

Flexible Treatment Options: What could be done at clay soil sites?

December 16, 2011
MIDS Work Group Meeting

Purpose

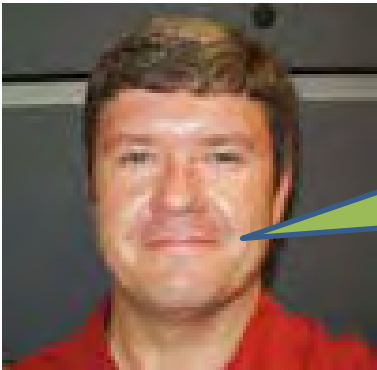
- Provide background so group can decide what, if any, performance goal MIDS should adopt for sites with restrictions, specifically sites with slow-draining soils

Presentation Outline

- Quick review of last month's presentation
 - "Prudent" and "Feasible"
 - Pollutant removal of various BMPs
- Example of volume control and non-volume control BMPs on a site

Flexible Treatment Considerations

- Objective for sites with restrictions is to still meet antidegradation requirements



Adoption of the MIDS package
is a path to compliance with
antidegradation

- MPCA's alternative analysis approach (draft) can provide a roadmap for evaluating flexible treatment options

Framing Flexible Treatment Options

Antidegradation

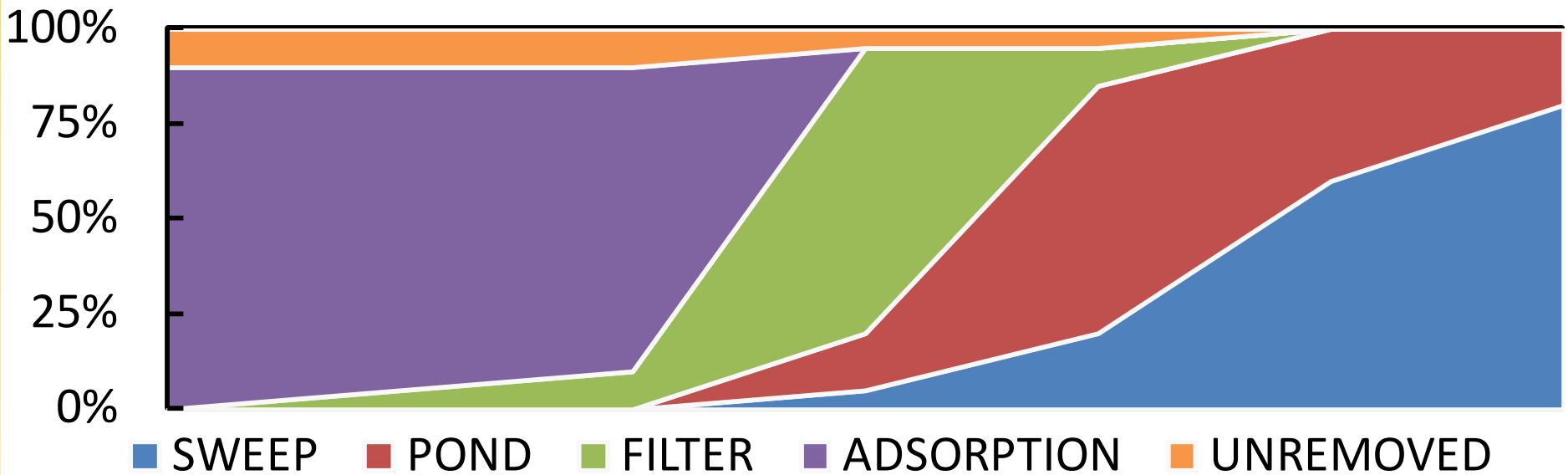
What are the prudent and feasible alternatives that avoid and minimize net increases in loading?

