Media Filters Factsheet

1.0 General Description

Media filters are usually in open bed or vault arrangements. Open bed filters generally have a settling area followed by the filter bed. The filter area typically has one or multiple perforated underdrains. Media filters can be made with one or multiple filtering media including, but not limited to, some mixture of two or more of the following: limestone, activated alumina, perlite, zeolites, sand, peat, biochar, and granular activated carbon. A schematic of a basic open bed, surface media filter is shown in Figure 2 and a schematic of a subsurface media filter is shown in Figure 3.

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<th>Potential Treatment Mechanisms</th>
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Legend:  
I = Infiltration  
ET = Evapotranspiration  
FA = Filtration and/or Adsorption  
B = Biochemical Transformation  
RH = Rainfall and Runoff Harvest  
S = Sedimentation  
F = Floatation  
P = Plant Uptake  
T = Trash Capture

Figure 1. Media filter (City of Portland OR)

Figure 2. General schematic of a surface media filter

Figure 3. Schematic of a basic subsurface media filter
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1.1 Variations and Alternative Names

- Sand filters
- Austin sand filters
- Delaware sand filters
- DC sand filters
- Canister filters
- Alternative media filters

2.0 ADVANTAGES & LIMITATIONS

2.1 Advantages

- Typically provide high solids removal
- Can be used where space is limited
- Can be used where the water table is high
- Does not require vegetation management/irrigation
- Can be augmented with absorptive media to increase pollutant removal

2.2 Limitations

- If the design includes a constant pool of water (e.g., Delaware sand filter), vector issues may arise.

3.0 SITING

Media filters require maintenance access and an elevation change from drainage surface to storm drainage systems.

4.0 DESIGN CONSIDERATIONS

When designing a media filter, the following parameters should be considered:

- Contributing drainage area (CDA)
- Filter media
- Filter bed size
- Hydraulic residence time (for sorptive media)
- Unlined underdrain (optional, to allow infiltration)

5.0 CONSTRUCTION CONSIDERATIONS

- Stabilization of the CDA or diversion of flows during construction to prevent sediment loading

6.0 MAINTENANCE

- Inspections for adequate drainage to avoid vector breeding
- Removal of sediment and debris

7.0 REFERENCES


