

EQAC

Watershed Management Plan Project Update

Department of Public Works and Environmental Services
Working for You!



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Watershed Management Plan Project Update

Project Selection and Prioritization Process Implementation Strategy

1. Drivers

- a) Public Safety
- b) Regulatory
 - I. Phosphorous
 - II. Nitrogen
 - III. Sediment
- c) Community Needs

Quander Road
Belle Haven WS
Mount Vernon District

2. Existing Project Metrics

- a) Cost Benefit Analysis
 - a) Overall
 - b) Trends

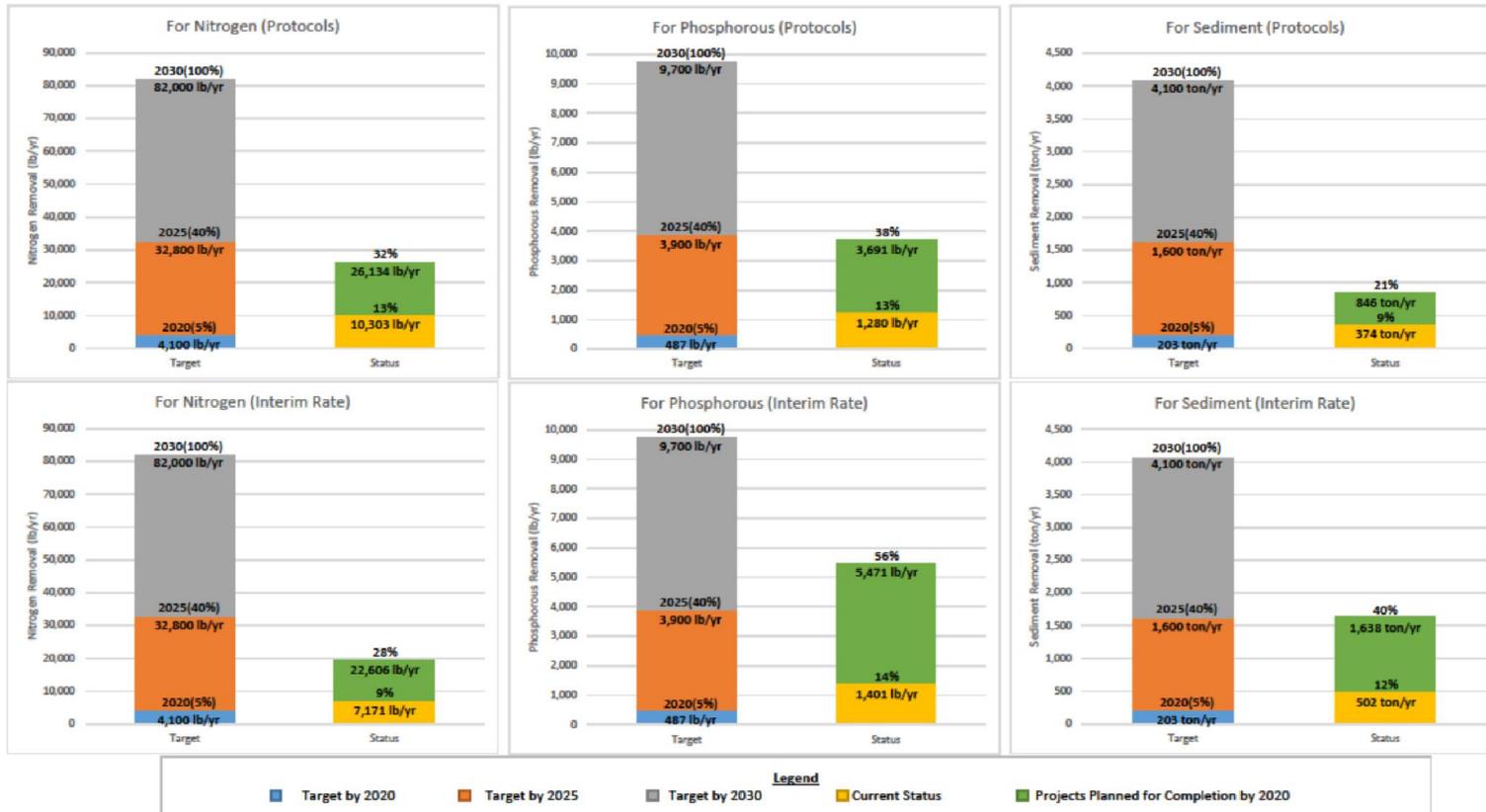
3. CIP Budget (Streams and Water Quality program)



Watershed Management Plan Project Update

Drivers

Progress Toward Meeting The Chesapeake Bay TMDL
 Projects Completed FY2009-2015 and Planned for Completion FY2015-2020



Stream Restoration Credit prorated to assume we receive half credit for Stream Restoration Projects due to loss of baseline for unregulated areas.

