

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

December 16, 2011  
MIDS Work Group Meeting

# Purpose

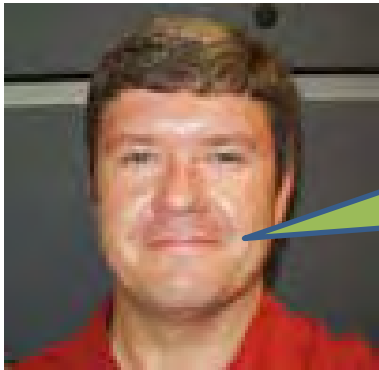
- Provide background so group can decide what, if any, performance goal MIDS should adopt for sites with restrictions, specifically sites with slow-draining soils

# 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

# Antidegradation

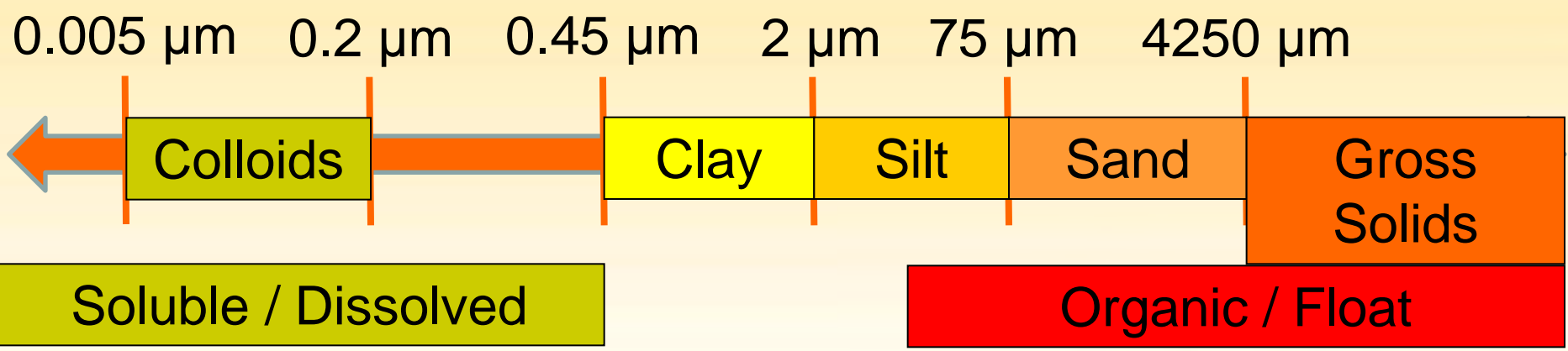
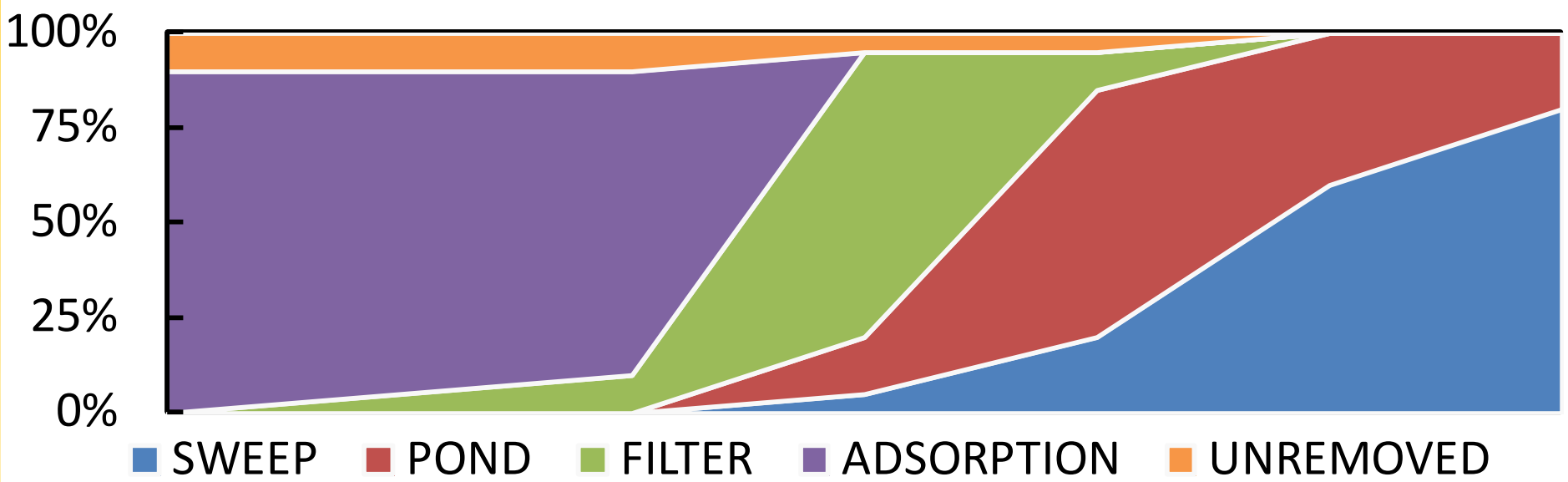
What are the prudent and feasible alternatives that avoid and minimize net increases in loading?

