# Flexible Treatment Options: How the calculator can help

January 20, 2012

MIDS Work Group Meeting

# Purpose

- Walk through example with beta calculator to help group decide what, if any, MIDS performance goal should be adopted for sites with restrictions, specifically sites with slow-draining soils
  - Show that several BMPs are needed at sites with slow-draining soils to provide equivalent TP and TSS removal as sites without restrictions

# Presentation Outline

- Remind everybody of the “big question” and some performance goal options
- Show performance of BMPs on an example site
- Demonstrate example with beta calculator
- Summarize results
- Lead into discussion of draft performance goal

# 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
- Provide some other lower performance standard
- Match TSS removal (~90%) of non-restricted site
- Match TP removal (~90%) of non-restricted site

# Discussion Options (non-inclusive)

- Install BMPs that will cost the same as non-restricted site or have cost cap

- Express restricted site performance goal as “inches off imperviousness” rather than “% removal”

# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

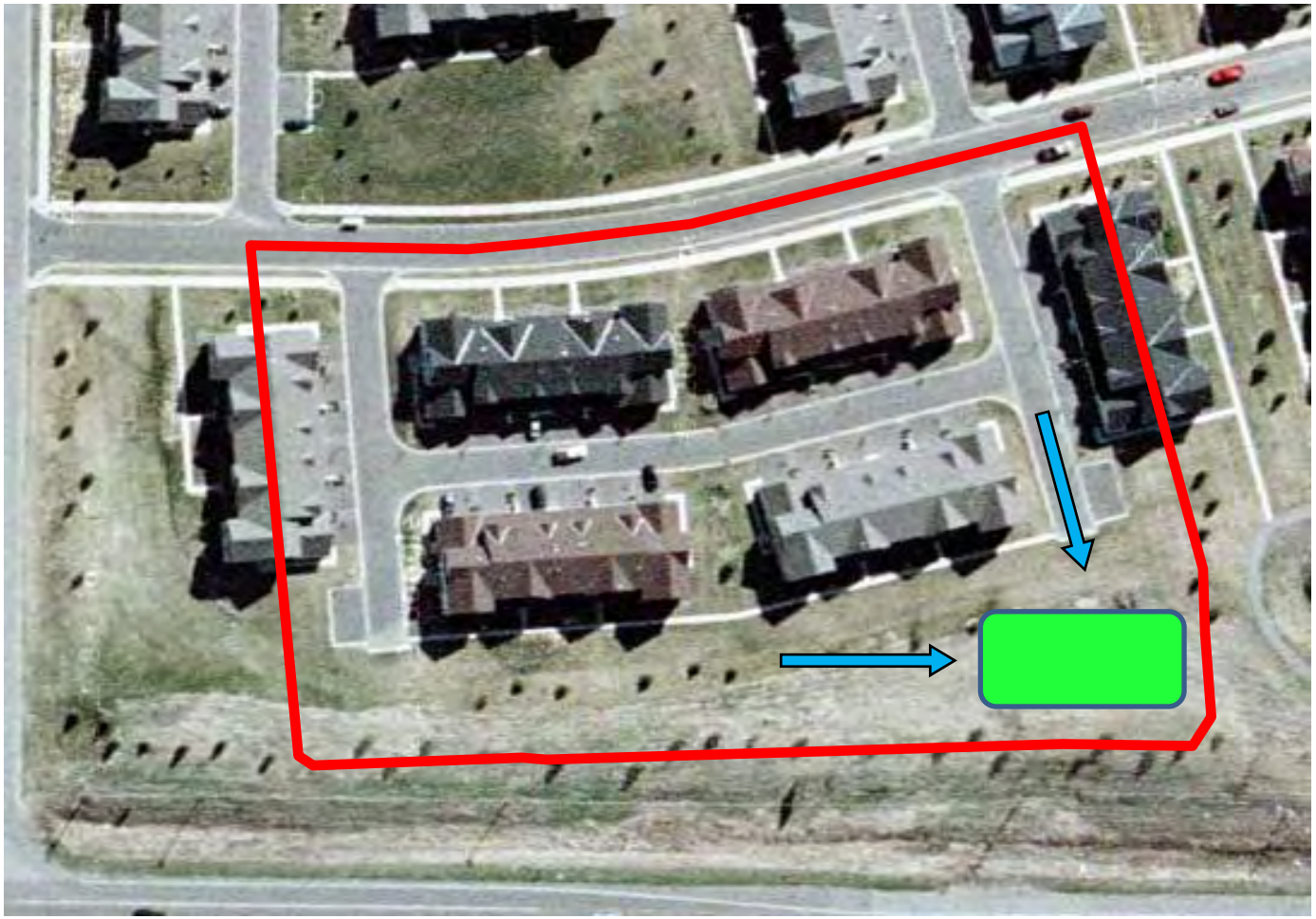
- Bioretention basin

**Site with D Soils:**

**Clay Site BMPs**

1. Pond
