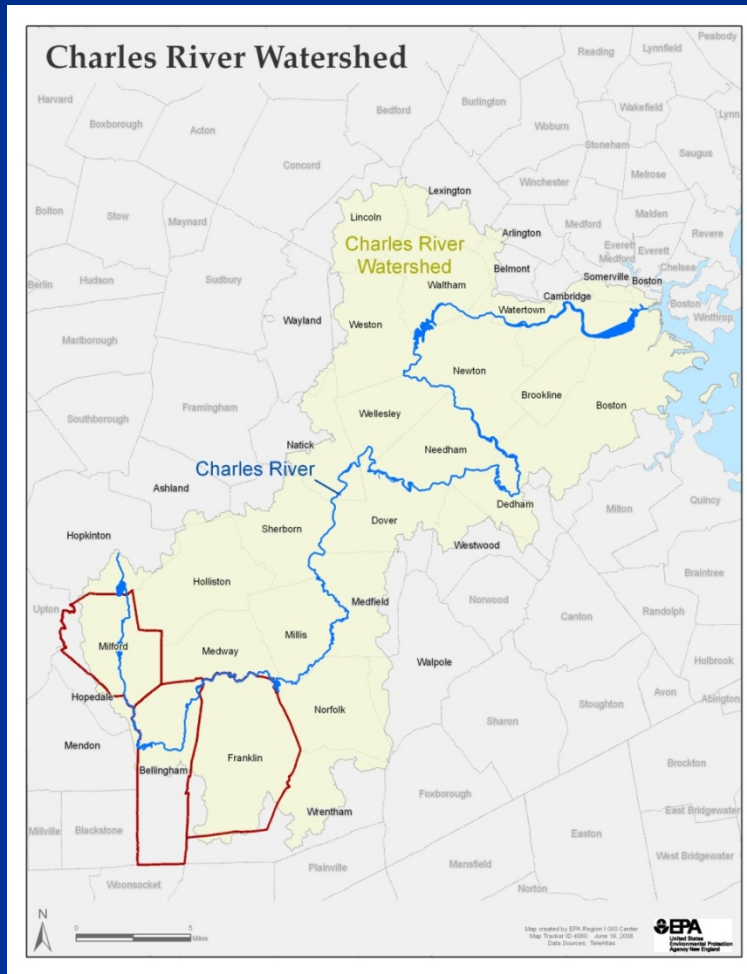


EPA Information Sessions Sponsored by the
495/MetroWest Partnership
on the
Draft Storm Water General Permit for Residually
Designated Discharges
held on:



- August 3, 2010 in Franklin, MA;
- August 18, 2010 in Bellingham, MA; and
- August 26, 2010 in Milford, MA.

Charles River Watershed



- Charles River Watershed
 - ~310 square miles
 - 35 communities
 - Flows from Hopkinton to Boston harbor

Charles Residual Designation Draft General Permit

- Who is covered
- Designated discharges must obtain permits
- EPA has recently published a draft permit
- Permit is on website and EPA welcomes comments on it until midnight on September 30, 2010

What has been designated as needing storm water permit

- Storm water discharges
- From properties with impervious surfaces equal to or greater than 2 acres
- Contiguous properties under common ownership or properties with common structures aggregated
- Certain land uses excepted: single family residential; government properties otherwise regulated by permits; specified land uses such as recreational camps, mobile home parks, etc.

What has been designated, cont.

- Designation covers Milford, Bellingham and Franklin
- Covers only discharges to the Charles River watershed
- EPA plans to designate rest of watershed later

Municipal Storm water Permits

- North Coastal permit published, public comment period has closed, EPA intends to issue by year's end
- The North Coastal municipal permit covers all cities and towns in Charles watershed
- Requires Municipalities to enhance the work they were required to do under 2003 permit
- Requires municipalities to develop a Phosphorus Control Plan (PCP) in four (4) years
- Requires municipalities to complete implementation of PCP within ten (10) years

Relationship between Residual Designation and municipal storm water permits

- Municipalities required to reduce phosphorus discharges by approx 50%
- Municipalities can achieve reductions from any sources, not just municipal property
- Reductions in phosphorus achieved at private sites will be credited to municipalities

Municipal Phosphorus Program

- Draft Residual Designation permit encourages municipalities to develop phosphorus control programs (such as utility)
- Designing a municipal-wide storm water strategy superior to lot-by-lot approach
- Some properties will be able to reduce phosphorus discharges more efficiently
- Draft Residual Designation permit provides flexibility in forming municipal programs

Next Steps for EPA

- EPA will accept written comments
- Comment period open until September 30, 2010
- EPA will issue final permit, final residual designation, and response to significant comments, probably by end of year

Next Steps for Permittees

- Permit becomes effective (Effective Date)
- Notice of Intent (NOI) due to EPA within 180 days of the Effective Date
- EPA reviews NOI
- EPA responds with an authorization letter
- Official start of permit coverage on date of receipt of EPA authorization letter

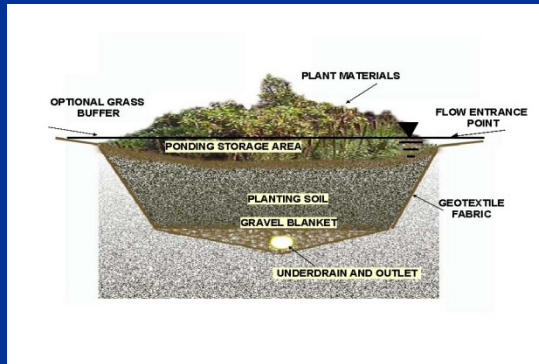
Draft Permit

Overview of Pollution Reduction Requirements

Two categories of requirements

Storm Water Management
Plan (SMP) & Baseline
Performance Standards

Phosphorus
Reduction
Requirements



Baseline Performance Standards for all DD Sites

- Implementation begins **30 days** after permit coverage is authorized
- Good housekeeping and pollution prevention practices

Also:



Phosphorus Reduction Requirements

- Achieve the equivalent of a 65% reduction in phosphorus load from the developed portion of the **Designated Discharge Site** through implementation of any one or combination of the following:

1. Enhanced non-structural Best Management Practices at the Designated Discharge Site

2. Structural Best Management Practices such as impervious area disconnections, infiltration practices, filtering systems, etc. at the Designated Discharge Site

3. Participation in a Certified Municipal Phosphorus Program (CMPP)

65%
Reduction
in annual
Phosphorus
Load

Summary of Individual Phosphorus Reduction Requirements

**Preliminary Phosphorus Reduction Plan
submitted to municipality – 2 years**

A thick black arrow pointing downwards from the first box to the second box.