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Watershed Management Plan Project Update

Metrics - Completed Facilities FY09-15

Practices	Number Installed	Capital Cost (\$/lb/yr)		
		TN	TP	TSS
Stream Restoration	27	\$ 2,300	\$ 20,900	\$ 60
Pond Retrofits	46	\$ 4,000	\$ 38,000	\$ 49
Infiltration Swales & Trenches	7	\$ 7,600	\$ 67,200	\$ 88
Dry Swales	8	\$ 10,400	\$ 118,000	\$ 174
Bioretention (Rain Gardens)	37	\$ 21,500	\$ 196,400	\$ 262
Pervious Pavement	12	\$ 54,300	\$ 469,000	\$ 611



Watershed Management Plan Project Update

CIP Budget - Streams and Water Quality Improvements

Project Title/ Project Number	2017	2018	2019	2020	2021	Total	Full Program
Stream and Water Quality Improvements / SD-000031	20,106	22,000	24,500	27,500	27,500	121,606	36,500/yr



Banks Property
Dogue Creek WS
Lee District



Big Rocky Run Stream Restoration
Cub Run WS
Sully District

Watershed Management Plan Project Update

Project Type Distribution (For Initial **Planning** Purposes)

Stream restoration

(75% of CIP Stream and Water Quality Program (SWQP))
25% design budget (20% SWQP)
75% construction budget (55% SWQP)

Coon Branch
Accotink Creek WS
Mason District



Pond Retrofit

(15% of CIP Stream and Water Quality Program)
25% design budget (4% SWQP)
75% construction budget (11% SWQP)

Brentwood East
Popes Head Creek WS
Braddock District



GSI/LID (10% of CIP Stream and Water Quality Program)

Planning: Initial Project Selection

Design Budget: (Approximately 25%)

Stream Restoration Projects

Flag Run
Accotink Creek WS
Braddock District



of Projects = $\frac{\text{Stream Design Budget}}{(\text{Avg stream design cost/LF})(\text{Avg Project Length})}$

Pond Retrofits Projects

Lower Potomac Ballfields
Pohick Creek WS
Mount Vernon District



of Projects = $\frac{\text{Pond Design Budget}}{\text{Avg Pond retrofit design cost}}$