2. Biofiltration basin
3. Grass swale with soil amendments to biofiltration basin
4. Grass swale with soil amendments to pond to biofiltration basin
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

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



# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

- Bioretention basin
  (89% TP, 89% TSS)

**Site with D Soils:**

**Clay Site BMPs**

1. Pond
2. Biofiltration basin
3. Grass swale with soil amendments to biofiltration basin
4. Grass swale with soil amendments to pond to biofiltration basin
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

# Clay Soil Site No. 1: BMP = Pond (Dead Storage Volume = Runoff from 2.5" Event)

# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

- Bioretention basin (89% TP, 89% TSS)

**Site with D Soils:**

**Clay Site BMPs**

1. Pond (50% TP, 84% TSS)
2. Biofiltration basin
3. Grass swale with soil amendments to biofiltration basin
4. Grass swale with soil amendments to pond to biofiltration basin
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

# Clay Soil Site No. 2:
# BMP = Biofiltration Basin

# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

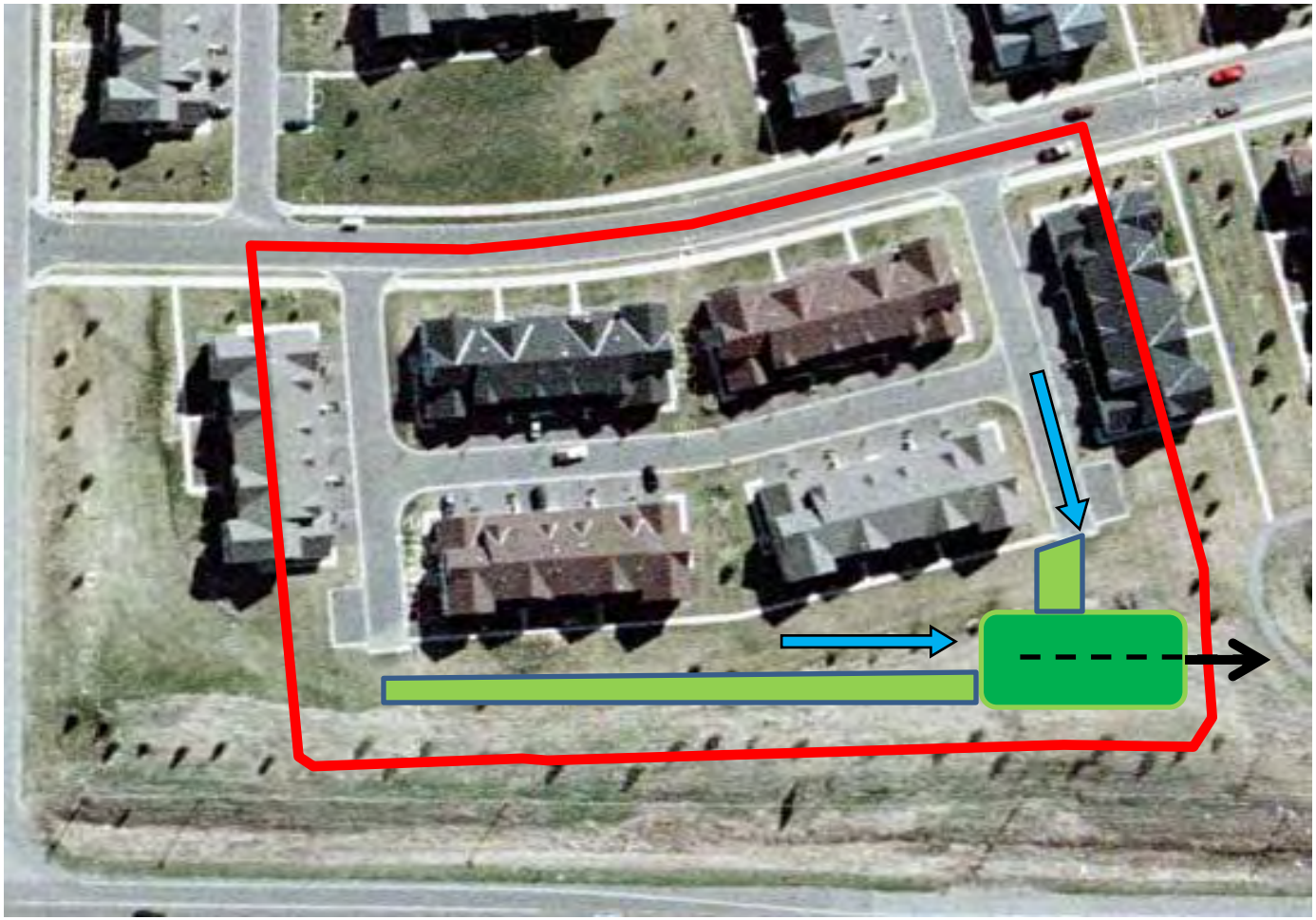
- Bioretention basin (89% TP, 89% TSS)