**Final Phosphorus Reduction Plan
submitted to municipality – 3 years**
Best Management Practices at the Site and/or Participation in
a Certified Municipal Phosphorus Program (CMPP)

A thick black arrow pointing downwards from the second box to the third box.

**Implementation of Final Phosphorus
Reduction Plan – 5 years**

Summary of Preliminary Phosphorus Reduction Plan

Submit to municipality by Year 2

Site
Suitability
Analysis
Site
Engineering

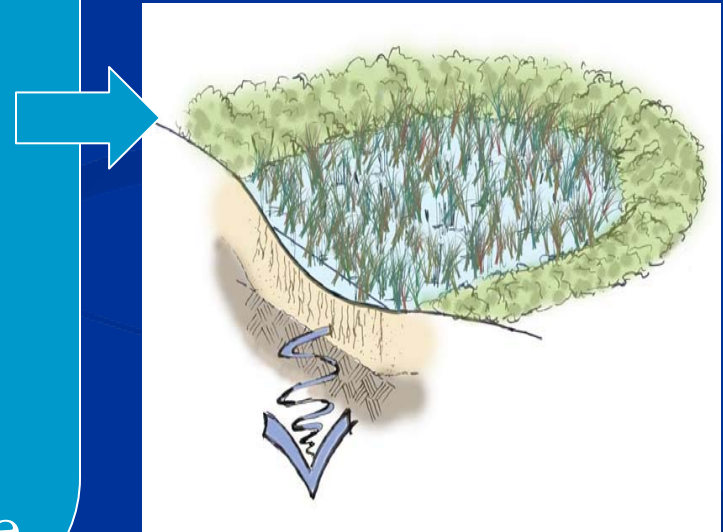


Statement of intent
(non- binding)
how permittee intends to
comply with phosphorus
load reduction requirements

One Inch Storm Water Control Provision

Draft Permit App. D II(C)

The capture and no discharge of one (1) inch of rainfall from impervious surfaces at the Designated Discharge Site could eliminate the permit requirements to conduct an engineering analyses at the Site



Enhanced Non-Structural Best Management Practices Eligible for Phosphorus Reduction Credits

■ Enhanced non-structural Best Management Practices

- Enhanced sweeping program
- Semi-annual catch basin cleaning
- No application of fertilizers containing phosphorus
- Weekly leaf litter and organic debris collection program

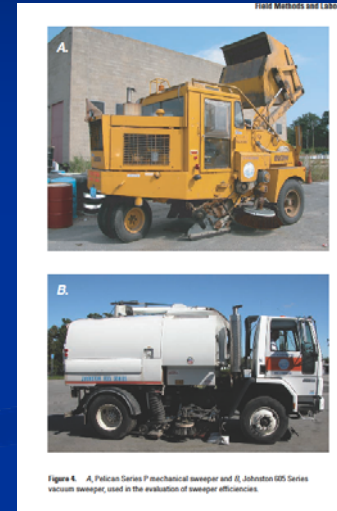


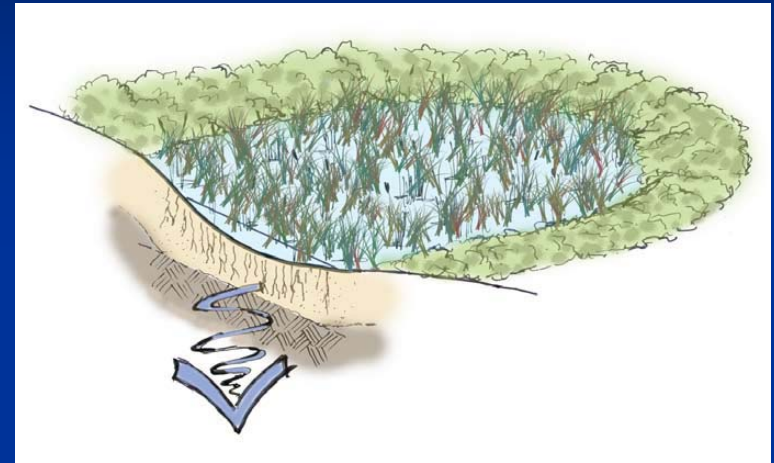
Figure 6. A, Pelican Series P mechanical sweeper and B, Johnstone 625 Series vacuum sweeper, used in the evaluation of sweeper efficiencies.



Attachment 2 to App. D to Permit provides methodology for calculating default phosphorus reduction credits for enhanced non-structural Best Management Practices

Structural Best Management Practices for Phosphorus Reduction Credit

- Infiltration practices are required when feasible
 - Surface infiltration (e.g., basins, swales, rain gardens)
 - Subsurface infiltration (e.g., trench and chambers)



Storm water infiltration is excellent for phosphorus and bacteria removal and replenishing ground water aquifers

Structural Best Management Practices for Phosphorus Reduction Credit (continued)

- When Infiltration practices are not feasible, other structural practices are acceptable. Some examples include:
 - Biofiltration systems
 - Filter systems
 - Gravel wetlands
 - Commercial or proprietary treatment systems
 - Permeable pavements
 - Etc.

Attachment 3 to App. D to the Permit provides a methodology to calculate phosphorus removal credits for several structural Best Management Practices based on physical storage capacity

Phosphorus Reduction Requirements (continued)

**Final Phosphorus
Reduction Plan details
how permittee will
achieve phosphorus
load reductions**

**Submit to municipality
by Year 3**

**Implement Best
Management
Practices at the
Site**

and/or

**Participate in a
Certified Municipal
Phosphorus Program
(e.g., Utility)**

Phosphorus Reduction Requirements (continued)

Implementation
of Final
Phosphorus
Reduction Plan
**Complete by
Year 5**

If structural Practices
at Site, complete
construction plans
and obtain permits by
year 4



