

HRG

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How Adopting And Updating An Act 167 Plan Helps Manage Stormwater More Effectively:

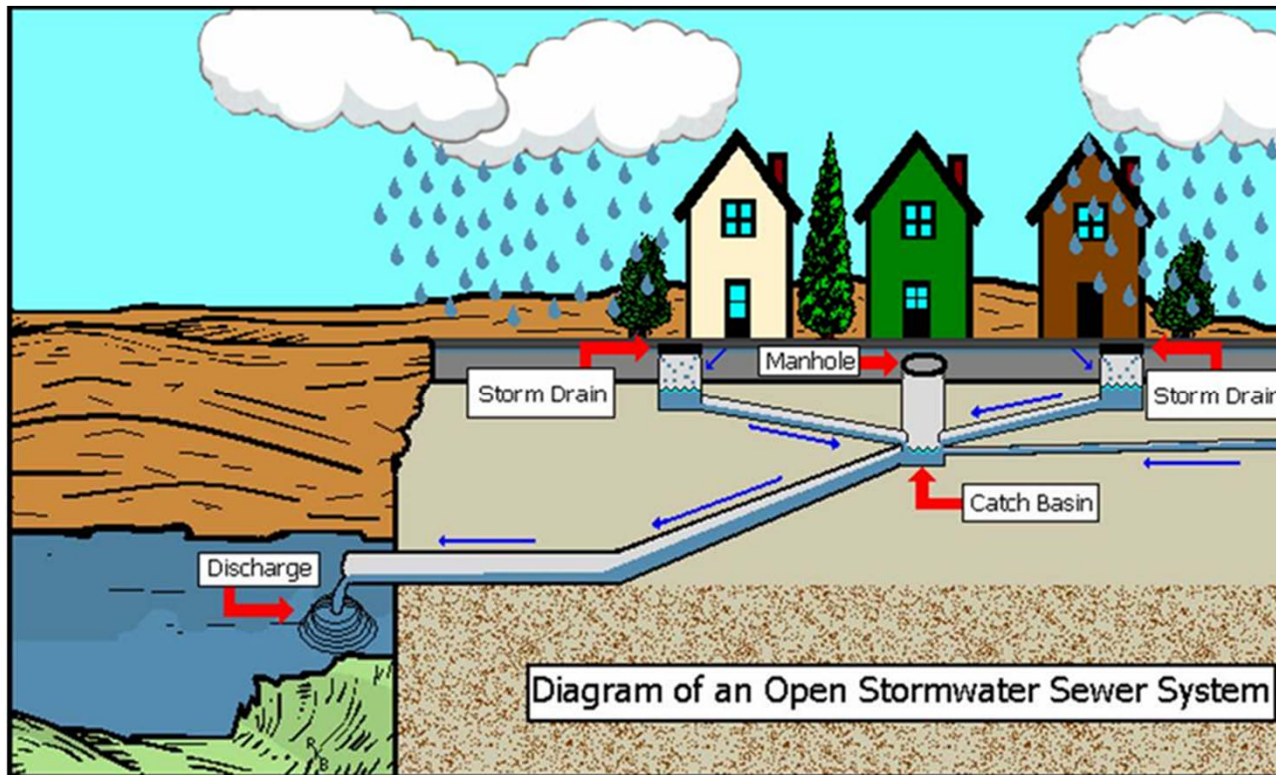
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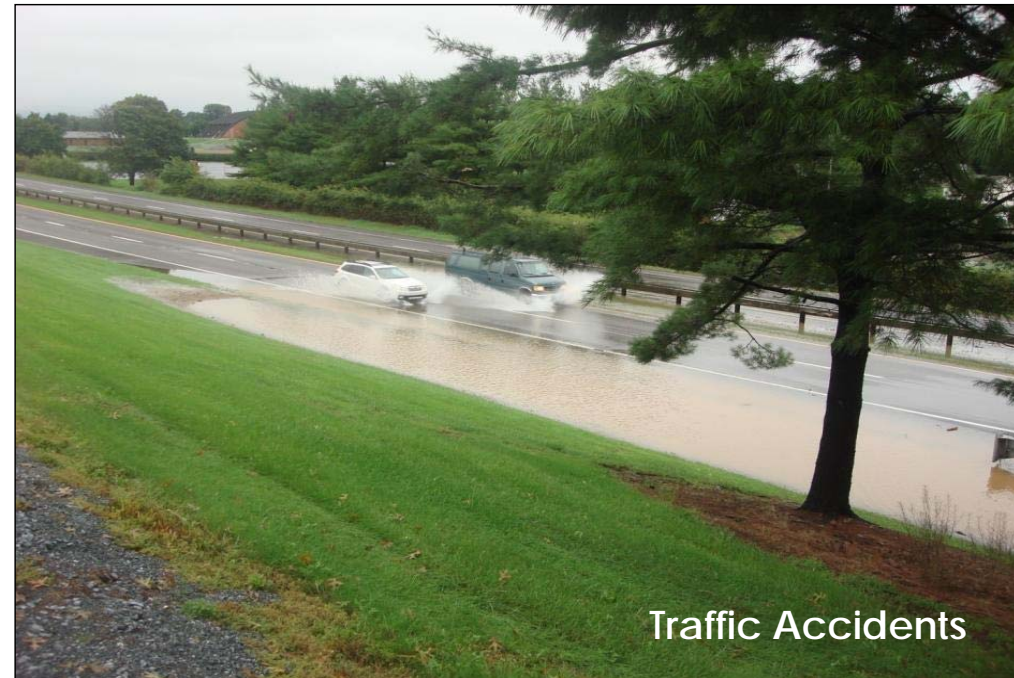
Ben Gilberti, P.E.

Stormwater Basics:

- > Stormwater is water runoff after a rain storm from streets, construction sites, parking lots, buildings and other areas that goes directly into storm drains and eventually into local streams and rivers.



Why is Good Stormwater Management Important?:



Why is Good Stormwater Management Important?:



What we will discuss today:

01 What Is Act 167?

02 How Is A Plan Completed And Implemented

03 Direct Impacts to Stormwater Management

04 What Are Some Side Benefits Of A Act 167 Plan

What Is An Act 167 Stormwater Plan?

01

History of Act 167

- > The Pennsylvania Stormwater Management Act Of 1978 (PDF), Or Act 167, Requires Every County To Prepare And Adopt A Watershed Stormwater Management Plan In Consultation With The Municipalities In The County.
- > The Goal of the Plan is to Provide Control Measures that affect Stormwater runoff, including Quality, Quantity, and Groundwater Recharge
- > Implementation by Adopting Ordinances and Regulations of Municipalities

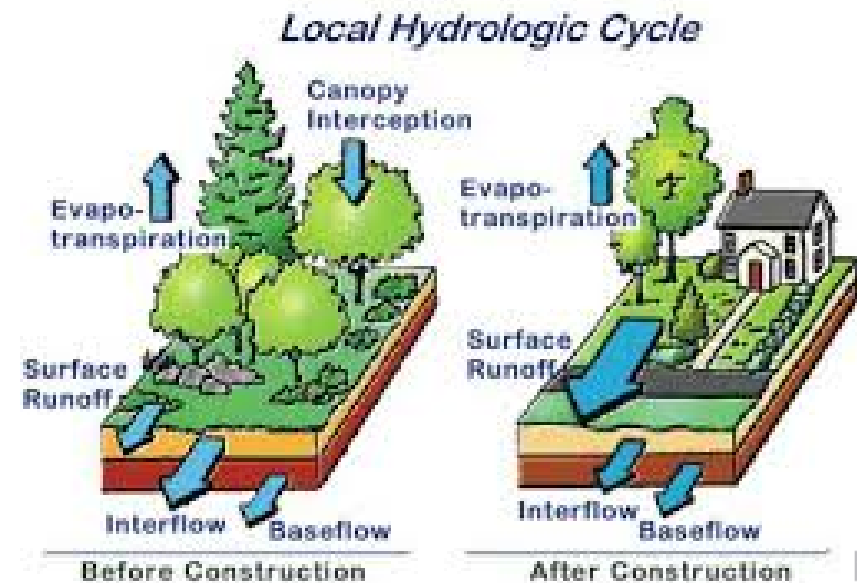
Quote From The Act

Quoted From the Act

“Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health and safety.”

