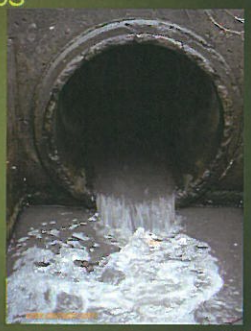
MS4 POLLUTANT PLANNING & REMOVAL REQUIREMENTS

May 18, 2016

Capital Region Council of Governments

Presentation Topics

- MS4 Review
- Pollution Reduction
  - Resources
  - Process
  - Funding Opportunities
- Sample Projects



Information provided is based on the DRAFT MS4 General Permit (PAG13) dated 5/2015.

Review

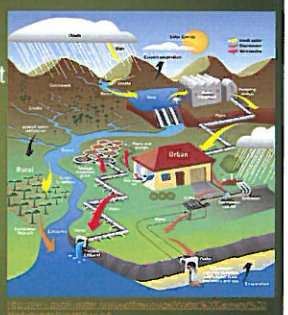
MS4 = Municipal Separate Storm Sewer System

MS4 Short Definition

- Network that conveys exclusively stormwater and is owned or operated by a municipality or similar regulated entity that discharges to a "waters of the United States"

Legal Basis

- 1972 - Clean Water Act
- 1987 – Amendments
  - Beginning of MS4



Goal of MS4 Program

- Prevent polluted runoff from entering watercourses

Purpose of MS4 Permit

- Provide enforceable framework for activities to prevent or mitigate pollution in stormwater

Required Components of the MS4 Permit

- Application/NOI Forms
  - Application Appendices
- Fee
- Minimum Control Measures (MCM)
  - Best Management Practices (BMPs)
- Pollutant Reduction Plan (PRP)
- MOUs

Minimum Control Measures

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-construction Stormwater Management in New Development
6. Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance

Pollutant Reduction

Required Components of the MS4 Permit

- Application/NOI Forms
  - Application Appendices
- Fee
- Minimum Control Measures (MCM)
  - Best Management Practices (BMPs)
- Pollutant Reduction Plan (PRP)
- MOUs

*Submit with Application/NOI

Sediment and Nutrient Reduction

- Required for MS4s discharging to waters impaired by sediment (siltation) or nutrients (nitrogen and/or phosphorus) **statewide**
- Required for all MS4s located in the Chesapeake Bay Watershed

PA DEP Required Pollutant Targets

- Sediment Reduction 10%
- Phosphorous Reduction 5%

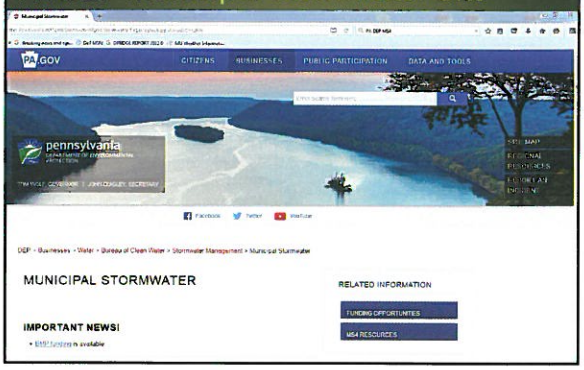
Application Appendices

- Creates the link between pollutant reduction planning and MS4 Permit Application

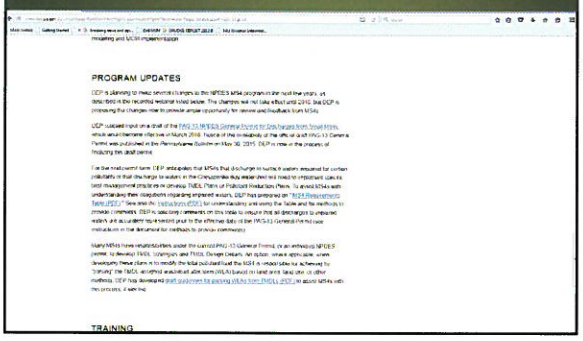
Name	Pollutant	Requirement
Appendix A	Metals and pH	Pollutant Control Measures
Appendix B	Pathogens	Pollutant Control Measures
Appendix C	Organic Compound (PCBs, Chlordane, etc.)	Pollutant Control Measures
Appendix D	Sediment and Nutrients	Chesapeake Pollutant Reduction Plan: Planning document with specific pollutant-reducing projects
Appendix E	Sediment and Nutrients	Pollutant Reduction Plan: Planning document with specific pollutant-reducing projects
TMDL Plan*	Sediment and Nutrients	TMDL Strategy: Planning Document with specific pollutant-reducing projects

Pollutant Control Measures (PCMs) identify source, monitor and report pollutant
Pollutant Reduction Plans (PRPs) reduce pollutant
*TMDL – Applies to Individual Permits where there is a WLA assigned to MS4 (added to instructions 3/29/2016)