Construct, operate, and
inspect structural Practices
by **year 5**

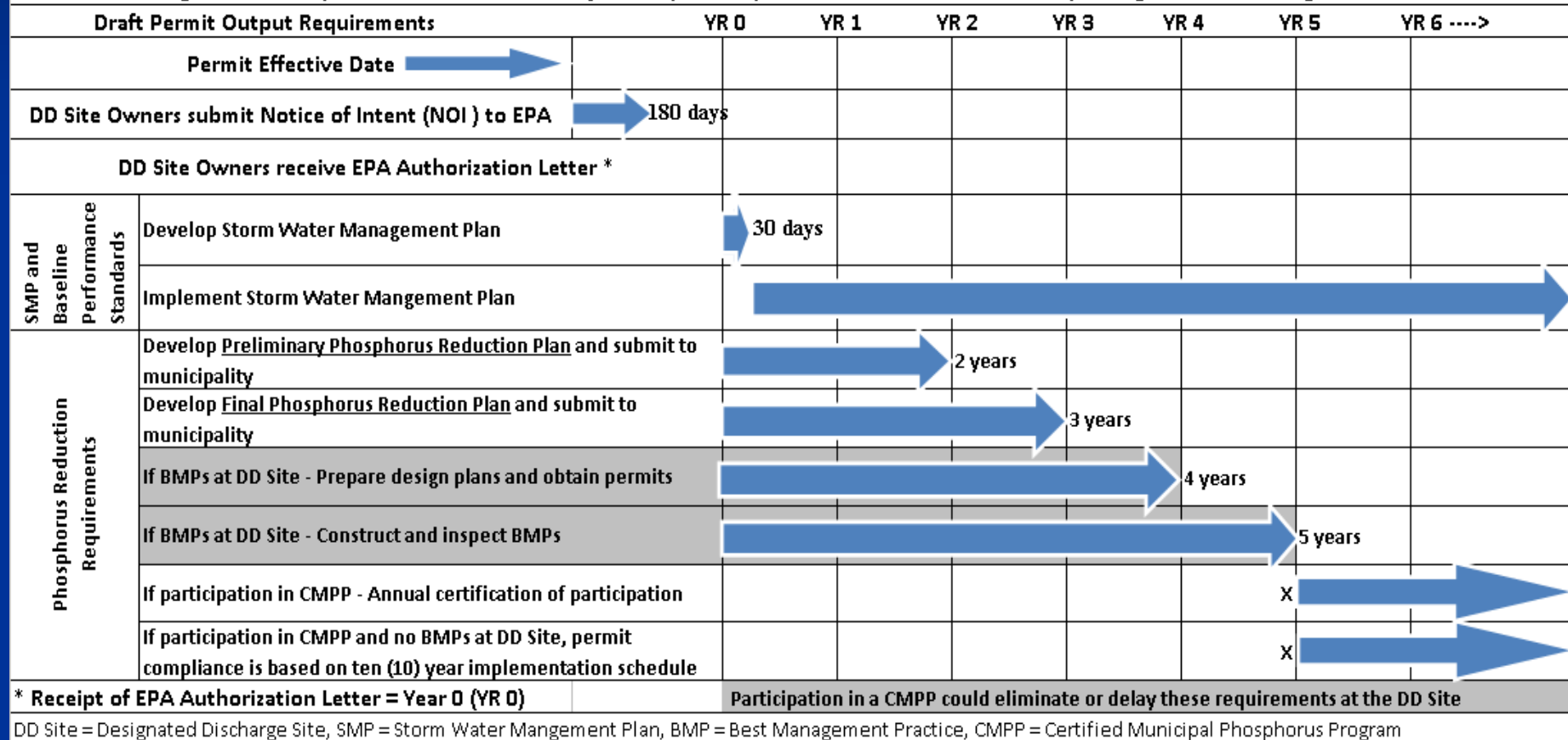
If participation in a
CMPP, begin annual
certification **by year 5**

Certified Municipal Phosphorus Program (CMPP)

- Utility?
- Cost effective
- Optimal Best Management Practice location and size
- Inter-related with Municipal storm water permits

Compliance Timeline for Major Permit Requirements

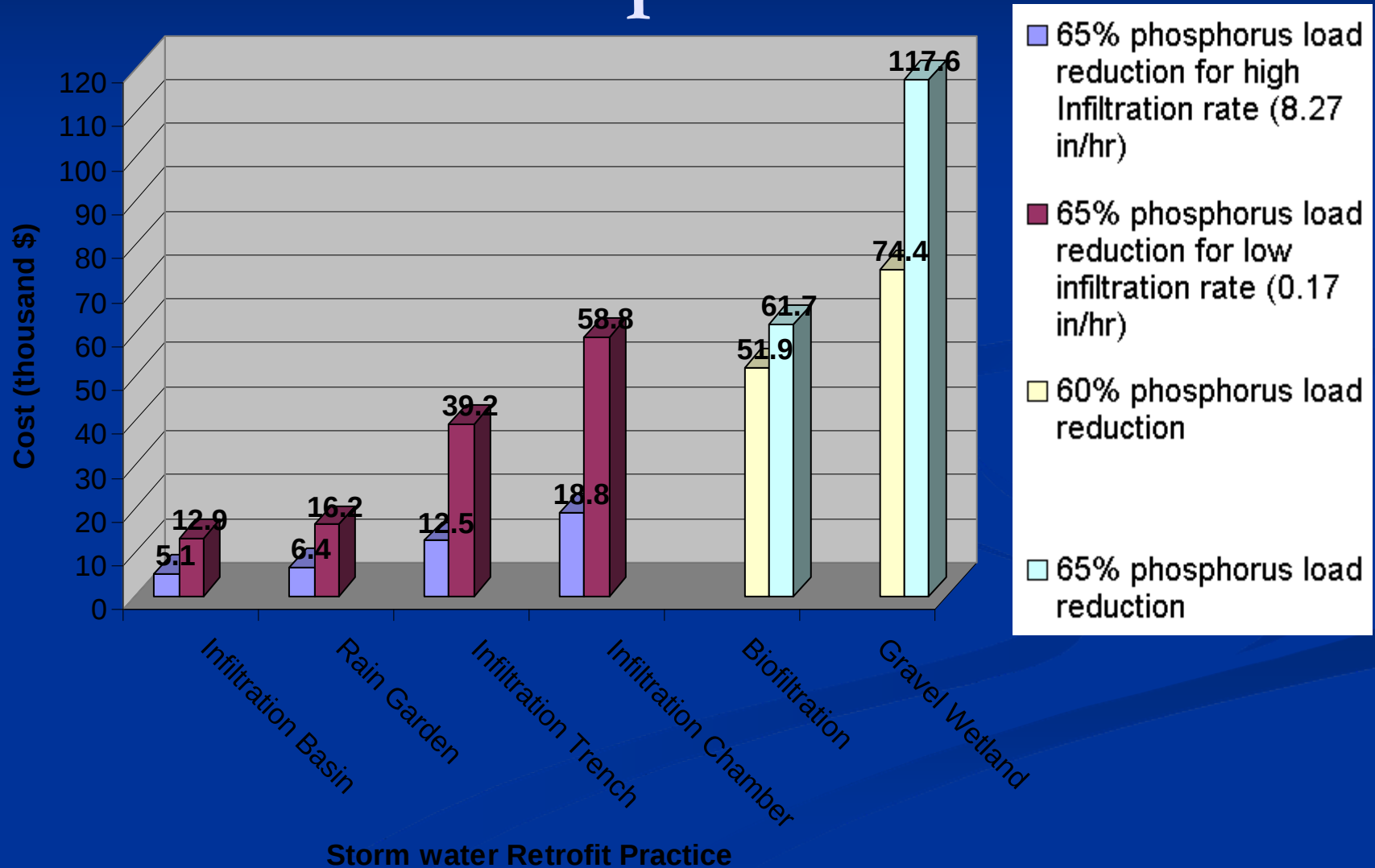
Figure 1 - Compliance Timeline for Major Output Requirements of Draft Residually Designated Discharge Permit