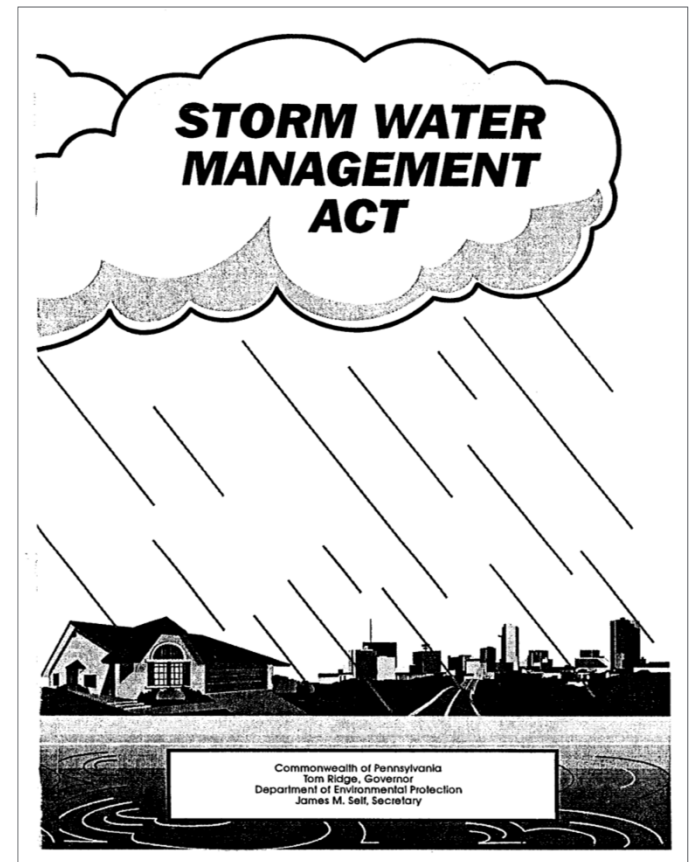
Quote From The Act

“A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety and welfare and the protection of the people of the Commonwealth, their resources, and the environment.”

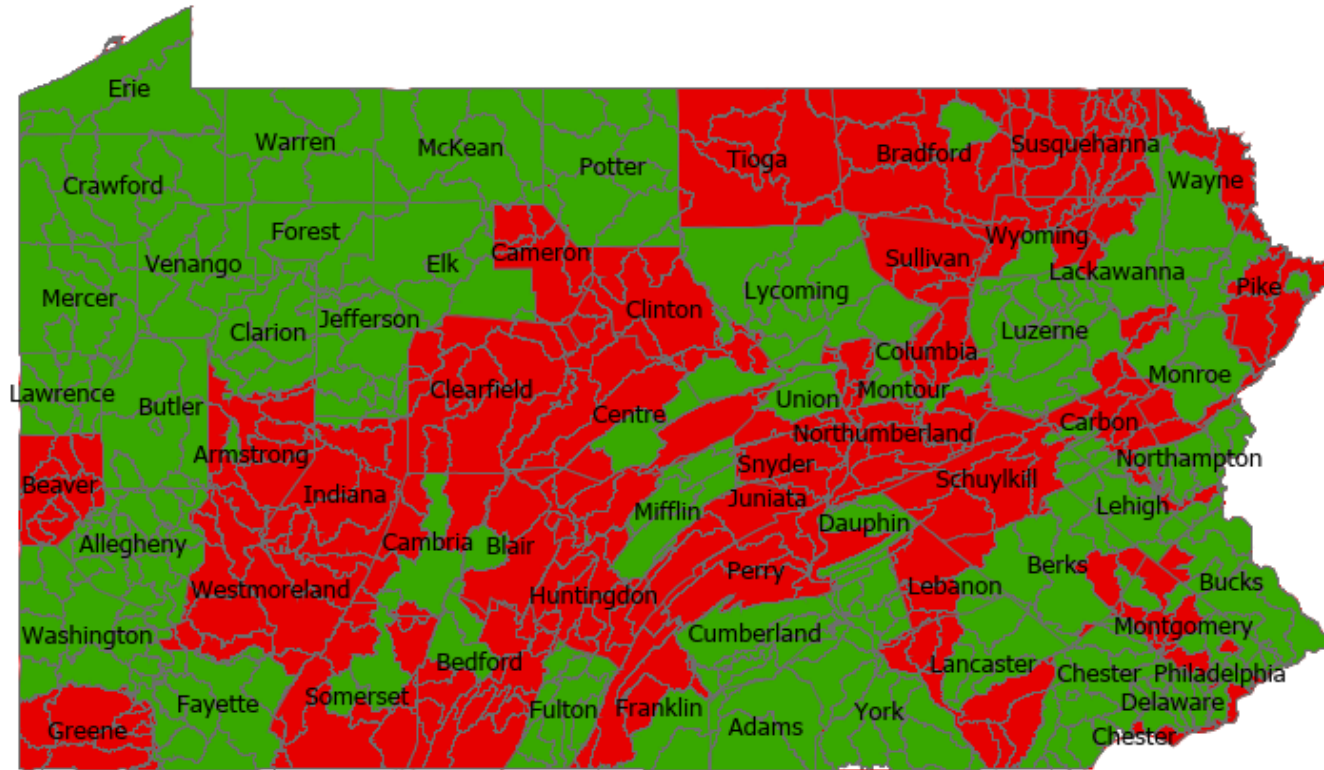


Act 167 Of 1978

- > Requires Each County To Develop & Adopt Plan For Each Watershed
- > Control Runoff Quantity/Quality; Protect Groundwater And Channel
- > DEP Reviews and Approves Plan
- > Municipalities Adopt Standards And Provisions of the Plan (Ordinance)



Who Has Completed Act 167 Plans



How Is A Plan Completed And Implemented

02

The Phases of Act 167

- > The Act Separates The Plan Into Two Separate Phases
- > Phase I - Scope Of Study
 - Establishing Procedures Used To Prepare The Plan
 - Assists In Setting Scope For Second Phase
- > Phase II - Scope Of Study
 - The Technical Assessment of Watershed
 - Identification of Problem Areas and Obstructions
 - Development Of The Model Ordinance
- > Plan Update
 - Every Five Years
 - Evaluate Implementation Success

Phase I - Scope Of Study

- > Establishes Watershed Working Groups (WPAC)
- > Solidifies Goals And Objectives Of The Plan.
- > Specific Watershed Characteristics And Hydrologic Conditions.
- > Discuss Problems And Significant Obstruction
- > Evaluate Alternative Measures For Control
- > Determine Scope And Cost Of Future Phase

From Butler County Comprehensive Plan	
Category	Percent
Urban Residential	4 %
Rural Residential	4 %
Industrial	5 %
Mixed Use Development	5 %
Public/Semi-Public	2 %
TOTAL DEVELOPED	20 %
Wooded/Forested	45 %
Wetlands	2 %
Major Bodies of Water	2 %
Strip Mined	1 %
TOTAL UNDEVELOPED	50 %
AGRICULTURAL	30 %
TOTAL COUNTY	100.0%

What is a Watershed Advisory Committee (WPAC)?

- > In Order To Initiate Municipal Level Involvement In The Overall Development Of The Plan
- > Watershed Plan Advisory Committee (WPAC) Typically Consists Of:
 - County Planning Commission
 - All Municipalities Within The County
 - County Conservation District
 - Pennsylvania Department Of Transportation (PENNDOT)
 - Other Interested Organizations

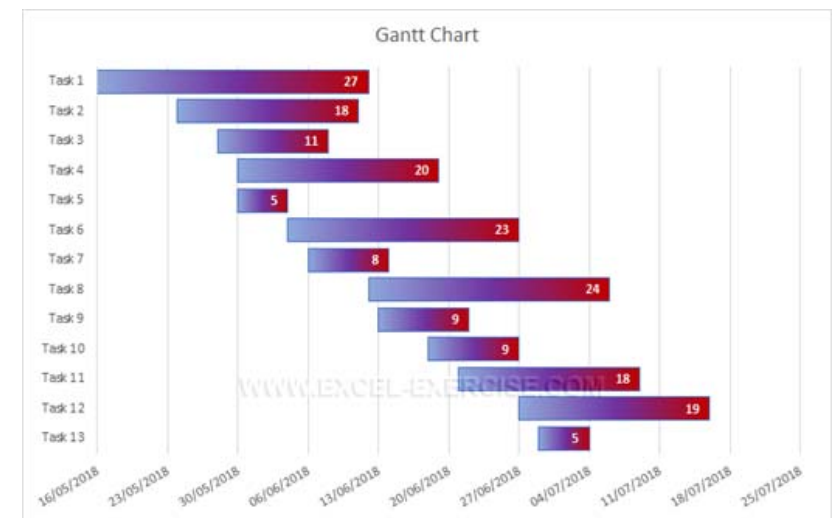
The Role of The Watershed Advisory Committee

- > Obtain General Municipal And Organizational Commitment To The Project
- > Communicate The Goals And Obtain Input At The Local Level.
- > Determined Scope And Level Of Effort To Complete The Plan



Phase I – Typical Schedules

- > Schedule Dependent on Size of County and Number of Coordination Meetings
- > Typical Phase 1 includes 2- 3 Meetings
- > Schedule Typically is 9 – 12 Months



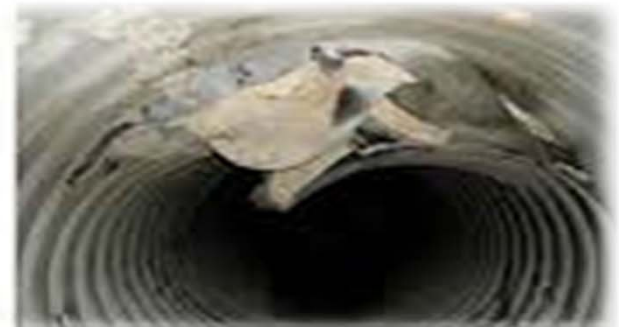
Phase I – Typical Costs

- > Costs Dependent on Size of County and Number of Coordination Meetings
- > Typical Phase 1 Cost can Range from \$10-\$20K
- > Cost Sharing available from DEP at 75%* (When Funding Available)



