Germantown View
Stormwater Pond Retrofit Projects

Second Public Meeting: March 13, 2018

DEPARTMENT OF
ENVIRONMENTAL
PROTECTION
MONTGOMERY COUNTY • MARYLAND

Working together for a cleaner, greener
economically vibrant community

Introductions

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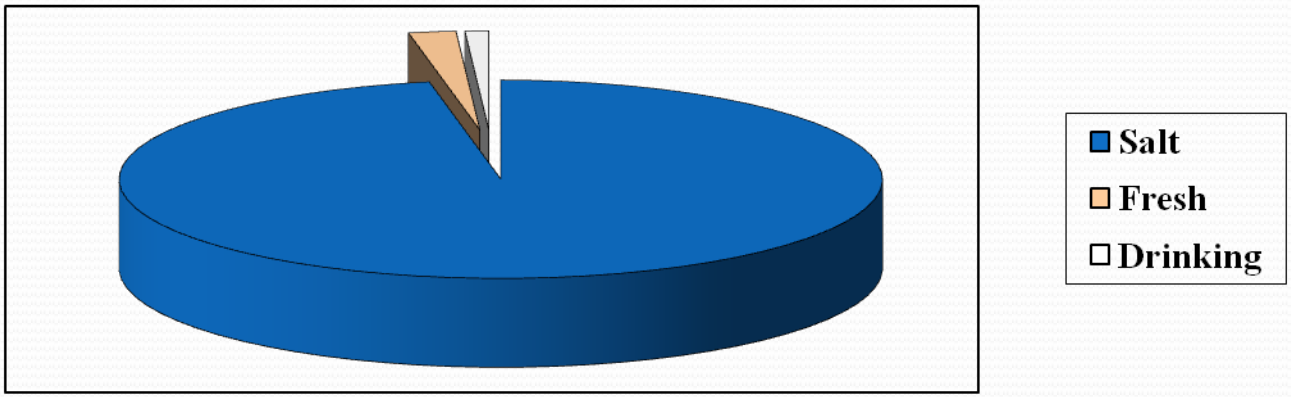
Tonight's Agenda

- Sources of water on earth
- Montgomery County background
- What is a watershed?
- Introduction to stormwater runoff
- What the County is doing to protect our waterways
- Project goals
- Proposed pond retrofit designs
- Examples of similar projects
- What to expect during construction
- Project schedules
- Questions/Comments

