



sample

## Monthly Performance Report

May 2016

### University Blvd Wet Pond

Montgomery County, MD

Client:	MWCOG	Location:	39.0385N, 77.0325W
Project:	NFWF SISMS Study	Drainage Area:	440 acres
Site:	University Blvd Wet Pond	Impervious Area:	158 acres
Product:	OptiNimbus for Water Quality Improvement	Pond Volume at Overflow:	4.95 million gallons
Goal:	Reduce peak flows and increase retention time	Controllable Volume:	4.00 million gallons

Opti provided treatment for **14.3 million gallons** of stormwater runoff to the Chesapeake Bay in May 2016 by optimizing the extended detention storage of University Blvd Wet Pond in the Anacostia River Watershed.

This is 1 of 3 OptiNimbus sites in the watershed.

### Site Summary

<b>Time Connected</b>	99.4%	A 4.95 million gallon wet pond was retrofit with Continuous Monitoring and Adaptive Control (CMAC) in December 2015. Opti-enabled hardware and cloud-based software controls the storage and release of 4 million gallons of the pond. The remaining volume is the permanent pool.
<b>Time Controlled</b>	97.9%	

### Monthly Event Summary

<b>Number of Forecast Events</b>	12	In May 2016 OptiNimbus prepared the wet pond for 12 storm events that resulted in a total of 16.4 million gallons of runoff, or 3.82 inches per impervious acre.
<b>Total Runoff Volume</b>	16.4 million gallons 3.82 inches per impervious acre	

### Hydraulic Performance

<b>Peak Inflow Rate</b>	212.5 cfs	The estimated peak flow rate of all inflows to the pond, including direct runoff and Sligo Creek, was 212.5 cfs. The peak flow rate exiting the pond was 45.9 cfs. Opti maximizes stormwater retention by limiting discharge during wet weather. Overall, OptiNimbus reduced the total wet weather runoff volume downstream of the pond by 67%.
<b>Peak Discharge Rate</b>	45.9 cfs	
<b>Reduction in Wet Weather Flow Volume</b>	67%	

### Water Quality Performance

<b>Average Retention Time of Pond Discharge</b>	47 hours	OptiNimbus retains event runoff for up to 48 hours, balancing the need for storage with water quality treatment. The average retention time of all water discharged from the pond during the month was 47 hours and 81% of all flow volume discharged met a 24-hour retention time.
<b>Percent of Discharge Meeting 24 hour Retention Time</b>	81%	

Pre-retrofit, the pond provided 24-hour extended detention of large events that filled the pond's storage completely. The pre-retrofit extended detention provided little water quality improvement to runoff from the majority of storm events.

## REPORT CALCULATION DEFINITIONS

### Site Summary

<b>Time Connected</b>	The percent of time that the Opti controller was connected to the internet.
<b>Time Controlled</b>	The percent of time that OptiNimbus was actively managing the pond storage, i.e. the system was in Automatic Mode and the pond was not overflowing.

### Monthly Event Summary

<b>Number of Forecast Events</b>	Opti reads the precipitation forecast every hour and adjusts the pond volume, if needed, when an event with greater than 70% probability and 0.05 inches is predicted.
<b>Total Runoff Volume</b>	<p>Million gallons: The calculated total volume of stormwater that flowed into the pond, including from precipitation events that were not forecasted or whose forecasts did not qualify as specified above.</p> <p>Inches per Impervious Acre: The total inflow volume divided by the watershed impervious area.</p>

### Hydraulic Performance

<b>Peak Inflow Rate</b>	The calculated maximum flow rate into the pond during the month. The inflow rate is estimated based on the observed change in volume.
<b>Peak Discharge Rate</b>	The maximum flow rate out of the pond during the month. The outflow rate is estimated based on the change in volume, the valve state, the water level, and an orifice equation.
<b>Reduction in Wet Weather Flow Volume</b>	The quantity of wet weather flow into the pond that was not discharged during storm events. Opti approximates the wet weather window by recording the latest available precipitation forecast for each current time period.

### Water Quality Performance

<b>Average Retention Time of Pond Discharge</b>	Outflow-weighted average retention time of all discharge volume from the pond, including estimated overflows.
<b>Percent of Discharge Meeting 24 hour Retention Time</b>	Percent of outflow that was retained within the pond for at least 24 hours before discharge.