Watershed Management Plan Project Update

Stream Restoration Projects

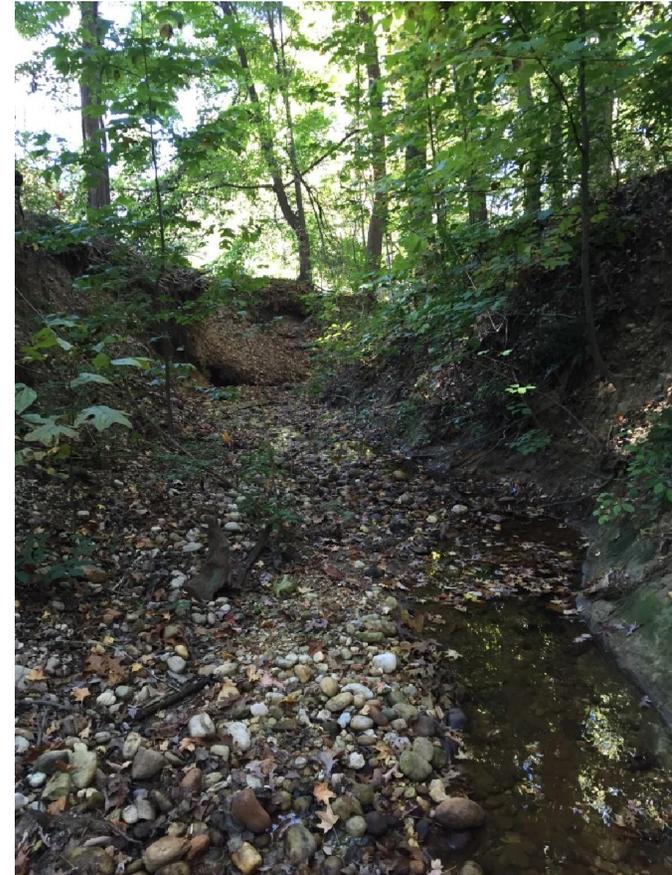
1. GIS search of WMP projects

- a) Project type
- b) Stream order
- c) Land rights

2. Resident Requests

3. Qualitative Desk Top Assessment

- a) Benefits
- b) TMDL or impaired water
- c) Upstream impervious area
- d) Drainage area within MS4 service area
- e) Access
- f) Known safety concerns
- g) Known headcuts
- h) Number of headwater channels and outfalls
- i) Downstream condition
- j) Tree cover
- k) Number of private properties
- l) Utilities
- m) Relation to other projects
- n) Relation to monitoring locations
- o) Existing field and monitoring data



Greendale Golf Course
Lee District

Stream Restoration Projects

4. Quantitative Desk Top Assessment (Confirmed in Field)

- a) Planning Score
 - i. Easements
 - ii. Access
 - iii. Utilities
 - iv. Number of Private Properties
 - v. Stream Order

Bradley Branch
Scotts Run WS
Dranesville District



Youngs Branch
Popes Head Creek WS
Springfield District

Watershed Management Plan Project Update

Stream Restoration Projects

Stream Restoration Scoping Form

Project Name: _____ WMP ID: _____
 Stream Name: _____ Drainage Area (acres): _____ % Impervious: _____
 Scoping Team: WPIB-N: _____ WPIB-S: _____ WPAB: _____
 Date: _____ Weather: _____

Planning Score: (Desktop analysis confirmed with field observations)

	Description	Score of 1	Description	Score of 3	Description	Score of 5
Easements	No easements exist		Partial easements exist		All necessary easements exist	
Access	No access points		Access is marginal		Good access exists	
Utilities	Utilities exist in the immediate area of the stream		Some utilities in the area of the stream, but don't appear to present a large problem		No utilities in the area	
Ownership	Multiple private owners		Private ownership, mostly HOA (limited number of owners)		Public ownership	
Stream Order	4 th -5 th		3 rd		0-2 nd	

TOTAL PLANNING SCORE: _____

Description of Construction Access: _____

Average Channel Dimension: (if appropriate based on channel/valley type changes or drainage area increases, use multiple reaches)

Reach	Left Top of Bank Ht. (ft) – looking DS	Right Top of Bank Ht. (ft) – looking DS	Bankfull Width (ft)	Channel Width (ft)	Length (linear ft)
1					
2					
3					

Notes on limits/extent of reaches, overall project, channel dimensions: _____

CEM Stage: R1: _____ R2: _____ R3: _____
I (stable) II (incision) III (widening) IV (aggradation) V (quasi stable)

The following to be qualitatively reviewed and comments/notes provided

- Bridges present (number, type, condition) – take photo of existing bridges
- Number of outfalls and condition of outfall channel (good, fair, poor) – take photo of all outfalls
- Safety issues, including potential infrastructure loss (trails, structures, utilities, roads) – take photos and approximate distance from top of bank
- Buffer: Width: Left R1: _____ R2: _____ R3: _____ Right R1: _____ R2: _____ R3: _____
 Quality and composition (overstorey trees/shrubs/invasives/lawn): _____

Human activities impacting buffer: _____

Stream Restoration Assessment Sheet_Fall 2015 for SOP.pdf
 04/07/2016

Attachment A2

Instability Score: (if multiple reaches are deemed necessary, score separately and then average the total)

