SMALL MS4 IMPLEMENTATION OF GREEN INFRASTRUCTURE

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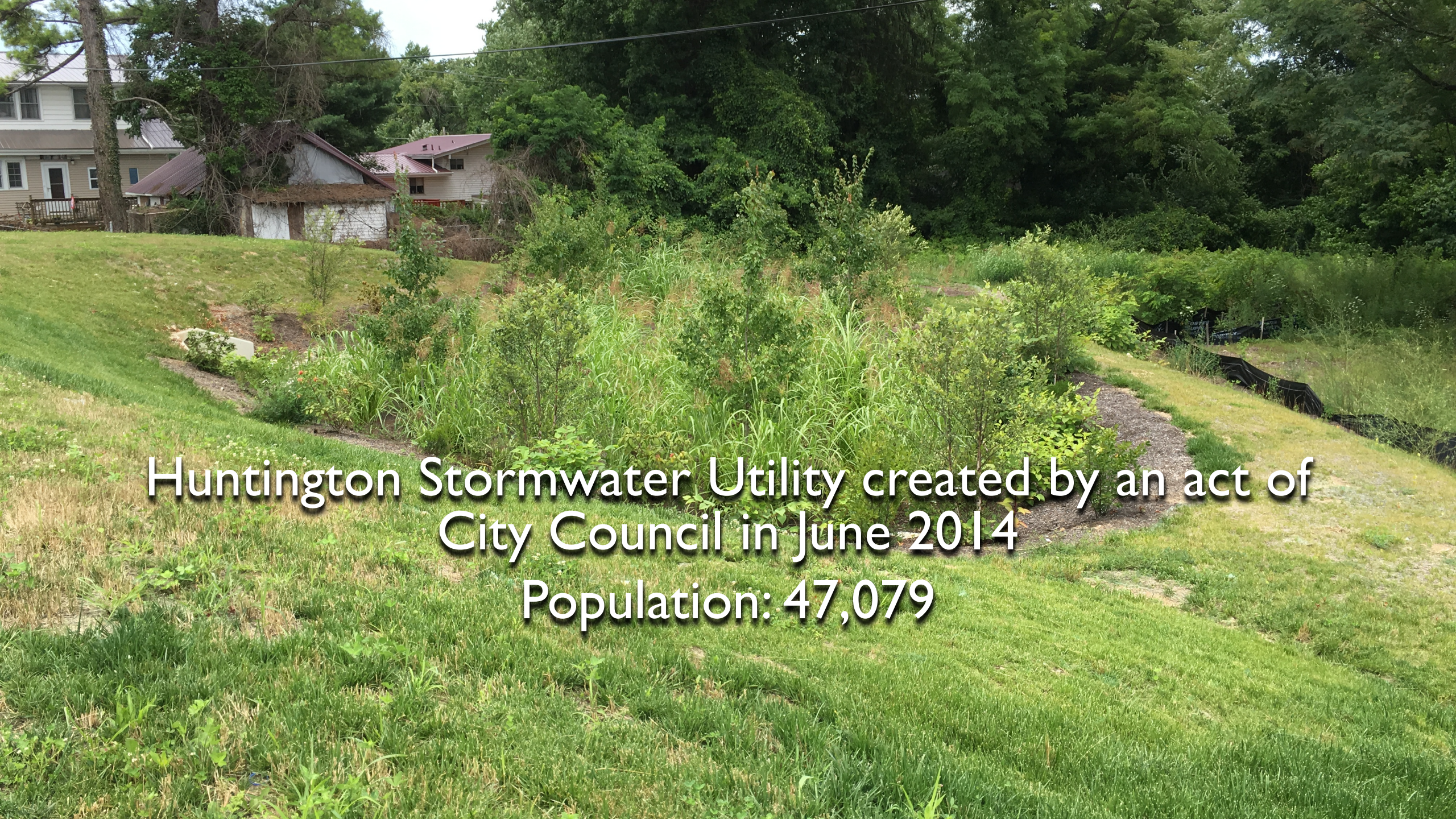
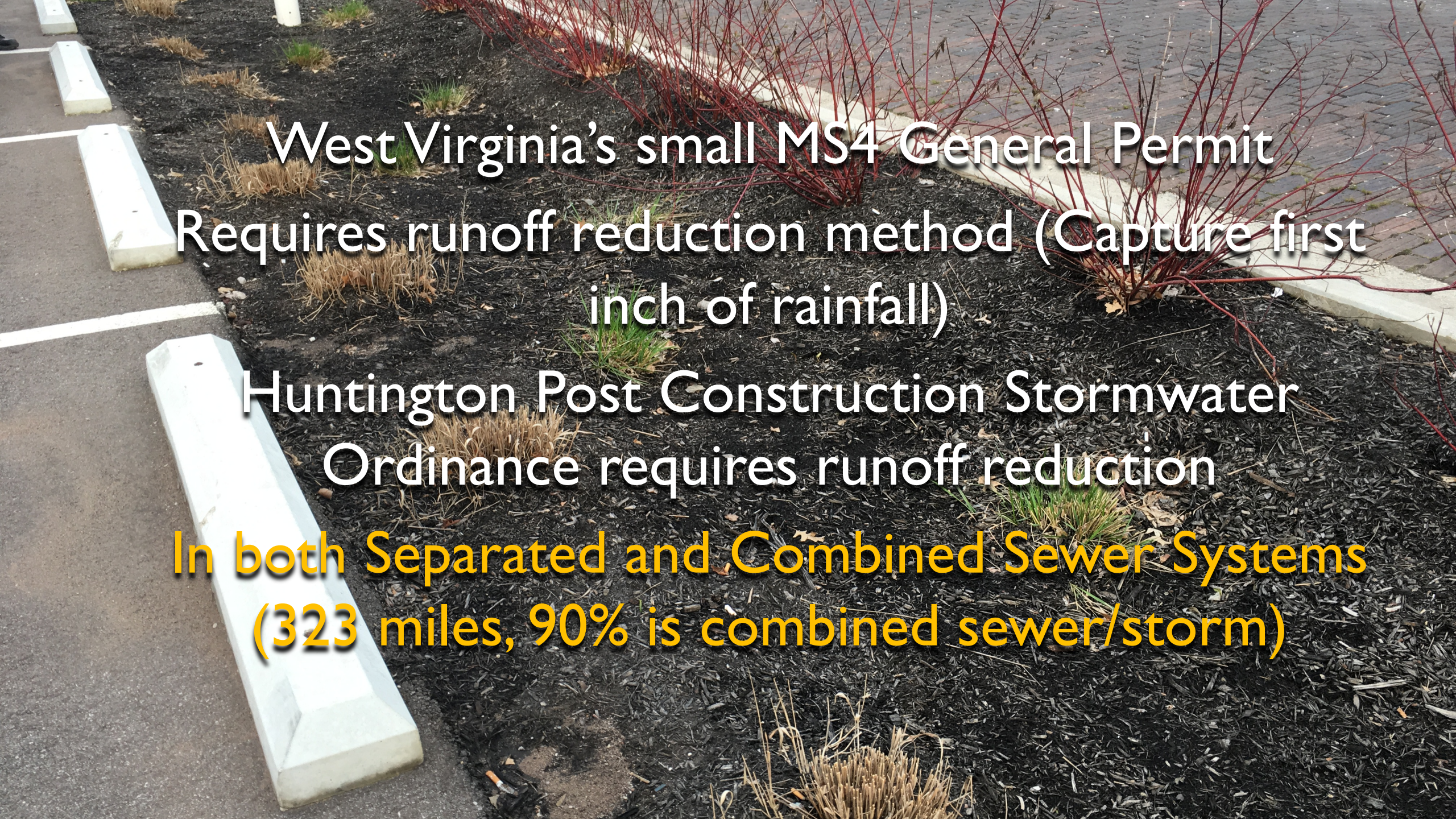
Ohio Stormwater Conference
May 2019