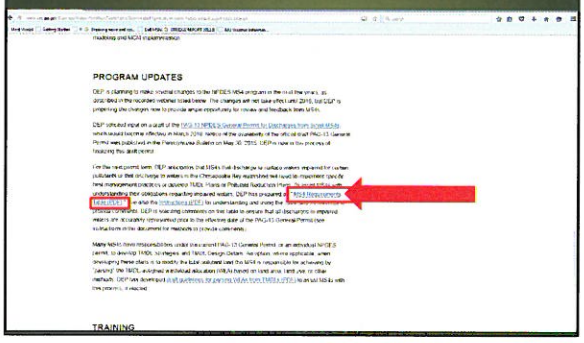
PA DEP Municipal Stormwater Site



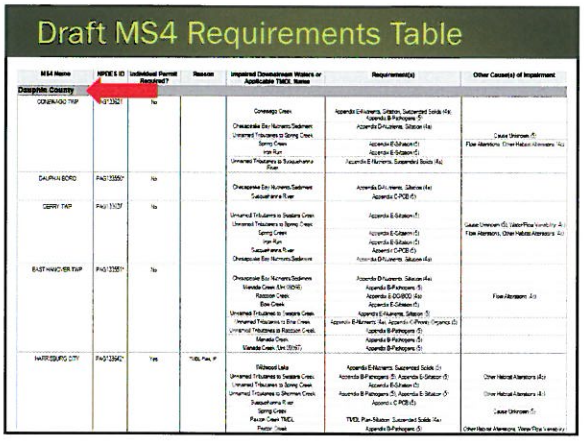
PA DEP Municipal Stormwater Site

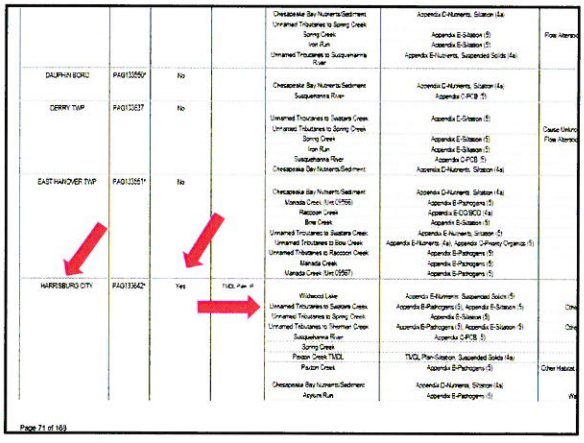


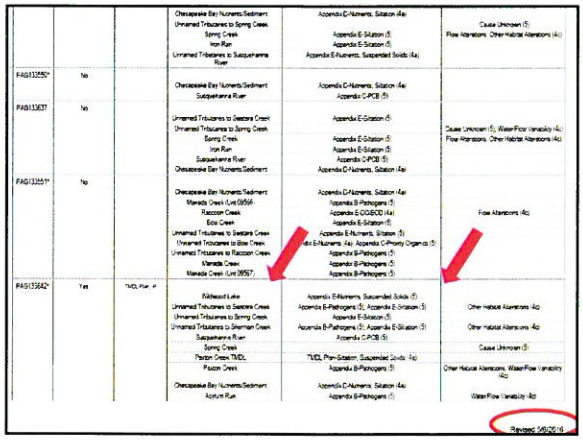
PA DEP Municipal Stormwater Site



Draft MS4 Requirements Table

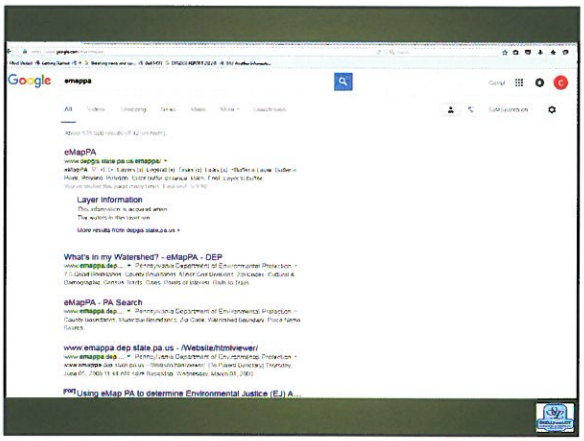


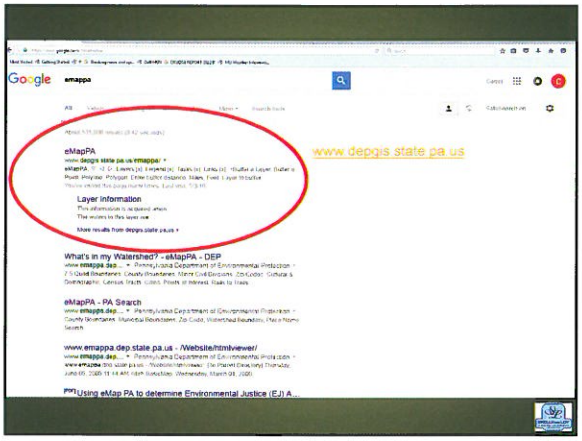


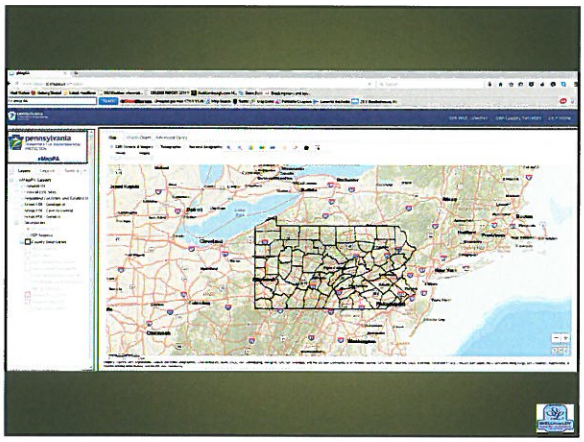


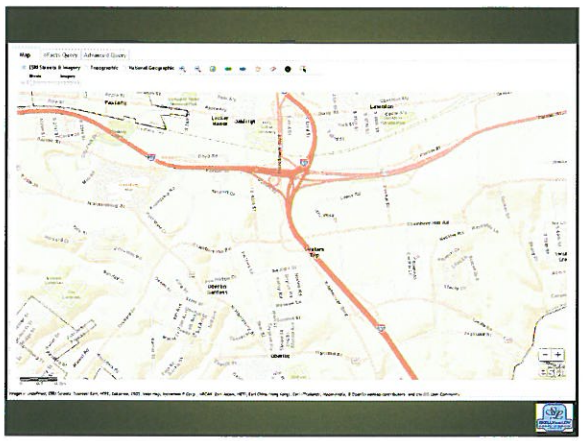
			Chesapeake Bay Nutrients,Sediment Unnamed Tributaries to Spring Creek Spring Creek Iron Run Unnamed Tributaries to Susquehanna River	Appendix C-Nutrients, Siltation (4a) Appendix E-Siltation (5) Appendix E-Siltation (5) Appendix E-Nutrients, Suspended Solids (4a)	Cause Unknown (5) Flow Alterations, Other Habitat Alterations (4c)
PAG133556*	No		Chesapeake Bay Nutrients,Sediment Susquehanna River	Appendix C-Nutrients, Siltation (4a) Appendix C-PCB (5)	
PAG133637	No		Unnamed Tributaries to Swatara Creek Unnamed Tributaries to Spring Creek Spring Creek Iron Run Susquehanna River Chesapeake Bay Nutrients,Sediment	Appendix E-Siltation (5) Appendix E-Siltation (5) Appendix E-Siltation (5) Appendix C-PCB (5) Appendix C-Nutrients, Siltation (4a)	Cause Unknown (5), Water Flow Variability (4c) Flow Alterations, Other Habitat Alterations (4c)
PAG133655**	No		Chesapeake Bay Nutrients,Sediment Manada Creek (Lwe 09566 Raccoon Creek Bow Creek Unnamed Tributaries to Swatara Creek Unnamed Tributaries to Bow Creek Unnamed Tributaries to Raccoon Creek Manada Creek Manada Creek (Lwe 09567	Appendix C-Nutrients, Siltation (4a) Appendix B-Pathogens (5) Appendix E-DO;BOD (4a) Appendix E-Siltation (5) Appendix E-Nutrients, Siltation (5) Appendix E-Nutrients, 4a) Appendix C-Priority Organics (5) Appendix B-Pathogens (5) Appendix B-Pathogens (5) Appendix B-Pathogens (5)	Flow Alterations (4c)
PAG133642*	Yes	TMDL Plan #	Nutwood Lake Unnamed Tributaries to Swatara Creek Unnamed Tributaries to Spring Creek Unnamed Tributaries to Sherman Creek Susquehanna River Spring Creek Paxton Creek TMDL Paxton Creek Chesapeake Bay Nutrients,Sediment Asylum Run	Appendix E-Nutrients, Suspended Solids (5) Appendix B-Pathogens (5), Appendix E-Siltation (5) Appendix E-Siltation (5) Appendix B-Pathogens (5), Appendix E-Siltation (5) Appendix C-PCB (5) TMDL Plan-Siltation, Suspended Solids (4a) Appendix B-Pathogens (5) Appendix C-Nutrients, Siltation (4a) Appendix B-Pathogens (5)	Other Habitat Alterations (4c) Other Habitat Alterations (4c) Cause Unknown (5) Other Habitat Alterations, Water Flow Variability (4c) Water Flow Variability (4c)