SCORE	1	2	3	4	5	Reach		
						1	2	3
Veg – Immediate streambank area	Good and consistent root density from top of bank to toe of bank; Bare spots on are rare		Moderate root density and gaps in root systems along reach. Overhanging roots. Tree roots do not extend to channel bed (~1/2 bank height).		Bare spots common; grass or shallow rooting (<25% bank height) plants; mostly herbaceous; very sparse trees – low root density and death			
Dominant slope of BKF to top of bank	Connected to floodplain or wide bankfull bench	Banks above bankfull slope back gently (easy walk)	Banks above bankfull slope back steep (difficult walk/climb - >2:1)	Vertical to near vertical banks	N/A - Max score is a 4			
Mass Erosion (Slumping)	No evidence of past events of mass erosion into the channel	Infrequent and/or very small. Mostly healed over, relatively stable, & may have veg.	Occasional sites of moderate mass erosion contributing sediment; BKF flow results in sediment introduction; toe erosion		Multiple sites at least 2 channel widths in length; Contributing large amounts of sediment OR potential to contribute large amounts			
Cutting (Banks and Bed)	Limited to some outside bends and constrictions; length of cuts <1 bankfull width		Significant portion (~50%) of reach with raw, vertical banks. Root mat overhangs and sloughing prevalent.		Headcuts (multiple >18" or one >2') OR almost continuous raw bank over 24" high to bank top. Banks frequently undercut.			
Scoping Team Score	Problems exist but not that bad of a site in comparison to other county streams	Bank stabilization needed in spots OR channel may be healing	Work needed but may not rise to top tier due to need, benefit, constructability, other issues		Stream needs work and a project would have great environmental benefit			
Adjustment Points								
Pools filled with sediment, excessive bar growth, midchannel bar/aggradation (+2)								
Significant portion of reach scoured to bedrock/hardpan (+2)								

TOTAL INSTABILITY SCORE: _____ / _____ / _____

Headcuts Present: Y / N (if yes, indicate number per reach, and approximate drop)

Restoration Priority and Opportunity: _____ (select 1-4, see descriptions below; may be combination or vary by reach)

- Priority 1 (bankfull channel at historical floodplain elevation) Priority 3 (wide floodplain at existing elevation)
- Priority 2 (new floodplain and stream pattern at present elevation) Priority 4 (stabilize in place)

Notes on restoration opportunities, including buffer restoration, outfall restoration: _____

Additional Comments on Site: _____

Planning Score: _____ /25 Instability Score: _____ /28 Total Stream Length: _____



Watershed Management Plan Project Update

Stream Restoration Projects

5. Field Scoping

a) Instability Score (Physical Characteristics of Each Stream Reach)

- i. Streamside Vegetation
- ii. Bank slope
- iii. Degree of mass erosion
- iv. Bank and bed cutting

b) Qualitative Overall Team Score (Based on Other Field Measurements and Observations of Each Reach)

- i. Channel and bankfull width
- ii. Channel evolution stage
- iii. Confirm access feasibility
- iv. Number and condition of outfalls
- v. Safety issues
- vi. Number of bridges
- vii. Buffer extent, condition and quality
- viii. Number and height of headcuts
- ix. Presence of utilities and infrastructure
- x. Potential impact on private properties



Crook Branch
Accotink Creek WS
Providence and Mason Districts

Stream Restoration Projects

6. Overall Stream Restoration Project Ranking

- a) Maximum Qualitative Team Score
- b) Maximum Instability Score
- c) Overall Planning Score
- d) Collective assessment and ranking of all stream projects
- e) Cost/Benefit



Cove Creek at Wakerobin Drive
Difficult Run WS
Hunter Mill District

Watershed Management Plan Project Update Stream Restoration Projects Bridal Path – Dranesville District

Before



2011



2013



2015



Watershed Management Plan Project Update

Pond Retrofit Projects

1. GIS search of WMP projects

- a) Project type
- b) Land ownership
- c) Storm Drainage Easements

2. Resident Requests

3. Qualitative Desktop Review

- a) Benefits
- b) TMDL or impaired water
- c) Upstream impervious area
- d) Drainage area to pond
- e) Access
- f) Tree cover
- g) Known public safety concerns
- h) Downstream conditions
- i) Relation to other projects
- j) Relation to monitoring locations
- k) Complaint logs

Towlston Meadows
Difficult Run WS
Dranesville District



Watershed Management Plan Project Update

Pond Retrofit Projects

4. Desk Top Assessment

a) Quantitative Planning Score

- i. Easements
- ii. Access
- iii. Utilities
- iv. Facility type
- v. MS4 facility
- vi. Number of private properties
- vii. Tree cover and vegetation
- viii. TMDL or impaired water
- ix. Potential to expand the facility

Flint Hill Manor
Accotink Creek WS
Providence District



b) Qualitative Assessment

- i. Complaint records
- ii. Proximity to residential Structures
- iii. Drainage area and impervious area draining to pond
- iv. Inline/offline

D'Evereux West Sec 2
Dougue Creek WS
Lee District



Watershed Management Plan Project Update

Pond Retrofit Projects

Watershed		Watershed Plan #	
BOS District		Facility ID #	

Pond Retrofit Criteria Sheet

Team Lead: _____ Date: _____

Members: WPBBS _____
 WPBIBN _____
 WPAB _____
 MSMD _____
 Urban Forestry _____

Alternative projects:

The project type and limits should be assessed as the first part of the on site assessment. If it is determined that the scope of the project should be expanded, changed completely or reduced, please note the alternative project. An assessment should be completed for both the originally proposed project and the alternative project.