Examples

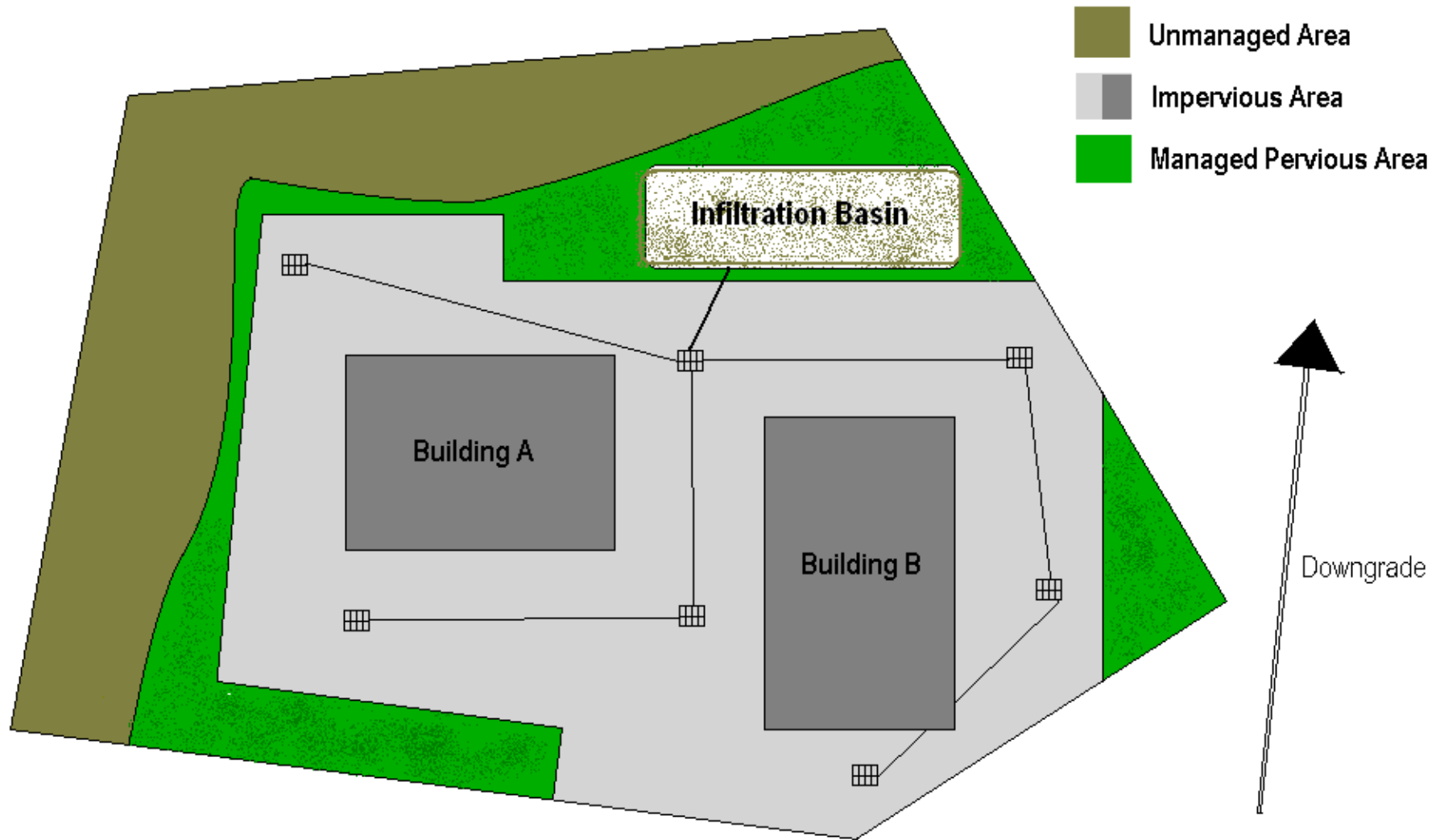
- Small Office Complex
 - (site meeting One Inch Storm Water Control Provision (Appendix D, Part 2.C))
- Condo Development
- Shopping Plaza
- Car Dealership

BMP Retrofit Capital Cost Per Impervious Acre for Reducing Annual Phosphorus Load



Example – Small Office Complex

(Site meeting One Inch Storm Water Control Provision)