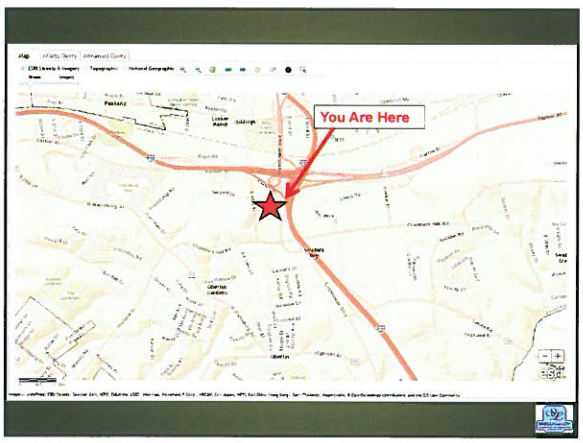
Revised 5/6/2016

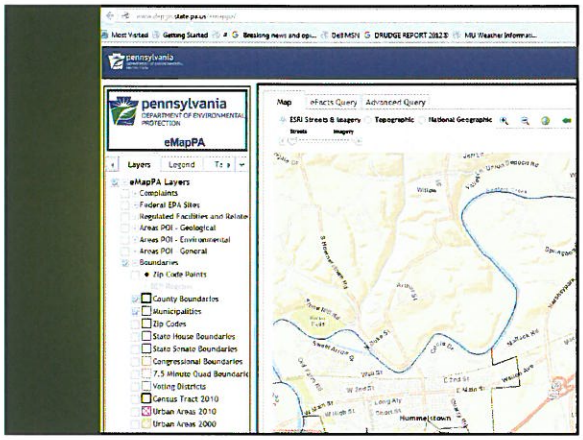


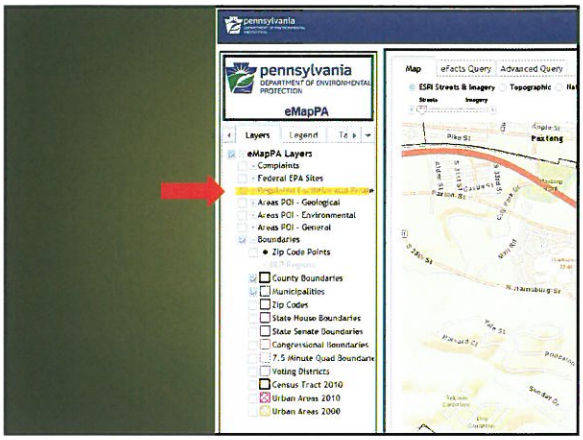


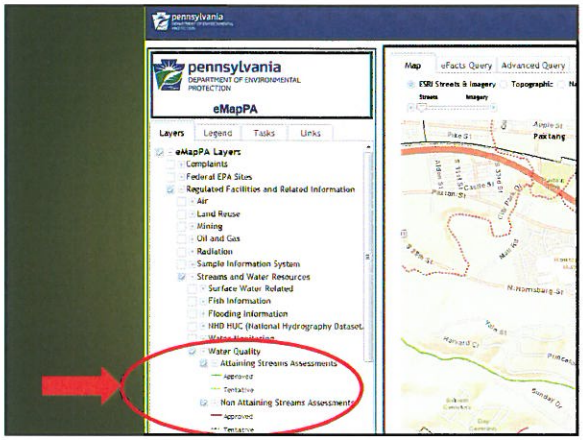


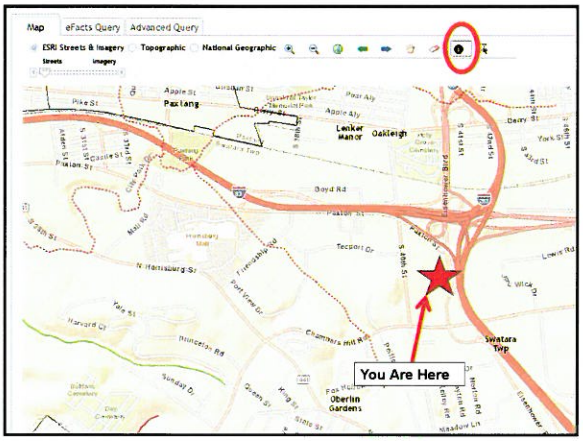


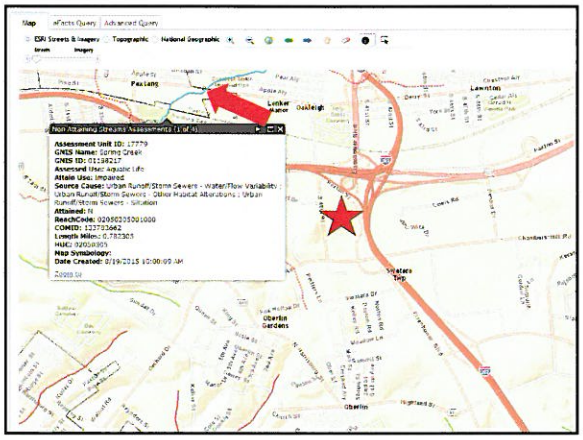


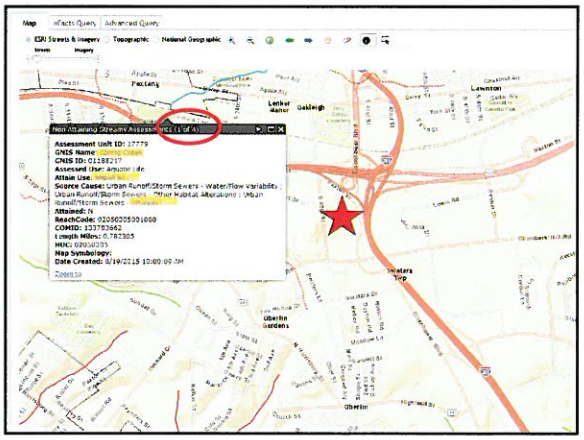

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
eMapPA
Layers
Legend
eMapPA Layers
Complaints
Federal EPA Sites
Areas POI - Geological
Areas POI - Environmental
Areas POI - General
Boundaries
Zip Code Points
County Boundaries
Municipalities
Zip Codes
State House Boundaries
State Senate Boundaries
Congressional Boundaries
7.5 Minute Quad Boundaries
Voting Districts
Census Tract 2010
Urban Areas 2010
Urban Areas 2000
Map
eFacts Query
Advanced Query

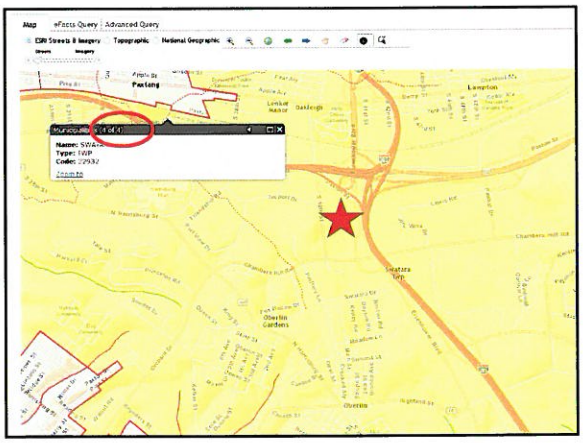

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
eMapPA
Layers
Legend
eMapPA Layers
Complaints
Federal EPA Sites
Areas POI - Geological
Areas POI - Environmental
Areas POI - General
Boundaries
Zip Code Points
County Boundaries
Municipalities
Zip Codes
State House Boundaries
State Senate Boundaries
Congressional Boundaries
7.5 Minute Quad Boundaries
Voting Districts
Census Tract 2010
Urban Areas 2010
Urban Areas 2000
Map
eFacts Query
Advanced Query