Background on “prudent” and “feasible” BMPs and their performance

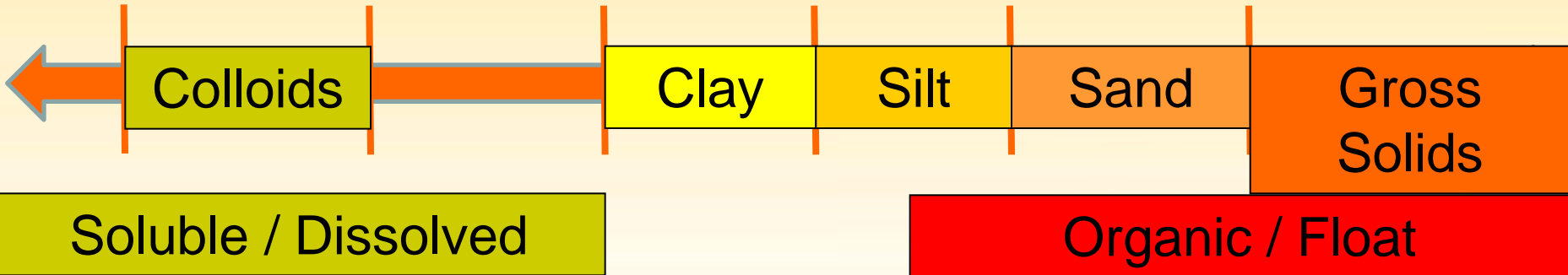
- Different BMPs remove different particle sizes & the pollutants attached to those particles
- Volume reduction BMPs remove pollutants from entire particle size spectrum
- Especially significant with phosphorus
 - Dissolved phosphorus difficult to remove



BMP pollutant size removals



0.005 µm 0.2 µm 0.45 µm 2 µm 75 µm 4250 µm



Flexible Treatment Considerations

Volume control might not always be “prudent” and “feasible”

- Can we achieve similar benefits through flexible treatment options?
- If not, what level of treatment is acceptable?

