

# *Clean Waters ... Green City*

*A sustainable approach to water utility management*



*Howard M. Neukrug, PE*  
*Philadelphia Office of Watersheds*



# ***Philadelphia Water Department Office of Watersheds***



- An integrated utility:
  - Drinking Water
  - Wastewater
  - Stormwater



- An integrated approach:
  - Land
  - Waterways
  - Infrastructure
  - Community

# *Philadelphia and it's Water Utility*



- Shared land and waterways
- Shared history
- Shared community
- Shared resources
- Shared vision:
  - Healthy, clean streams & rivers
  - Waterfront parks & access
  - Vibrant, expanding Green City



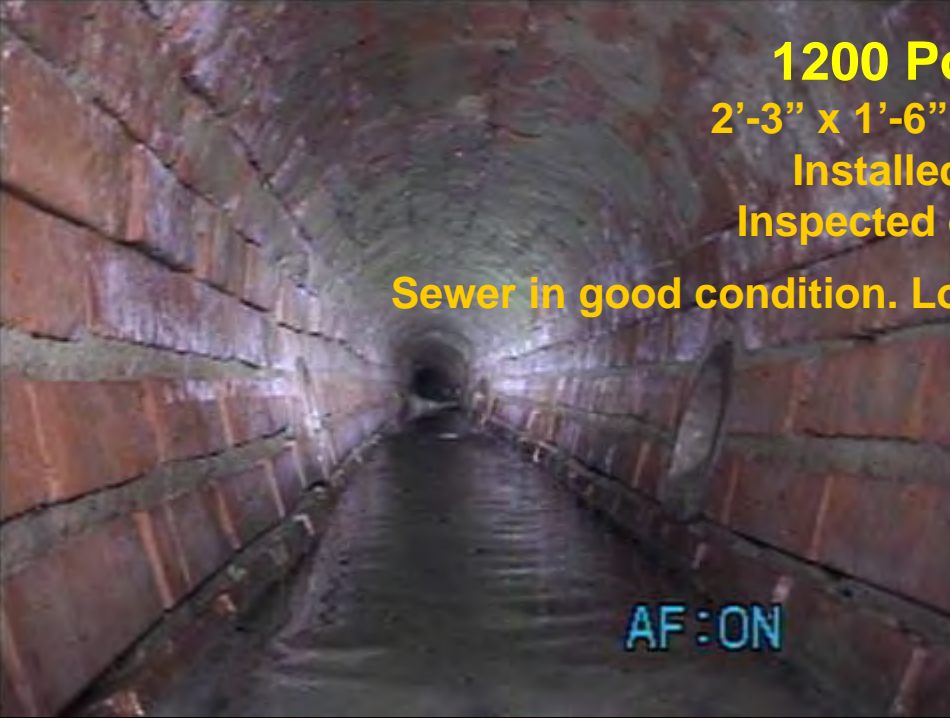
# *Big, Old Pipes*





**1200 Porter St.**  
**2'-3" x 1'-6" Brick Sewer**  
**Installed in 1894**  
**Inspected on 10/21/06**

**Sewer in good condition. Low lateral connections seen.**







# התעוררות העיר העתיקה





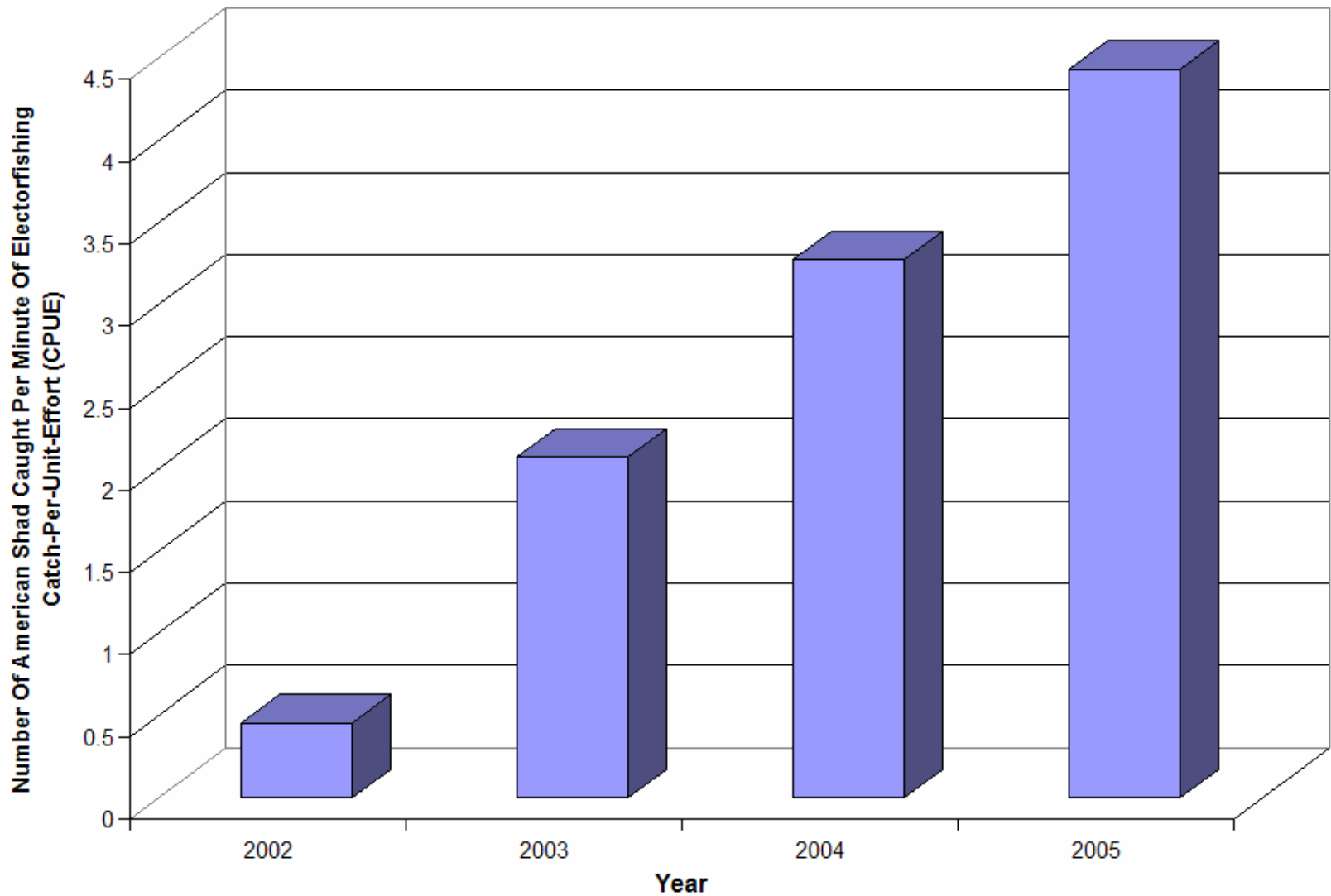




# Outfalls in South Philadelphia







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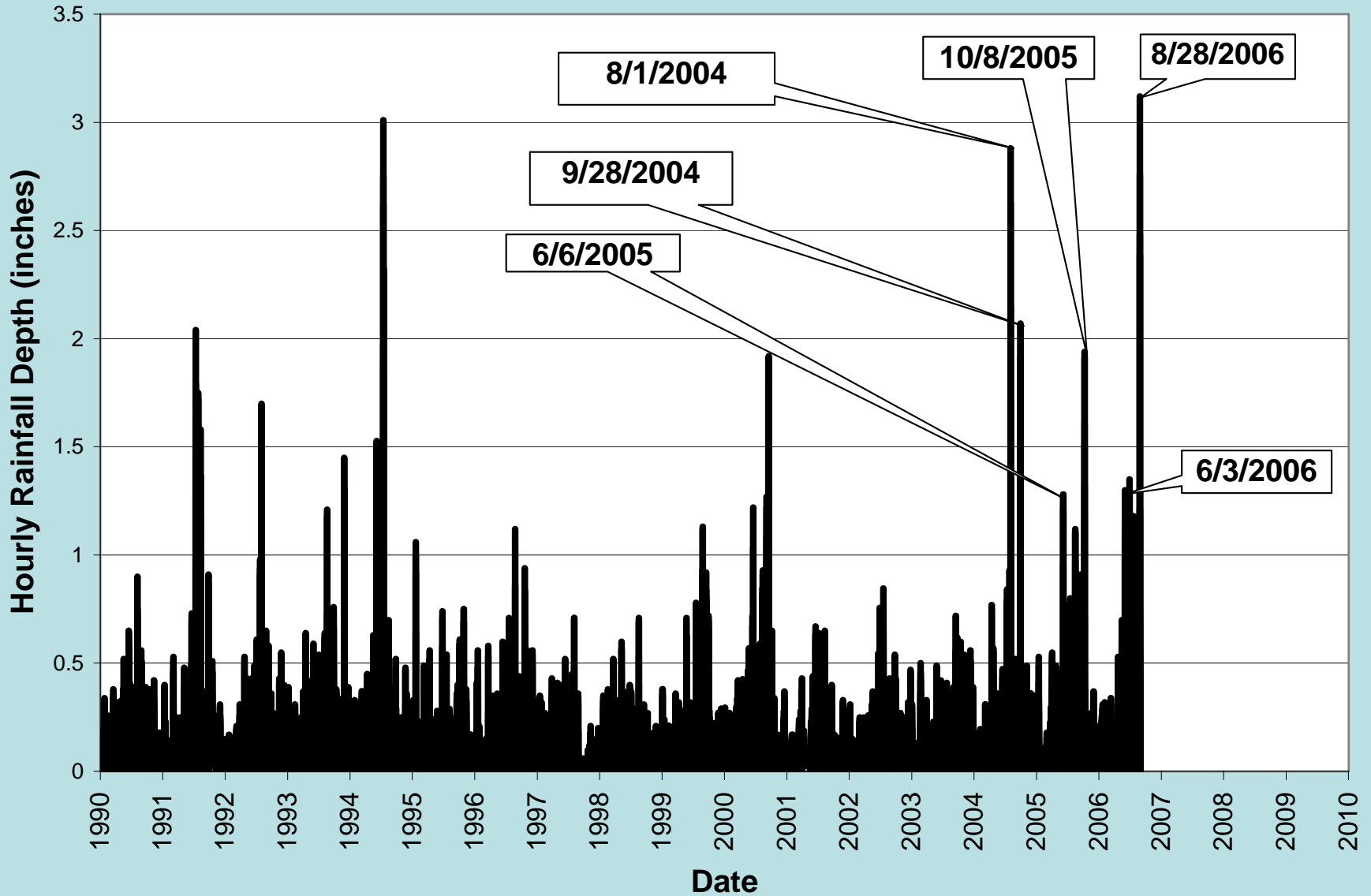