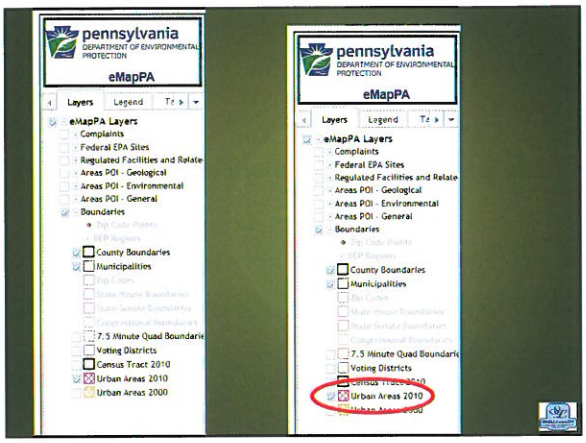

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
eMapPA
Layers
Legend
Tasks
Links
eMapPA Layers
Complaints
Federal EPA Sites
Regulated Facilities and Related Information
Air
Land Reuse
Mining
Oil and Gas
Radiation
Sample Information System
Streams and Water Resources
Surface Water Related
Fish Information
Flooding Information
NHD HUC (National Hydrography Dataset
Water Quality
Attaining Streams Assessments
Approved
Tentative
Non Attaining Streams Assessments
Approved
Tentative
Map
eFacts Query
Advanced Query

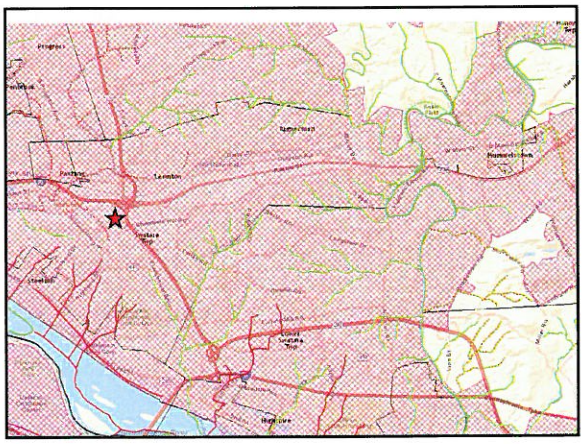

Map
eFacts Query
Advanced Query
ESRI Streets & Imagery
Topographic
National Geographic
Paxtang
Lenker Manor
Oakleigh
Boyd Rd
Swatara Twp
Oberlin Gardens
You Are Here

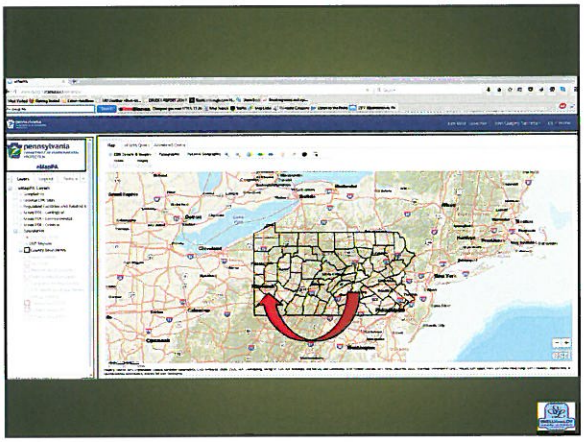

Map
eFacts Query
Advanced Query
Non Attaining Streams Assessments (1 of 4)
Assessment Unit ID: 17779
GNIS Name: Spring Creek
GNIS ID: 01198217
Assessed Use: Aquatic Life
Attain Use: Impaired
Source Cause: Urban Runoff/Storm Sewers - Water/Flow Variability ; Urban Runoff/Storm Sewers - Other Habitat Alterations ; Urban Runoff/Storm Sewers - Siltation
Attained: N
ReachCode: 02050205001000
COMID: 123783662
Length Miles: 0.782305
HUC: 02050205
Map Symbology:
Date Created: 8/19/2015 10:00:00 AM
Zoom to
Paxtang
Lenker Manor
Oakleigh
Lawnton
Swatara Twp
Oberlin Gardens

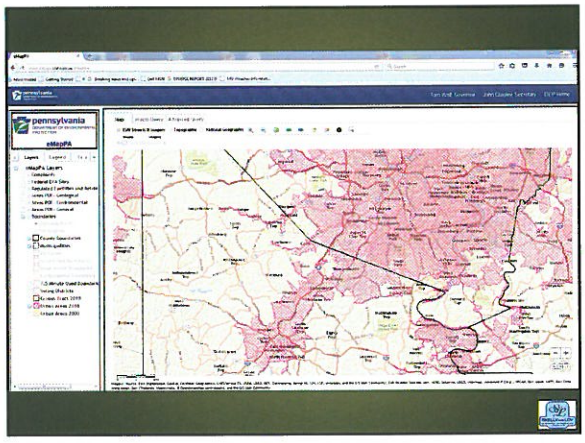

Map
eFacts Query
Advanced Query
Non Attaining Streams Assessments (1 of 4)
Assessment Unit ID: 17779
GNIS Name: Spring Creek
GNIS ID: 01198217
Assessed Use: Aquatic Life
Attain Use: Impaired
Source Cause: Urban Runoff/Storm Sewers - Water/Flow Variability ; Urban Runoff/Storm Sewers - Other Habitat Alterations ; Urban Runoff/Storm Sewers - Siltation
Attained: N
ReachCode: 02050205001000
COMID: 123783662
Length Miles: 0.782305
HUC: 02050205
Map Symbology:
Date Created: 8/19/2015 10:00:00 AM
Zoom to
Paxtang
Lenker Manor
Oakleigh
Lawnton
Swatara Twp
Oberlin Gardens

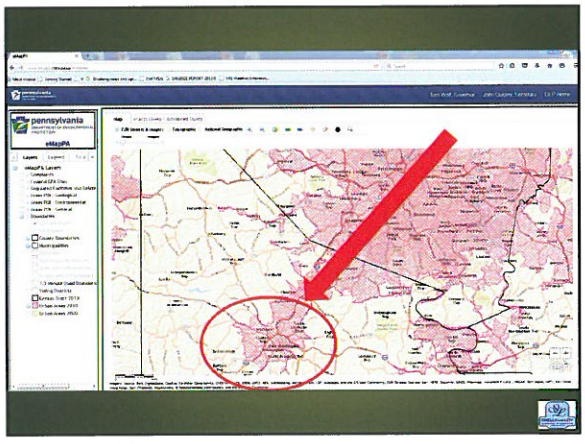

Map
eFacts Query
Advanced Query
Municipality
Name:
Type:
Code:


pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
eMapPA
Layers
Legend
eMapPA Layers
Complaints
Federal EPA Sites
Regulated Facilities and Relate
Areas POI - Geological
Areas POI - Environmental
Areas POI - General
Boundaries
County Boundaries
Municipalities
7.5 Minute Quad Boundarie
Voting Districts
Census Tract 2010
Urban Areas 2010
Urban Areas 2000