One Example

10 acre site, 50% Imperviousness, B soils

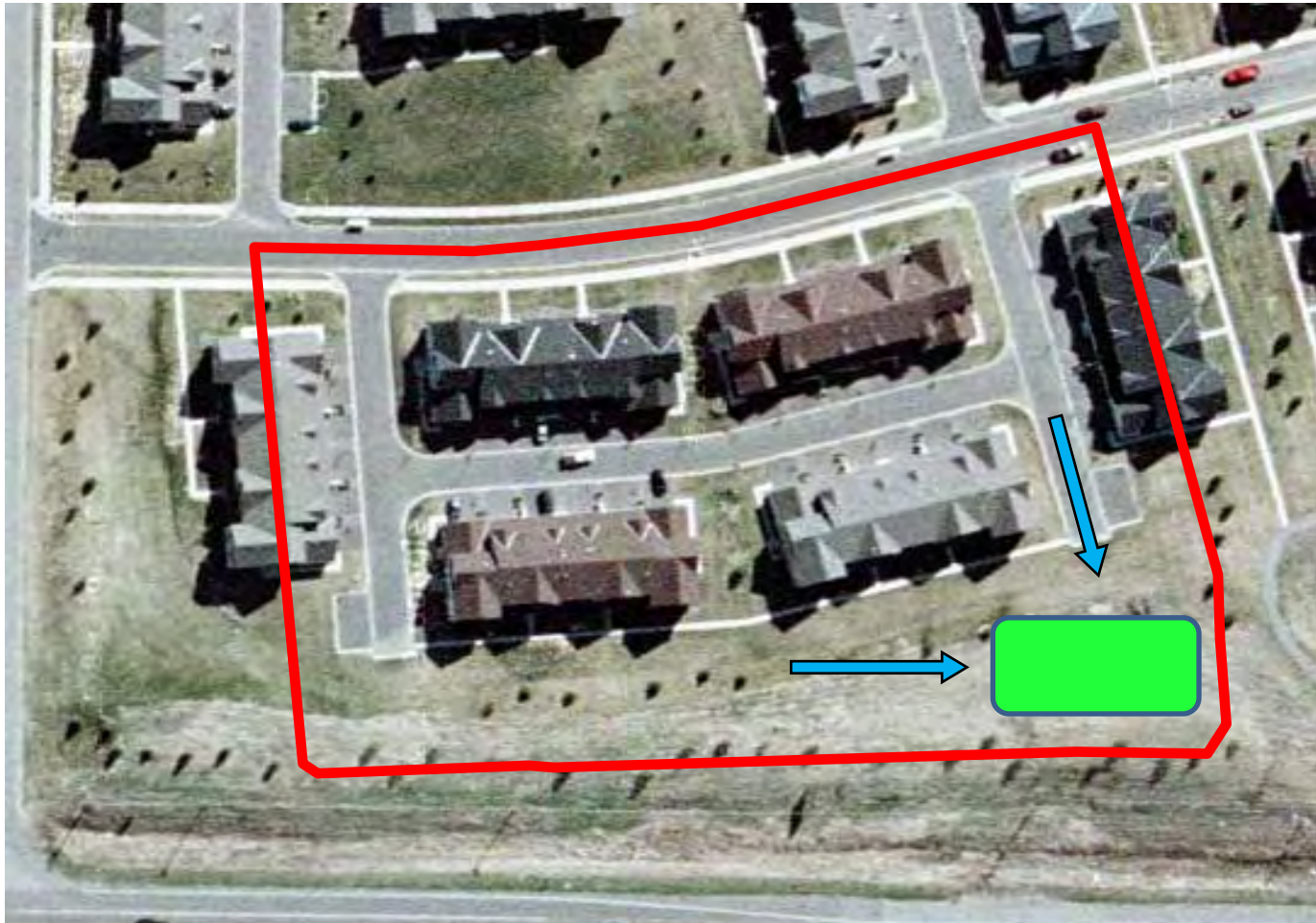
Volume Control BMP

- Bioretention basin