Phase 2 - Scope Of Study

- > Complete Watershed Planning And Modeling.
- > Identification Of Administrative Procedures For Implementation Of The Plan
- > Identify Problem Areas



Phase 2 - Scope Of Study

- > Development Of Technical Standards And Criteria For Stormwater Management (Model Ordinance)
- > Adoption By County
- > Approval By PADEP
- > Adoption of Model Ordinance By All Municipalities
- > Municipal Implementation



Phase 2 – Typical Schedules

- > Schedule Dependent on:
 - Number of Meetings
 - Number of Problem Area Analysis
 - Extents of Watershed Modeling
- > Typical Phase 2 includes 4-12 Meetings
- > Schedule Typically is 12 – 24 Months

Phase 2 – Typical Costs

- > Costs of Phase 2 work Determined by Scoping Efforts in Phase 1
- > Costs Dependent on Extents of Modeling, Number of Meetings, and Number of Problem Area Analysis
- > Typical Phase 2 Cost can Range from \$75-\$350K
- > Cost Sharing available from DEP at 75%*
(When Funding Available)



Act 167 Plan Updates

- > Per The Act, The Plan Should Be Updated Every Five Years
- > Evaluate Growth Assumptions From the Approved Plan to Actual Growth Experienced
- > Evaluate Implementation Effectiveness
- > Address Inconsistencies as Necessary
- > Look at New Stormwater Regulations/Methodologies



Direct Impacts to Stormwater Management

03

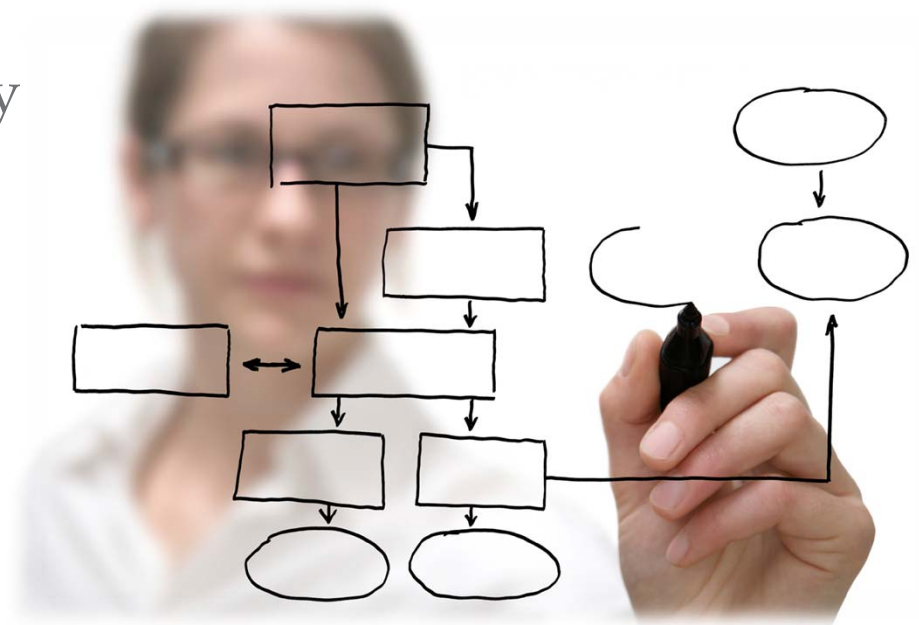
Benefits of Adopted Act 167 Plan

- > Plan will Provide Model Stormwater Management Ordinance for all Municipalities
- > Encourages use of Stormwater BMP's
- > Promotes Low Impact Design



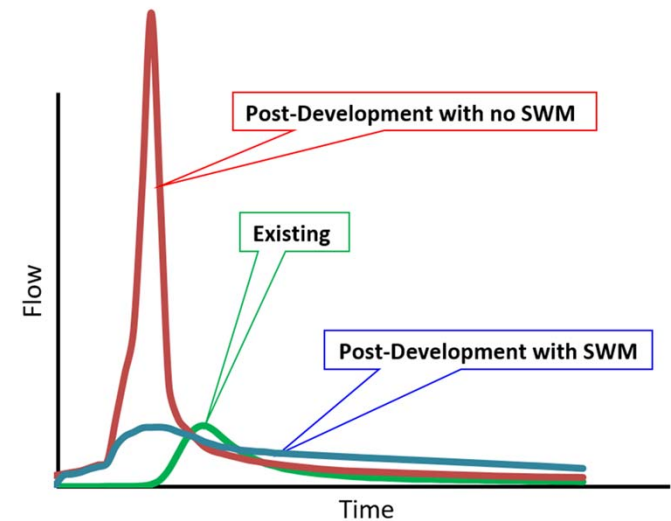
Consistency with Stormwater Regulation

- > Each Municipality Will Have The Same Minimum Stormwater Regulations
- > Consistency With Reviews Of Stormwater Plans Across The County And Neighboring Municipalities
- > Allows For Better Enforcement Of Regulations
- > Encourages New Approaches To Stormwater Management



Model Ordinance

- > Clearly Identifies What Are Regulated Activities
- > Clearly Lists Activities That Are Exempt From Regulation
- > Clarifies Who And How The Plans Are Reviewed
- > Can Include Construction Standards



Adjust Historical Stormwater Management Mindset

- > Conventional Stormwater Management
- > Focus Only On Rate Control
 - Really Only Focuses On Large Storms
 - No Volume Control
 - No Water Quality
- > Potential For Compounding Effects Of Extended Peaks Within Watershed

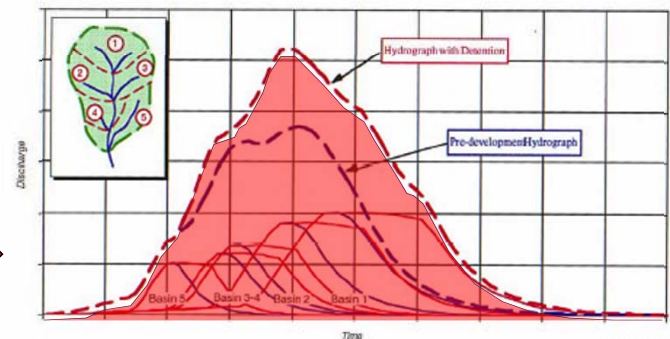
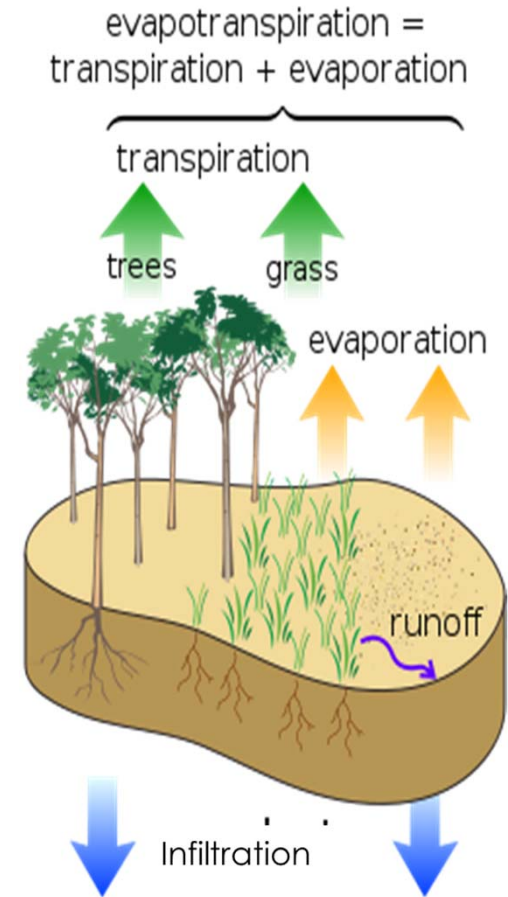


Figure 2-9 Effects of stormwater detention on hypothetical Watershed A

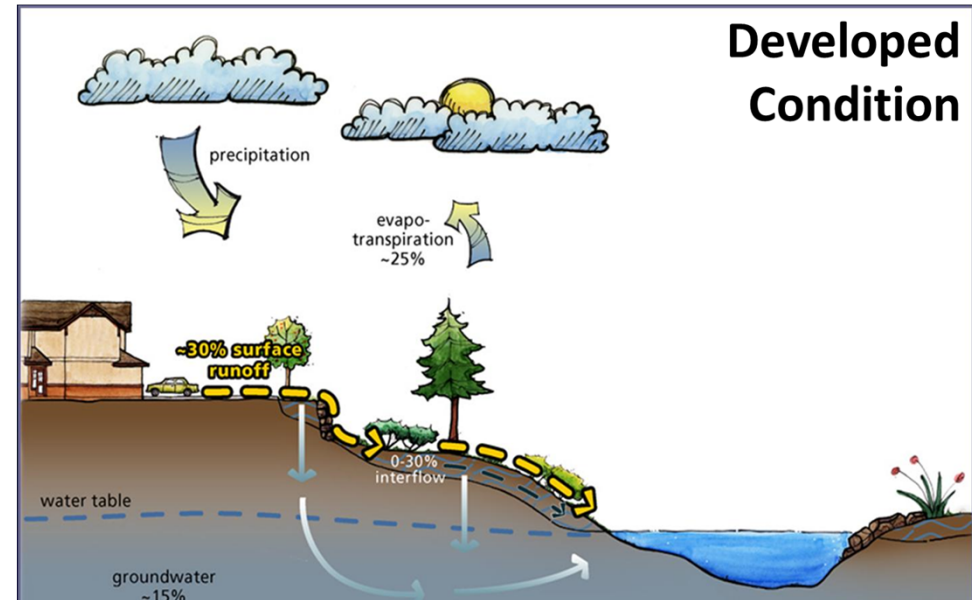
New Approach -Promote Stormwater Infiltration/Treatment