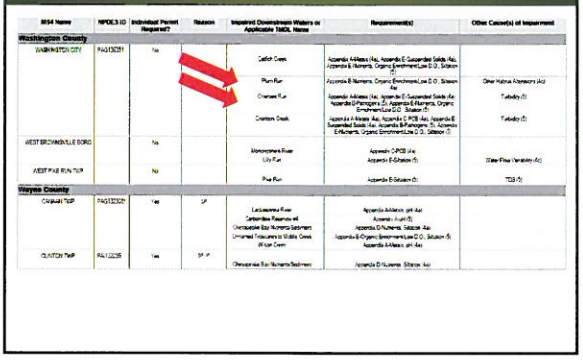



pennsylvania


pennsylvania
eMapPA

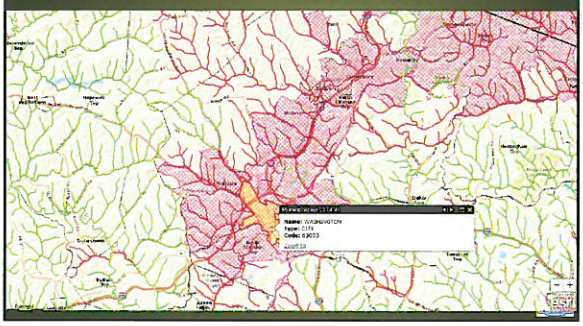

pennsylvania
eMapPA

City of Washington, PA

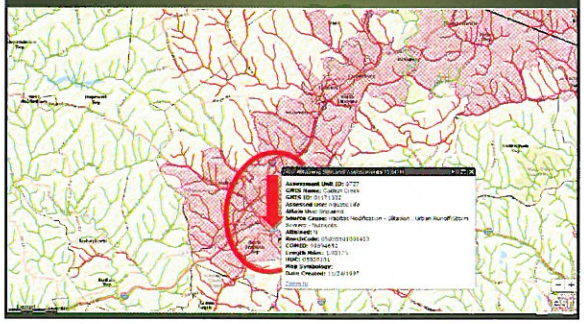


MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Washington County						
WASHINGTON CITY	PAG136231	No		Catfish Creek	Appendix A-Metals (Al), Appendix E-Suspended Solids (As), Appendix B-Nutrients, Organic Enrichment/Low D.O., Siltation (S)	
				Plum Run	Appendix B-Nutrients, Organic Enrichment/Low D.O., Siltation (S)	Other Habitat Alterations (As)
				Chartiers Run	Appendix A-Metals (As), Appendix E-Suspended Solids (As), Appendix B-Pathogens (I), Appendix B-Nutrients, Organic Enrichment/Low D.O., Siltation (S)	Turbidity (I)
				Chartiers Creek	Appendix A-Metals (As), Appendix C-PCB (As), Appendix E-Suspended Solids (As), Appendix B-Pathogens (I), Appendix B-Nutrients, Organic Enrichment/Low D.O., Siltation (S)	Turbidity (I)
WEST BROWNSVILLE BORO		No				
				Monongahela River	Appendix C-PCB (As)	
WEST PIKE RUN TWP		No		Lilly Run	Appendix B-Siltation (S)	Water Flow Variation (As)
				Pike Run	Appendix B-Siltation (S)	TDS (I)
Wayne County						
CARMAN TWP	PAG136225	Yes	SP	Lackawanna River, Carbondale Reservoir, Unnamed Tributary to Bobbs Creek, Wilson Creek	Appendix A-Metals (pH, As), Appendix I-Iron (I), Appendix D-Nutrients, Siltation, Algae, Appendix B-Organic Enrichment/Low D.O., Siltation (S), Appendix A-Metals (pH, As)	
CLINTON TWP	PAG136235	Yes	SP, P	Dyberry Creek, Unnamed Tributaries to Dyberry Creek	Appendix D-Nutrients, Siltation, As	

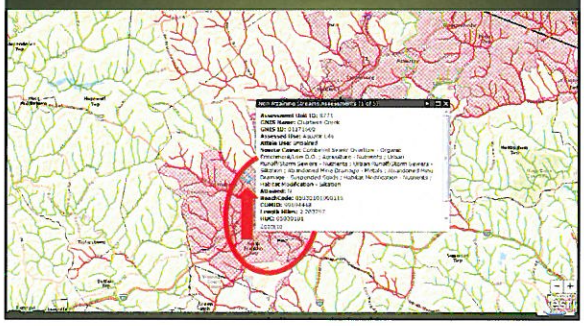
City of Washington, PA



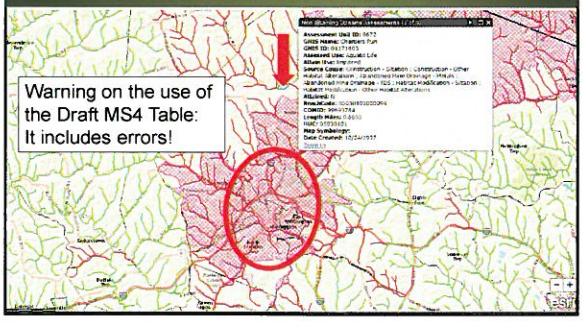
City of Washington, PA
Catfish Creek



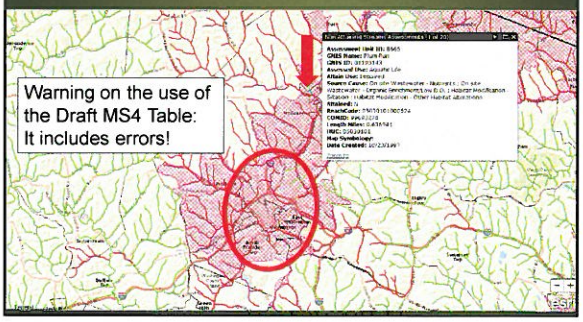
City of Washington, PA
Chartiers Creek



City of Washington, PA
Chartiers Run



City of Washington, PA
Plum Run



eMapPA

- http://www.depgis.state.pa.us/emappa/
- Other Information of interest to MS4
  - Approved Act 167 plans
  - Watersheds
  - Water quality and use designation (Double check Chapter 93 list)
  - Approved Total Daily Maximum Load (TMDL)
    - usually with path to TMDL report as well as approval dates

Pollutant Control Measures

- Response to Appendices
  - Appendix A (Metals and pH)
  - Appendix B (Pathogens)
  - Appendix C (Priority Organic Compounds e.g. PCBs, Pesticides and Chlordane)
- Due Permit Year one (1st Annual Progress Report)
- Inventory and Map of anthropogenic (manmade) sources of pollutant in stormwater within the regulated stormsewershed that discharge to the impaired stream.
  - Known
  - Suspected

Pollutant Control Measures

Known Pollutant Source	Suspected Pollutant Source
Proposed Action to Control Pollutant	Investigation • Include water sampling if part of IDD&E