**Site with D Soils:**

**Clay Site BMPs**

1. Pond (50% TP, 84% TSS)
2. Biofiltration basin (50% TP, 85% TSS)
3. Grass swale with soil amendments to biofiltration basin
4. Grass swale with soil amendments to pond to biofiltration basin
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

# Clay Soil Site No. 3:
# BMP = Grassed Swale with Amended Soils to Biofiltration Basin



# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

- Bioretention basin (89% TP, 89% TSS)

**Site with D Soils:**

**Clay Site BMPs**

1. Pond (50% TP, 84% TSS)
2. Biofiltration basin (50% TP, 84% TSS)
3. Grass swale with soil amendments to biofiltration basin (66% TP, 96% TSS)
4. Grass swale with soil amendments to pond to biofiltration basin
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

# Clay Soil Site No. 4:
# BMP = Grassed Swale with Amended Soils to Pond to Biofiltration Basin

# One Example
# 10 acre site, 50% Imperviousness

**Site with B soils:**
**Volume Control BMP**

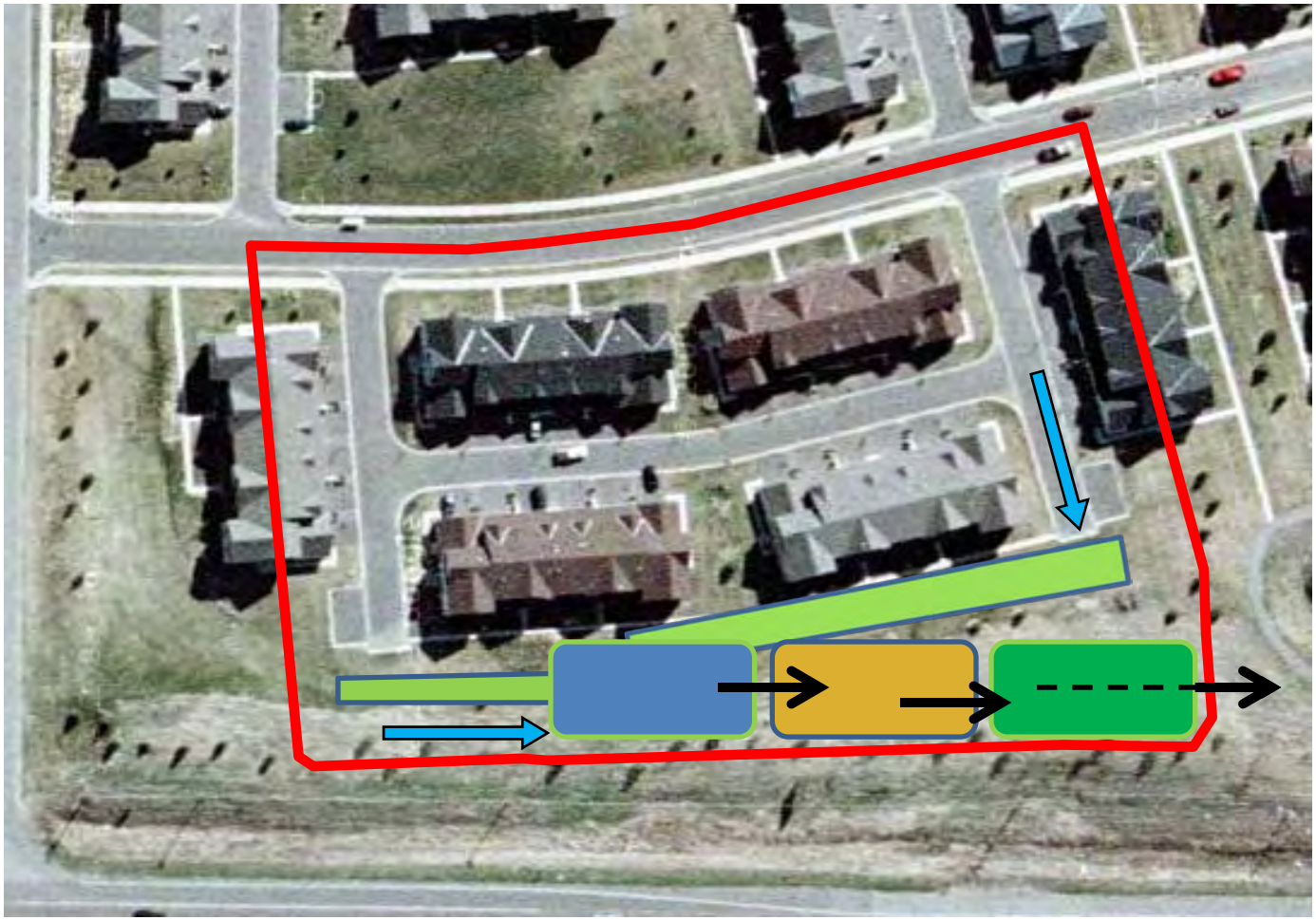
- Bioretention basin (89% TP, 89% TSS)

