

# Challenges to BMP Maintenance in Fairfax County: Lessons Learned

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Department of Public Works and Environmental Services  
*Working for You!*



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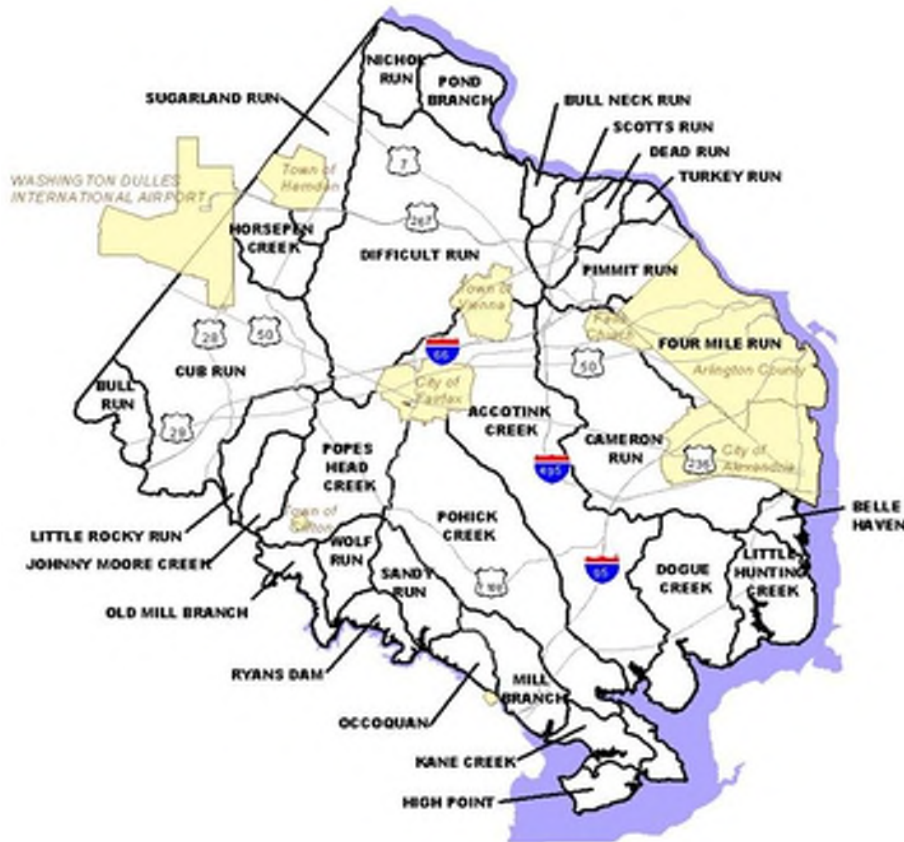
# Today's Presentation

- **Regulatory Drivers and Program Descriptions**
- **Overview of Public Inspections & Maintenance Program**
- **Challenges**
- **Lessons Learned**



# Regulatory Drivers and Program Descriptions

## Fairfax County Overview



- Washington, DC metropolitan area
- 400 square miles
- 30 Watersheds
  - Chesapeake Bay Watershed
- 1.1 Million residents
- Phase 1 MS4 Permittee
- Latest Permit (VA0088587) became effective April 1, 2015

# Regulatory Drivers and Program Descriptions

- MS4 Permit: Publicly Maintained SWM Facilities (Part I.B.2.h)
  - 1(a): “The permittee shall provide for adequate long-term operation and maintenance of SWM facilities owned or operated by the permittee in accordance with written inspection and maintenance procedures included in the MS4 Program Plan.”
  - 1(b): Inspect annually or alternative schedule based on risk assessment.