# *Floatables Skimming Vessels*





# Hourly Rainfall Depths Recorded at PWD Rain Gage #05 (South Philadelphia) 1990 - August 28, 2006



# How much water from a rowhouse roof?



**28, 45-Gallon Trash Cans**



# How much water from a rowhouse roof?



**28, 45-Gallon Trash Cans**

*(That's 1,000,000 gallons / hour from a 10-square block South Philadelphia neighborhood)*

**!!!**

# *Adding New Tanks to the Big Old Pipes*



- An approach used by many cities.
- But, does this approach just build on yesterday's engineering mistakes ?
- Is this approach sustainable?
- Will it get us to our environmental goals ?
- What else can we do with our limited \$\$\$\$ ?







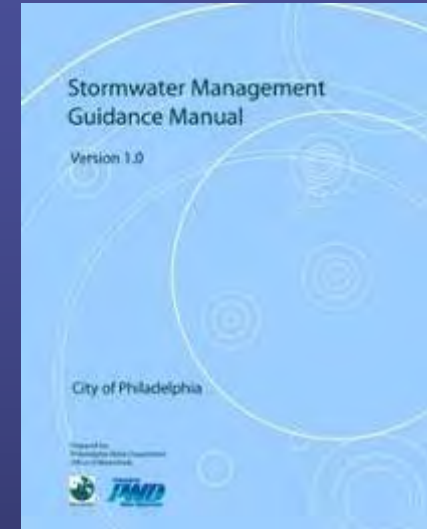
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# Land-Based Strategies

- *New, strictly enforced stormwater regulations*
  - All developments > 15000 sq ft
  - Manages the “first inch”
  - Encourages sustainable development and greening
- *First Year’s report card:*
  - 1 Square Mile newly managed
  - Equal to 1 % of City’s built environment
    - Every 1” Storm - 17 million gallons removed
    - Every year - 500 million gallons removed
  - City Savings: \$170 million in capital costs avoided
- *Next: A new SW charging system that encourages retrofits on large, impervious tracts of land.*



# Subsurface Storage Solution







Add Second 8' x 7' Barrel



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# Snyder Ave Project



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# ***Biomimicry: Engineering natural systems***

- Disconnectivity
- Stormwater Harvesting
- Bioretention Systems



- Infiltration Systems
- Open Swales
- Permeable Paving
- Vegetated (Green) Roofs





