

Update Meetings

Common : Rain Gardens, Ordinances, Simple Calculator, Updates Important

- **Detroit Lakes**: infiltration practices prevent flooding. Simple calculator
- **Duluth**: Flexible Treatment Options for clays, steep slopes, trees (thermal credits) for trout streams and baseflow
- **Rochester**: flexible treatment, RG
- **Brainerd**: infiltration starting, calculator for RG's
- **Metro**: simple calculator, ordinances, regional treatment/flexible treatment



Minimal Impact Design Standards

(c) The agency shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other stormwater management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

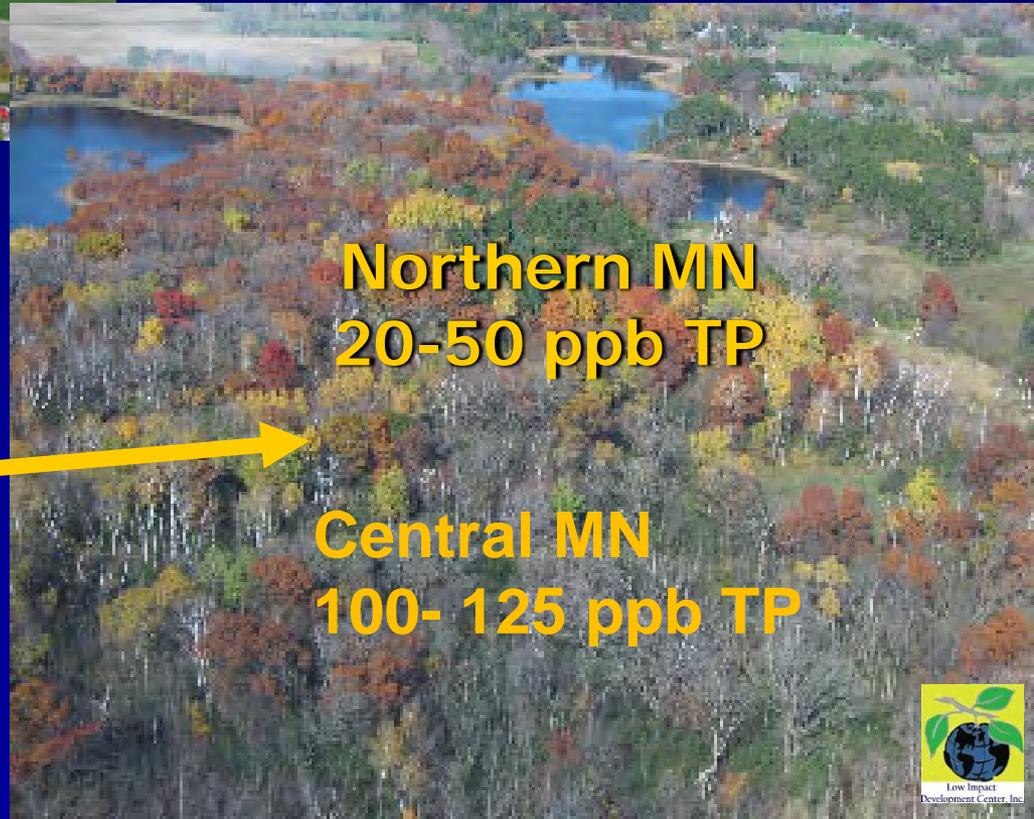
Minnesota Statutes 2009, section 115.03, subdivision 5c

**How do you
make this...**



300-600 ppb TP

**function like
this?**



**Northern MN
20-50 ppb TP**

**Central MN
100- 125 ppb TP**



Flexible Treatment Options

- Better Site Design
- Disconnection of impervious cover
- Filtration
- Trees & turf
- Reuse, capture
- Evapo-transpiration
- Offsite infiltration
- Green roofs/cisterns
- Wet detention
- Bank credits
- In-lieu of \$