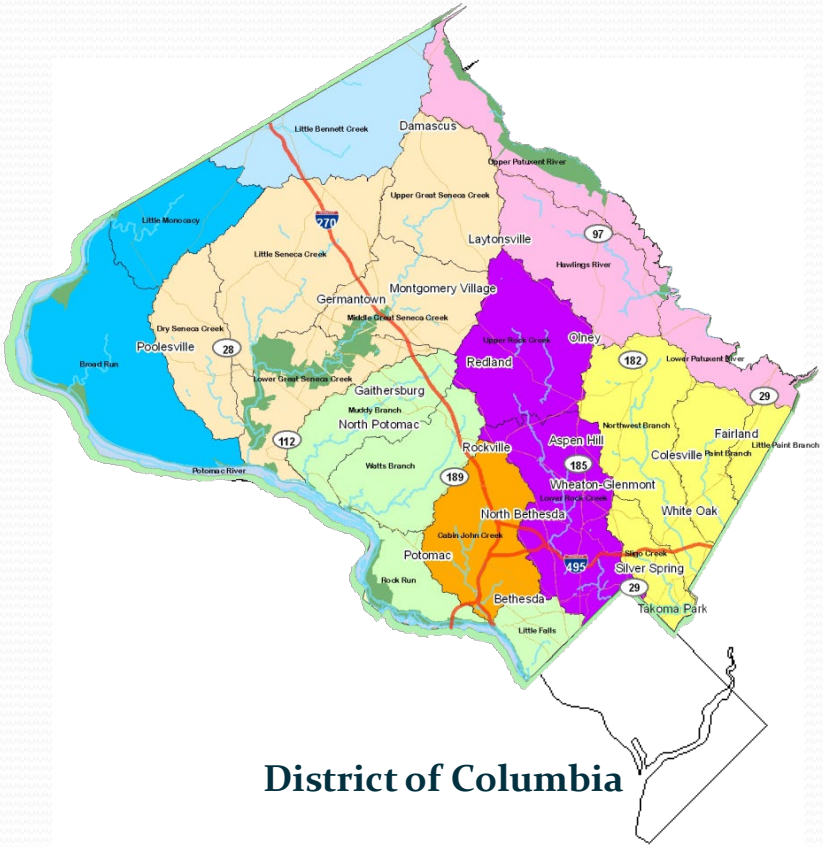
Sources of Water



- About 97% is salt water
- About 2% is fresh
- Only 1% is available for drinking water
  - 95% from groundwater across the Country
  - 32% from groundwater, 68% from surface water in Maryland
    - Potential for greater impacts from runoff in Maryland

Montgomery County, MD

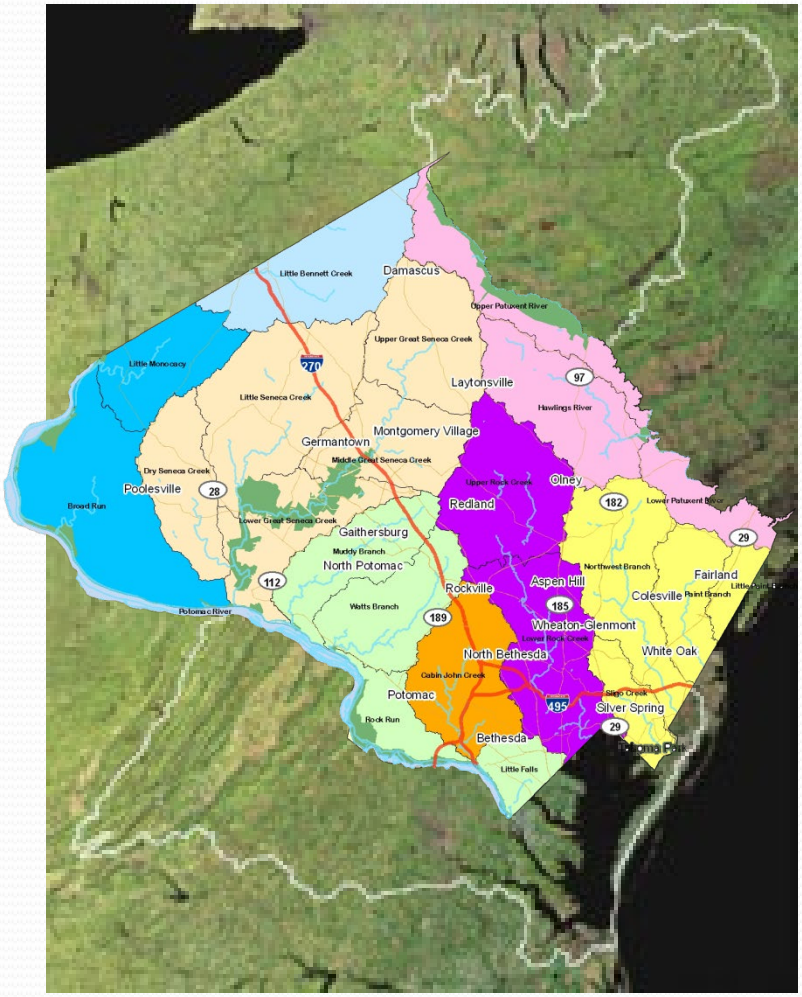
- Over 1,000,000 people
  - Second only to Baltimore City within Maryland in average people per square mile
- 500 sq. miles
- About 12% impervious surface overall
  - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
  - Potomac
  - Patuxent
- Eight local *watersheds*



Impervious: Not allowing water to soak through the ground.

What is a Watershed?