** Work to be performed in the office prior to site visit*

The following items should be rated:

- ❖ Easements*
 - 1- Easements are required
 - 3- Partial easements exist/ Additional easements are required
 - 5- No additional easements are required
- ❖ Access*
 - 1- No access points
 - 3- Access is marginal (Impacts private property, Impacts utility lines)
 - 5- Good access exists (Dedicated access easement, entrance location, or available area to add access without extensive grading or new easements)
- ❖ Utilities*
 - 1- Utilities exist within the pond footprint and present a challenge
 - 3- Utilities exist near the pond footprint or appear to present a challenge
 - 5- No utilities observed in the pond footprint or appear to present a challenge
- ❖ Ownership
 - 1- Multiple private owners
 - 3- Private ownership, mostly HOA (limited number of owners)
 - 5- Public ownership (BOS, FCPA, FCPS, Other? _____)
- ❖ Tree Impacts within basin footprint
 - 1- Heavily forested – More than 60% covered and trees are generally 10" caliper or greater.
 - 3- Moderate tree cover – More than 30% covered and trees are generally 6" to less than 10" caliper.
 - 5- No existing tree cover.

Pond Retrofit Assessment Criteria
 \\fshare01\dpwes\STW\Divisions & Branches\SWPD\WPAB\MONITORING\COMPREHENSIVE
 BIOLOGICAL\Protocols\SOP\Ponds
 Sheet format update date (May 4, 2016)

Attachment B2

Pond Retrofit Assessment Criteria
 May 4, 2016

Attachment B2

- ❖ Overall vegetation impact within basin footprint
 - 1- Majority high quality vegetation and basin footprint cover is less than 25% invasive plants observed.
 - 3- Moderate amount of high quality vegetation and basin footprint cover is 25% to less than 50% invasive plants.
 - 5- Mowed/no vegetation impact or basin footprint is covered 50% or greater with invasive plants.
- ❖ Existing Facility Type
 - 1- Water quality BMP
 - 3- Peak shaver only
- ❖ MS-4*
 - 1- Not located inside an MS-4 area
 - 3- Located inside of an MS-4 area
- ❖ Local TMDL/Impairment*
 - 1- No local TMDLs identified
 - 3- An impairment identified
 - 5- A local non-bacteria TMDL identified
- ❖ Footprint Expansion Capacity (consider: outlet vs. easement size, RPA, floodplain, proximity to residential properties, other)
 - 1-none/limited (Includes basins in an RPA)
 - 3-moderate
 - 5-excellent

The following to be qualitatively reviewed and comments/notes provided (to be used as part of the Best Professional Judgment discussion following the numerical scoring of the projects)

- MSMD records (complaints, inspections (to a point 500' downstream))*
- Condition Assessment
 - Spillway
 - Outfall/Downstream Channel (to a point minimum 500' downstream)
 - Embankment
- Expansion Capacity
 - Outlet vs. easements size*
 - RPA/Floodplain*
 - Proximity to residential properties/structures/active recreational areas
- In-line/off-line*
- Drainage/treated area (acres) *
 - Available storage
 - Impervious drainage area (acres)

Other comments and observations:



Watershed Management Plan Project Update

Pond Retrofit Projects

5. Field Scoping

- a) Validate desktop review
- b) Safety concerns
- c) Construction and permanent access
- d) Condition of pond footprint
- e) Condition of spillway and dam embankment
- f) Condition of outfall and downstream channel
- g) Potential impact to mature trees and vegetation
- h) Proximity to residential structures



Copper Crossing
Horsepen Creek WS
Hunter Mill District

Pond Retrofit Projects

6. Overall Pond Retrofit Project Ranking

- a) Desk/Field Scoping results
- b) Facility Type
- c) Pollutant Loading
- d) Collective assessment and ranking of all pond retrofit projects
- e) Cost/Benefit