# Overview of Public Inspections & Maintenance Program

- **Above-ground Facilities**

- Wet and Dry Ponds (WP, DP)
- Extended Detention DP (EDD)
- Infiltration Trench (TR)
- Constructed Wetland (WL)
- Permeable Pavement (PP)
- Rooftop Detention (RT)

- **Below-ground Facilities**

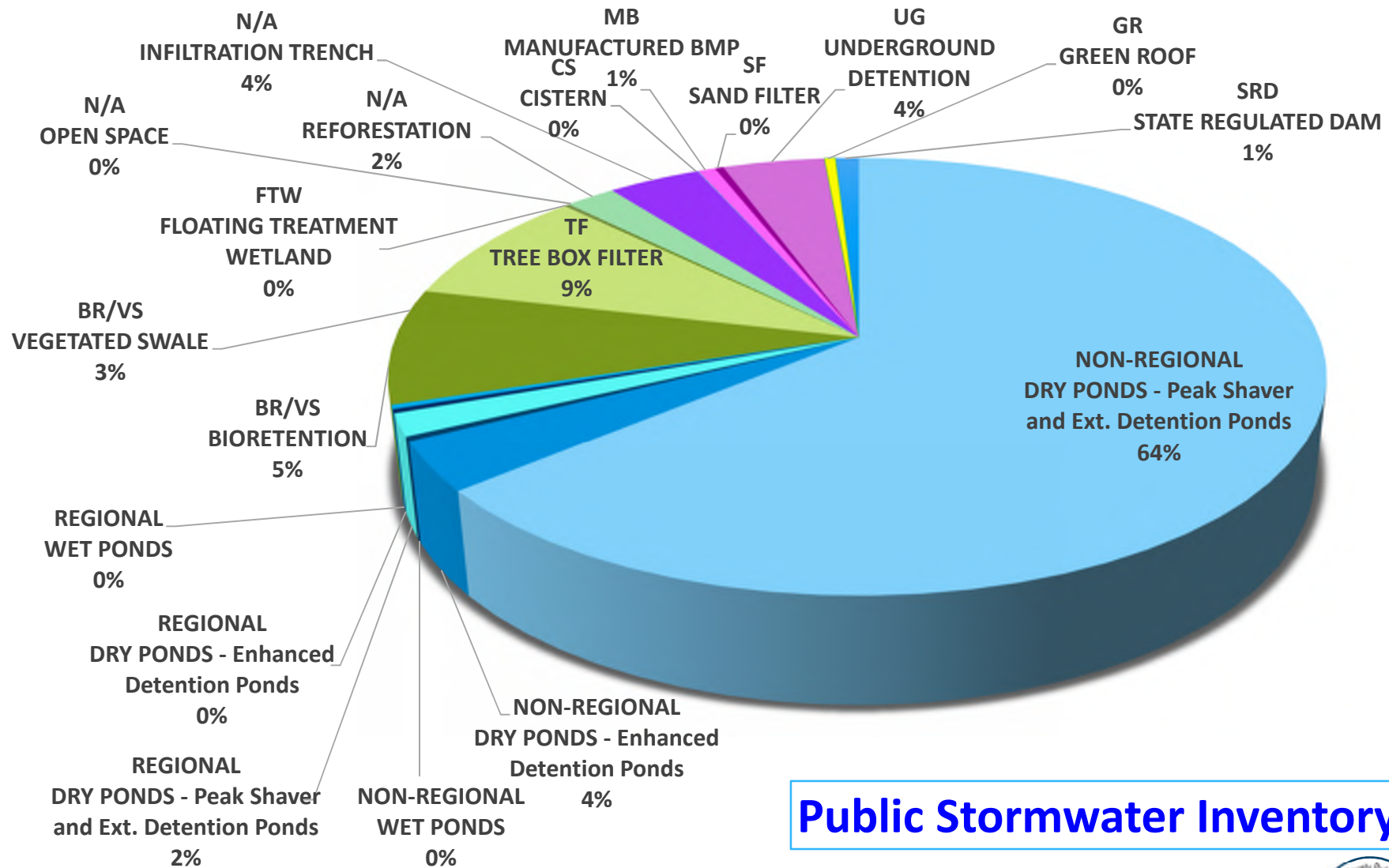
- Underground Detention (UG)
- Cistern (CS)
- Sand Filter (SF)
- Manufactured BMP (MB)
  - Proprietary
  - Non-proprietary

- **Vegetative Practices**

- Bioretention (BR)
- Treebox Filter (TF)
- Green Roof (GR)
- Vegetative Swale (VS)
- Floating Treatment Wetland (FTW)
- Open Space (OS)
- Reforestation (RF)
- Amended Soil (AS)