- A ***watershed*** is an area from which the water above and below ground drains to the same place.
- Different scales of watersheds:
  - Chesapeake Bay
  - Eight local watersheds
  - Neighborhood (to a storm drain)

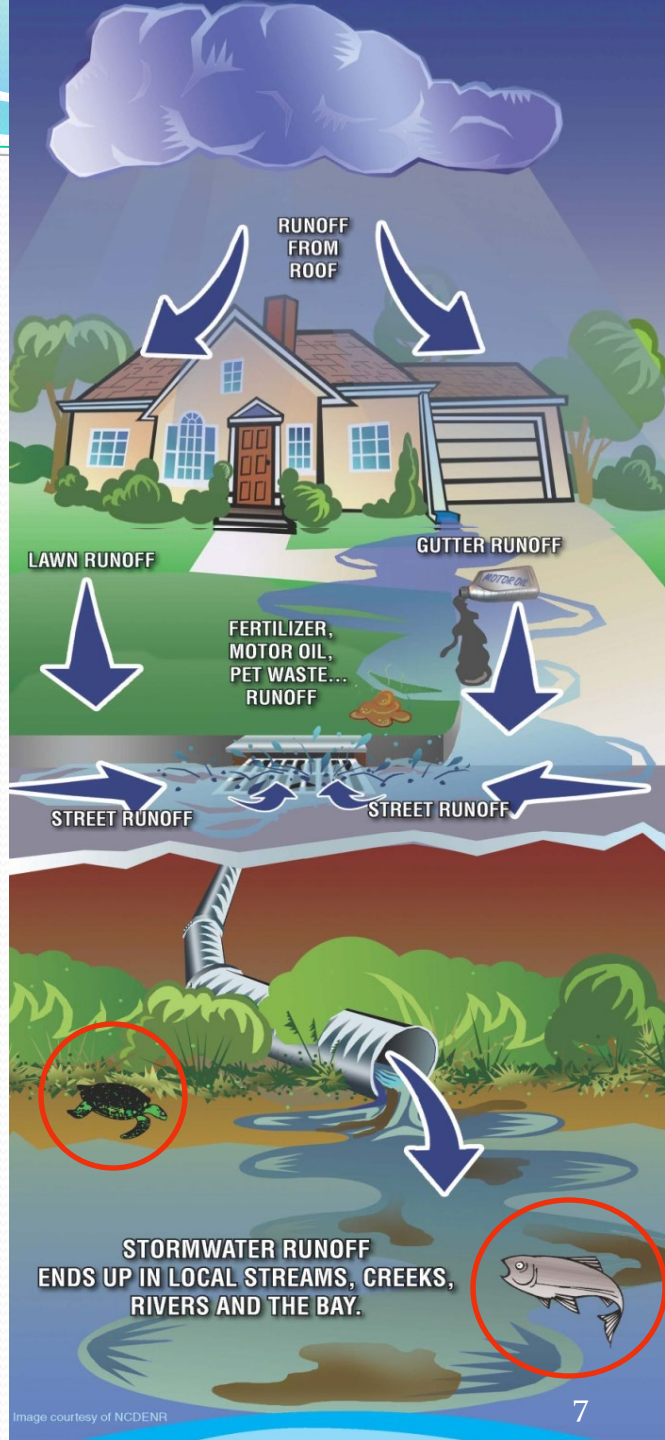


What is Runoff?

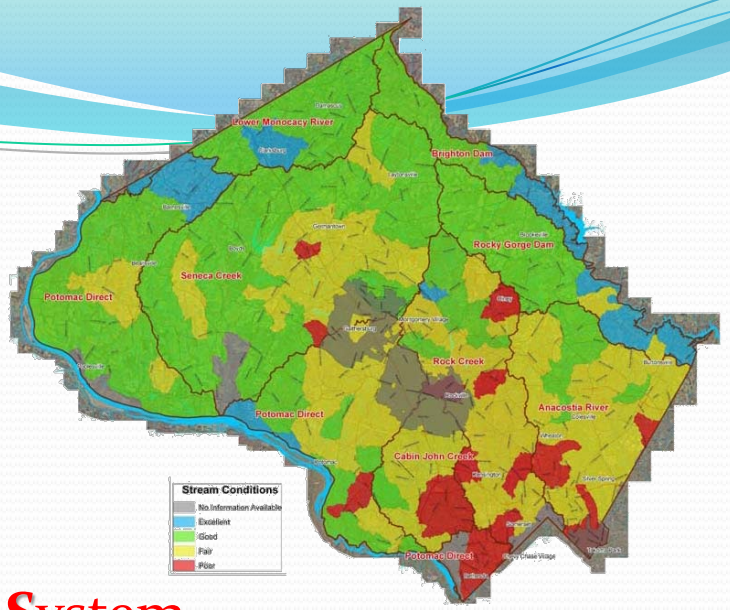
Water that does not soak into the ground becomes surface runoff. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:

- **Directly into streams**
- **Into storm drain pipes, eventually leading to streams**
- **Into stormwater management facilities, then streams**

Two Major Issues:
Volume/Timing of Runoff
Water Quality



What is the County doing to protect our Streams?