Providence Rec Center
Cameron Run WS
Mason District



Clifton Farms
Little Rocky Run WS
Springfield District



Watershed Management Plan Project Update

Pond Retrofit Projects

Fair Woods - Cub Run WS – Sully District

1



2



3

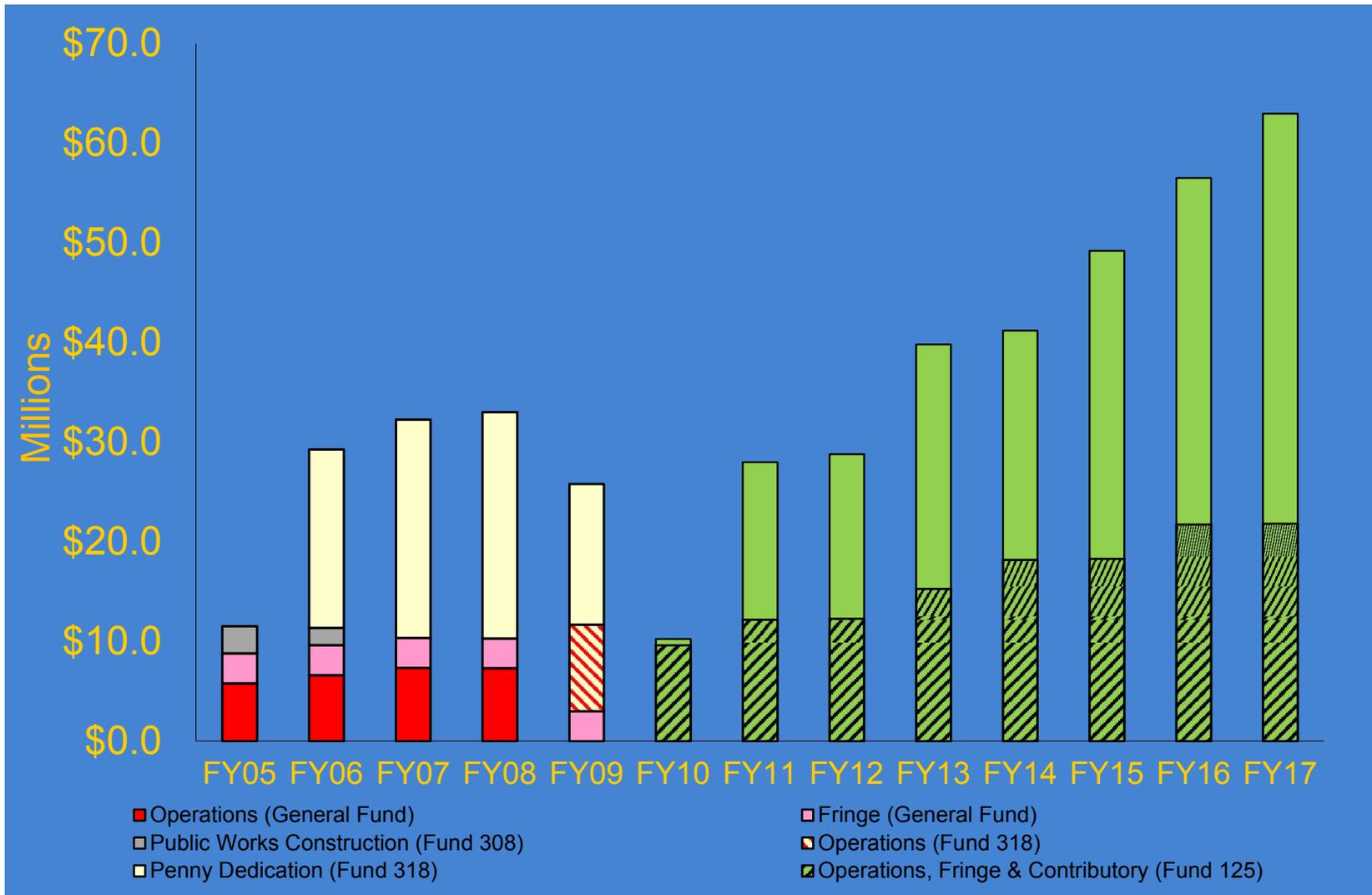


4