**Site with D Soils:**

**Clay Site BMPs**

1. Pond (50% TP, 84% TSS)
2. Biofiltration basin (50% TP, 84% TSS)
3. Grass swale with soil amendments to biofiltration basin (66% TP, 96% TSS)
4. Grass swale with soil amendments to pond to biofiltration basin (83% TP, 99% TSS)
5. Grass swale with soil amendments to pond to sand filter to biofiltration basin

# Clay Soil Site No. 5:
# BMP = Grassed Swale with Amended Soils to Pond to Sand Filter to Biofiltration Basin



# Comparison of Results from Current Beta Version MIDS Calculator

| Site Soils | BMP(s) | TP % Reduction | TSS % Reduction |
|---|---|---|---|
| B | Bioretention | 89 | 89 |
| D | Pond | 50 | 84 |
| | Biofiltration | 50 | 85 |
| | 1) Grass swale with amended soils, 2) Biofiltration | 66 | 96 |
| | 1) Grass swale with amended soils, 2) Pond, 3) Biofiltration | 83 | 99 |
| | 1) Grass swale with amended soils, 2) Pond, 3) Sand filter, 4) Biofiltration | 91 | 100 |

# Calculator Demonstration

# Comparison of Results from Current Beta Version MIDS Calculator

| Site Soils | BMP(s) | TP % Reduction | TSS % Reduction |
|---|---|---|---|
| B | Bioretention | 89 | 89 |
| D | Pond | 50 | 84 |
| | Biofiltration | 50 | 85 |
| | 1) Grass swale with amended soils, 2) Biofiltration | 66 | 96 |
| | 1) Grass swale with amended soils, 2) Pond, 3) Biofiltration | 83 | 99 |
| | 1) Grass swale with amended soils, 2) Pond, 3) Sand filter, 4) Biofiltration | 91 | 100 |

# Summary

- Achieving equivalent TP % reduction is feasible (amounts given by calculator will likely be revised, based on feedback from BMP groups and to address/track dissolved phosphorus performance of BMPs )
- Is it prudent?

# Framing Flexible Treatment Options: Antidegradation
# Definition of "Prudent" Alternatives*

"Prudent" (in context of antidegradation alternatives analysis):

- Selected with care and sound judgment
- Does not have unusual or extraordinary economic, social, or environmental costs

* Based on MPCA's Draft Antidegradation Rule (5/25/11)

# Framing Flexible Treatment Options: Antidegradation
# Definition of "Feasible" Alternatives*

"Feasible" (in context of antidegradation alternatives analysis):

- Capable of being done with existing technology;
- In accordance with acceptable engineering standards;
- Consistent with reasonable public health, safety, and welfare requirements;
- Legally possible; and
- Has supportive governance that can be successfully put into practice to accomplish the task.

* Based on MPCA's Draft Antidegradation Rule (5/25/11)