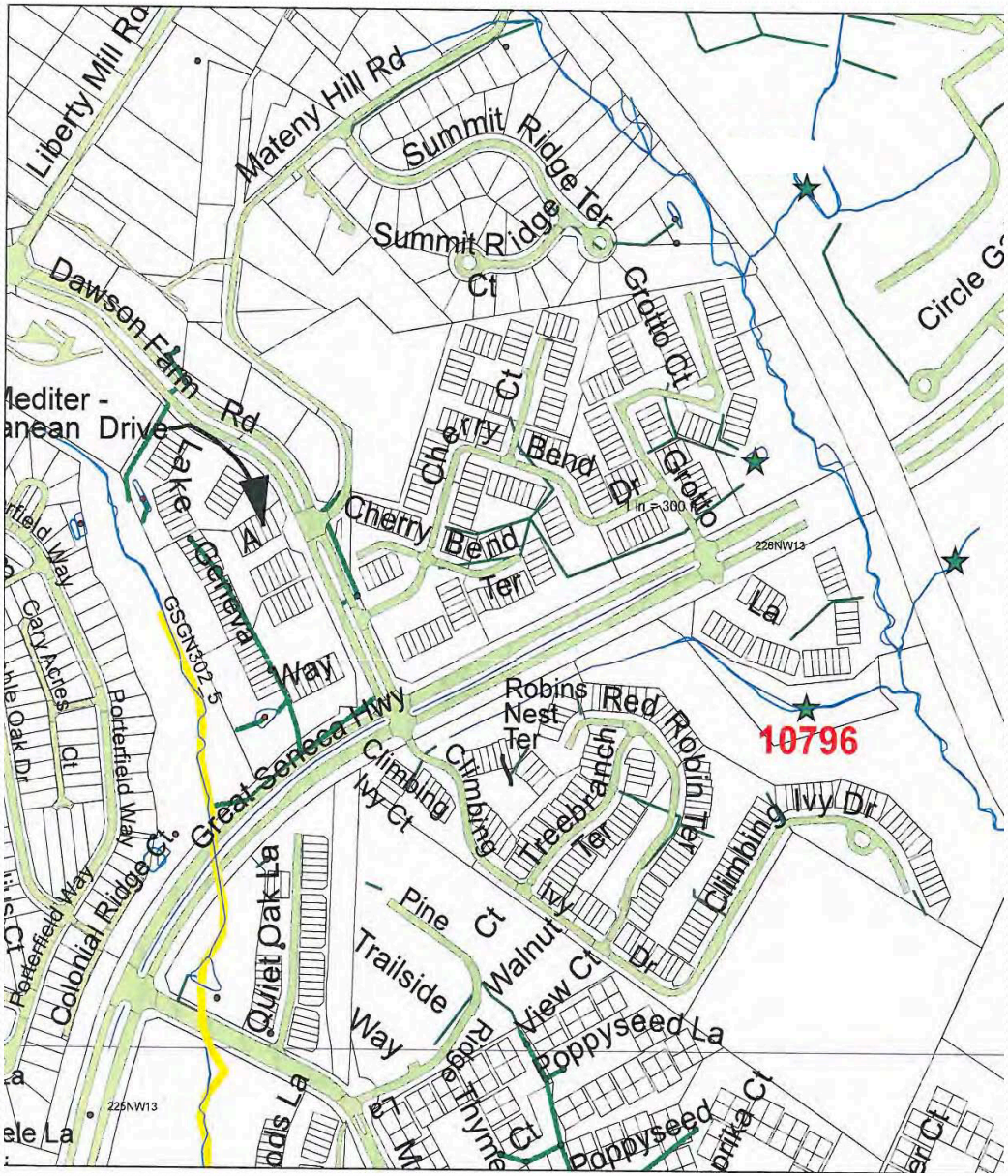
- Must meet regulatory requirements
  - Federal Clean Water Act permit program
  - **MS4 = Municipal Separate Storm Sewer System**
- Applies to all large and medium Maryland jurisdictions
- County programs
  - Restore our streams and watersheds
    - Add runoff management
  - Meet water quality protection goals
    - Reduce pollutants getting into our streams
  - Educate and engage all stakeholders
    - Individual actions make a difference
  - Focus on watersheds showing greatest impacts

MS4 permit, what is it?