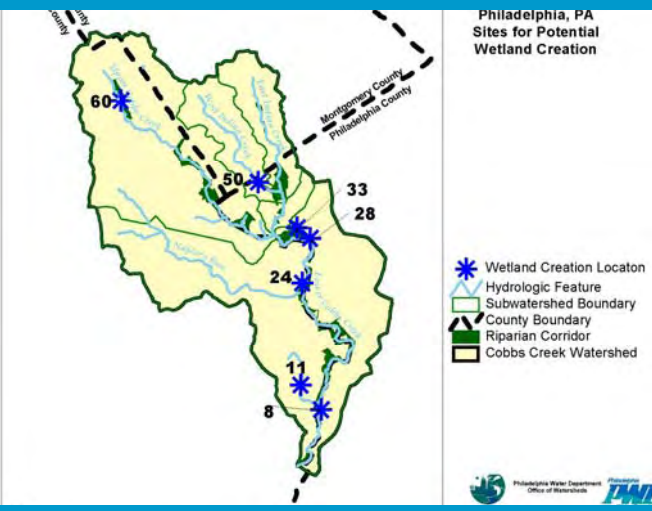
## Stream Daylighting

After



- Existing Tr
- Park Path
- Stormwater Management Meadow Tr
- Streambed
- Facilitate Filter
- Floodplain
- Floodplain

## Stream Buffers



## Wetlands Creation



## Habitat Creation



## Fish Passage

# Natural Solutions On Public Lands





**Traffic Triangles**



**Venice Island CSO Tank**



**Green Roof  
Pump Station**



**Clark Park  
BB Court**



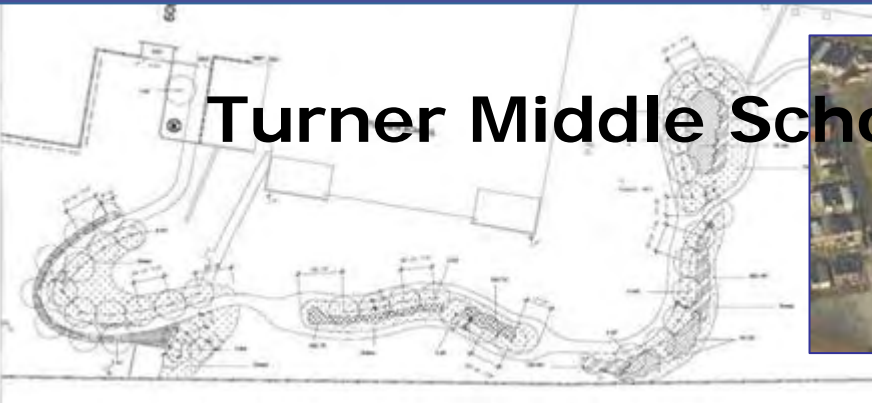
**Street Tree Trenches**

**In the built environment on  
Public Lands**

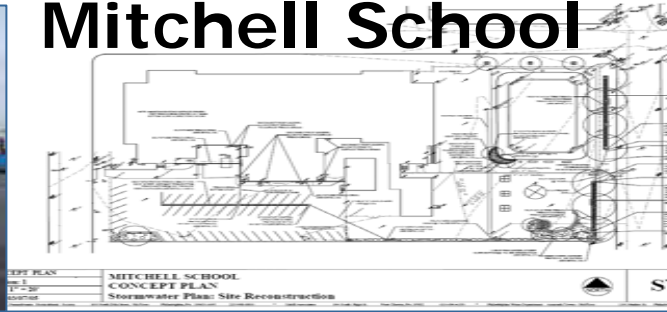


# Campus Parks Initiatives

## Turner Middle School



## Mitchell School



## School of the Future



## PENN-Alexander



## Wissahickon Charter






# Belmont Intake "Goose" Project



25 tons poop / year

Protect Your River & Drinking Water

## Please Do Not Feed the geese




Geese flock where people feed them. The grazing and droppings from unnaturally large goose populations damage the land and water, which in turn can degrade the Schuylkill River, one source of Philadelphia's drinking water.

- The intake for the Belmont Water Treatment Plant is immediately downstream of this site. The degradation of the river increases the treatment effort required to make your drinking water safe.
- This sign is part of the Belmont Water Intake Protection Project. This project, a precautionary effort of the Philadelphia Water Department and the Fairmount Park Commission, has been developed to restore this section of the park and protect your source of drinking water.

*A single goose can produce 1.5 pounds of droppings per day, the 150 geese in this area can produce up to 40 tons of droppings per year!*

*The Belmont Water Treatment Plant, which provides fresh drinking water to Philadelphia, is immediately downstream from where the geese gather.*



**Project Partners:**  
Fairmount Park Commission  
Philadelphia Water Department

**Project Funding:**  
The League of Women Voters of PA, Citizen Education Fund  
Partnership for the Schuylkill Estuary, Inc.

