff volumes exceeding BMP capacity will bypass the infiltration basin via the existing closed drainage system. By designing for the water quality volume, this BMP will capture and treat the entire runoff volume for 90 percent of storm events.

This project is a retrofit project, and available space is limited. As this site is located adjacent to a frequently-used Little League field, the proposed project will include shallow side slopes while minimizing standing water depth. Assuming a conservative design infiltration rate of 4 inches per hour, it is estimated that a “full” BMP will drain within approximately 10 to 12 hours. Construction will not affect the field itself, with all disturbance taking place outside recreational areas.

The project consists of construction of a pretreatment forebay and a shallow-planted infiltration basin. Once stormwater is in the sediment forebay, sediment particles will settle out, helping to keep the infiltration basin free of sediment and making maintenance easier. Stormwater will then flow into the vegetated infiltration basin where it will infiltrate into the ground and recharge to the underlying aquifer. Specially-selected hardy plants will provide further treatment by absorbing nutrients from stormwater. Currently, the design incorporates an outlet structure that is designed to prevent uncontrolled overflows and route excess flows back into the existing street drainage system. This will prevent overflows even in the unlikely scenario of an obstruction in the storm drain between the upstream diversion and the connection point



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of the overflow outlet. Additional design elements include a sediment forebay erosion protection pad made from recycled granite curbing and a new walking path for public access.

A schedule outlining remaining design items and construction tasks is attached to this letter. In brief, the schedule currently anticipates an approximate three-week construction period beginning the week of May 19 and concluding by the end of the week of June 2, 2014. Final planting would occur the following week.

If you have any questions or require additional information, please feel free to call me at 800-725-2550 ext. 305. We look forward to the approximate two week stakeholder review and comment period, in part because such review and comment will help clarify some design assumptions that need to be resolved before initiation of construction activities.

Very truly yours,

COMPREHENSIVE ENVIRONMENTAL INC.

Matthew Lundsted

Matthew Lundsted, P.E.
Project Manager

Enclosure

cc: Ken Hickey
Bruce Jacobs

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Design and Construction of Mashapaug Pond BMP Schedule

Week

Tasks	4/14	4/21	4/28	5/5	5/12	5/19	5/26	6/2	6/9	6/16	6/23	6/30
Design Review												
Finalize draft design	X											
EPA/Stakeholder review		X	X									
Finalize design based on comments				X								
Construction												
Construction Coordination				X	X							
Mobilization, access, setup					X	X						
Rough grading						X						
Road work- pipe to CB						X						
Pipe work							X					
Finish grading							X					
Landscaping							X	X				
Road work- new manhole								X				
Paving								X				
Planting									X			
Clean-up								X	X			