# 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



# 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

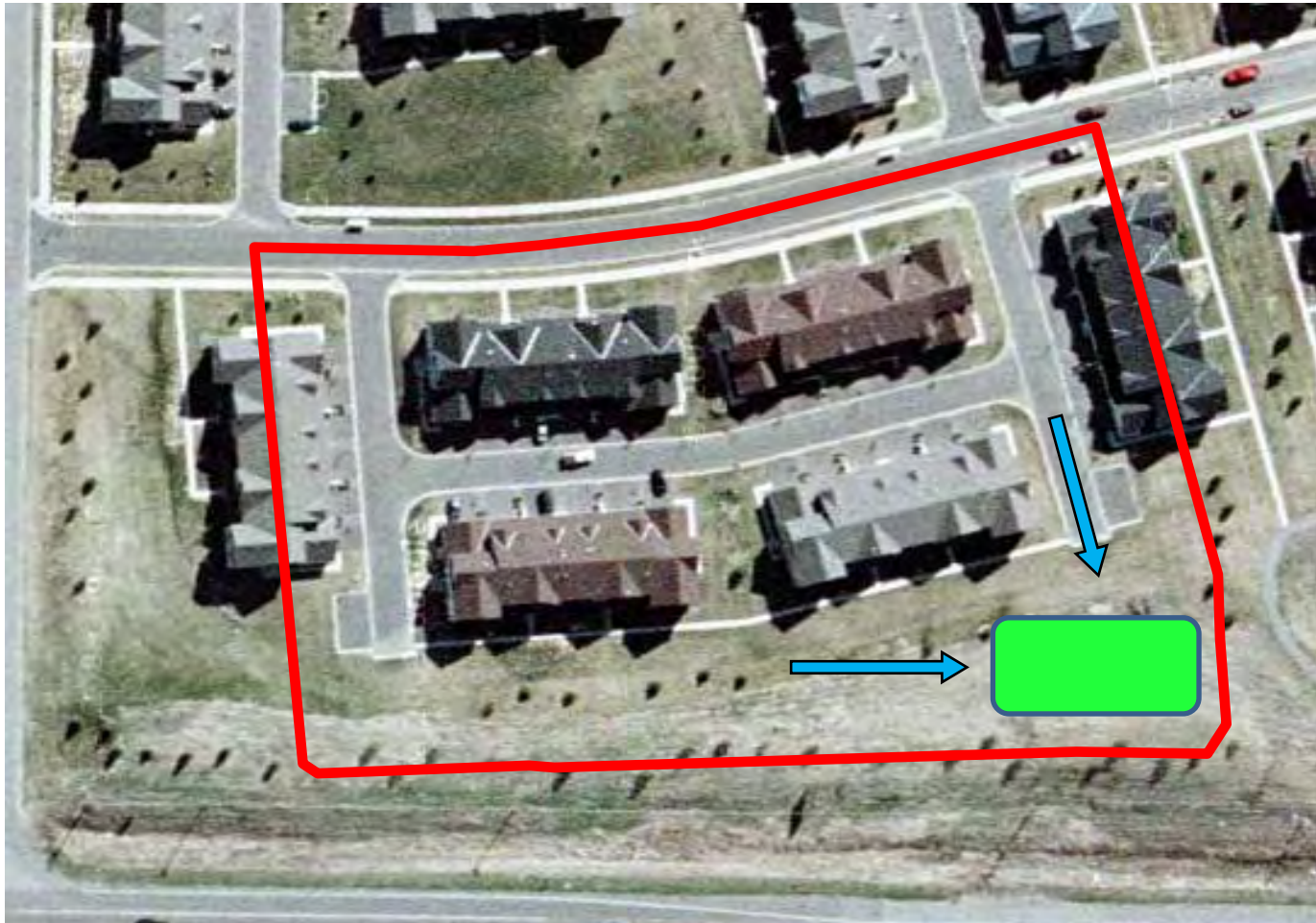
## Volume Control BMP

- Bioretention basin