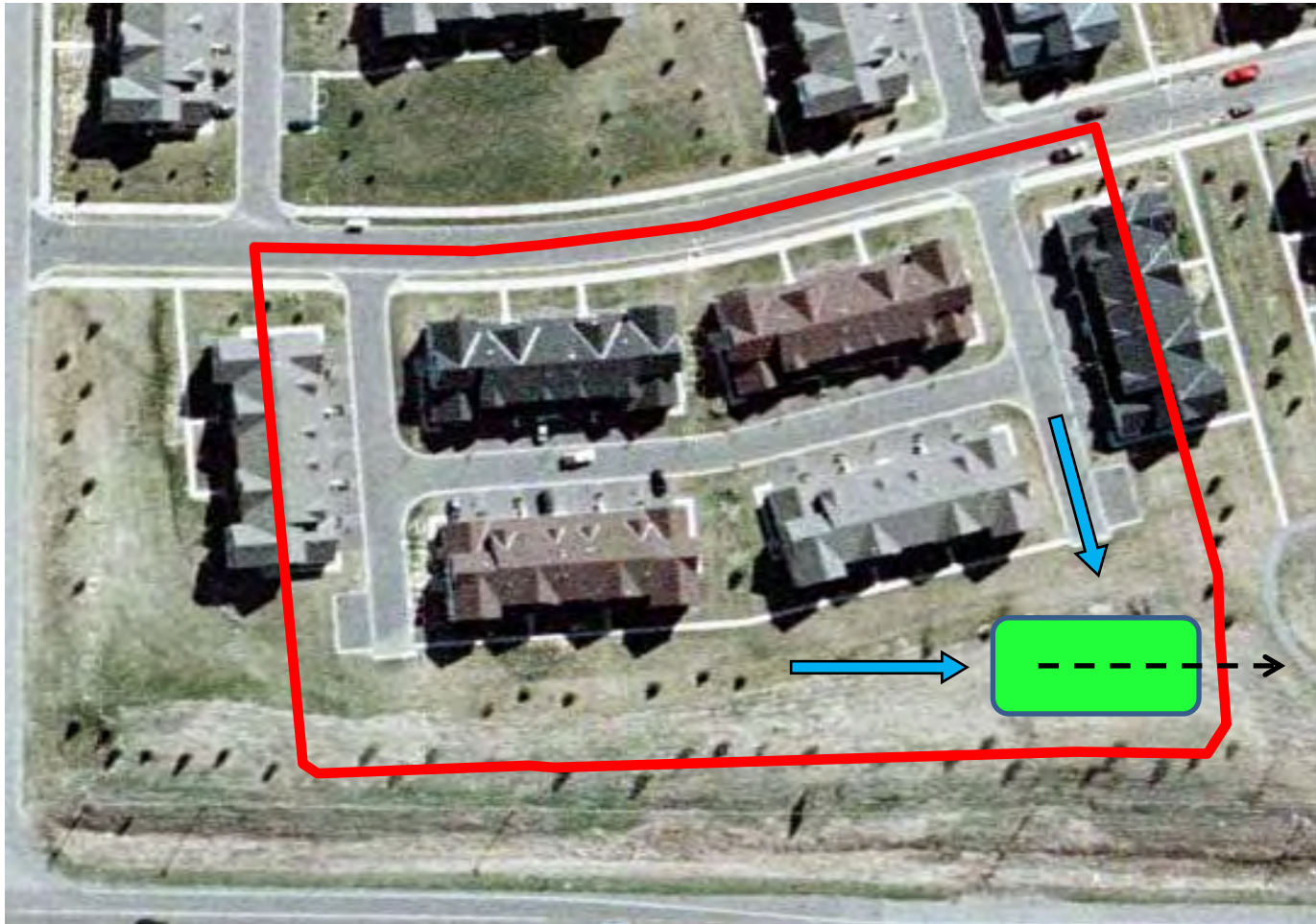
Clay Site BMPs

- Biofiltration basin
- Biofiltration basin with iron enhancement
- Larger biofiltration basin with iron enhancement