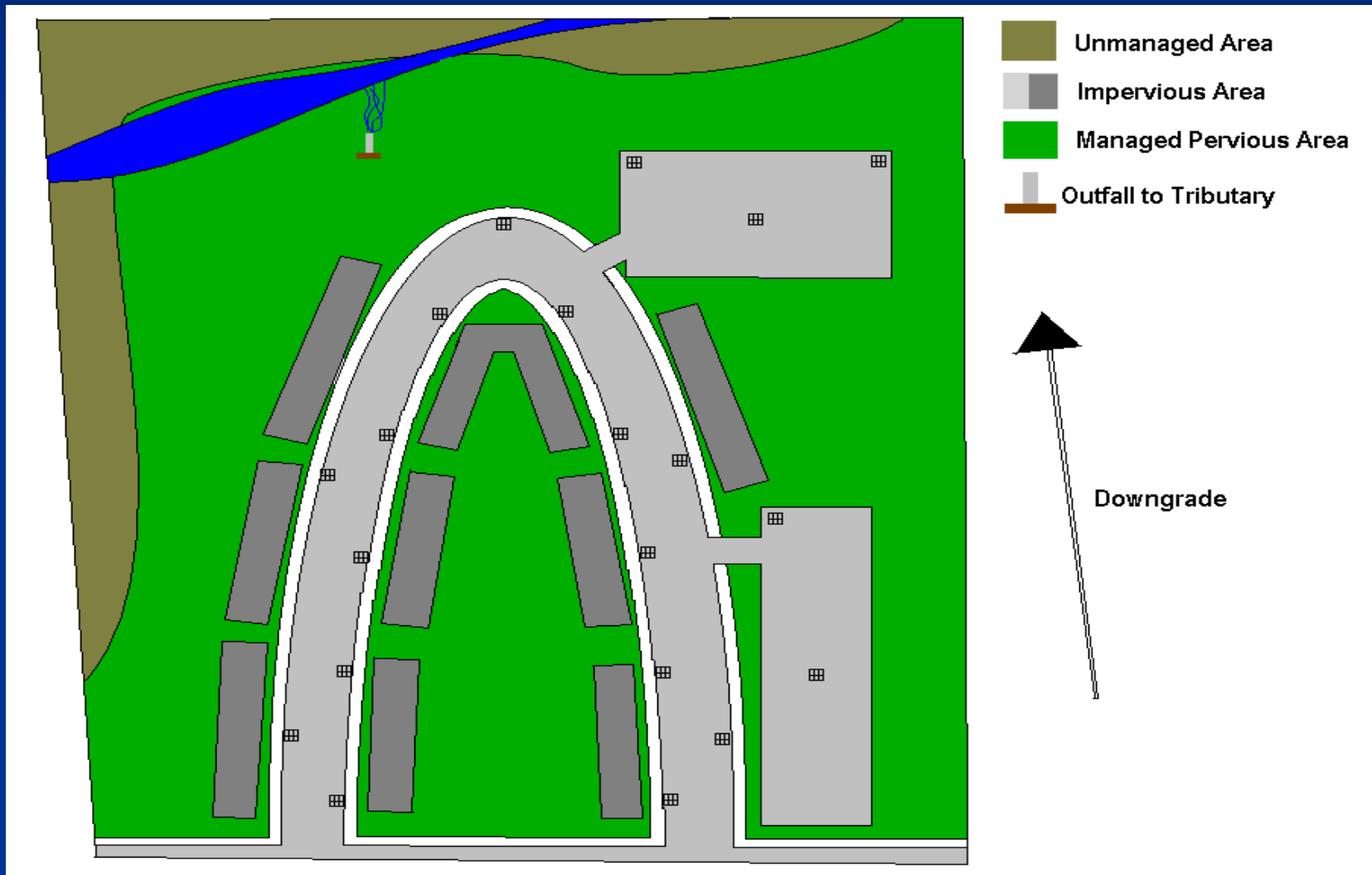
Example – Small Office Complex

(Site meeting One Inch Storm Water Control Provision)

- 3.5 acre site
 - 2.0 acres impervious
 - 0.5 acres managed pervious
 - 1.0 acres unmanaged pervious
- 1” runoff volume from impervious surfaces: 7,260 ft³
- Existing SW BMPs
 - Parking lot sweeping (as needed)
 - Semi-annual catch basin cleaning
 - Infiltration basin
 - 7,500 ft³ capacity
 - Treats stormwater runoff from 100% of impervious areas on site
 - Soil infiltration rate: 1.02 in/year
 - Cumulative phosphorus load reduction: 97%

One Inch Storm Water Control Provision found in Appendix D

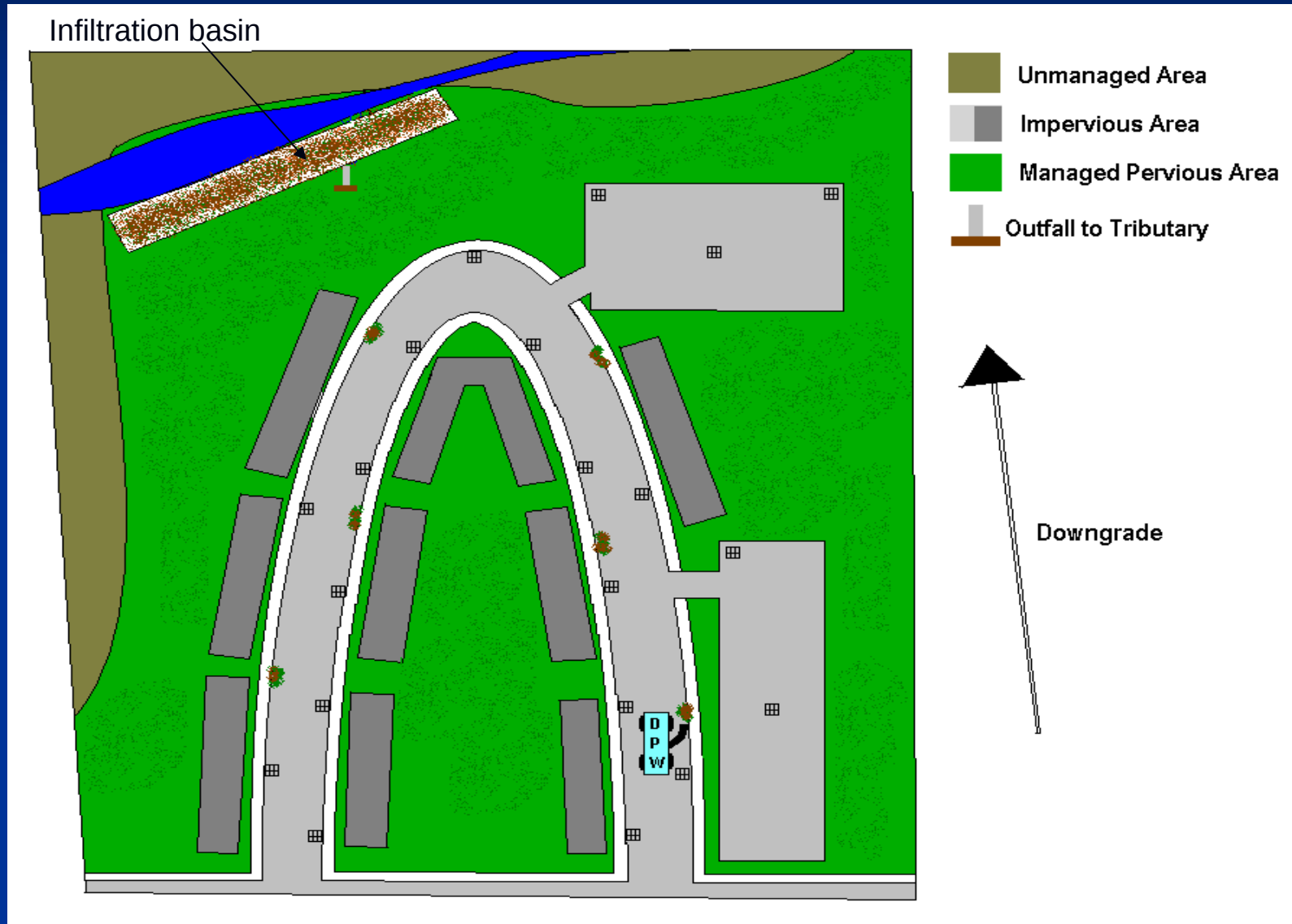
Example – Condominium Development (pre-retrofit)



