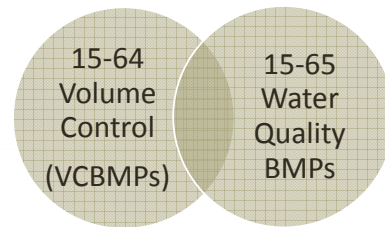


Article VIII: Post Construction Best Management Practices

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Post Construction Best Management Practices (PCBMPs)

Includes BMPs intended to provide volume control and those designed to improve water quality.



Water Quality vs. Volume Control

- **Volume Control Best Management Practices (VCBMPs)** are stormwater retention practices that encourage infiltration and the reduction of runoff. Some examples are dry wells, infiltration trenches
- **Water Quality BMPs** reduce the pollutants of concern. Some examples are manufactured structures, bio-swales, rain gardens, naturalized detention ponds

Space at a premium?

Many Water Quality BMPs can double as Volume Control facilities.
Examples: Constructed wetlands, Wet or wetland bottom site runoff storage basins, vegetated comp storage, and other VC BMPs that also treat the pollutants of concern.

Designing BMPs: How much is enough?

Combining Volume Control, water quality, and/or detention requirements.

There are separate requirements for each category, but they can work in harmony. Document that the requirements for each category are met.

VCBMPs:	15-63, 15-64, 15-66
VCBMPs/Detention:	Article IX, 15-66
Water quality BMPs:	15-65, BMP Manual

When are BMPs required?

When 2,500 square feet or more net new impervious area is added, compared to pre-development conditions, both volume control and water quality BMPs are required.

Net New Impervious is the difference between the total impervious area prior to development and the total proposed impervious area.

Pre-development site includes the maximum extent of the legal impervious areas within the last 3 years.



Designing BMPs: How much is enough?

Volume Control:

Ordinance section 15-64.A: Calculate volume based on a 1.25", 2-hour event for all new impervious surfaces.

No abstractions should be applied to the calculation

Applicant may subtract volume from detention

48 hour retention time

Void space storage in stone allowed up to a maximum of 36%

Submittal requirements:

- Tributary area to each BMP
- Details and specifications
- Long term maintenance plan
- Soil profile description as necessary
- Treatment train narrative if applicable
- Easement or record against title
- Proof of construction (as-built)

Designing BMPs: How much is enough?

Water Quality:

Ordinance section 15-65 and BMP Manual: Design for a 2", 24-hour event to treat all new impervious surfaces.

Use the BMP Manual for design guidance

Consider the entire tributary area, not just the area of disturbance

May bypass off-project flow

May treat offsite flow as long as it has the same pollutants of concern

Treatment trains are encouraged

Submittal Requirements:

- Tributary area to each BMP
- Model where appropriate
- Soil profile description as necessary
- Planting plan, management and monitoring plan
- Narrative description of treatment train
- Cost Estimate
- Long term maintenance plan
- Easement or deed restriction as appropriate
- Proof of Construction (as-built)

How deep is that trench?

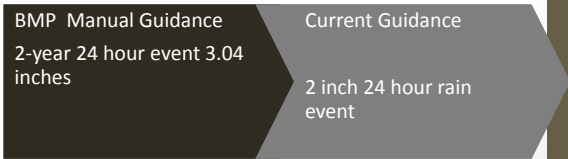
As-built documentation

- Document that the BMP was constructed properly and be prepared to require/submit materials tickets, photos and other relevant information at the time of as-built approval.

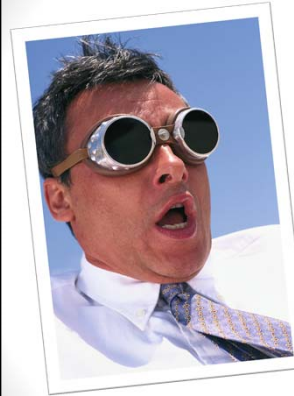


Calculating for Water Quality BMPs: Where did 2 inches come from?