Huntington Stormwater Utility created by an act of
City Council in June 2014
Population: 47,079


West Virginia's small MS4 General Permit
Requires runoff reduction method (Capture first inch of rainfall)
Huntington Post Construction Stormwater Ordinance requires runoff reduction
In both Separated and Combined Sewer Systems
(323 miles, 90% is combined sewer/storm)

- New development (5000 sq ft or greater) is required to manage the first inch of rainfall on site.

- All new developments since 2014 have met the "redevelopment credit" which allows for a reduction of 0.2" off the one inch capture requirement
- The majority of developments choose bioretention to manage stormwater

Challenges

- Small staff of two
- Education of LOCAL developers and engineers
- Confirmation of the construction of stormwater facilities in compliance with approved plans & drawings
- Maintenance of stormwater facilities


Huntington Stormwater Utility
&
Mott MacDonald Engineering
Developer pays upfront
Only use engineering services as needed

PROCESS TO APPROVAL

Receive application and payment

Application with calculation, drawings sent to engineer

Comments back to applicant – revisions received

Maintenance Agreement signed and recorded at County Courthouse - Approval issued

Partnership with Marshall University

- Interns
- Engineering Department
- Participation in Outreach events

Maintenance Agreement

- Lots of trial & error
- All maintenance agreements contain the property owner and the Parcel ID number.
- Must be signed and notarized
- Recorded at the County Courthouse
- HSU must receive recorded copy