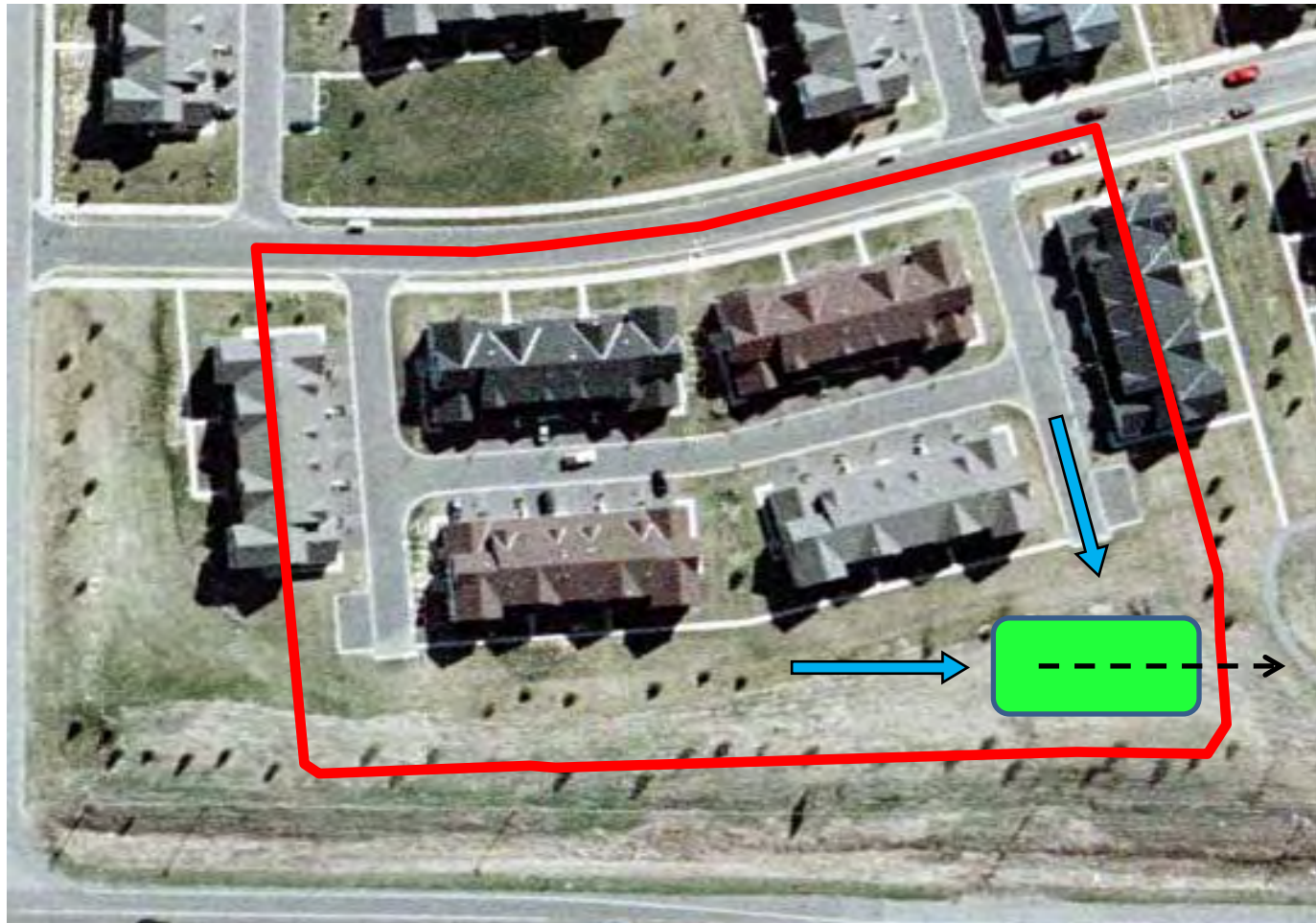
## Clay Site BMPs

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

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

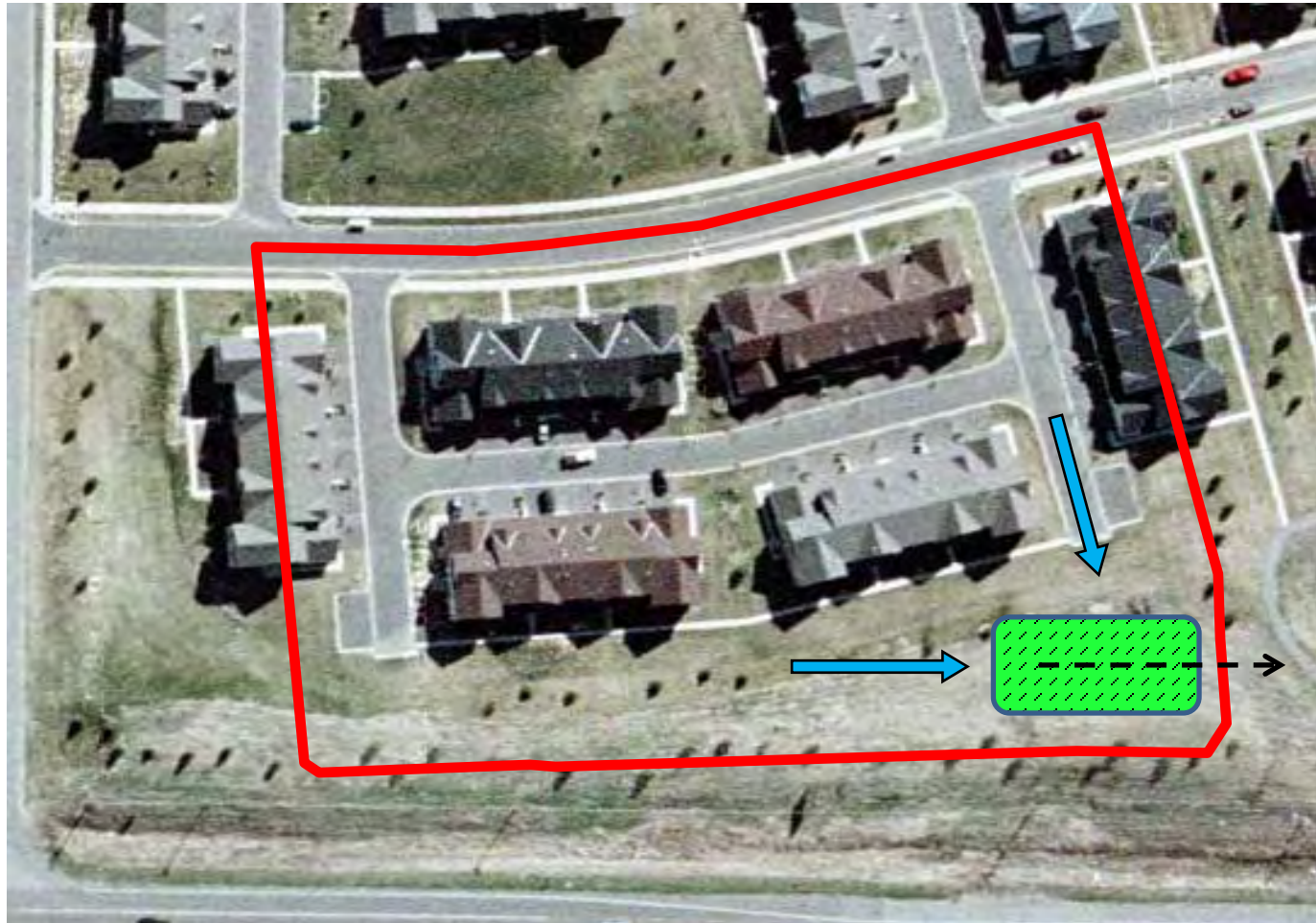