Example – Condominium Development (post-retrofit)

Enhanced organic waste and leaf litter collection program on all impervious areas

Discontinue application of fertilizer containing phosphorus on all managed pervious areas



Example – Condominium Development

PRE-RETROFIT

- Land Use: High Density Residential
- 18 acre site
 - 5.8 impervious
 - 9.3 managed pervious
 - 2.9 unmanaged pervious
- Infiltration rate: Excellent
- Current SW mgmt
 - Street/Parking lot runoff collection in catch basins - discharged into tributary
 - Rooftop runoff unmanaged
- SW BMPs in place
 - Catch basin cleaning
 - Street sweeping

From Appendix D, Attachment 1:

- Phosphorus Load
 - 15.45 lb/year
- Required Reduction
 - 10.04 lb/year

RETROFITS

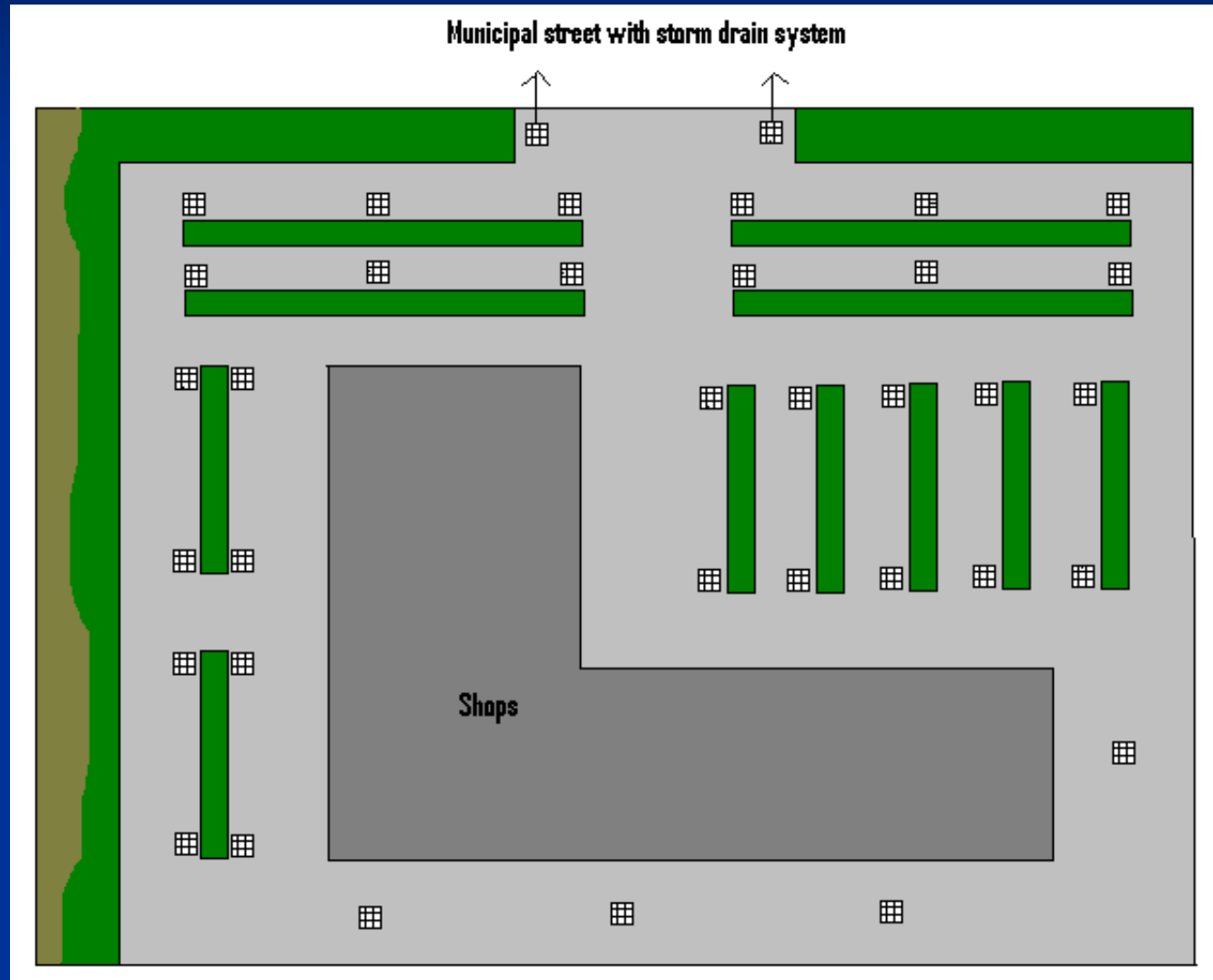
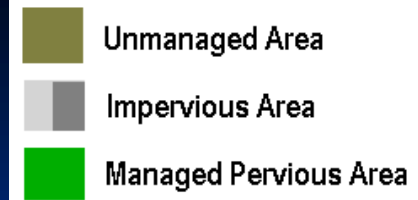
- Infiltration Basin
 - 8,500 cubic foot basin reducing phosphorus loading by ~ 10.5 lbs/year
- Enhanced organic waste and leaf litter collection program
 - On all impervious areas
- Phosphorus-free fertilizer application
 - On all managed pervious area

Using Appendix D, Attachments 2 and 3, total annual phosphorus reduction credit from structural and non-structural BMPs: **12.03 lb/yr**