Challenges & Lessons Learned

Challenge

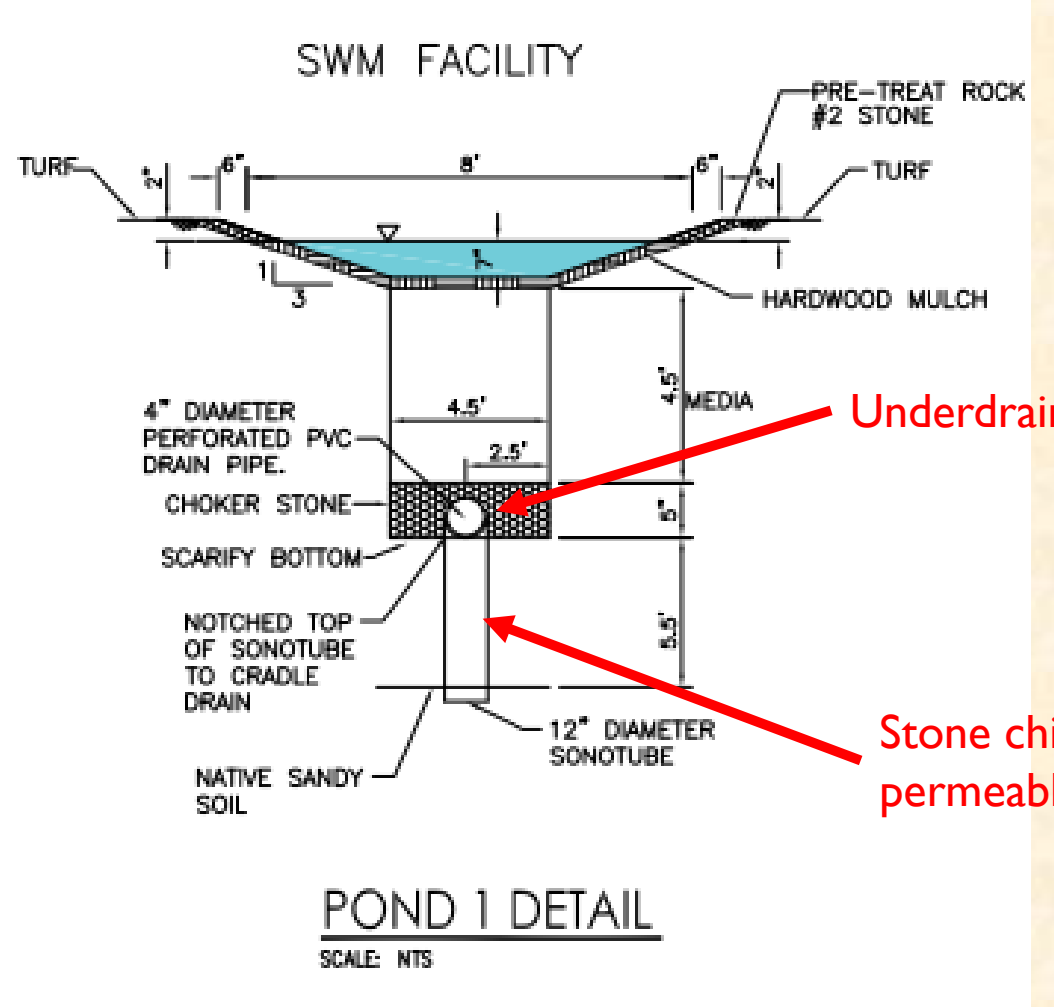
- Manage first 1" of runoff onsite with GSI BMP (water quality volume)

Lesson Learned

- Allow underdrains with connection to storm or combined sewer in areas where soil infiltration is poor
- Stone chimneys or over excavation down to permeable layer.