- Montgomery County is responsible for:
  - What goes into our storm drain pipes
  - What comes out of them
  - What flows into the streams
- Requires additional stormwater management for **20 percent** of uncontrolled impervious surfaces (3,778 acres)

Two types of designs for Ponds

- Channel Protection Volume (CPV)
  - Designing a pond to capture 2.6 inches of rain (a 1-year storm event)
  - Storing and slowly releasing this rain event for 12 to 24 hours
  - Main Objective for this Design: Provide the greatest impact to reduce downstream erosion
- Water Quality Volume (WQV)
  - Capturing and filtering out the pollutants during a 1-inch rain event, and is based on impervious area
  - Main Objective for this Design: Reduce nutrients from entering the stream
- Ideal Situation
  - Design a facility that does both with the land area being the only limiting factor



Germantown View Site Vicinity Map

Germantown View

Aerial Image of Site Area

Aerial Image – Looking North

Germantown View Pond Design

Existing Conditions

Existing corrugated metal riser

Existing embankment (dam)

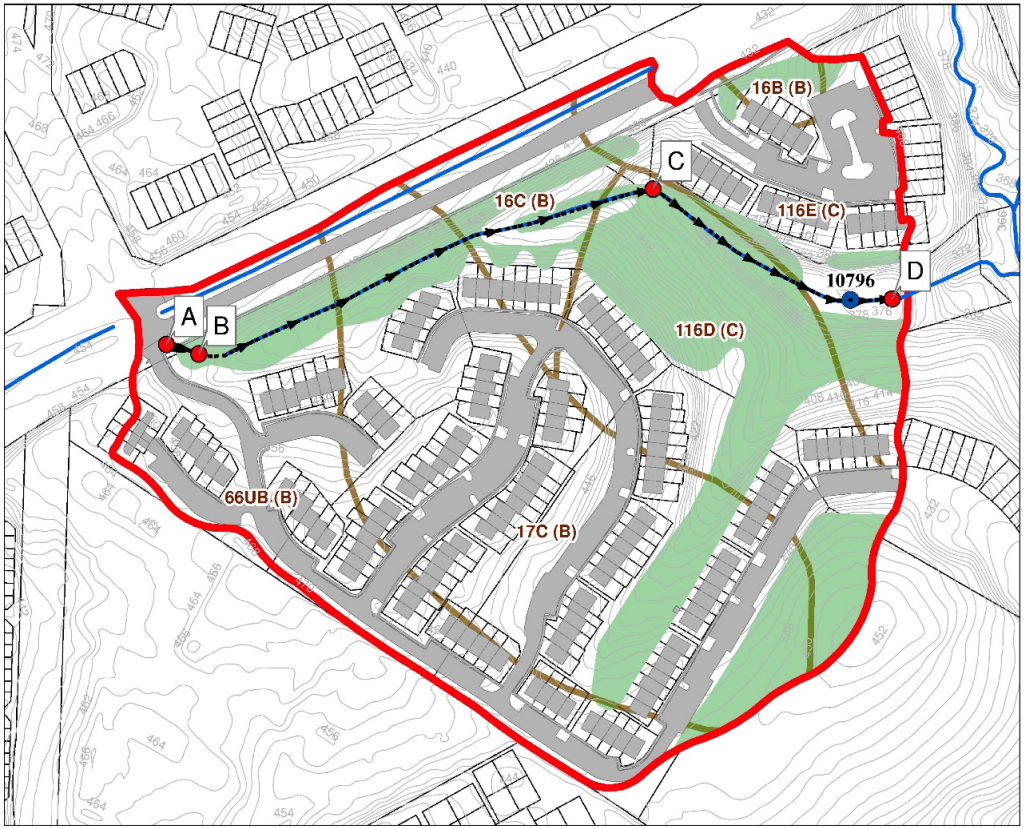
Existing pond outfall pipes

Inflow stream channel

Goals of the Germantown View Project

- Create a permanent pool to capture nutrients and provide water quality treatment (full Water Quality Volume, WQv)
- Reduce runoff "peak-flow" also called Channel Protection Volume (CPv)
- Enhance site aesthetics with extensive plantings
  - Aquatic plants within and along the perimeter of the permanent pool will help absorb nutrients and provide a balanced aquatic ecosystem.
    - Will attract amphibian (frogs, salamanders, etc.) and (smaller) fish species
    - The resulting aquatic ecosystem will have a balance of prey (mosquitoes) and predator species
- Replace riser structure
- Upgrade outfall barrel to current standards Using Slip Lining