- **State Regulated Dams (SRD)**

# Overview of Public Inspections & Maintenance Program



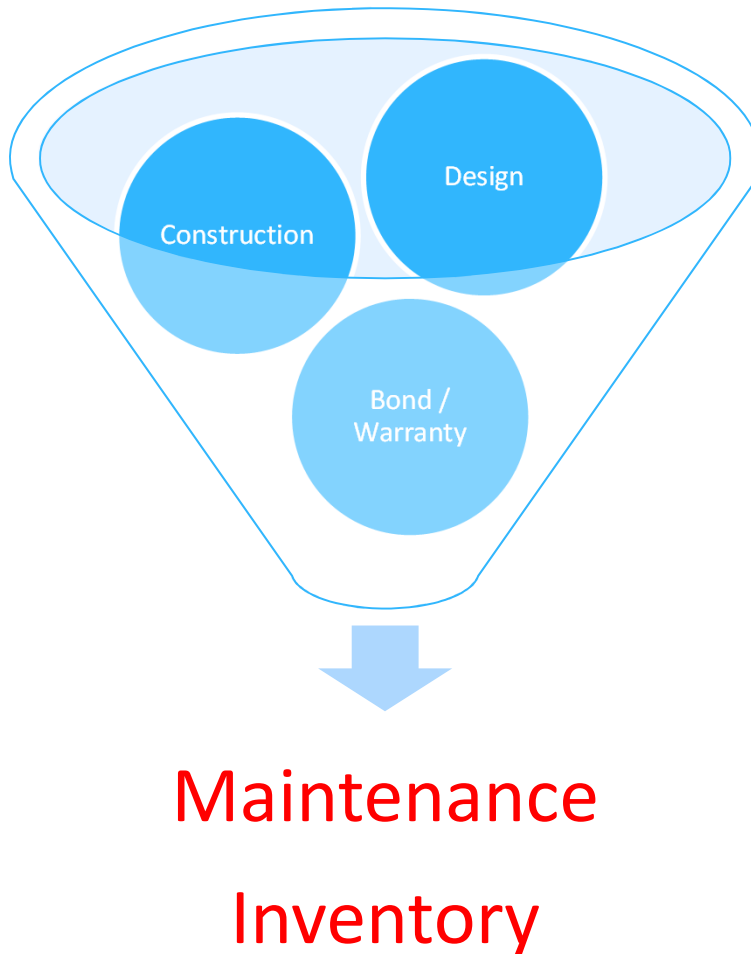
**Public Stormwater Inventory**



# Challenges

- **Design Phase**
  - Site/facility type selection
- **Construction Phase**
  - Installation key to success
  - Requires technical expertise
- ***Post-Construction Maintenance***
  - Majority of cost over life cycle
  - Centralized maintenance program dealing with variety of site conditions & expectations
  - Reliance upon contractors