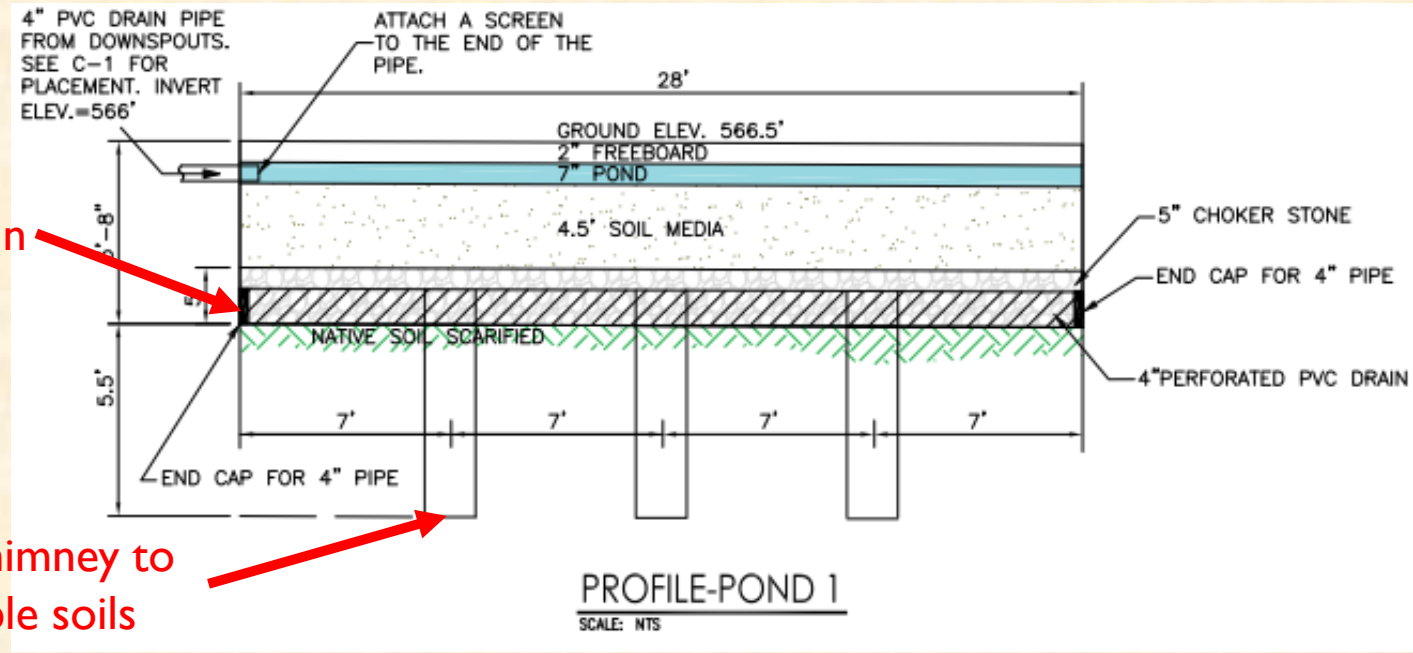
Challenges & Lessons Learned

Underdrain and Stone Chimney Example from Developer Submitted Design



Underdrain

Stone chimney to permeable soils



Challenges & Lessons Learned

Challenge

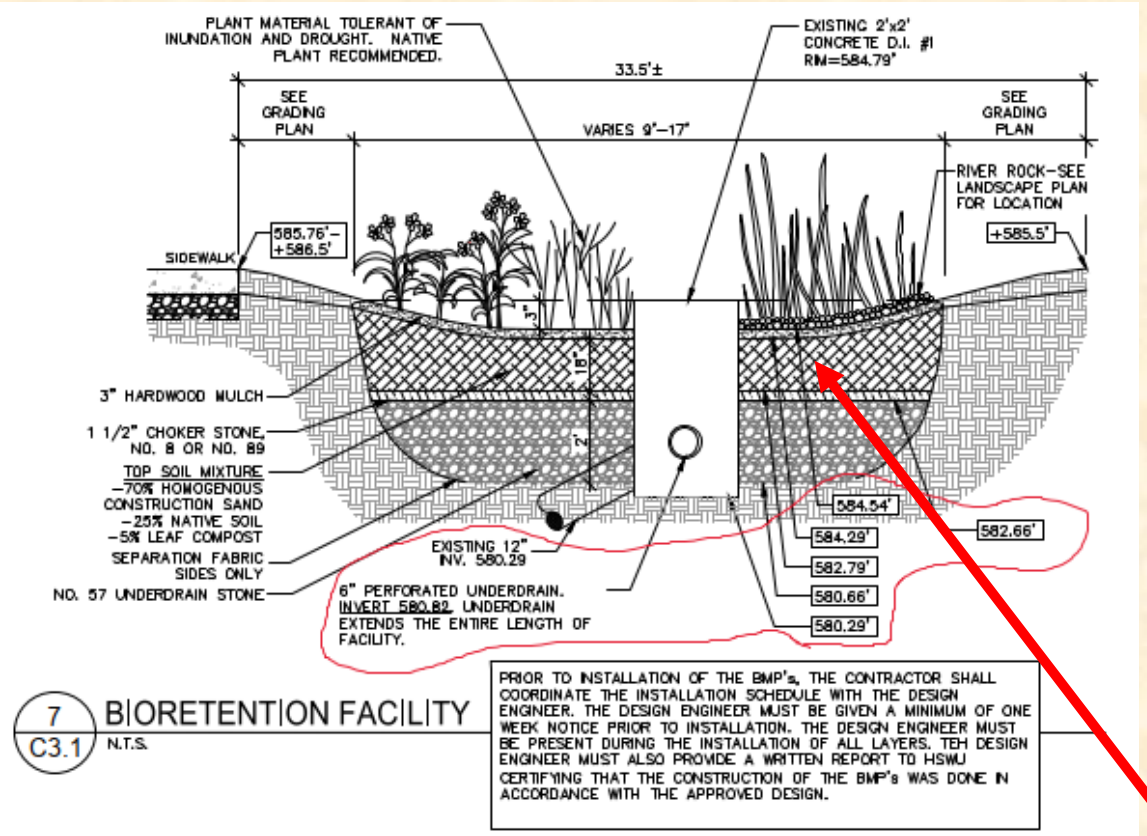
- Post-development Peak Flow cannot exceed Pre-development Peak Flow for 2, 10, 25, 50 & 100-yr storm events