# Clay Soil Site No. 1: BMP = 1.1" off Impervious, Sand Filtration

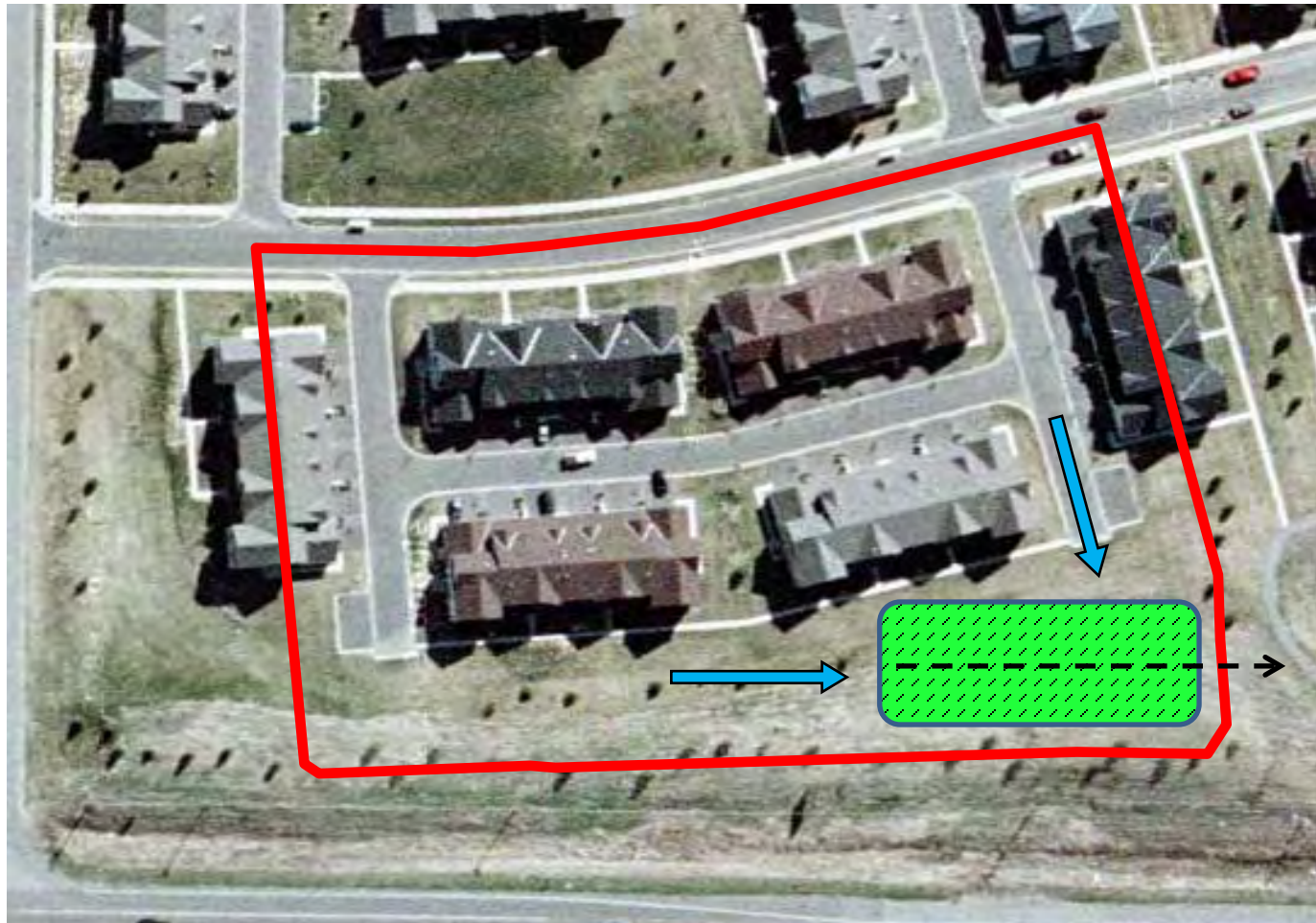




# Clay Soil Site No. 2: BMP = 1.1" off Impervious, Iron-Enhanced



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



# Comparison<sup>1</sup>

	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

<sup>1</sup> 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 (2<sup>nd</sup> 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”?