80% of runoff is from storms which are 2 inches or less
80% of the sediment load is from storms 1.78 inches or smaller*



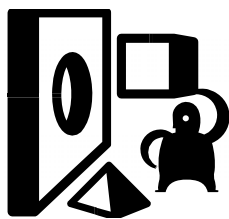
*Based on Wisconsin Data



BMP Practices Selection

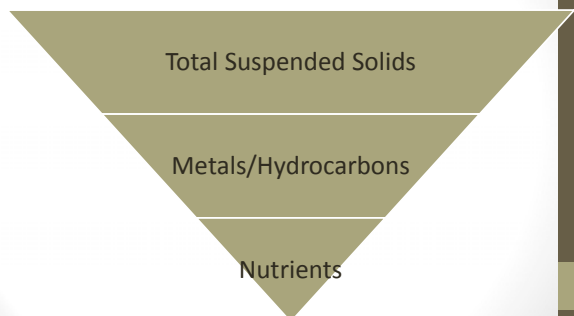
Flexibility can be scary

*The selection guide is a **guide, not regulation.**



If it isn't fitting with the pollutants of concern, don't be afraid to set it aside in favor of a more practical solution.

Example Pollutants of Concern listed by importance for a commercial use.



BMP Selection Guide

Sample BMPs	Value	Pollutant Limitation
Vegetated Swale, native	2	Metals/Oil
Permeable Pavers	3	None
Dry Detention	1	Oil
Wet Bottom Detention	2	Oil
Wetland Detention (no open water)	2	None
Constructed Wetland (CWD)	3	None
Manufactured	Varies	Varies

Importance Value (BMP Effectiveness)
 1 = Low 2 = Moderate 3 = High

BMPs should ...average or exceed a 2.5 average importance value.

*Excerpt example from large scale Single Family Residential

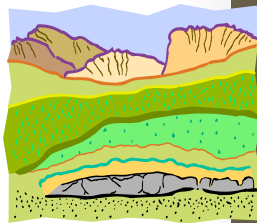
Common Exemptions from all PCBMPs

The development is limited to....

- Resurfacing or reconstructing a roadway with 2,500 square feet or less per ¼ mile
- Bridge or culvert replacement
- Flood or stormwater control facility
- Ecological restoration or streambank stabilization
- Path no wider than 16 feet (including shoulder) constructed for general public use
- Water or sewer improvement
- Underground or overhead utility conduit or line

Common exemptions from the construction of Volume Control BMPs

- Fueling and vehicle maintenance areas
- Soils are in Hydrologic subgroup A
- Groundwater table is within 2 feet of the surface



Submittal Requirements:

- Provide a soil profile description at the location of the BMP, also noting depth of water table as indicated by soil characteristics to document exemption.
- Fee in lieu of VCBMPs
- Water quality BMPs are required onsite

Uncommon exemptions from the construction of volume control BMPs

- A commercial, industrial, or institutional development within 400 feet of a known community water system well or 100 feet from a private well
- USEPA or IEPA has identified contaminants of concern in the soil where infiltration may occur

Submittal Requirements:

- Provide documentation of the exemption requested
- Fee in lieu of VCBMPs
- Water quality BMPs are required



Fee-in-lieu of BMPs

If placing one or both types of BMPs in your development is found to be impractical, a fee-in-lieu option is available.

Volume Control:

Ordinance section: 15-98.B.1

Cost: \$500/1000 ft² *net new impervious area

Water Quality:

Schedule B

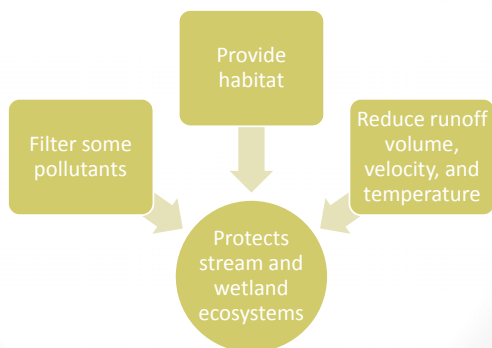
Cost: Per acre *new impervious surface based on land use.

Can BMPs and Special Management Areas Coexist?



Answer: a qualified "yes".