Germantown View – Drainage Area



GRAPHIC SCALE
100 0 50 100 200
SCALE: 1" = 100'

Legend

Flow Section	Contour
Flow Path	Impervious Area
Drainage Area	Forest
Stream	Property Line
Water Body	Soil Divide

Hydrologic Summary

Name	Germantown View SWM Pond	
MCDEP Asset	10796	
Drainage Area	25.25	acres
RCN	74	
Time of Concentration	0.139	hours

Land Use/Soils Composition

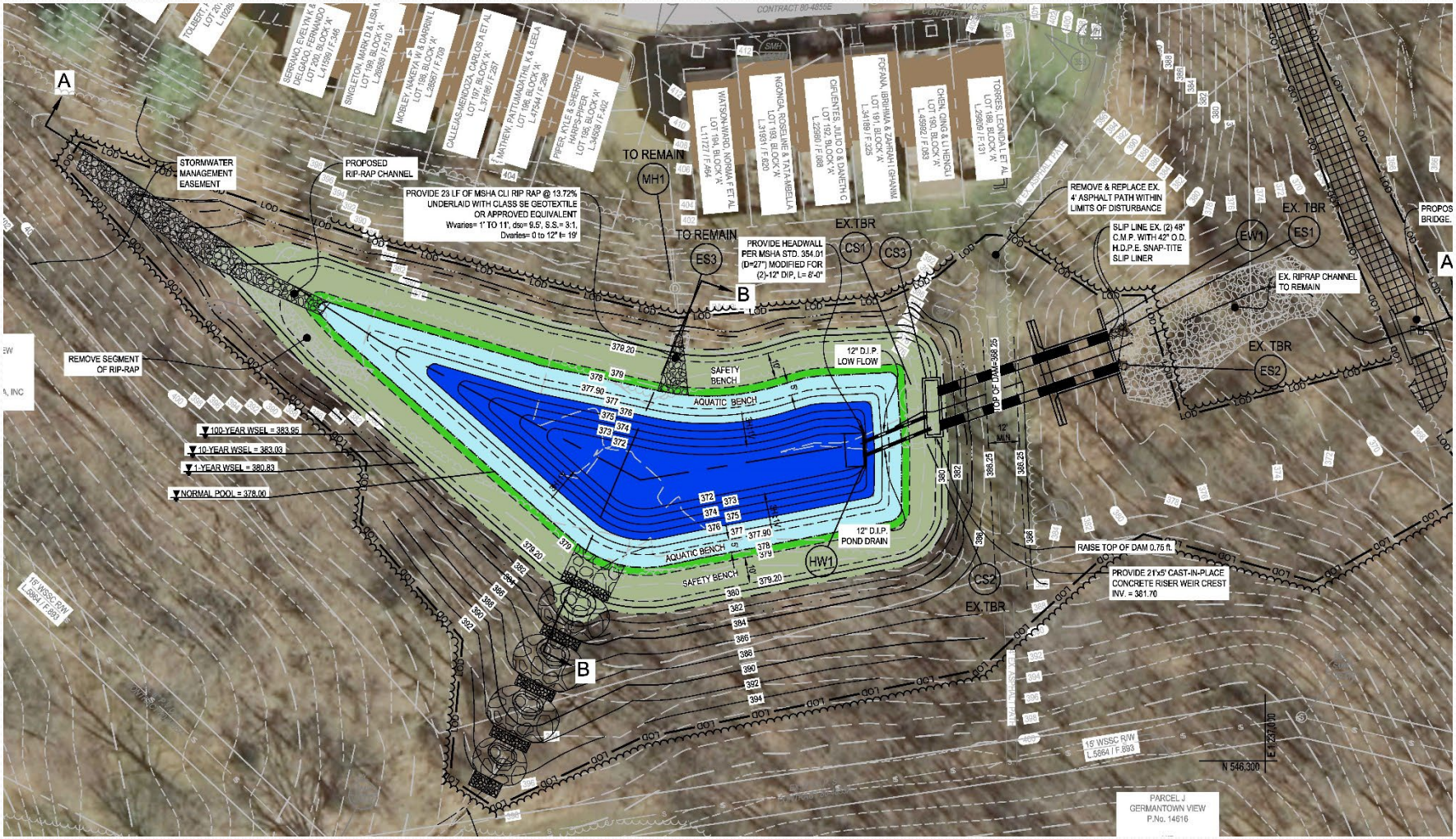
Land Use/Hydrologic Soil Group	B (ac)	C (ac)
Open Space / Grass > 75%	7.89	3.30
Impervious Area	5.59	1.95
Woods/Good Conditions	3.18	3.63