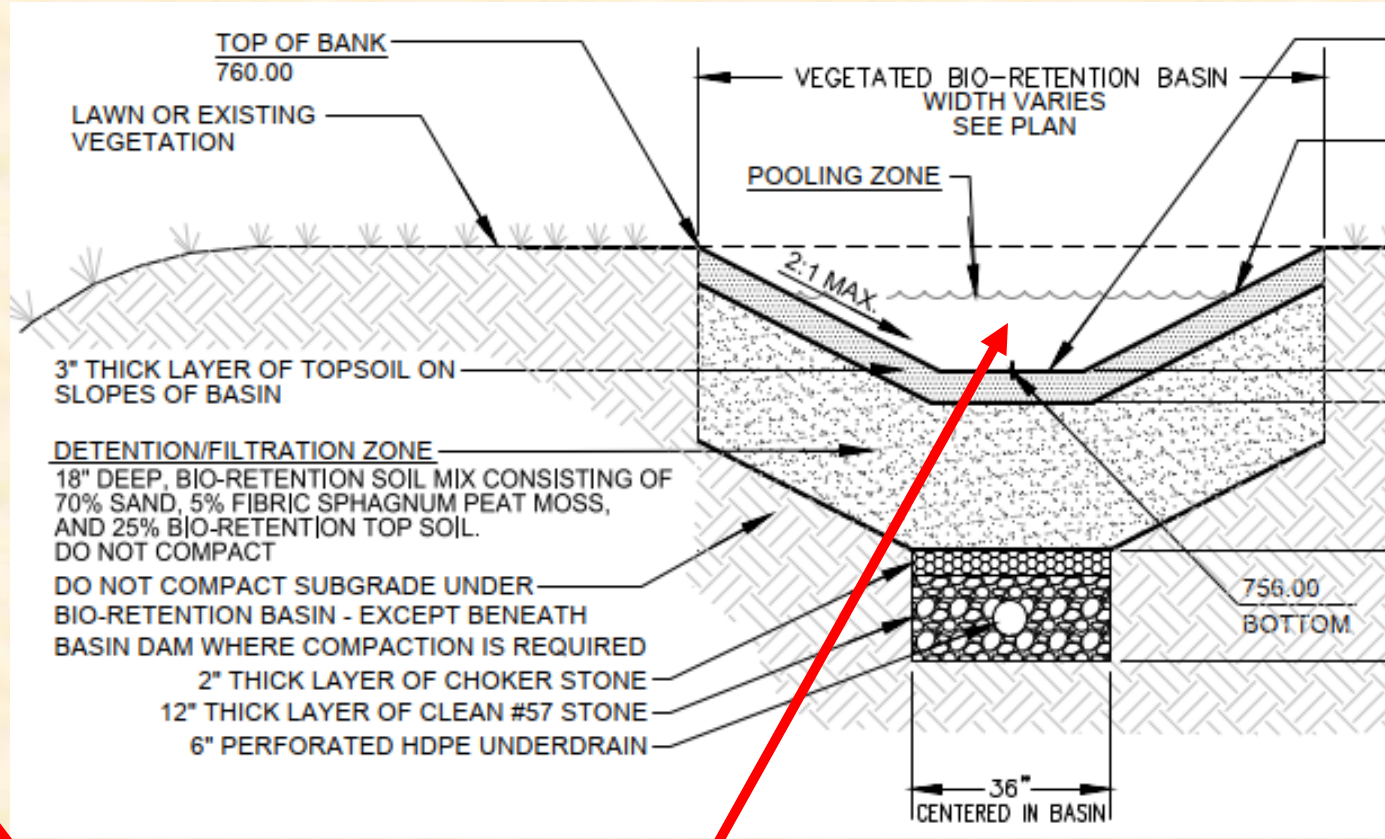
Lesson Learned

- Combine functionality of GSI BMP for 1" water quality volume with traditional detention for peak flow
- For areas with localized flooding or basement backups, consider solutions that exceed the minimum (i.e., detain a 25-year post-development storm and release at a 2-year storm rate)
- Dependent on utility's governing level of service related to flood protection and ability to manage costs