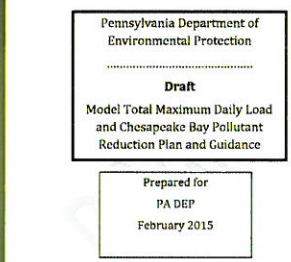
Report progress in Annual Report	Report Discharges into MS4
	• **Pathogen Discharge**
	  ▪ Remedial action taken for sanitary sewage discharges in Annual Report
	  ▪ Create Ordinance (1st year of permit) to control animal waste discharge
	• **Industrial Discharge** (metals, pH, Organic compounds) Report to PA DEP w/in 90 days of finding

Pollutant Reduction Plan

- Sediment and Nutrient Focus
  - Appendix D (Chesapeake Bay watershed)
  - Appendix E (Streams impaired by sediment or nutrients - statewide)
- Due *with* Application/NOI
- Reduction Targets (per Draft PRP Instructions)
  - 10% sediment
  - 5% Phosphorus
- Prior to PA DEP Submission, requires
  - Public advertisement and meeting
  - Public comment period
  - Response to comments
  - Adoption by governing authority

Pollutant Reduction Plan Guidance

- Guidance for preparing plan to reduce pollution to impaired receiving waters
- PA DEP Sample
  http://files.dep.state.pa.us/Water/BPNPSM/StormwaterManagement/MunicipalStormwater/MunMSWResources/Model_TMDL_Plan0527.15.pdf



Pennsylvania Department of Environmental Protection

Draft

Model Total Maximum Daily Load and Chesapeake Bay Pollutant Reduction Plan and Guidance

Prepared for
PA DEP
February 2015

Pollutant Reduction Plan

Map

- Regulated area, orientation and key characteristics for evaluating required pollutant reductions

Narrative

- Written description of pollutant analysis process and prioritized projects to attain pollutant reduction goals

Map:
Delineate MS4 Regulated Area

Contributory Drainage Area to MS4 Outfall(s) (Storm Sewershed)
Identify Excluded Areas • Other directly permitted entities (federal facilities, universities, etc.) • Areas of private ownership or configuration that preclude municipal opportunity for pollutant removal (might be parsed) ○ Example: Parcel whose runoff entirely bypasses municipal network
Streams and Watersheds • All Streams in MS4 Service Area • Identify Impaired Streams
Municipal Boundaries
Urbanized Area
Land Uses and/or Impervious/Pervious Surfaces

Narrative Topics

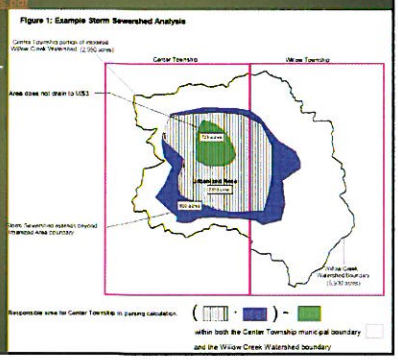
Watershed Characteristics	**Selected Method for Estimating Pollution Loading and Pollution Reduction**
Population Served	**Reduction Targets**
Land Use (acres)	**Alternative Solutions Considered**
Land Cover (Pervious/Impervious %)	**Selected Projects**
Receiving Streams (linear feet)	**Rationale for Selected Projects**
Current Water Quality	**BMP Locations**
Note Impaired Streams	**Summary of Operations and Maintenance**
Excluded Areas	**Preferred Means of Funding**

➢Note: Identify sources of information: U.S. Census, PASDA, USGS National Land cover Database, Locally Available GIS Database

Map: Simplified Sample

http://files.dep.state.pa.us/Water/BPNPSM/StormwaterManagement/MunicipalStormwater/Draft_TMDL_Parsing_Guidelines.pdf

PA DEP Draft Guidelines for Parsing MS4 Wasteload Allocations from TMDLs



Pollutant Loading and Reduction Estimation

- Baseline Pollution Loads
- Targets for Sediment and Phosphorus Reduction
  - General Scenarios to achieve goals
- Selection of Specific BMPs
  - Locations and price

Pollutant Loading and Reduction Estimation

- Simplified Spread Sheets
- Computer Simulations

➢ Chesapeake Bay Program Model Pollutant Removal Effectiveness Values are mandatory for MS4s in the Chesapeake Bay Watershed

➢ Recommended statewide

Simplified Spread Sheet

- Pervious and Impervious
  - Per PA DEP Draft Pollutant Reduction Plan Instructions (3800-PM-BPNPSM0100k Revised 5/2015)
  - Apply Chesapeake Assessment and Scenario Tool (CAST) approved loading rates to generalized land cover areas

According to CAST, Dauphin County's developed land loading rates for TN, TP, and sediment (Sed.) are as follows:

County	Category	TN Loading Rate (lbs/acre/yr)	TP Loading Rate (lbs/acre/yr)	Sed. Loading Rate (lbs/acre/yr)
Dauphin	impervious developed	28.59	1.07	1,999.14
	pervious developed	21.24	0.34	299.62

- Select BMPs to reduce pollutant load.
- Calculate proposed area dedicated to proposed BMP x CAST Pollutant Removal Effectiveness rates = Pollutant Removal per Year
- Add BMPs until Target is achieved

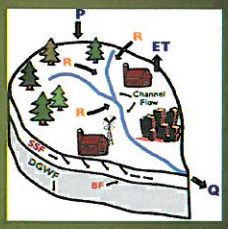
Computer Simulations

- Provide more detailed analysis
- Increases efficiency for reiterative analysis
  - Samples
    - MapShed
    - Chesapeake Bay Facility Assessment Scenario Tool (BayFAST)
    - Chesapeake Assessment Scenario Tools (CAST)
    - EPA Storm Water Management Model (SWMM)

psiee penn state institutes of energy & the environment

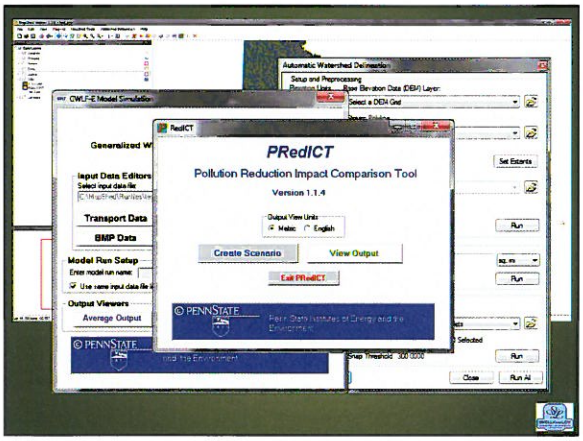
MapShed

V 1.3



MapShed Overview

- GIS-based watershed modeling
  - Uses ESRI formatted data files
  - Free: Based on MapWindow
- GWLF-E – Generalized Watershed Loading Function
  - Used to establish TMDLs for PA since 1999
  - Simulates runoff, sediment, nutrient loads (N and P) and colony forming units (CFUs)
  - Simulates BMP pollutant removal using default or user modified efficiencies
- PRedICT – Pollutant Reduction Impact Comparison Tool
  - Detailed pollutant reduction predictions using watershed level scenarios
  - Cost comparison of scenarios



MapShed Pros & Cons

- Pros
  - Free
  - Flexible – Can be used statewide
    - Chesapeake Bay (Susquehanna and Potomac Rivers), Ohio River, Lake Erie, Genesee River, Delaware River
    - Can import other GIS shapefiles such as storm sewershed boundaries
  - Watershed data loaded for all of PA (also for New York and New England)
  - Customizable: Can adjust land cover and BMP efficiencies
  - Includes a variety of pollutants in database
  - Good tutorials