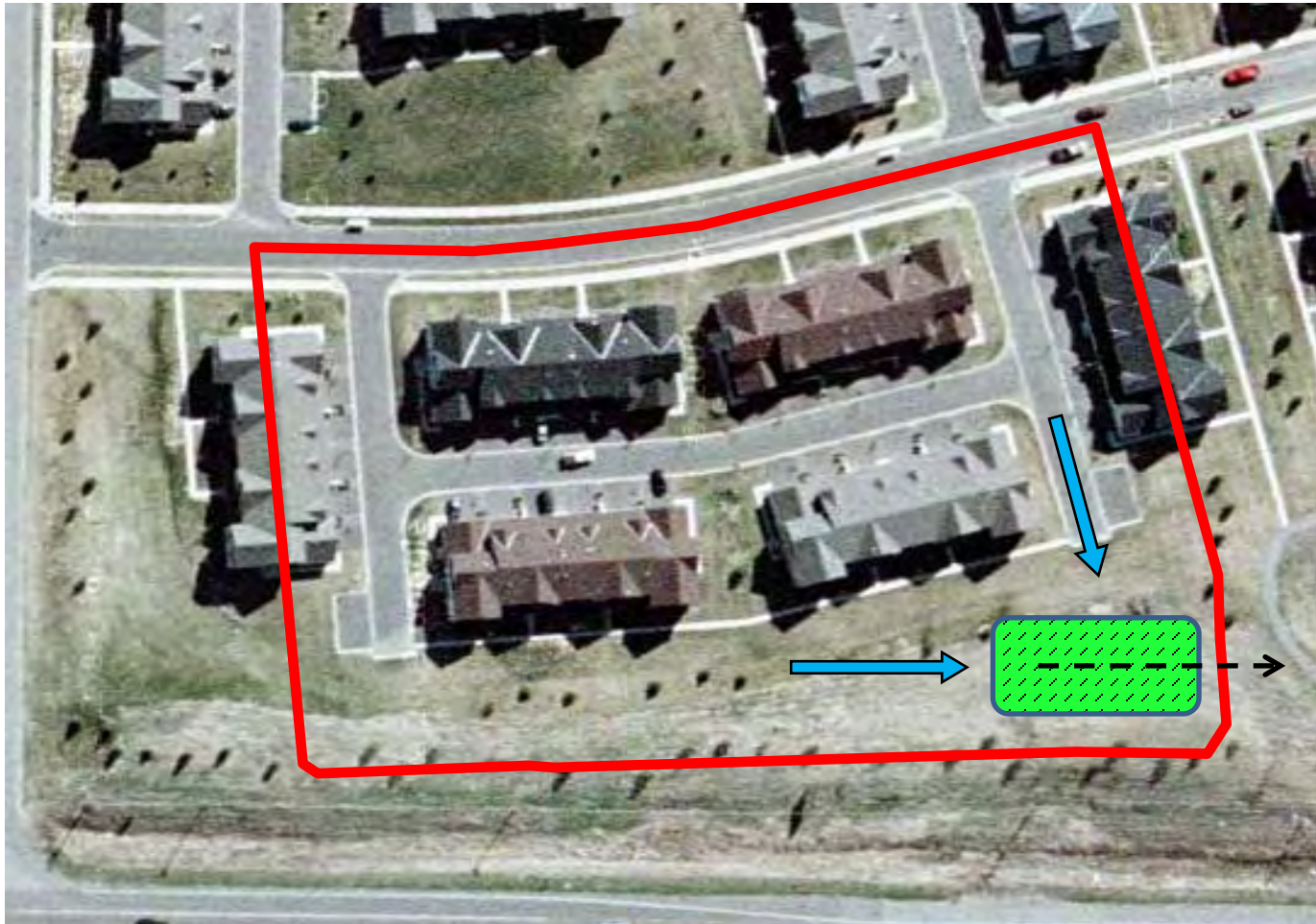
Volume Control Site: B Soil, 10-Acre Site 50% Impervious