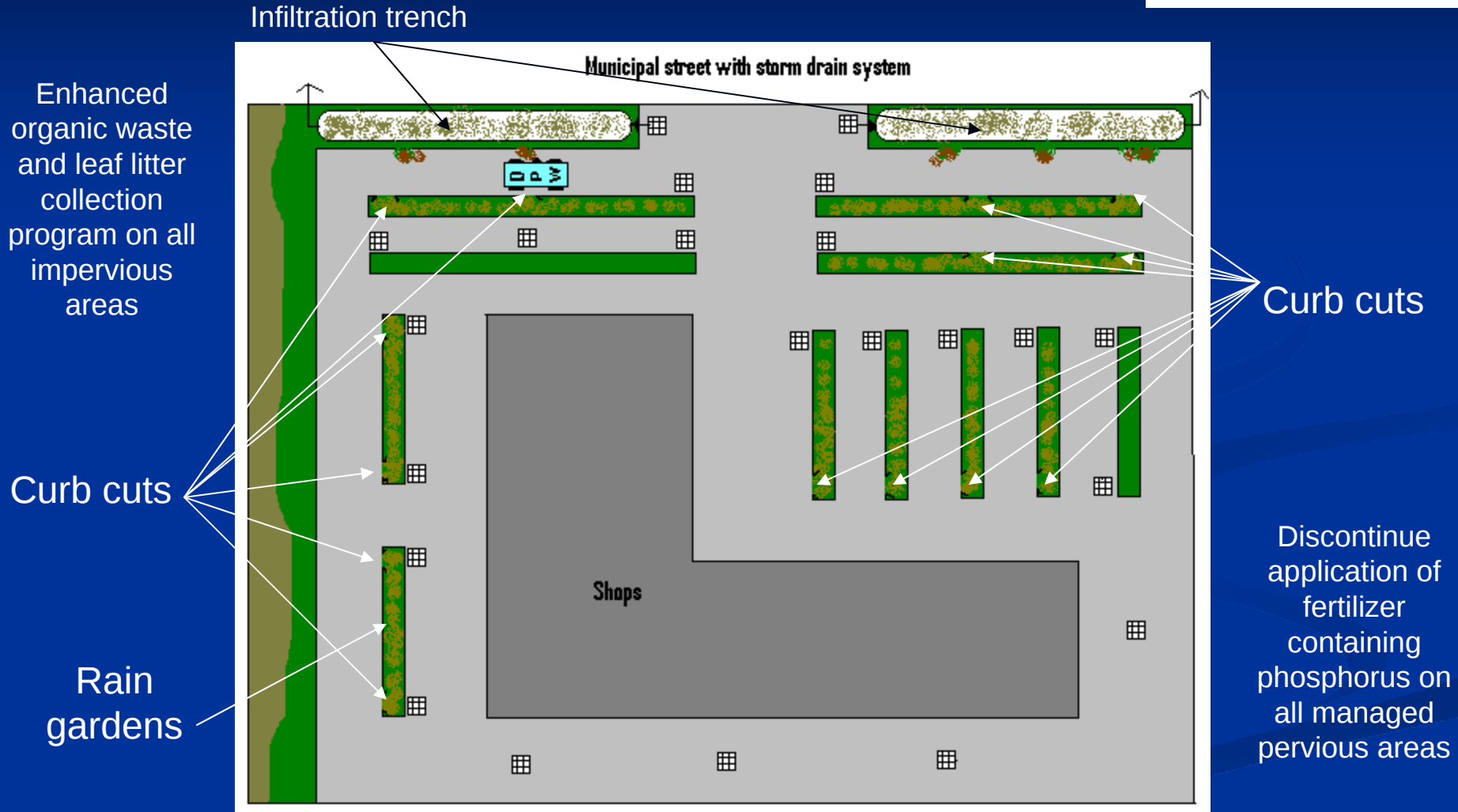
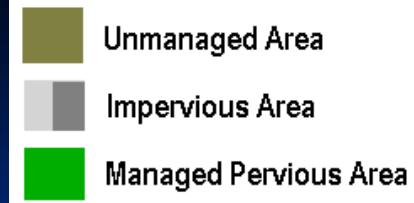
**Order of Magnitude Capital Cost Estimate:
Infiltration Basin ~ \$92,000**

**Structural BMP cost saved by implementing
non-structural BMPs ~ \$19,800**

Example – Shopping Plaza (pre-retrofit)



Example – Shopping Plaza (post-retrofit)



Example – Shopping Plaza

PRE-RETROFIT

- Land Use: Commercial
- 5.5 acre site:
 - 5.02 acres impervious
 - 0.25 acres managed pervious
 - 0.23 acres unmanaged pervious
- Infiltration rate: Good
- Current SW mgmt:
 - Street/Parking lot runoff collection in catch basins, discharged into municipal storm drain system
 - Rooftop runoff directly connected to storm drain system
- SW BMPs in place:
 - Catch basin cleaning
 - Street sweeping

Using Appendix D, Attachment 1:

- Phosphorus Load:
 - 11.26 lb/year
- Required Reduction:
 - 7.32 lb/year

RETROFITS

- Curb cuts and rain gardens on nine existing parking islands
 - Close off catch basins
 - Allow infiltration of stormwater
- Infiltration Trenches
 - Treating stormwater runoff from site's storm drain system prior to discharge to municipal system
- Disconnect rooftop runoff
 - Allows longer residence time and some capture by bioretention
- Phosphorus-free fertilizer application
 - On all managed pervious areas
- Enhanced organic waste and leaf litter collection program
 - On all impervious areas, 1/week, April 1 through December 15