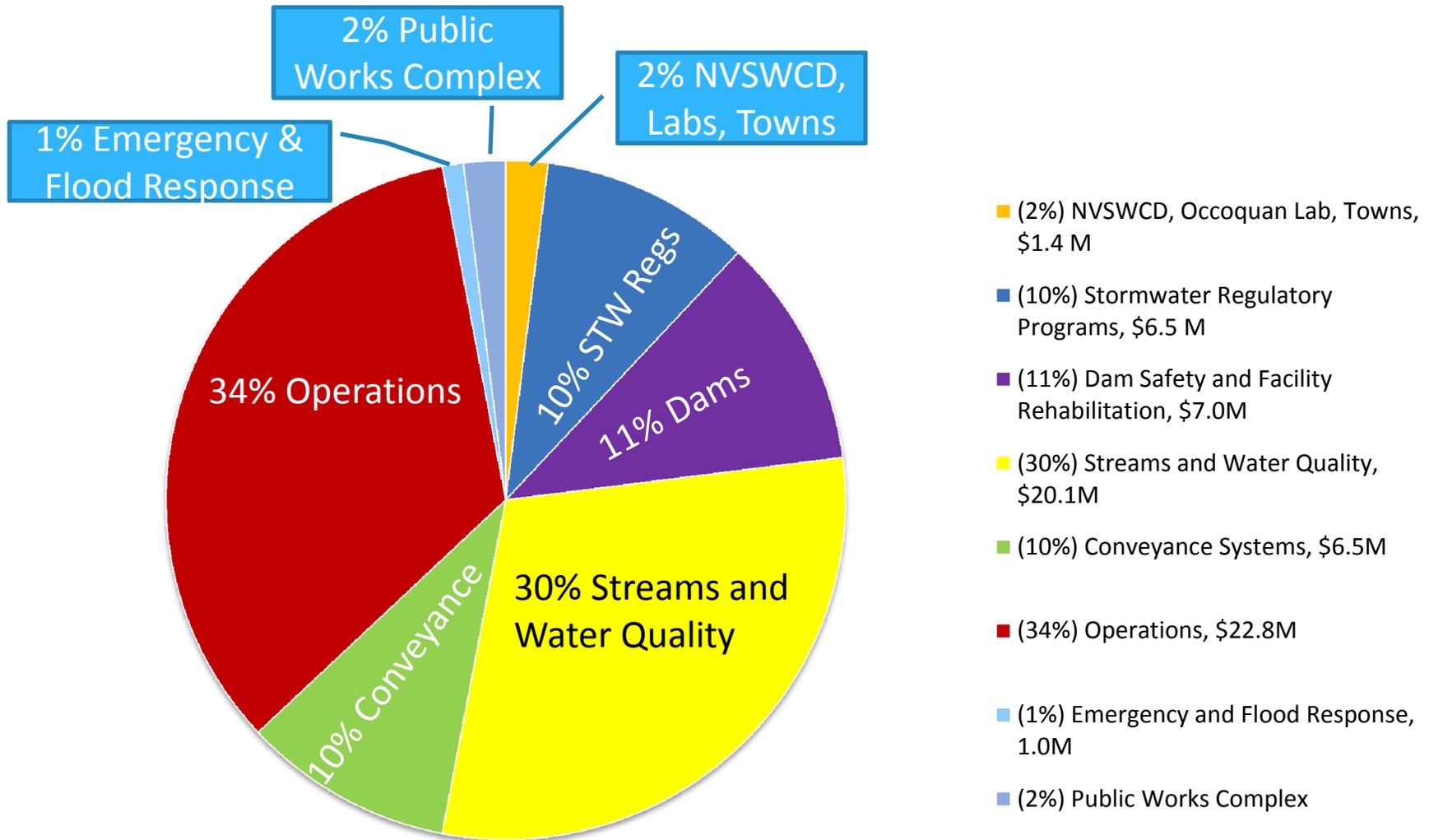
Watershed Management Plan Project Update

Stormwater Funding History



Watershed Management Plan Project Update

Stormwater FY17 Budget



Watershed Management Plan Project Update Completed Projects

Completed WMP Projects (as of May 6, 2016)