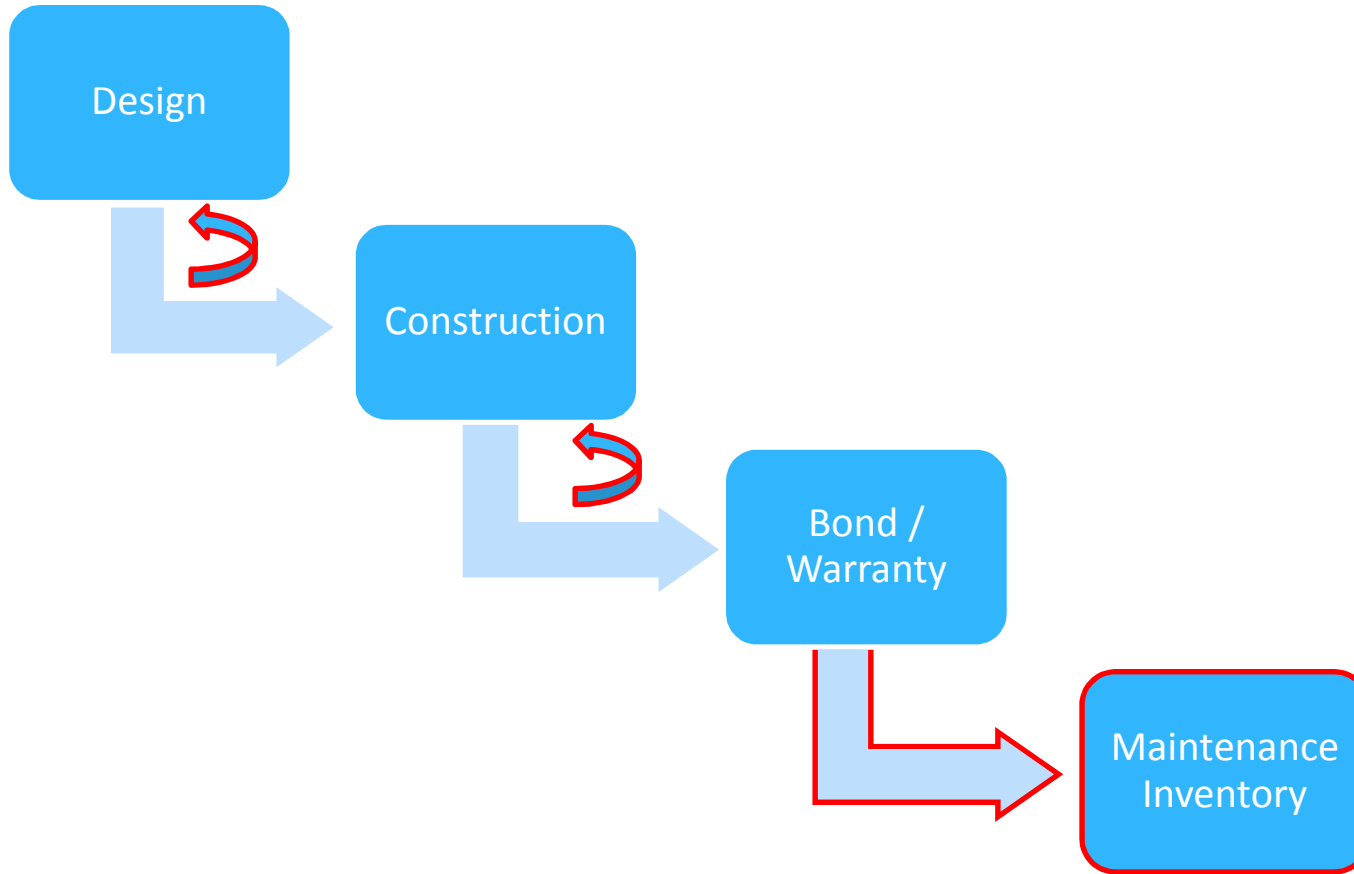
# Challenges



- Focus on points of control
- Currently, focus primarily concerned with post-warranty maintenance of our inventory



# Challenges



**Slide 9**

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**AH2**

Not sure I understand the intent of the red arrows

Ambrose, Heather, 5/29/2018

## Challenges: Design Phase

- Coordination with site reviewers and land development services
- Opportunity to provide comments on designs
  - Address comments
- Community buy-in



# Lessons Learned: Design Phase

- Participate in review process
- Think function and access
  - Incorporate pretreatment when possible
- Community outreach





# Challenges: Construction Phase

- Technical nature of work
- Limited pool of contractors performing specialized construction
- Phasing and coordination with site development



# Lessons Learned: Construction Phase

- Technical expertise needed in field – Training
- Inspections – Check Lists



# Challenges: Post-construction Maintenance

1. Cost & Efficiency
  - Determines Level of Service
  
2. Institutional Knowledge
  - Constantly turnover in key personnel in-house and contractors
  
3. Specialized experience
  
4. Levels of Service
  - Functionality vs. aesthetics, Plant vs. weed
  - Customer service above and beyond functional components



# Lessons Learned: Post-construction Maintenance

## 1. Cost & Efficiency

- Partially determines Level of Service
- What is the value of the optics?
- Only get credit for function





# Lessons Learned: Post-construction Maintenance

## 1. Cost & Efficiency

- From neighborhood resident, “We hope that the current condition may be maintained and that there will now be consistent and periodic grass cutting, including more when needed this year before winter, in order to avoid the wildlife look that we have now, fortunately, lost. Thanks for your efforts. **The Park now looks as good as the asphalt.”**



# Lessons Learned: Post-construction Maintenance

## 2. Institutional Knowledge

- Contractor training
- Developed facility specific O&M guidelines



GREEN INFRASTRUCTURE IS  
THE FUTURE. START TRAINING  
FOR YOURS.