MapShed Pros & Cons

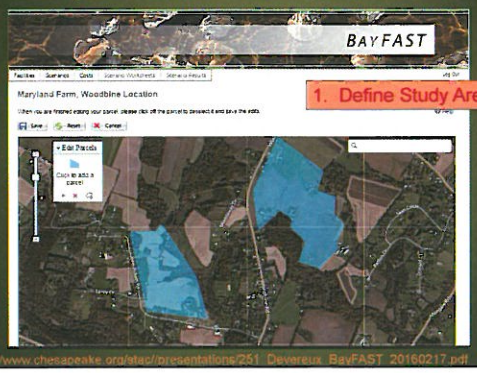
- Cons
  - Challenging for initial setup
  - Better used for macro scale (general planning level)
    - Not designed to be accurate at site specific scale
  - Chesapeake efficiencies are not the default
    - Being upgraded to allow for Chesapeake Bay efficiencies override to be toggled on

BAYFAST

Chesapeake Bay Facility Assessment Scenario Tool

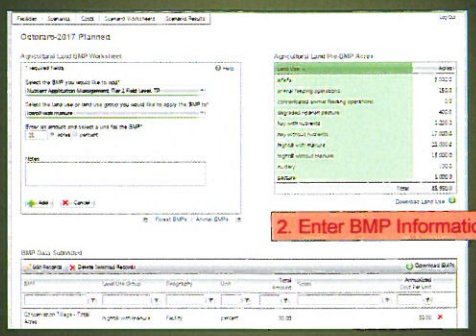
BayFAST

Images retrieved from WWW.BAYFAST.ORG Presentation by Olivia Devereux February 17, 2016



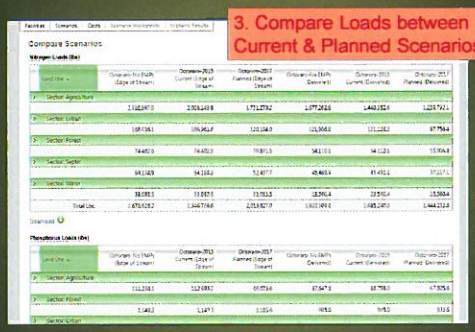
http://www.chesapeake.org/stac//presentations/251_Devereux_BayFAST_20160217.pdf

Images retrieved from WWW.BAYFAST.ORG Presentation by Olivia Devereux February 17, 2016



http://www.chesapeake.org/stac//presentations/251_Devereux_BayFAST_20160217.pdf

Images retrieved from WWW.BAYFAST.ORG Presentation by Olivia Devereux February 17, 2016



http://www.chesapeake.org/stac//presentations/251_Devereux_BayFAST_20160217.pdf

BayFAST Pros & Cons

- Pros
  - Free
  - Uses Chesapeake Bay Program approved BMPs and efficiencies
  - Watershed pollutant load data for areas contributory to the Chesapeake Bay
  - Easy to use…Fast
  - Good for site specific projects
    - User defines planning area and proposed land uses
  - Customizable: Can adjust defaults (land cover & construction estimating unit costs)
  - Good Support and Training
  - Frequently updated to improve consistency with other Chesapeake Bay Program approved models and to add features

BayFAST Pros & Cons

- Cons
  - Can't import a project boundary from another program like CAD or GIS
  - Default land cover (landuse) sometimes needs adjustment in urban areas where project area also contains agriculture (open space like parks may be identified as agriculture)

CAST and SWMM

- CAST is the foundation for subsequently created Alternative Scenario Tools (VAST, MAST, BayFAST)
  - Watershed-based (in contrast to project based) planning tool
  - Often used for meeting TMDL allocations
- SWMM very detailed…Others are more appropriate for planning-level models
  - Good for detailed analysis of both flooding and water quality
  - Plan extra front end time to input and verify data required for running simulations

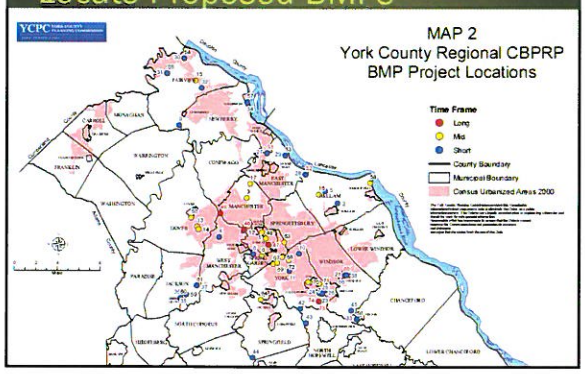
Chesapeake Bay Pollutant Reduction Plan Sample: York County

http://yorkcity.org/user-files/file/City%20Council/BillsResolutions/2015Bills/Chesapeake-Bay-Pollutant-Reduction-Plan.pdf

YORK COUNTY REGIONAL CHESAPEAKE BAY POLLUTANT REDUCTION PLAN

DECEMBER 2014

Locate Proposed BMPs



Locate & Rank Proposed BMPs

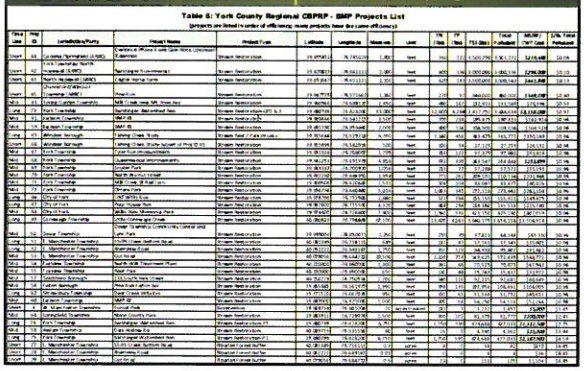


Table 6: York County Regional CBPRP - BMP Projects List
(projects are listed in order of efficiency; many projects have the same efficiency)

Locate & Rank Proposed BMPs

Time Line	Proj ID	Jurisdiction/Party	Project Name	Project Type
Short	44	Codorus/Springfield (ARRC)	Cwiklinski Phase II and Glen Rock Upstream Extension	Stream Restoration
Short	42	York Township/ NC Hopewell (ARRC)	Barshinger Run-Innerest	Stream Restoration
Short	43	North Hopewell (ARRC)	Zeigler Horse Farm	Stream Restoration
Short	45	Chanceford/Windsor	Pine Run	Stream Restoration
Mid	63	Lo	Mill Creek near Mt. Rose Ave	Stream Restoration
Long	73		Barshinger Watershed Ren.	Stream Restoration-GP1 & 3
Mid	61	Jackson Township	BMP #3	Restoration
Mid	59	Jackson Township	BMP #1	Restoration
Long	65	Windsor Borough	Fishing Creek Study	Stream Rest./ Park Improv.
Short	66	Windsor Borough	Fishing Creek Study-Subset of Proj ID 65	Stream Restoration
Mid	67	York Township	Tyler Run Impoundment	Stream Restoration
Mid	68	York Township	Queenswood Improvements	Stream Restoration
Mid	69	York Township	Snyder Park	Stream Restoration
Mid	70	York Township	North Walnut Street	Stream Restoration
Mid	71	York Township	Mill Creek @ Red Lion	Stream Restoration
Mid	72	York Township	Orrens Park	Stream Restoration
Long	46	City of York	UNT Willis Run	Stream Restoration
Long	47	City of York	Poor House Run	Stream Restoration
Mid	48	City of York	Willis Run - Memorial Park	Stream Restoration