Watershed Management Plan (WMP)	WMP Total Est Cost	WMP Projects	Completed Projects	WMP Proj Estimate	Percent of WMP Projects
ACCOTINK CREEK	\$86,576,000	230	5	\$1,379,000	2.20%
CAMERON RUN	\$90,597,000	193	7	\$1,992,000	3.60%
CUB RUN/BULL RUN	\$78,315,804	233	16	\$13,854,340	6.90%
DIFFICULT RUN	\$83,784,000	285	8	\$985,000	2.80%
DOGUE CREEK, BELLE HAVEN AND FOUR MILE RUN	\$33,818,000	92	1	\$872,000	1.10%
LITTLE HUNTING CREEK	\$17,340,000	68	12	\$1,600,000	17.70%
LITTLE ROCKY RUN/JOHNNY MOORE CREEK	\$24,580,000	81	0	\$0	0.00%
LOWER OCCOQUAN	\$59,050,000	82	3	\$790,000	3.70%
MIDDLE POTOMAC	\$81,720,000	182	9	\$950,000	5.00%
NICHOL RUN/POND BRANCH	\$13,290,000	70	1	\$510,000	1.40%
POHICK CREEK	\$107,980,000	201	3	\$1,420,000	1.50%
POPES HEAD CREEK	\$19,290,000	58	2	\$640,000	3.50%
SUGARLAND RUN/HORSEPEN CREEK	\$42,970,000	120	1	\$490,000	0.80%
Grand Total	\$739,310,804	1,895	68	\$25,482,340	3.50%



Watershed Management Plan Project Update Active Projects (Design and Construction)

Active WMP Projects (design, construction, partnerships, etc.)

Watershed Management Plan (WMP)	WMP Total Est Cost	WMP Projects	Active Projects	WMP Proj Estimate	Percent of WMP Projects
ACCOTINK CREEK	\$86,576,000	230	13	\$7,737,000	5.70%
CAMERON RUN	\$90,597,000	193	7	\$6,165,000	3.60%
CUB RUN	\$78,315,804	233	11	\$9,872,000	4.70%
DIFFICULT RUN	\$83,784,000	285	2	\$1,265,000	0.70%
DOGUE CREEK, BELLE HAVEN AND FOUR MILE RUN	\$33,818,000	92	3	\$1,497,000	3.20%
LITTLE HUNTING CREEK	\$17,340,000	68	1	\$80,000	1.50%
LITTLE ROCKY RUN/JOHNNY MOORE CREEK	\$24,580,000	81	0	\$0	0.00%
LOWER OCCOQUAN	\$59,050,000	82	0	\$0	0.00%
MIDDLE POTOMAC	\$81,720,000	182	5	\$920,000	2.80%
NICHOL RUN/POND BRANCH	\$13,290,000	70	2	\$560,000	2.90%
POHICK CREEK	\$107,980,000	201	7	\$4,040,000	3.50%
POPES HEAD CREEK	\$19,290,000	58	1	\$1,080,000	1.70%
SUGARLAND RUN/HORSEPEN CREEK	\$42,970,000	120	2	\$890,000	1.70%
Grand Total	\$739,310,804	1,895	54	\$34,106,000	2.80%



Watershed Management Plan Project Update Bench Projects

"Bench" WMP Projects

Watershed Management Plan (WMP)	WMP Total Est Cost	WMP Projects	Deferred Projects	WMP Proj Estimate	Percent of WMP Projects
ACCOTINK CREEK	\$86,576,000	230	1	\$18,000	0.40%
CAMERON RUN	\$90,597,000	193	3	\$212,000	1.60%
CUB RUN/BULL RUN	\$78,315,804	233	5	\$2,202,000	2.20%
DIFFICULT RUN	\$83,784,000	285	3	\$1,343,000	1.10%
DOGUE CREEK, BELLE HAVEN AND FOUR MILE RUN	\$33,818,000	92	3	\$2,282,000	3.30%
LITTLE HUNTING CREEK	\$17,340,000	68	1	\$150,000	1.50%
LITTLE ROCKY RUN/JOHNNY MOORE CREEK	\$24,580,000	81	3	\$960,000	3.70%
LOWER OCCOQUAN	\$59,050,000	82	0	\$0	0.00%
MIDDLE POTOMAC	\$81,720,000	182	4	\$1,450,000	2.20%
NICHOL RUN/POND BRANCH	\$13,290,000	70	0	\$0	0.00%
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POPES HEAD CREEK	\$19,290,000	58	2	\$640,000	3.50%
SUGARLAND RUN/HORSEPEN CREEK	\$42,970,000	120	4	\$1,280,000	3.30%
Grand Total	\$739,310,804	1,895	31	\$12,557,000	1.60%



Additional Information

For additional information, please contact

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