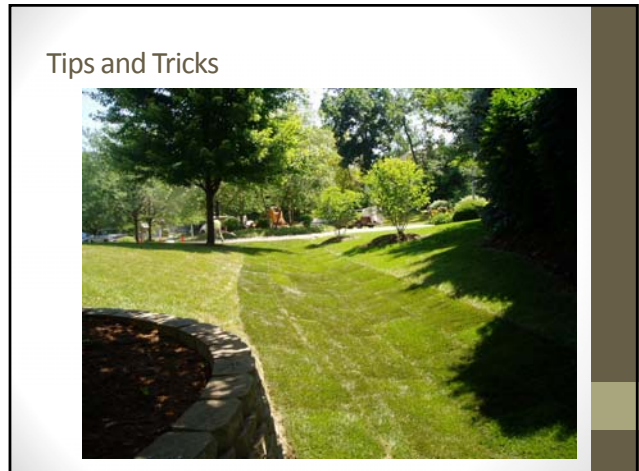
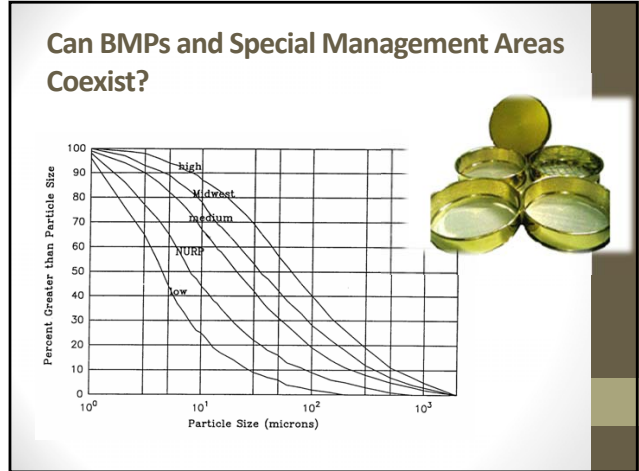
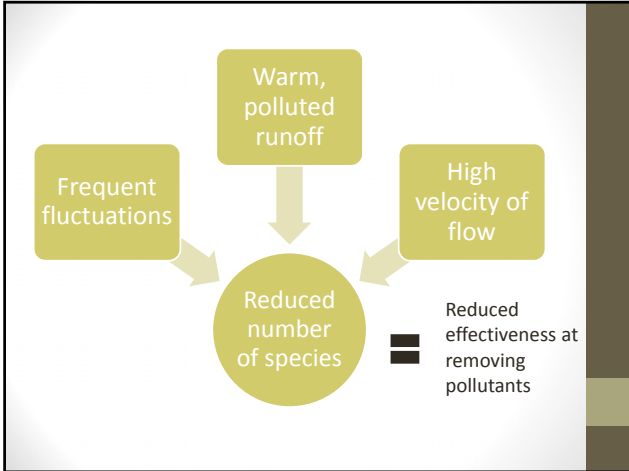
Healthy, diverse buffers are super



Why is this important?

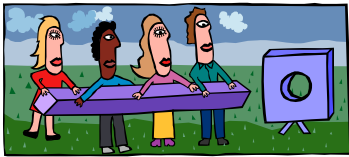
Diverse ecosystems are better at everything

- Greater plant diversity supports diverse soil fauna
- Different kinds of plants and organisms assimilate different kinds of pollutants
- Tend to reduce runoff volume more efficiently through evapo-transpiration and infiltration



BMPs Just Won't Fit

- Development scenario
 - Too many constraints on a small site
- Example solution
 - Demonstrate how a BMP will not work on the site and pay in fee-in-lieu



Topo doesn't work

- Development scenario
 - Driveway aprons run to the street, not to the BMP
- Example solution
 - Swap apron area for flow from an existing paved surface outside of the developed area



Artificial turf fields

- Can double as a BMP **IF...**
- 80% of OK110-sized sediment is being trapped in the 2 inch event
 - Sediment will not be re-suspended
 - May accept sediment from off the field



Grading filter strips can be tricky


- Grading a filter strip may cause soils to compact, settle, develop rills and concentrate flows.
- Runoff must sheet flow **evenly** and slowly through the filter strip
- Ideally, place in ungraded soil where topo conditions are already just right.

Pretreatment

Can I place my manufactured structure downstream of my detention pond?

Not recommended.

The idea of a pretreatment structure is to prevent the oils and metals from getting into the basin where they may infiltrate and contaminate groundwater or cause basin sediments to be classified as special hazardous waste.




Pretreatment

Regular cleanout of a pre-treatment device is easier and may extend the life of your BMPs and detention basins.

Examples of pretreatment practices:

- Manufactured structure placed **upstream** of the basin or BMP
- Detention basin forebay




**New development? An addition?
No Problem!
IF...**

The basin treats the pollutants of concern for the new development
and
The basin meets the design standards in the BMP manual
and
The basin is in good condition



Good News

More developers today are taking basin and BMP maintenance seriously from the start of construction.

Those who do are getting signoff by the end of their monitoring period. Some are saving money and time by achieving early signoff.



The Morton Arboretum

Questions?



www.dupageco.org/stormwater