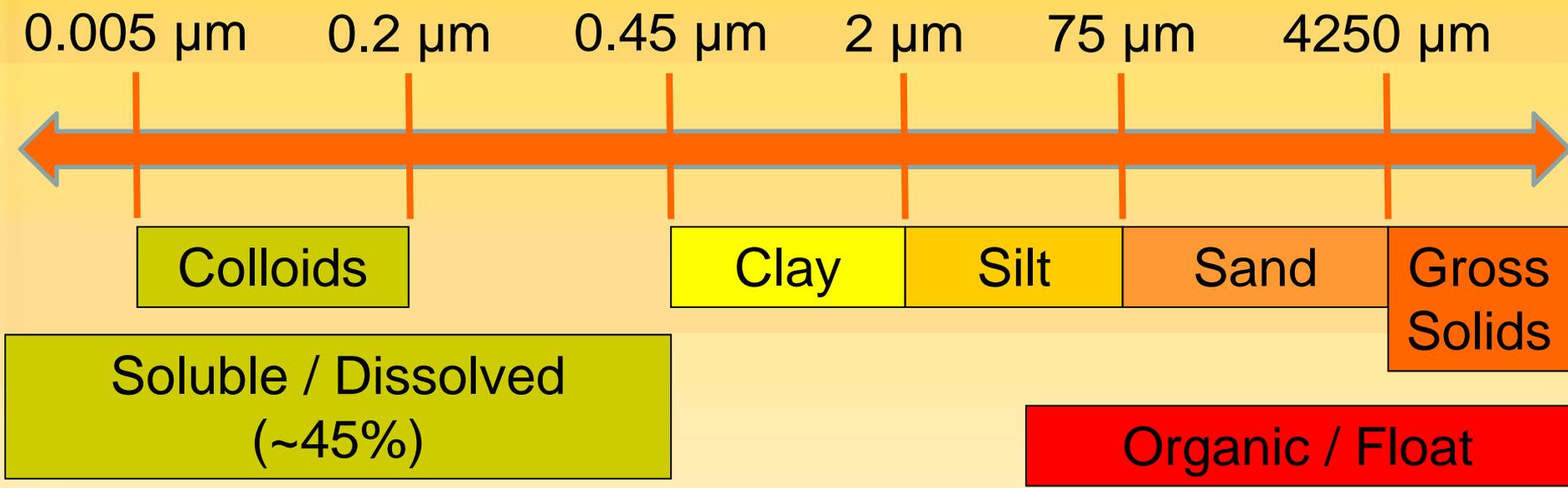


Current Treatment Methods

- Most stormwater treatment practices provide:
 - Filtration
 - Infiltration
 - Sedimentation
 - Biological or chemical
- Most urban watersheds need:
 - 80+% capture of solids **and** dissolved pollutants. (Pollutant Spectrum and Flux)