# Lessons Learned: Post-construction Maintenance

## 3. Specialized Experience

- Segregation of facility types in Maintenance Contract



# Lessons Learned: Post-construction Maintenance

## 4. Levels of Service

- Asset Maintenance Cards
- O&M Guidelines

**GENERAL MAINTENANCE CARD**  
 SiteID/FacilityID: 11885/1704DP  
 Location: 6083 Wicker Ln, Centreville, VA 20121  
 PFM: Enhanced Extended Detention Dry Pond  
 Ownership: Fairfax County Board of Supervisors

**ROUTINE MAINTENANCE**  
 Note: Maintenance staff should be prepared for entry into the pool and marsh areas. Waders may be necessary. Waterproof gloves and eye protection should also be worn during maintenance and inspection activities.

**First Routine Maintenance**      Annually: July - August

**Trash and Debris Management**

1. Check for trash and debris in and around the facility including the inlets (A), sediment forebays (B,C), gabion walls (D), and micropool (E). Walk entire site including upland (K) and marsh areas (F,G) to check for and remove trash and debris caught in vegetation or in the pools.
2. Report excessive trash to MSMD.

**Operation Management**

1. Check for blockage at the control structure (H), principal spillway pipe (I), and outlet (J). Remove debris when necessary.
2. Clean out excess sediment where applicable.

**Wetland Plant Identification and Invasive Plant Species Removal**

1. Catalog the type, health, distribution and density of wetland plant species within the facility.
2. Identify and remove invasive species after cataloging, and before invasive plant species go to seed.


**Second Routine Maintenance**      Annually: November - January

**Trash and Sediment Forebay Maintenance**

1. Remove all trash and debris as in the First Routine Maintenance.
2. Clean out sediment in the forebays (B,C) down to gabion wall (D).

**Grass and Wetland Vegetation Management**  
 This maintenance should occur after Invasive Wetland Plant Identification and Invasive Plant Species Removal has been completed.

1. **Upland and Dam Embankment Zone (K,L):** Mow all access areas, the top and back of the dam embankment, 10 feet from the toe of the dam, and down the face of the embankment in accordance with the landscaping plan.
2. **High Marsh Zone (G):** Use a rotary mower (Bush Hog or equivalent) to harvest vegetation (trim to six inches) in all high marsh areas. Remove all clippings from facility. Do not mow or trim trees and shrubs. While maintenance personnel should always use the landscaping plan to determine where the high marsh zones are, a general rule of thumb is that if personnel can access the area with a rotary mower, it is a high marsh zone.
3. **Low Marsh Zone (F):** Use a string trimmer to harvest vegetation (trim to six inches) in all low marsh areas. Remove all clippings from facility. While maintenance personnel should always use the landscaping plan to determine where the low marsh zones are, a general rule of thumb is that if personnel can walk through the area without standing or sinking in mud, then it is a low marsh area.
4. **Micropool Zone (E):** Do not harvest the emergent vegetation found growing in the micropools. Continue routine maintenance.



Key	Function	Vegetation/Surface Cover
A	Inflow Structure	N/A
B	Sediment Forebay 1	Seed Mix A
C	Sediment Forebay 2	Seed Mix A
D	Gabion Wall	Rip-Rap
E	Micropool 1	Seed Mix B & Micropool Plugs
F	Low Marsh	Seed Mix B
G	High Marsh	Seed Mix B
H	Outlet (Str 10)	N/A
I	Principal Spillway Pipe	N/A
J	Control Structure (Str 4)	N/A
K	Upland	Seed Mix A
L	Dam Embankment	Turfgrass
M	Access Road	Asphalt





# Lessons Learned: Post-construction Maintenance

## 4. Levels of Service

- Simplify planting palettes



-  Rudbeckia Fulgida var. Fulgida - Black Eyed Susan
-  Asclepias Tuberosa - Butterfly Milkweed
-  Juncus Effusus - Soft Rush
-  Iris Versicolor - Blue Flag
-  Asclepias Inornata - Swamp Milkweed



# Lessons Learned: Post-construction Maintenance

## 4. Levels of Service

- Consequences of simplified planting plan
- What is the alternative?
- Reseeding?
- Limited interplanting?



# Additional Information

**For additional information, please contact**

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