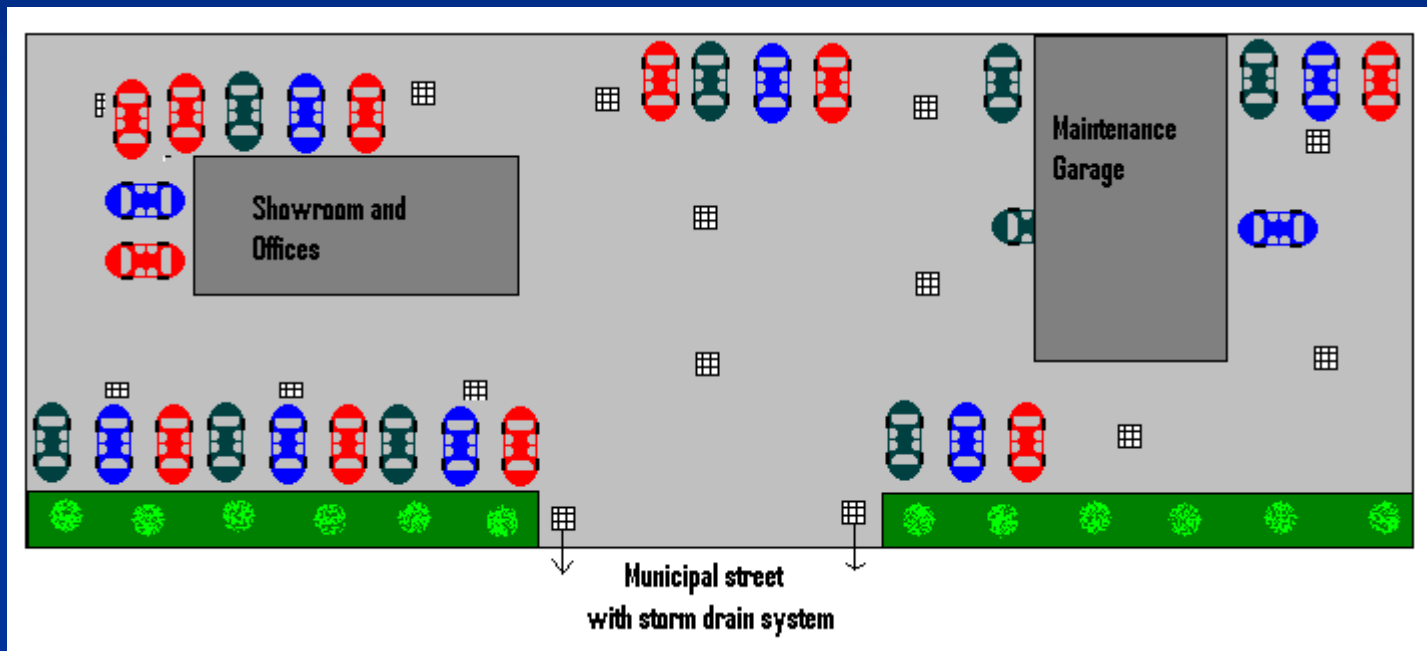
Using Appendix D, Attachments 2 and 3, total annual phosphorus reduction credit from structural and non-structural BMPs: **7.45 lb/yr**

Order of Magnitude Capital Cost Estimate:

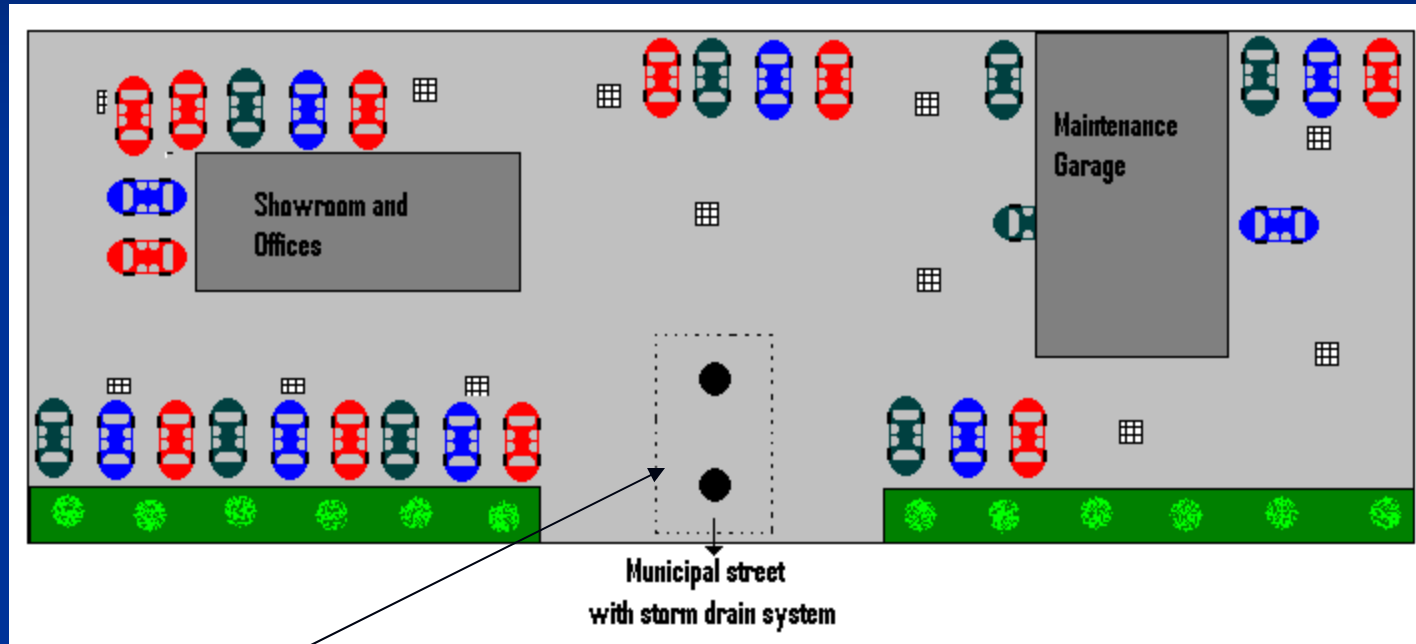
Rain Gardens and Infiltration Trenches ~ \$105,000

Structural BMP cost saved by implementing non-structural BMPs ~ \$20,000

Example – Car Dealership (pre-retrofit)



Example – Car Dealership (post-retrofit)



Proprietary stormwater filter system

Example – Car Dealership

PRE-RETROFIT

- Land Use: Industrial
- 2.02 acre site
 - 0.01 acres managed pervious
 - 2.01 acres impervious
- Infiltration rate: Extremely poor
- Current SW mgmt:
 - runoff collection in catch basins, discharged into municipal storm drain system
- SW BMPs in place:
 - None

Using Appendix D, Attachment 1:

- Phosphorus Load:
 - 3.58 lb/year
- Required Reduction:
 - 2.33 lb/year

RETROFITS

- Proprietary Stormwater Filter
 - Collect storm water from site and filter prior to discharge to municipal system

Using manufacturer's specifications, total annual phosphorus reduction credit from structural BMP:
3.02 lb/yr

**Order of Magnitude Capital Cost Estimate:
Stormwater Filter ~ \$105,000**

Examples (disclaimer)

- The examples presented are meant only to demonstrate the general principles and process a permittee might take to calculate phosphorus loading from the site, estimate the phosphorus reductions required, and identify needed BMPs.
- The purpose is only to provide an illustration for clarification purposes.
- The particular facts or calculations in the hypotheticals should not be relied upon, and each permittee must conduct an evaluation for its property as described in the permit.

Costs (disclaimer)

- Costs include engineering, design, and construction.
- Costs represent an Order of Magnitude level of accuracy (-30% to +50%).
- Costs include a 35% engineering and design contingency.
- Costs do not include any additional permitting.
- Capital costs only (do not include any annual operation and maintenance).

Information and Contact

- Permit Documents are located online at:

<http://www.epa.gov/ne/npdes/charlesriver/index.html>

- Contact Information:

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Questions and Discussion