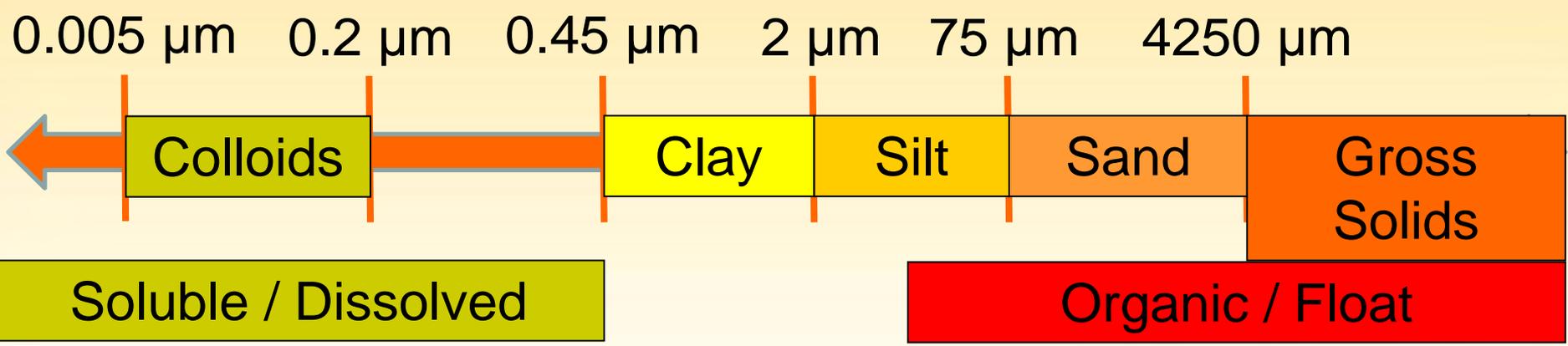
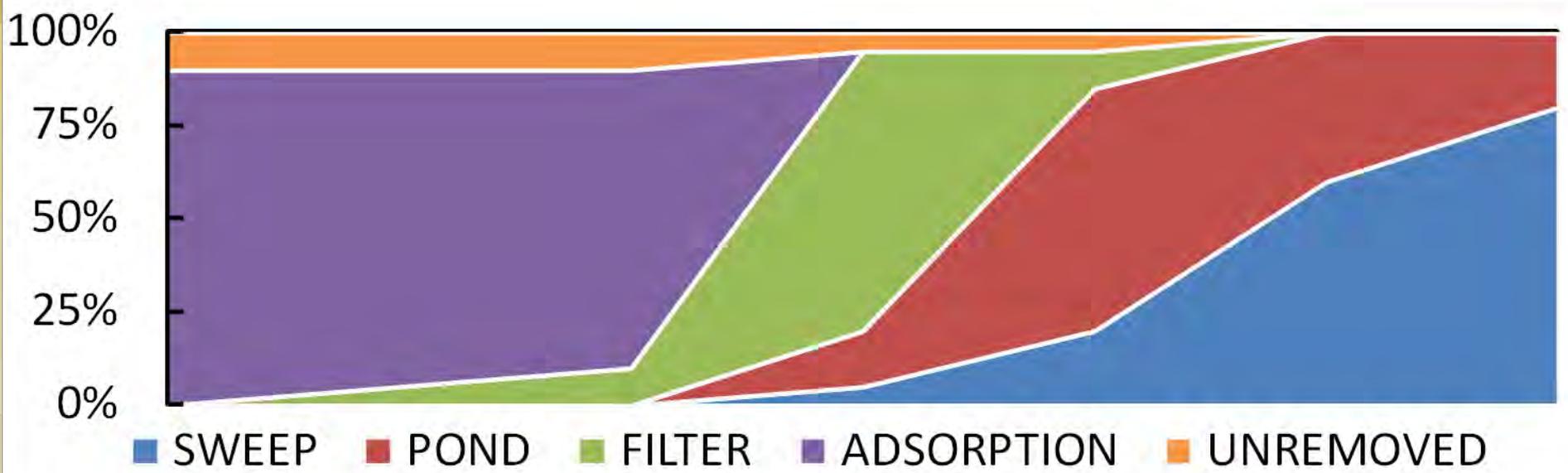
Pollutant Spectrum



- Varies by:
 - Pollutant
 - Location in management system



Treatment Train



Pending Puzzle Pieces

- Atlas 14 (revised TP-40) spring 2012
- Met Council's Reuse/Harvesting Project
- EPA national standards (December) & brownfield study (? date)
- Northeastern Area State and Private Forestry tree grant being pursued (\$200K – \$400K)
- St. Croix Pilot (Ordinance goals, examples)

Linkage to Stormwater Manual Update

MIDS

- **2009-2011 (\$478,000) MN & EPA**
 - Performance goal (new residential development)
 - Calculator (beta)
 - Credits (antidegradation and TMDL)
 - Ordinance goals and examples from Pilot (2013)
- **Phase II Clean Water Legacy \$400,000 through FY 2013**
 - Flexible/alternative treatment options
 - Redevelopment and linear development goals
 - Trees and turf: USFS grant program requires 50% match
 - Costs and Benefits
 - Credits, specifications, O & M
 - Calculator Updating
 - Pilot testing



MIDS Phase II



MIDS

- Minimally-impacted native conditions
- Native soils
 - HSG (A, B, C, D)
- Native vegetation
 - Prairie/grass
 - Forest (deciduous)
- Address regional differences