



University of Minnesota

## Pollutant Removal and Maintenance of Underground Sand Filters

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# Study Goals

- Assess pollutant removal
  - Total Suspended Solids
  - Total Phosphorus
  - Total Dissolved Phosphorus
  - Orthophosphate
  - E. coli
- Assess drawdown time / filtration rate
- Assess maintenance
  - Has it been maintained?
  - Affecting performance?

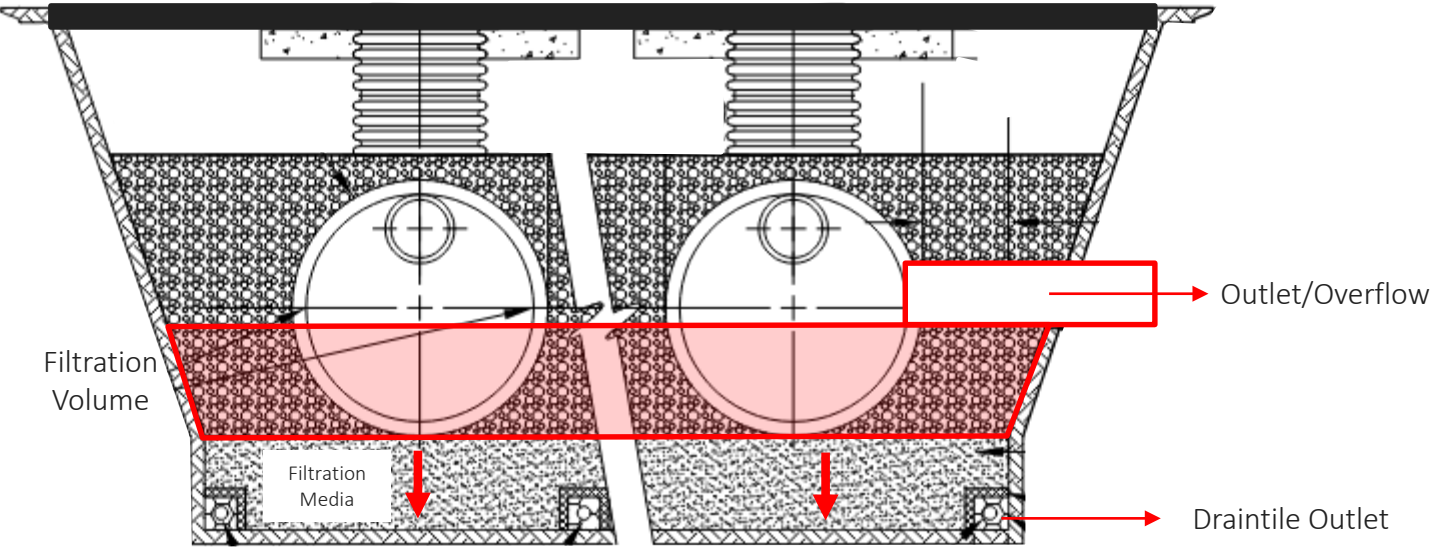


# Why study?

- Common stormwater BMP in urban/suburban areas with poor or contaminated soils
- Underground design based on guidance for surface filters
- A filter is designed to clog
- Current designs allow for minimal filter maintenance
- Unlikely that property owners know what is underground and how/when to maintain it



# Generic System Detail



# 2020 vs 2021 – What's changed?

- Two continued from 2020, two new sites\*:
  - Animal Site
  - School Site
  - Office Site\*
  - Apartment Site\*
- Sampled 9 storms  
Targeting 15 storms
- Focusing on capturing peak of hydrograph

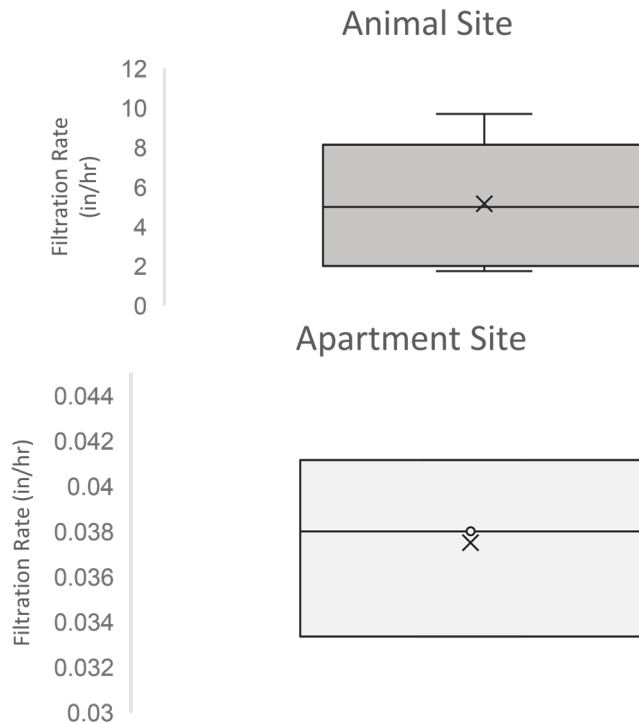


# Results (Six 2021 Storms)

## Rainfall Depth

.12-.94 inches

## Drawdown Rates



## Removal Rates

**TSS** – Goal 75-90% Decrease

91% Decrease to 74% Increase

**TP** – Goal 35-55%

52% Decrease to 56% Increase

**TDP** – decrease not expected

52% Decrease to 65% Increase

**OP** – decrease not expected

52% Decrease to 73% Increase

**E.Coli** – Goal 50%

50-92% Decrease

Questions?