Flow Path Summary

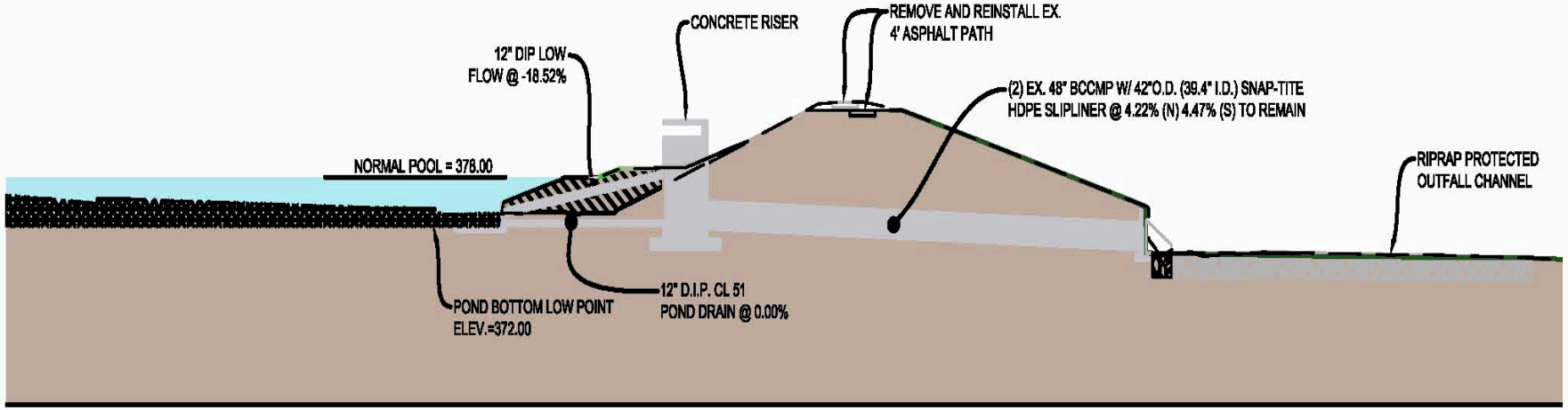
Segment	Flow Type	Length (ft)	Slope (ft/ft)	Surface
A to B	Sheet Flow	50	0.06	Grass-Range, Short
B to C	Shallow Concentrated	680	0.06	Unpaved
C to D	Open Channel	460	N/A	Open Channel