**For more information:**  
215-686-3000 Philadelphia Water Commission  
310-880-0000 Philadelphia Water Department

**Project Partners:**  
Morris Arboretum of the University of Pennsylvania  
PA Department of Environmental Protection  
PA Fish and Boat Commission  
PA Game Commission  
Philadelphia Department of Public Health  
US Environmental Protection Agency  
US Fish and Wildlife Service

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**REMEMBER: CLEAN WATER BEGINS & ENDS WITH YOU!**





Sourcewater Protection;  
Improved Riparian Habitat



# Cobbs Creek Streambank Restoration





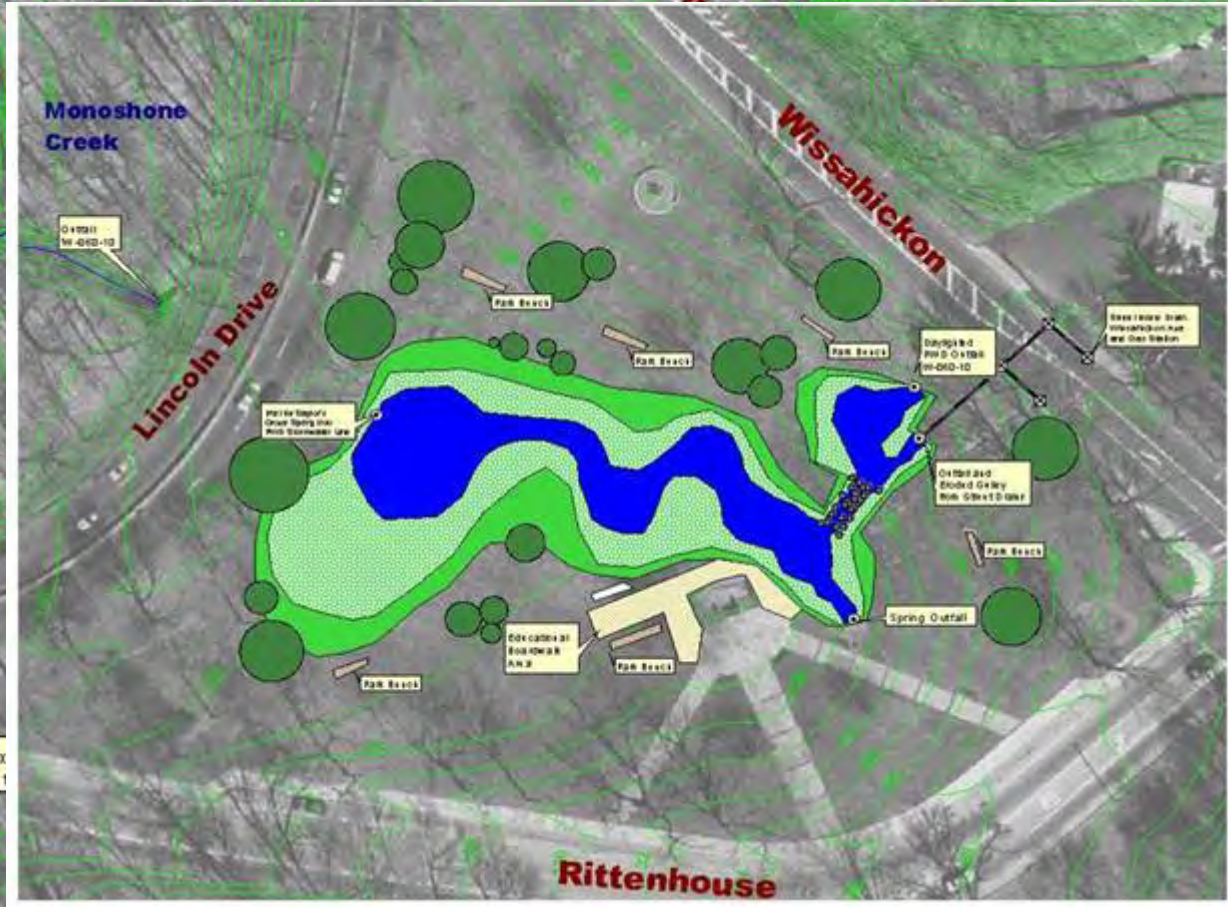








# Saylor Grove Stormwater Wetland









# *Mill Creek Pervious Basketball Court*



4 9:29 AM





22 5:22 PM