Challenges & Lessons Learned

Combined functionality of GSI BMP with Detention from Developer Submitted Design





Bioretention for 1" water quality volume & detention volume for peak flow

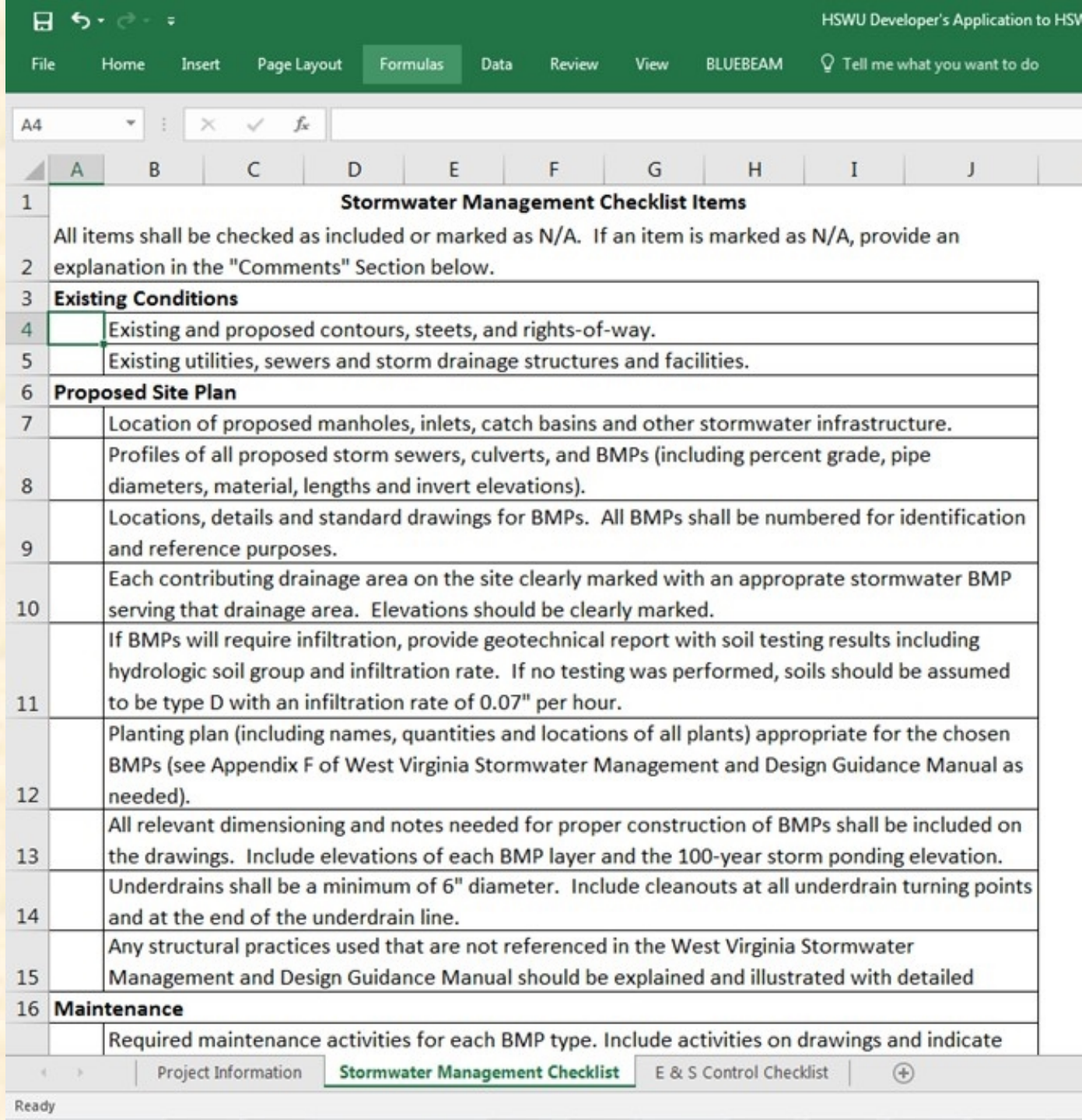
Challenges & Lessons Learned

Challenge

- Eliminate Submission of Incomplete Stormwater Plans

Lesson Learned

- Developed Standard Checklist
- Locked excel file and pdf versions for use with plan submission



HSWU Developer's Application to HSW

File Home Insert Page Layout Formulas Data Review View BLUEBEAM Tell me what you want to do