- > Utilize Stormwater BMPs
 - Non-Structural – *Prevent*
 - Structural – *Mitigate*
- > Processes
 - Infiltration
 - Capture and Reuse
 - Vegetated Systems w/ ET



Non-Structural BMP's

- > Protect and Preserve
 - Avoid and Minimize Impacts
 - Preserve Riparian Buffers/Woodlands
 - Minimize Disturbance
- > Maximize Green Infrastructure
 - Conservation Corridors
 - Green Belts
 - Decentralize, Disconnect, Distribute Runoff

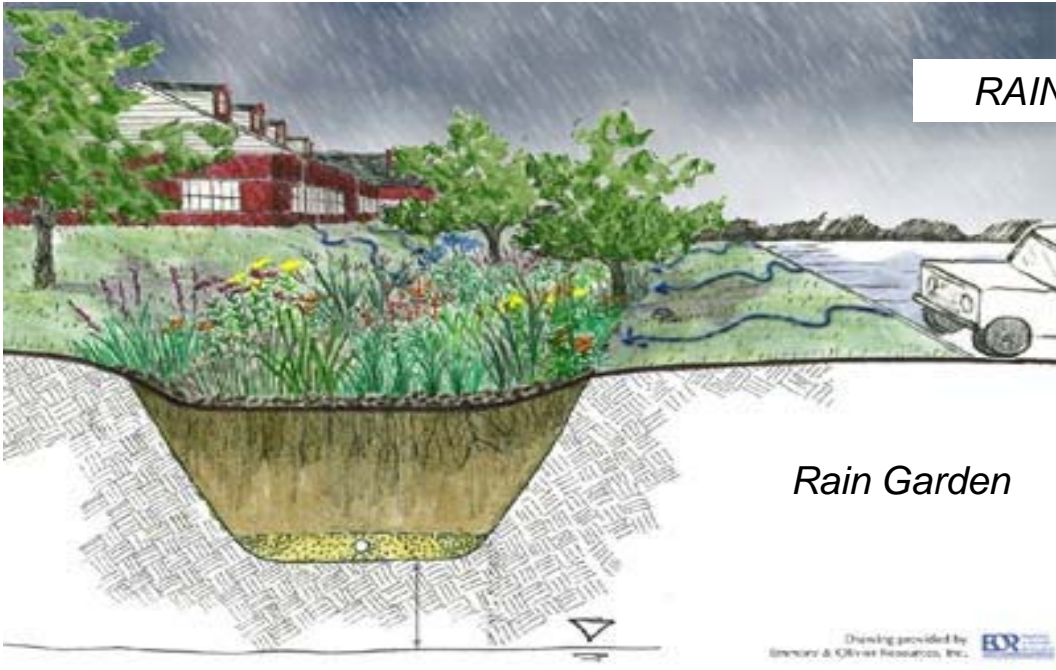


Structural BMP's

- > What they Do
 - Manage Runoff Rates and Volume
 - Promote Infiltration
 - Provide Treatment
- > Types of Structural BMP's
 - Infiltration Basins/Trenches
 - Rain Gardens
 - Bio-retention Basins
 - Vegetated Filter Strips



RAINFALL



Rain Garden

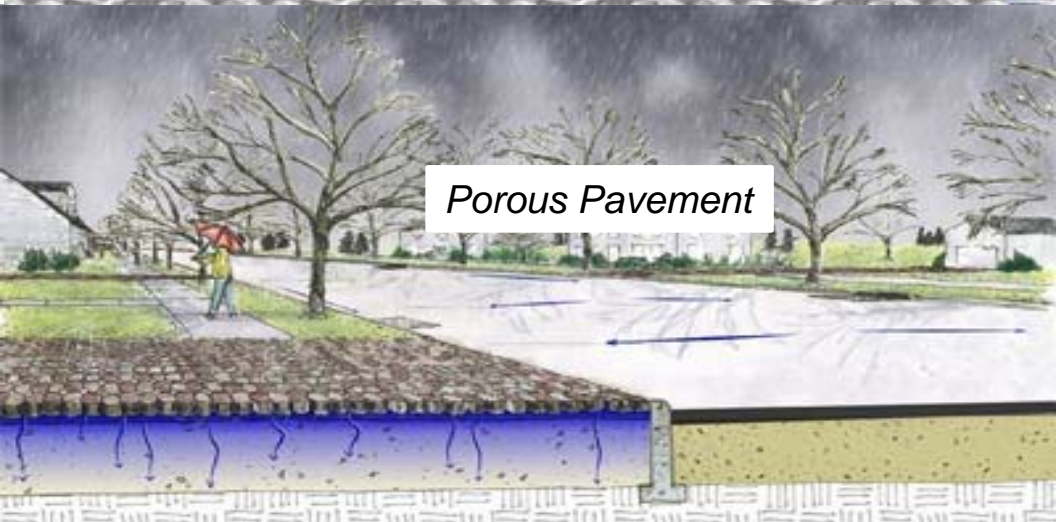
Drawing provided by
Innovative & Green Research, Inc. 