N

Germantown View Proposed Pond Design



Germantown View Proposed Pond Design



Examples of Wet Pond Retrofits

In Construction

1 Year After Construction

5 Years After Construction

5 Years After Construction

Example Native Vegetation for Aquatic Bench

OBLIGATE WETLAND SEED MIX (ERNMX-131)			
Seeding Rate (lb/acre)		20	
Botanical Name	Common Name	Distribution	Total (lbs)
Carex vulpinoidea, PA Ecotype	Fox Sedge, PA Ecotype	35.0%	0.49
Carex lurida, PA Ecotype	Lurid (Shallow) Sedge, PA Ecotype	20.0%	0.28
Carex lupulina, PA Ecotype	Hop Sedge, PA Ecotype	12.8%	0.18
Carex scoparia, PA Ecotype	Blunt Broom Sedge, PA Ecotype	8.0%	0.11
Sparganium eurycarpum, PA Ecotype	Giant Bur Reed, PA Ecotype	4.0%	0.06
Verbena hastata, PA Ecotype	Blue Vervain, PA Ecotype	4.0%	0.06
Juncus effusus	Soft Rush	3.0%	0.04
Sparganium americanum	Eastern Bur Reed	2.5%	0.04
Asclepias incarnata, PA Ecotype	Swamp Milkweed, PA Ecotype	1.0%	0.01
Glyceria canadensis, PA Ecotype	Rattlesnake Grass, PA Ecotype	1.0%	0.01
Iris versicolor, PA Ecotype	Blueflag, PA Ecotype	1.0%	0.01
Onoclea sensibilis	Sensitive Fern	1.0%	0.01
Scirpus cyperinus, PA Ecotype	Woolgrass, PA Ecotype	1.0%	0.01
Alisma subcordatum, PA Ecotype	Mud Plantain, PA Ecotype	0.5%	0.01
Aster puniceus, PA Ecotype	Purplestem Aster, PA Ecotype	0.5%	0.01
Aster umbellatus, PA Ecotype	Flat Topped White Aster, PA Ecotype	0.5%	0.01
Carex crinita, PA Ecotype	Fringed (Nodding) Sedge, PA Ecotype	0.5%	0.01
Eupatorium fistulosum, PA Ecotype	Joe Pye Weed, PA Ecotype	0.5%	0.01
Eupatorium perfoliatum, PA Ecotype	Boneset, PA Ecotype	0.5%	0.01
Helenium autumnale, PA Ecotype	Common Sneezeweed, PA Ecotype	0.5%	0.01
Ludwigia alternifolia, PA Ecotype	Seedbox, PA Ecotype	0.5%	0.01
Mimulus ringens, PA Ecotype	Square Stemmed Monkeyflower, PA Ecotype	0.5%	0.01
Scirpus validus, PA Ecotype	Softstem Bulrush, PA Ecotype	0.5%	0.01
Solidago patula, PA Ecotype	Roughleaf Goldenrod, PA Ecotype	0.5%	0.01
Chelone glabra, PA Ecotype	Turtlehead, PA Ecotype	0.2%	0.01









Common Riparian Trees and Plants Examples

Trees

Live Stakes

Shrubs

Vegetated Pond Fringe Examples

Aquatic vegetation provides buffer between the water's edge and adjacent land

Native plant species foster aquatic ecosystem development within pond

What to Expect During Construction

- **Duration**
  - Approximately 8-10 months (weather dependent)
- **Construction Hours**
  - Monday through Friday, 7AM – 4PM
- **Safety**
  - Work limits will be fenced with high visibility orange construction safety fence
- **Traffic**
  - Access off Great Seneca Highway
- **Noise**
  - Contractor is required to comply with Montgomery County Noise Ordinance
- **Sediment**
  - Contractor will be required to comply with Montgomery County Sediment Control Permit and not track dirt onto roads

Schedule

Germantown View
Stormwater Pond Retrofit Projects

- **Survey and Site Analysis – Spring 2014**
- **Concept Planning and Design – Fall 2014**
- **Public meeting to discuss final design– March 13, 2018**
- **Prepare Permit Plans/Final Plans – Winter 2014/Winter 2018**
- **Construction – Winter 2018 - Spring 2020**

Questions/Comments?

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Germantown View Project Page:

https://www.montgomerycountymd.gov/water/restoration/germantown-view-seneca-forest.html

Mosquito Predators

- **Non-Biting Midge**
- **Diving Beetle**
- **Damselfly Larvae**
- **Backswimmers**
- **Water Scorpion**
- **Dragonfly Nymph**
- **Phantom Midge**
- **Water Strider**
- **Swallows, Adult Dragonflies, Frogs**


Dragonfly

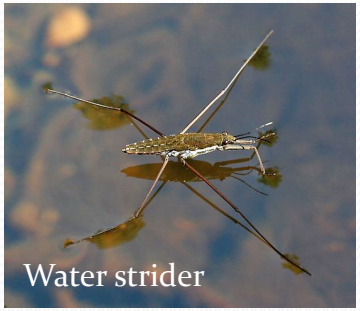

Diving beetle


Dragonfly larva


Megaloptera


Frog


Water scorpion


Water strider