A4

	A	B	C	D	E	F	G	H	I	J
1	**Stormwater Management Checklist Items**									
2	All items shall be checked as included or marked as N/A. If an item is marked as N/A, provide an explanation in the "Comments" Section below.									
3	**Existing Conditions**									
4		Existing and proposed contours, steets, and rights-of-way.								
5		Existing utilities, sewers and storm drainage structures and facilities.								
6	**Proposed Site Plan**									
7		Location of proposed manholes, inlets, catch basins and other stormwater infrastructure.								
8		Profiles of all proposed storm sewers, culverts, and BMPs (including percent grade, pipe diameters, material, lengths and invert elevations).								
9		Locations, details and standard drawings for BMPs. All BMPs shall be numbered for identification and reference purposes.								
10		Each contributing drainage area on the site clearly marked with an approprate stormwater BMP serving that drainage area. Elevations should be clearly marked.								
11		If BMPs will require infiltration, provide geotechnical report with soil testing results including hydrologic soil group and infiltration rate. If no testing was performed, soils should be assumed to be type D with an infiltration rate of 0.07" per hour.								
12		Planting plan (including names, quantities and locations of all plants) appropriate for the chosen BMPs (see Appendix F of West Virginia Stormwater Management and Design Guidance Manual as needed).								
13		All relevant dimensioning and notes needed for proper construction of BMPs shall be included on the drawings. Include elevations of each BMP layer and the 100-year storm ponding elevation.								
14		Underdrains shall be a minimum of 6" diameter. Include cleanouts at all underdrain turning points and at the end of the underdrain line.								
15		Any structural practices used that are not referenced in the West Virginia Stormwater Management and Design Guidance Manual should be explained and illustrated with detailed								
16	**Maintenance**									
		Required maintenance activities for each BMP type. Include activities on drawings and indicate								