Infiltration Trench



Vegetated Swale

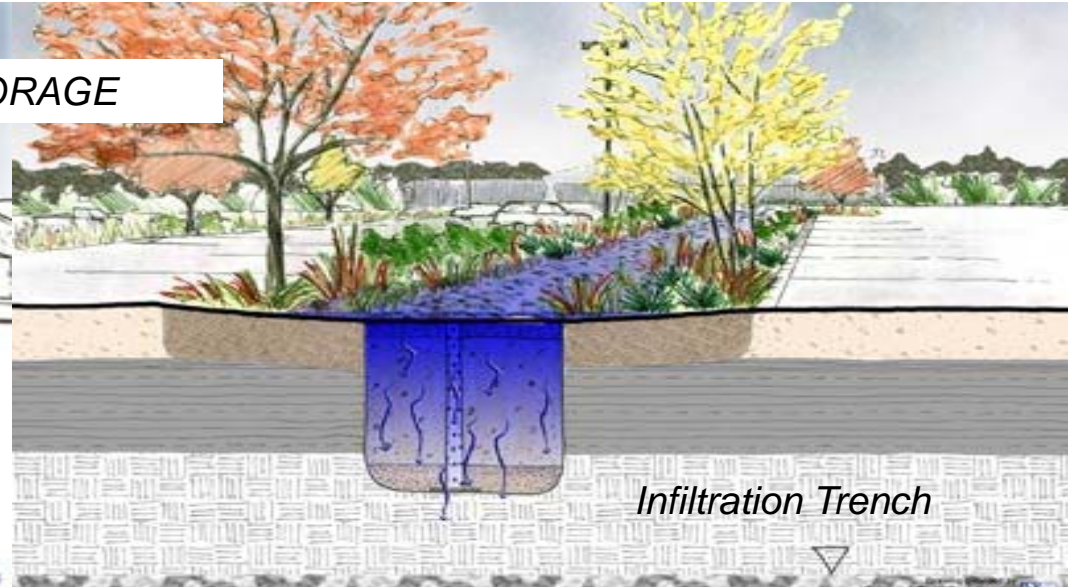


Porous Pavement

STORAGE



Rain Garden



Infiltration Trench

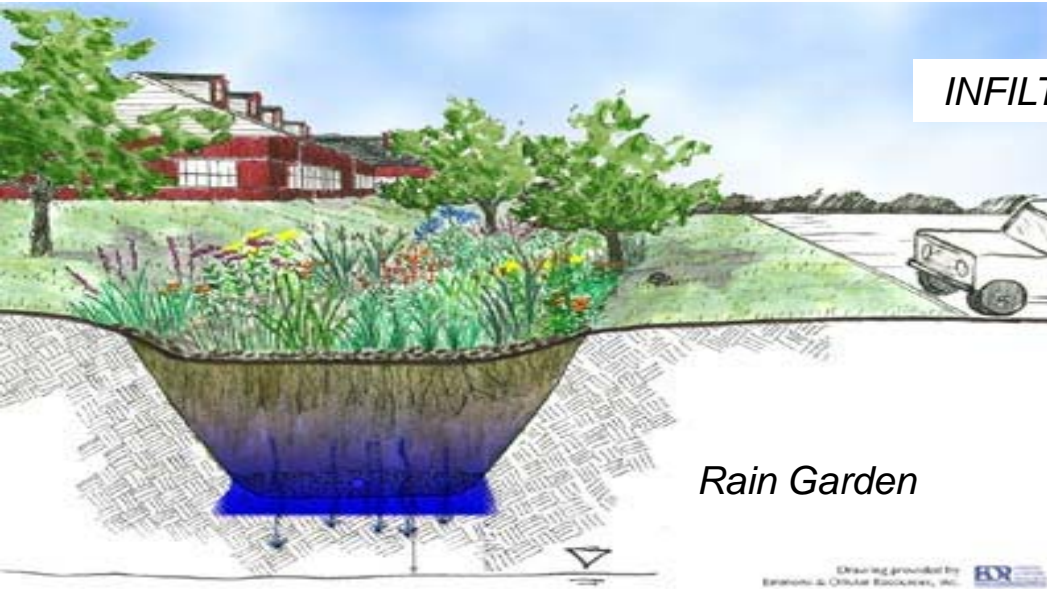


Vegetated Swale



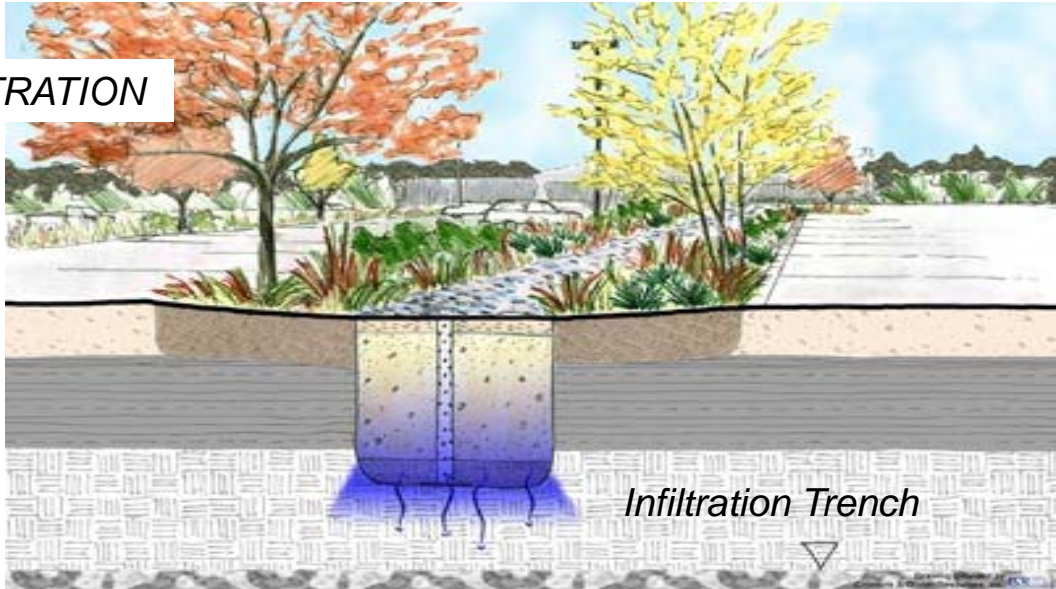
Porous Pavement

INFILTRATION

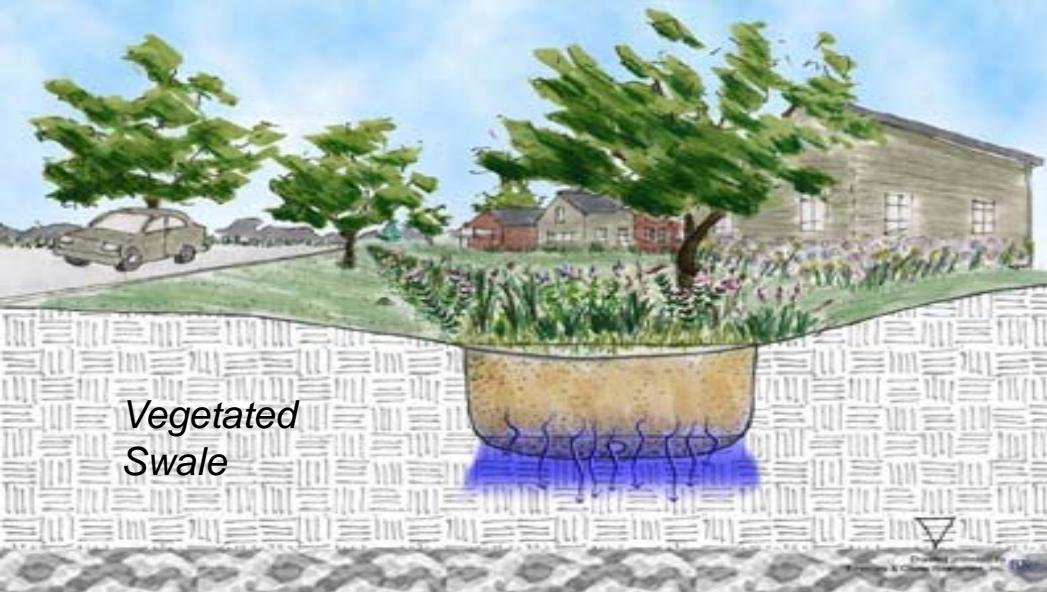


Rain Garden

Drawing provided by
Eaton & O'Neil Resources, Inc.

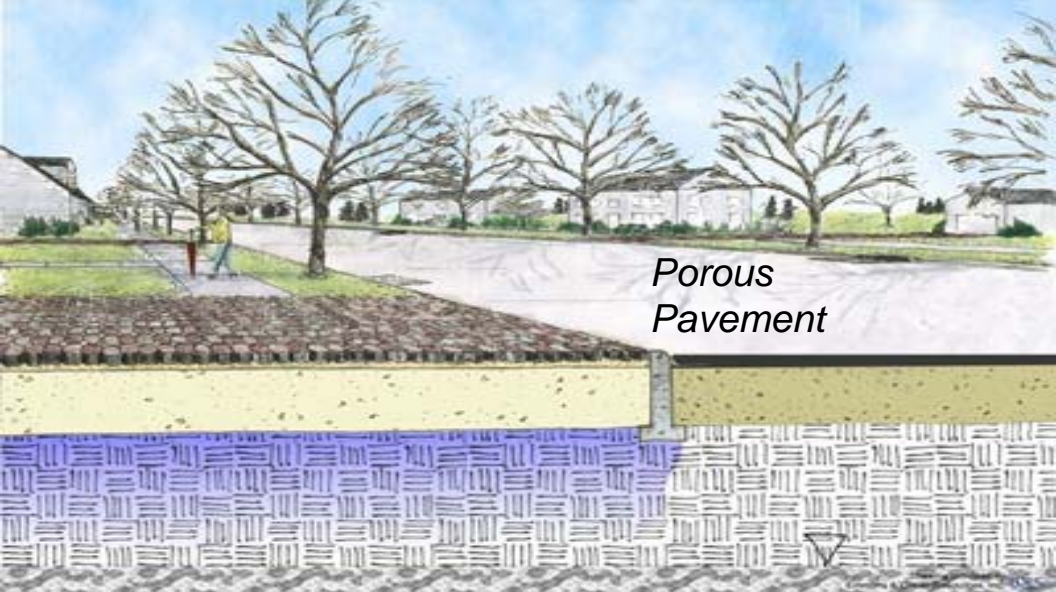


Infiltration Trench



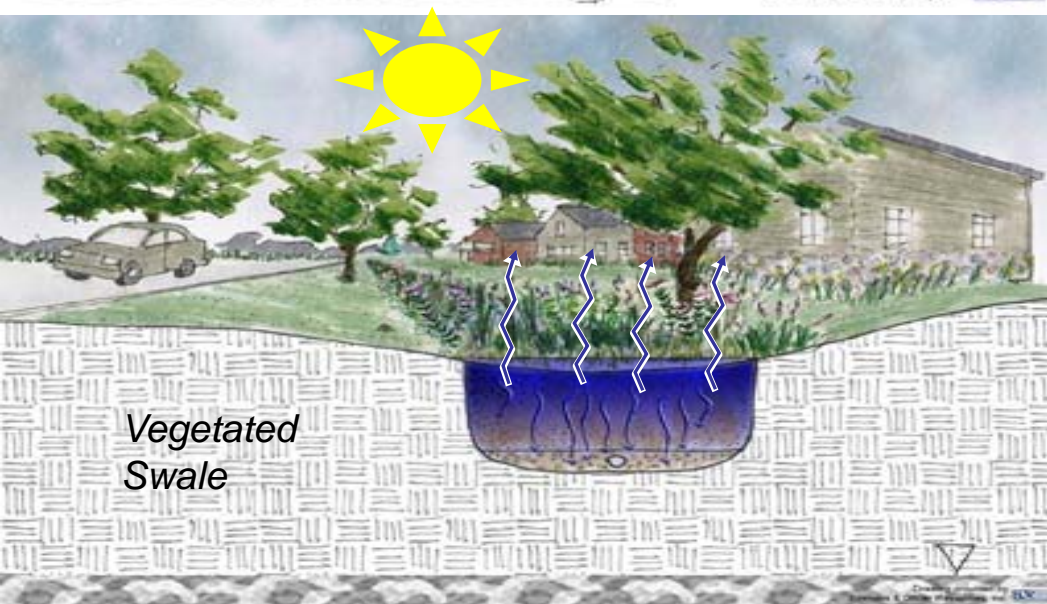
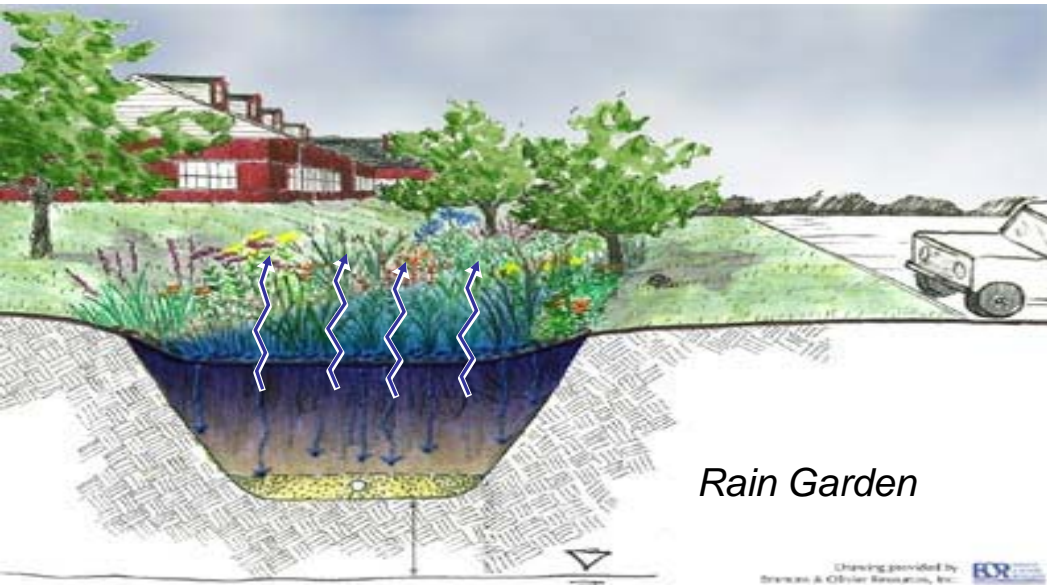
Vegetated Swale