Responsible Party

Type of Project

Locate Proposed BMPs

Latitude	Longitude	Measure	Unit	TN (lbs)	TP (lbs)	TSS (lbs)	Total Pollutant	MUNI / CWP Cost	$/lb. Total Pollutant
39.805452	-76.745026	1,800	feet	360	122	3,500,790	3,501,272	*$219,480*	$0.06
39.870833	-76.661111	2,000	feet	400	136	3,000,000	3,000,536	*$296,000*	$0.10
39.851667	-76.651111	2,100	feet	420	143	3,500,000	3,500,583	*$441,846*	$0.13
39.867778	-			270	92	860,000	860,000	*$348,088*	$0.40
39.960966	-76.						3,569	$78,396	$0.59
39.880789	-76.628200	63,000	feet				34,634	*$3,150,000*	$0.92
39.903666	-76.841213	3,500	feet	700	238	189,875	190,813	$182,924	$0.96
39.891780	-76.859460	2,000	feet	400	136	108,500	109,036	$104,528	$0.96
39.915646	-76.579213	6,700	feet	1,340	456	363,475	365,271	$350,169	$0.96
39.915699	-76.582016	500	feet	100	34	27,125	27,259	$26,132	$0.96
39.931928	-76.708007	1,795	feet	359	122	97,379	97,860	$93,814	$0.96
39.941253	-76.691979	4,858	feet	972	330	263,547	264,848	*$253,899*	$0.96
39.933387	-76.700970	1,056	feet	211	72	57,288	57,571	$55,191	$0.96
39.907280	-76.646950	3,854	feet	771	262	209,101	210,134	$201,446	$0.96
39.900500	-76.620680	1,531	feet	306	104	83,067	83,477	$80,026	$0.96
39.936736	-76.680460	5,016	feet	1,003	341	272,118	273,462	$262,156	$0.96
39.978700	-76.757900	2,860	feet	572	194	155,155	155,921	$149,475	$0.96

Specific Location

Cost Estimate

Select BMPs for Implementation During Permit Period

Table 7: York County Regional CBPRP 2014-2015 Action Plan

Time Line	Proj ID	Jurisdiction/Party	Project Name	Project Type	Latitude	Longitude	Measure	Unit	Total Pollutant	MUNI/ CWP Cost	$/lb. Total Pollutant
Long	73	York Township	Bashinger Watershed Ren	Stream Restoration-GPI 1 & 3	39.880789	-76.628200	63,900	feet	3,434,934	$3,150,000	$0.92
Mid	99	Jackson Township	BMP #1	Stream Restoration	39.891780	-76.859460	2,900	feet	109,936	$104,528	$0.96
Mid	83	Spring Garden Township	Mill Creek near Mt. Rose Ave	Stream Restoration	39.960968	-76.888120	2,450	feet	133,569	$78,396	$0.59
Short	44	Codorus/ Springfield Townships (ARRC)	Cwikinski Phase II and Glen Rock Upstream Extension	Stream Restoration	39.805452	-76.745025	1,800	feet	3,500,790	$219,480	$0.06
Short	5	Hellam Township	Ore Bank & Spring Rd	Bioswale	40.029241	-76.615096	4	acres treated	744	$17,190	$23.12
Short	98	Windsor Borough	Fishing Creek Study-Subset of Proj ID 65	Stream Restoration	39.915993	-76.582016	500	feet	27,259	$26,132	$0.96
Short	38	Windsor Borough	Fishing Creek Study	Riparian Forest Buffer	39.915646	-76.579213	0.1	acres	8	$72	$8.65
Short	4	West Manchester Township	Sunset Park	Bioretention	39.968754	-76.801098	20	2268 treated	3,457	$5,000	$1.45
Short	35	Jackson Township	BMP #1	Riparian Forest Buffer	39.891780	-76.859460	46	acres	6,241	$55,200	$8.85

Prepared by York County Planning Commission and Center for Watershed Protection in Cooperation with the Regional CBPRP Steering Committee

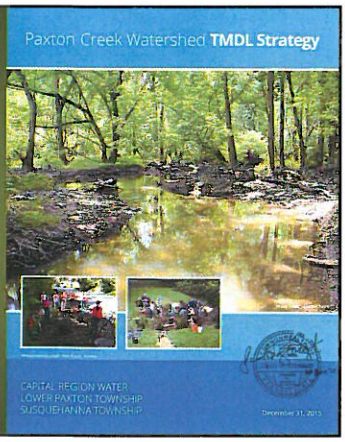
TMDL Strategy

- Sediment and Nutrient Focus
- Due *with* Application
- Applies only to Individual Permits where MS4 has an identified Waste Load Allocation (WLA) for Sediment or Nutrients

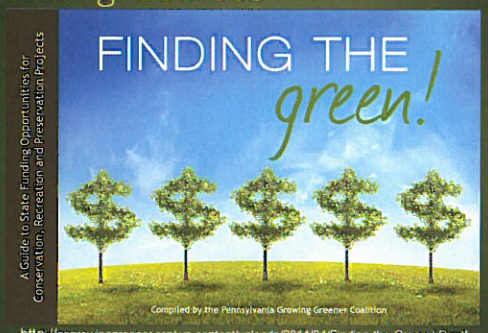
TMDL Strategy Sample

- Strategy for achieving pollution reduction targets in an approved TMDL
- Collaborative Example

http://capitalregionwater.com/wp-content/uploads/2015/11/Paxton-Creek-Watershed-TMDL-Strategy-Final-123115.pdf



Funding: Sources



http://pagrowinggreener.org/wp-content/uploads/2014/04/Finding-the-Green-LR.pdf

Funding: Sources

PA DCED	US EPA
PA DCNR	US Army Corps of Engineers
PA DEP	US Housing and Urban Development
PennDOT	National Fish and Wildlife
PennVEST	Chesapeake Bay Foundation
PA Public Utility Commission	Chesapeake Bay Trust
PA Fish and Boat Commission	Land Trust and Conservancies
Commonwealth Financing Assoc	Endowments
League of Women Voters	Users Fees
	General Funds

Funding: Sources

PA DCED	US EPA
PA DCNR	US Army Corps of Engineers
PA DEP	US Housing and Urban Development
PennDOT	National Fish and Wildlife
PennVEST	Chesapeake Bay Foundation
PA Public Utility Commission	Chesapeake Bay Trust
PA Fish and Boat Commission	Land Trust and Conservancies
Commonwealth Financing Assoc	Endowments
League of Women Voters	Users Fees
	General Funds

Other Resources

- PADEP MS4 Resources Page

http://www.dep.pa.gov/Business/Water/PointNonPoint/StormwaterMgmt/Stormwater/Pages/MS4-Resources.aspx#.VvA4uvkrKUk

Maps, Modeling Tools

- Materials Related to MCMs
- Draft MS4 Water Quality Requirements
- Other DEP, EPA and Philadelphia Reference material

Sample Projects: BMP Retrofit- Catfish Creek, Washington, PA