Project Information | Stormwater Management Checklist | E & S Control Checklist

Ready

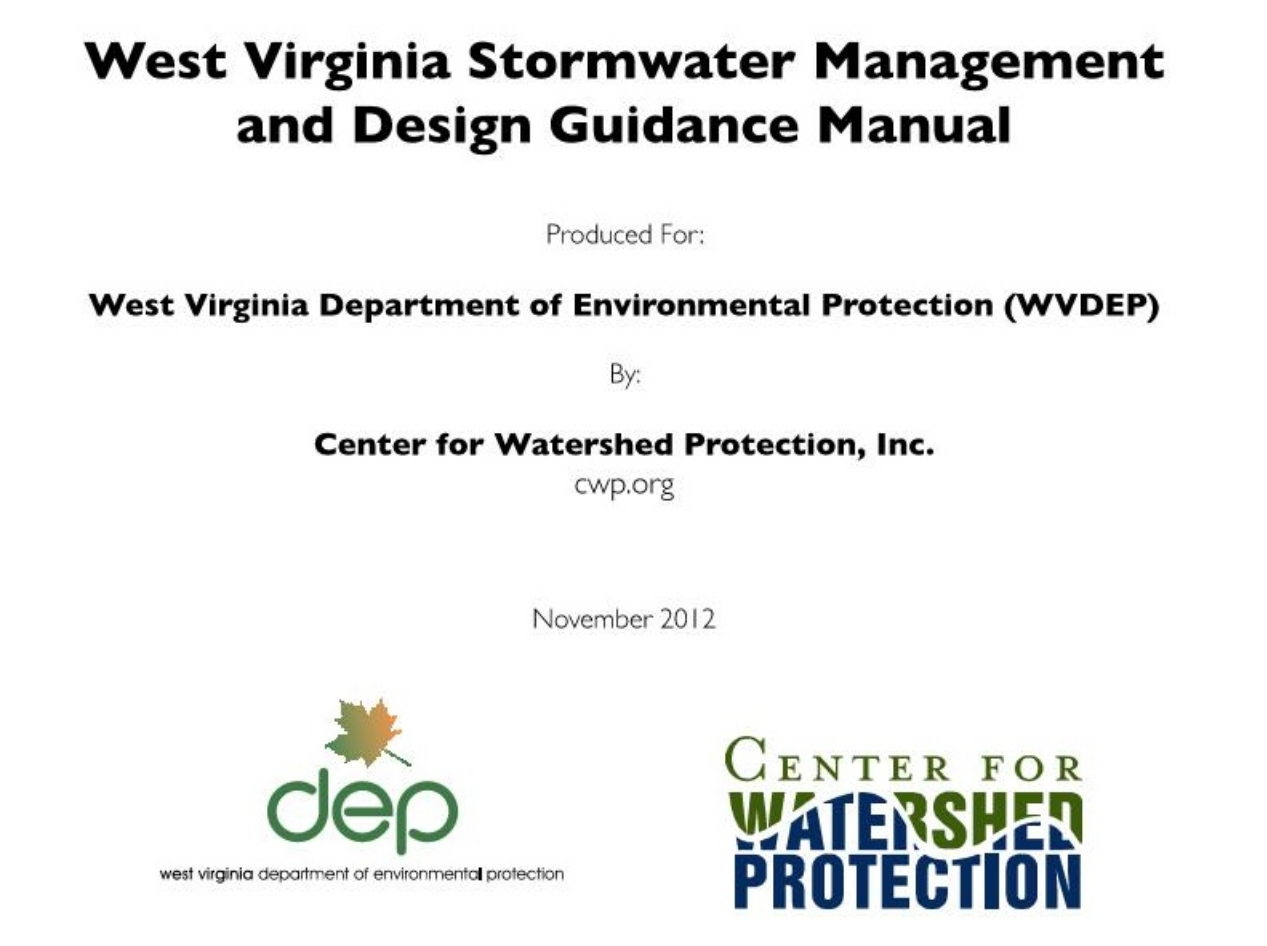
Challenges & Lessons Learned

Challenge

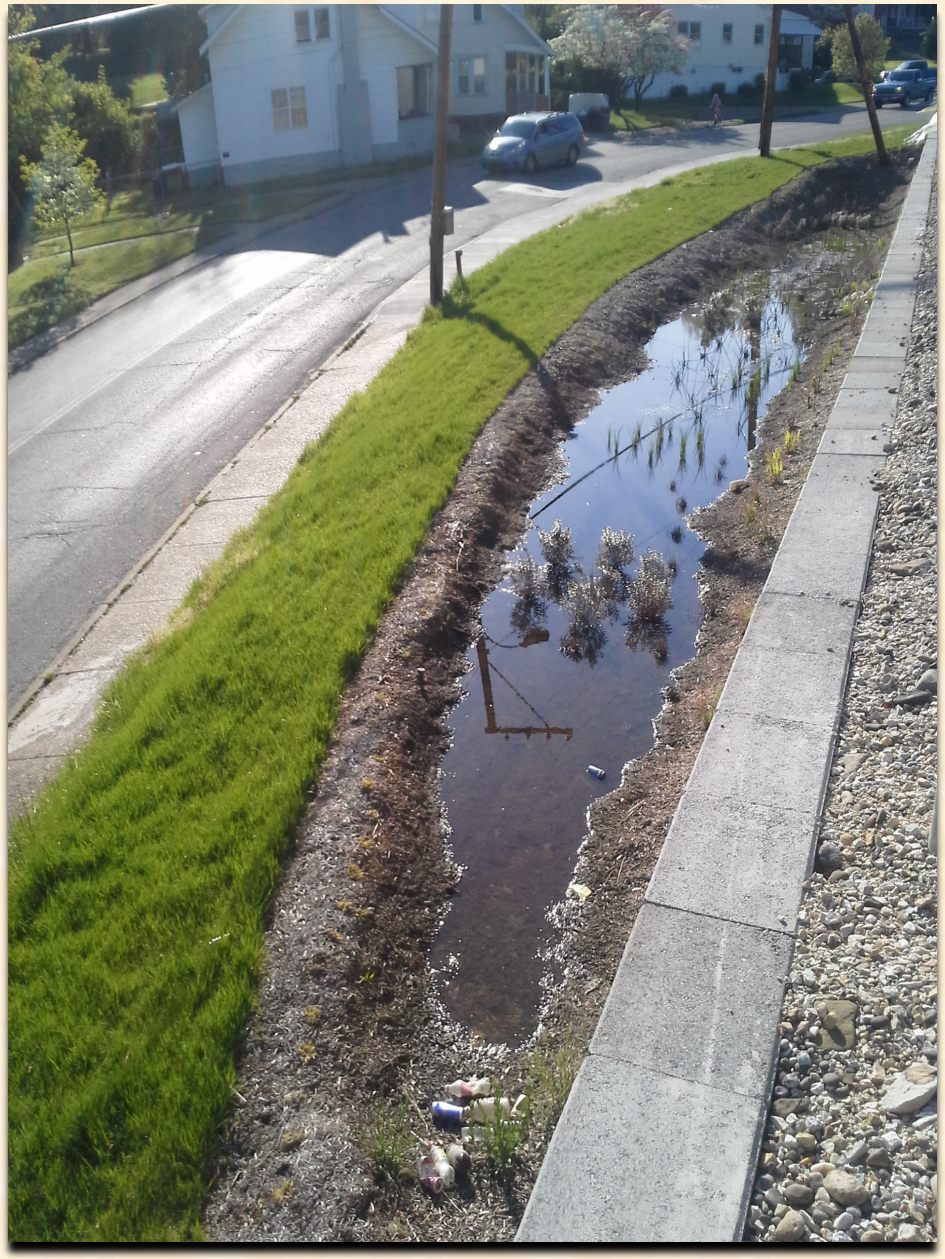
- Confirmation the BMP(s) are constructed properly

Lesson Learned

- Requirements for design engineer to be onsite during BMP construction and prepare a report certifying the BMP installation was completed in accordance with design documents,
- As-Built drawings of BMPs provided by site owner
- Standardized Design & Maintenance requirements per WVDEP Stormwater Management & Design Guidance Manual



Fails?



Successes


LOT A
RIVER PARK HOSPITAL


LOCAL
TRUCK
ROUTE
BB&T
Peoples
BlueTie

QUESTIONS?

MOTT MACDONALD