Eaton & O'Neil Resources, Inc.



Porous Pavement

Eaton & O'Neil Resources, Inc.



- > Evapotranspiration
 - The “missing link”
 - Dual processes at work.
 - Not well understood

Benefits of Low Impact Design

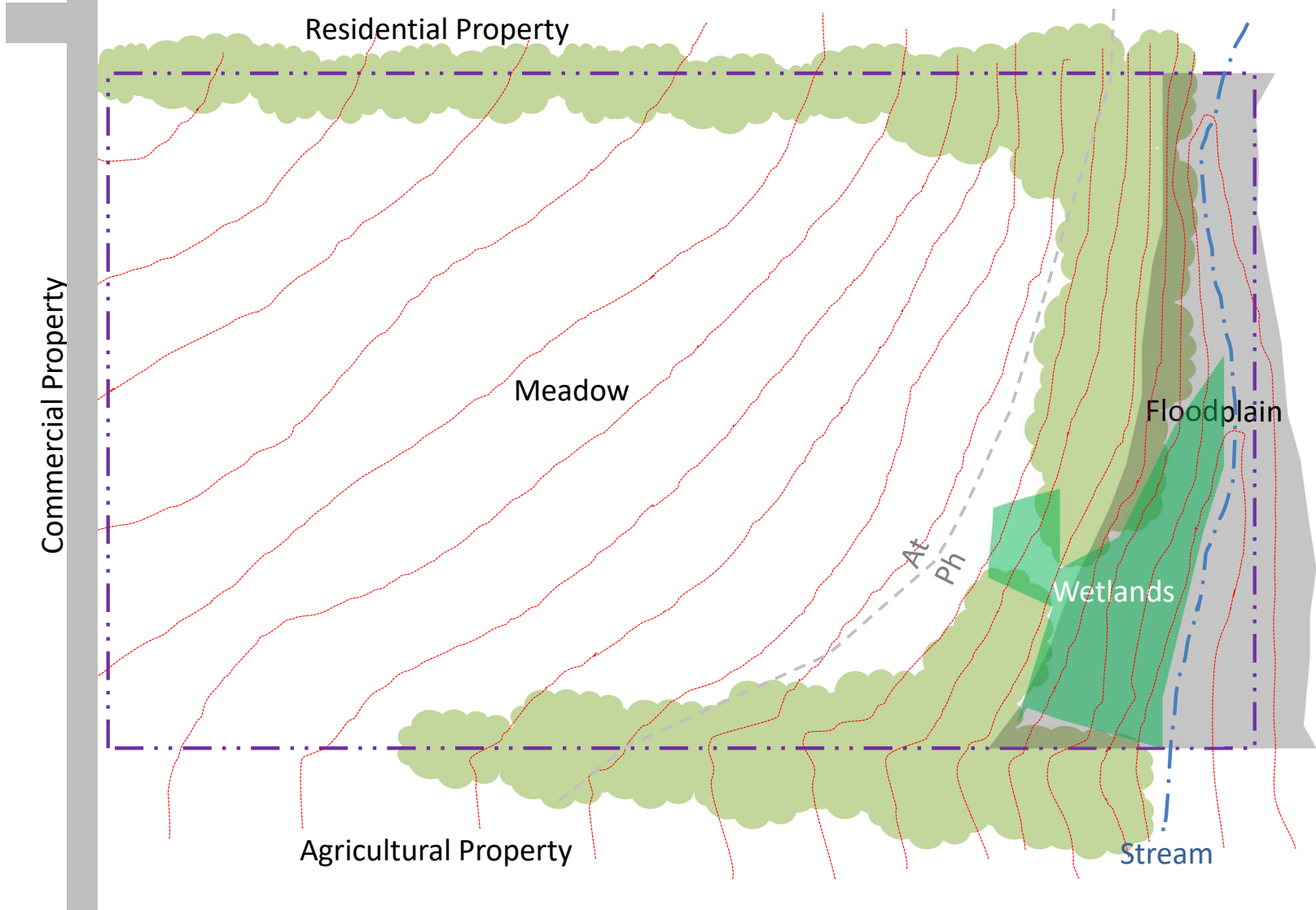
> Core Design Principals of LID:

- Minimize land disturbance & preserve open space
- Protect natural systems & use as design elements (wetlands, drainage ways, veg.)
- Minimize the use and size of traditional site infrastructure (streets, curbs, pipes)
- Distribute and decentralize stormwater for management close to the source



Source: LID Technical Guidance Manual for Pudget Sound (2005)