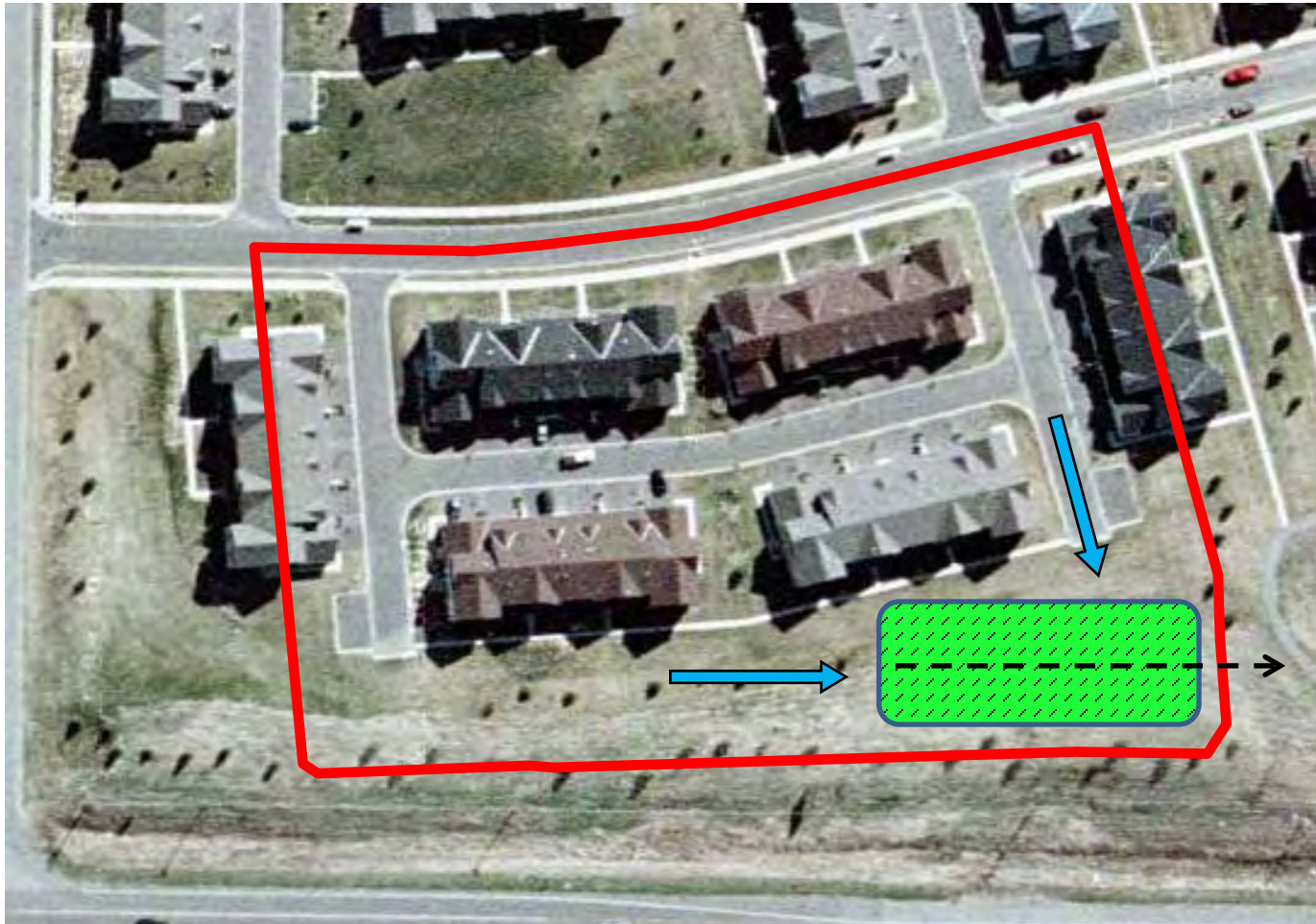
Clay Soil Site No. 1: BMP = 1.1" off Impervious, Sand Filtration



Clay Soil Site No. 2: BMP = 1.1" off Impervious, Iron-Enhanced



Clay Soil Site No. 3: BMP = 2.0" off Impervious, Iron-Enhanced



Comparison¹

	Volume Control 1.1"	Clay Site #1 1.1" No Iron	Clay Site #2 1.1" with Iron	Clay Site #3 2.0" with Iron
BMP % of Site	5%	5%	5%	8%
% Annual Volume Retained	90	0	0	0
% TP Removal	90	65	80	90
% DP Removal	90	0	70	80
% TSS Removal	90	80	80	90
Estimated Annualized Cost (no land)	\$1.0X	\$1.15X	\$1.25X	\$2.3X

¹ Rough estimates for comparison purposes only

Big Question:

Only non-infiltration, volume control BMPs and BMPs that manage dissolved phosphorus can achieve similar treatment results on sites with restrictions.

Is requiring these BMPs prudent and feasible?

Yes

- Performance goal for sites with restrictions:
“provide equivalent TP removal”

No

- How much treatment is enough?

Discussion Options (non-inclusive)

- Filter same volume as non-restricted site (2nd column)
- Some other lower performance standard
- Match TSS removal (90%) of non-restricted site (last column)
- Match TP removal (90%) of non-restricted site (last column)

Discussion Options

- Install BMPs that will cost the same as non-restricted site or have cost cap
- Should restricted site performance goal be expressed as “inches off imperviousness” or “% removal”?