Existing Features Plan



Residential Property

Commercial Property

Meadow

Floodplain

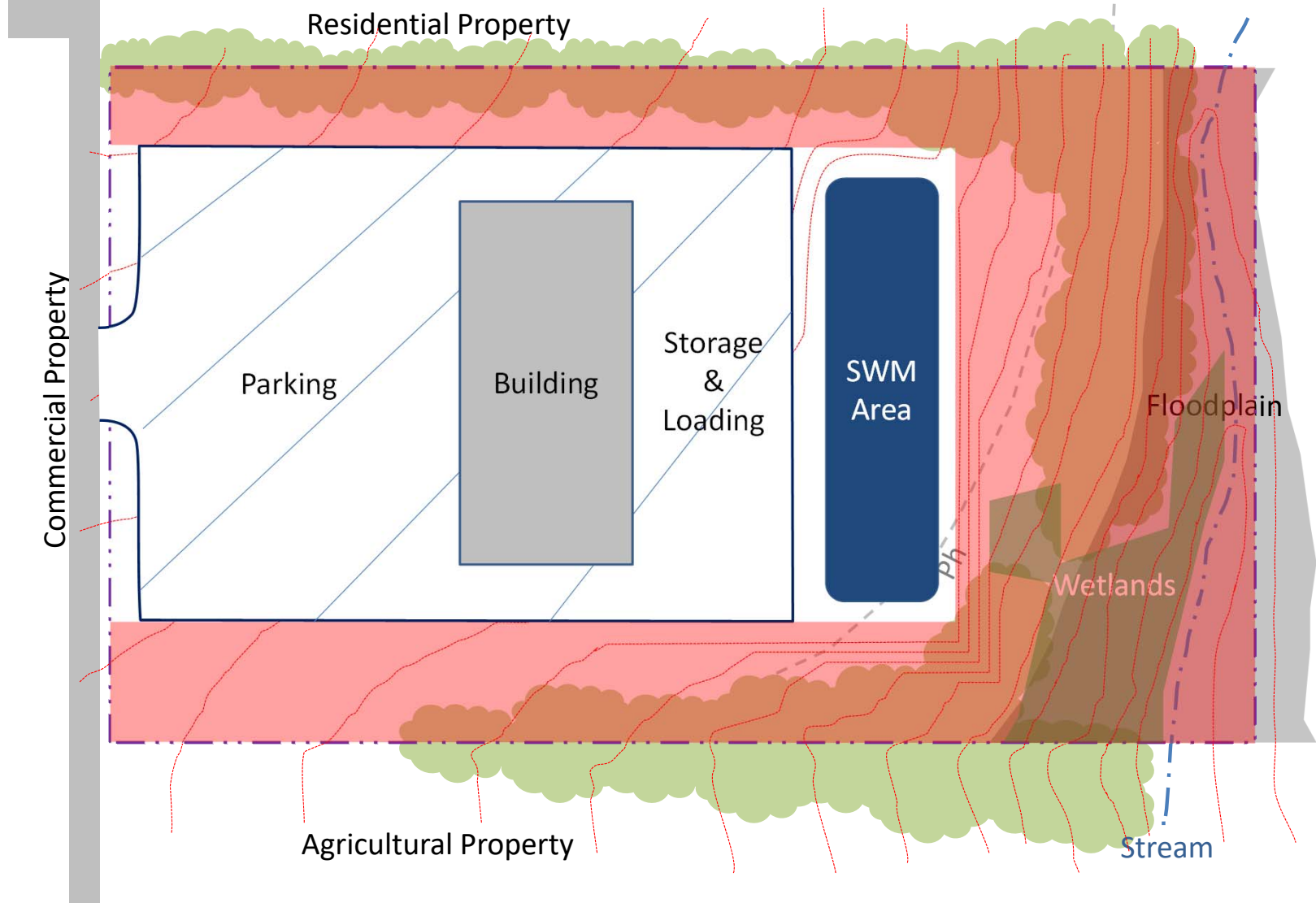
At
Ph

Wetlands

Agricultural Property

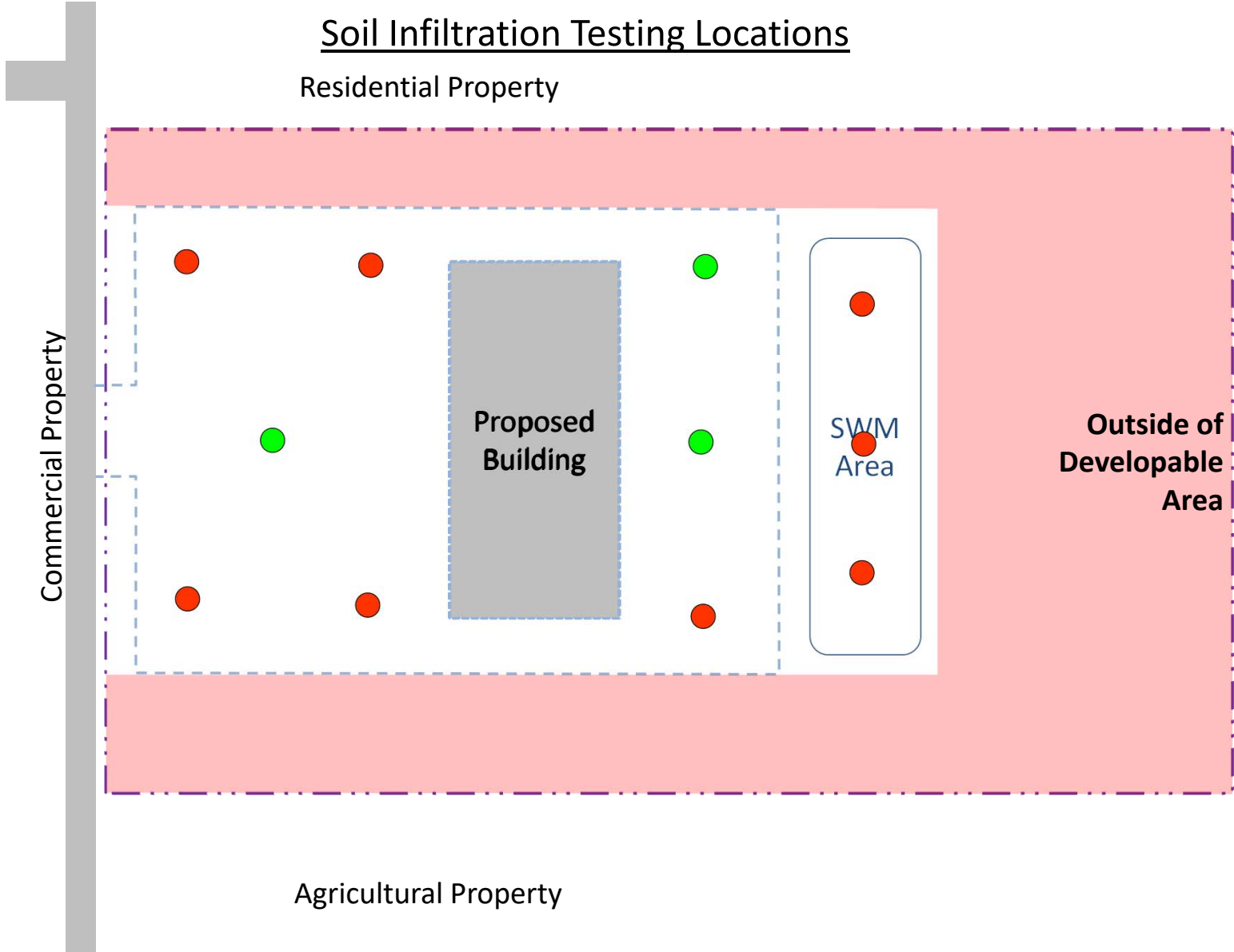
Stream

Concept Plan (w/ new grading)



Soil Infiltration Testing Locations

Residential Property



Commercial Property

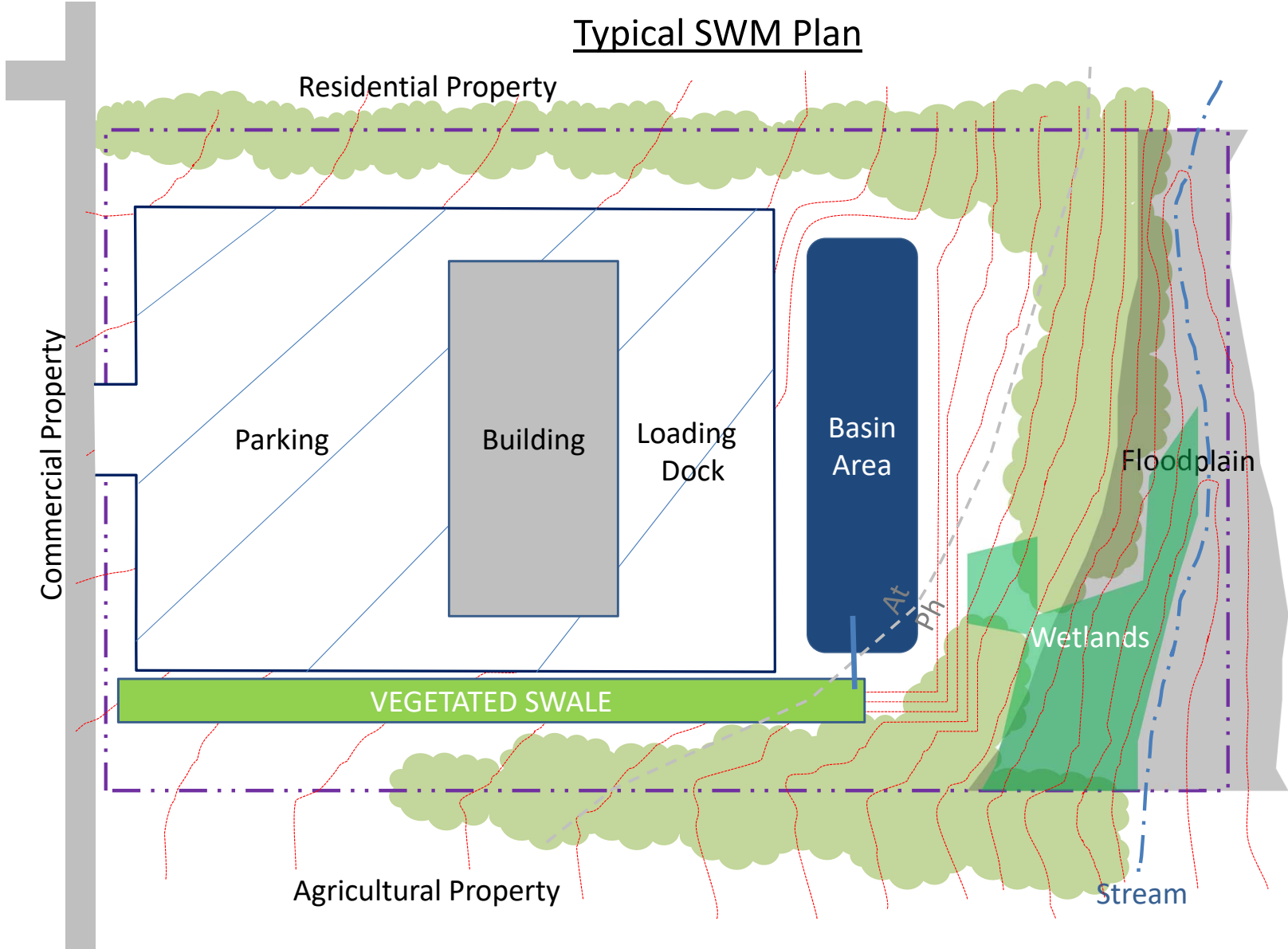
Proposed Building

SWM Area

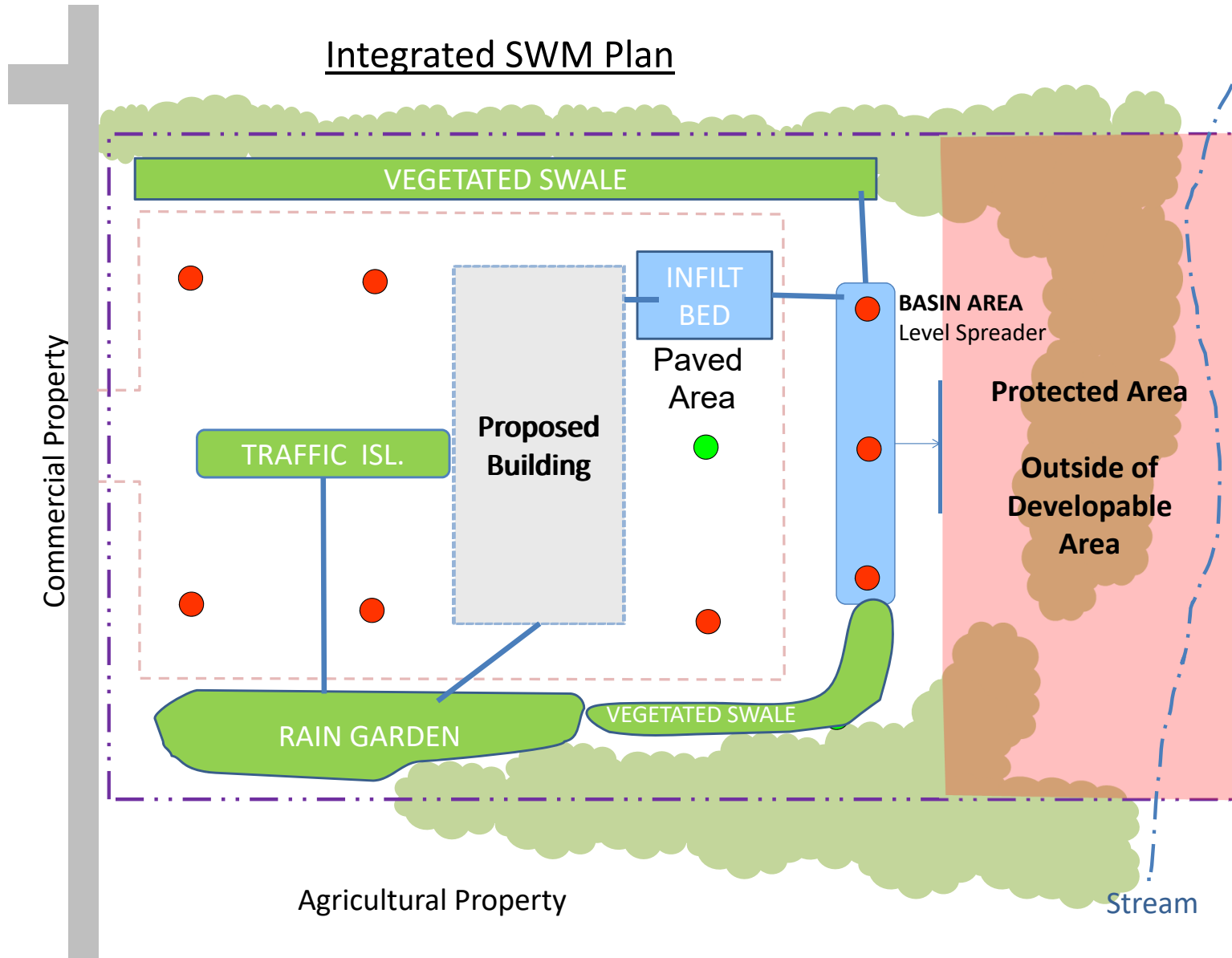
Outside of Developable Area

Agricultural Property

Typical SWM Plan



Integrated SWM Plan



**What Are Some Side Benefits
Of An Approved Act 167 Plan?**

04

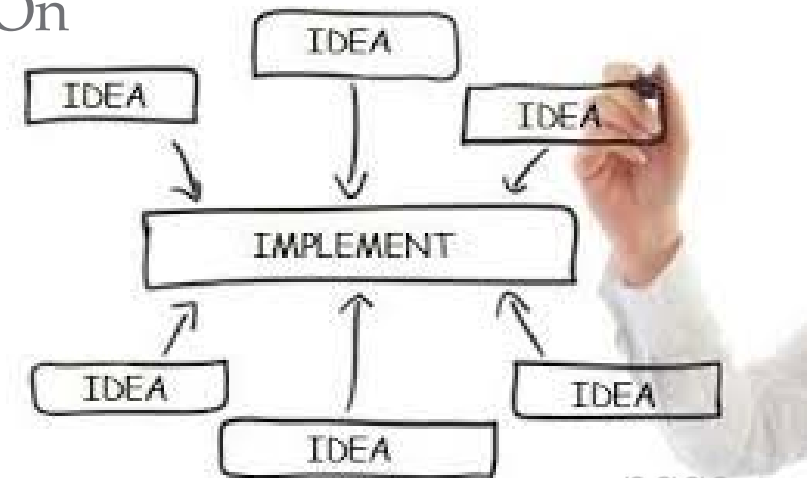
How else can Use My Approved Plan be Used to Address Stormwater?

- > Another Tool In The Box To Address Stormwater Challenges
- > Opportunities To Address MS4 Regulation Requirements
- > The “Plan” Is A Roadmap To Stormwater Improvements



Watershed Model can be Utilized for other Projects

- > Provides Useable Technical Information In Future Planning And Engineering Efforts
- > Flows From Models Can Save Consultant Costs In Design And Permitting Efforts.
- > Better Understanding Of Development On Impacts On A Watershed Basis.



Problem Areas Serve as Improvement Road Map

- > Countywide List of Problem Areas
- > Basis of a Capital Improvement Plan
- > Smart Development
 - Don't Make Problems Worse
 - Address Problems with Development
- > Use the List to Solicit and Leverage Funding Opportunities



> Promotes Watershed or Regionalized Approach to Stormwater

- > Stormwater Doesn't Follow Municipal Boundaries
- > The Solution To A Problem May Be Up Or Downstream
- > Utilize Efficiencies To Address Issues
- > Possible Foundation for Stormwater Authority



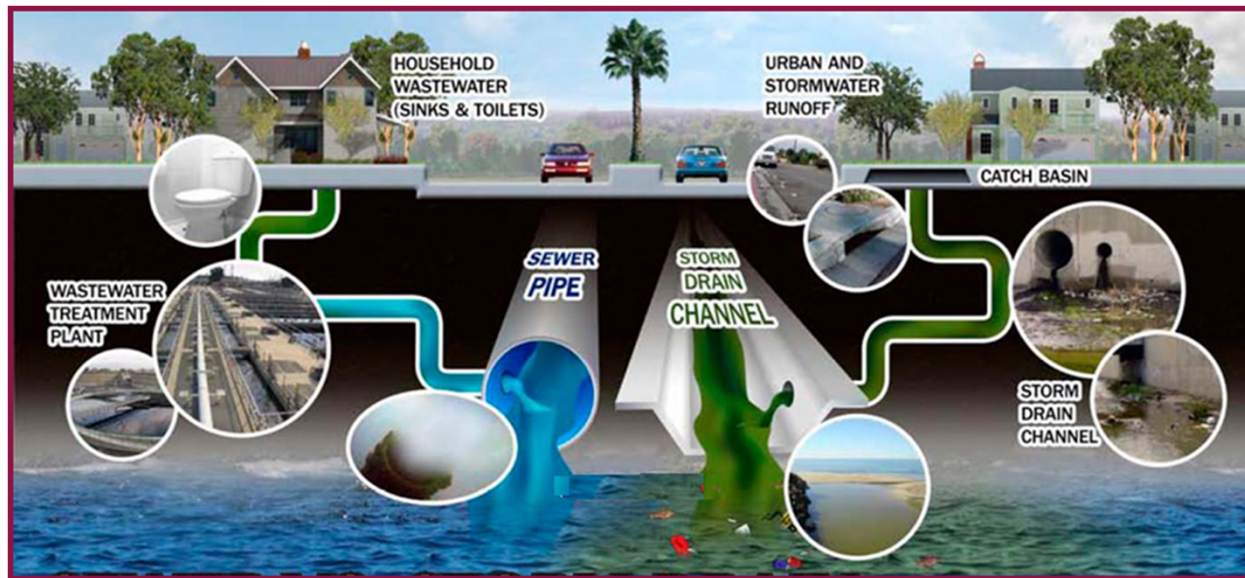
Fosters Collaboration Between Municipalities

- > Limits “Finger Pointing” As To Who/What Is The Source Of The Problem
- > Multi Municipal Projects Can Be More Fundable
- > Enforcement Resources And Costs Can Be Shared Across Multiple Municipalities
- > Review Responsibilities Could be Shared with the County or Council of Governments



MS4 Compliance Assistance

- > Model Ordinance can Assist With MCM #4 and MCM #5
- > Enforcement Process Helps with MCM #3







Ben Gilberti, P.E.

Group Manager | Pittsburgh Civil

(724) 779-4777 bgilberti@hrg-inc.com

The Southwestern Pennsylvania Commission (SPC) Water Resource Center (WRC) will promote regional collaboration on water topics; be a leader in facilitating coordination and education; and provide technical assistance to its member governments.

More information can be found at: www.spcwater.org



Southwestern Pennsylvania Commission