

Description Compost stormwater filters (CSFs), work by percolating stormwater through compost, which traps particulates and adsorbs dissolved materials such as metals and nutrients. Floating surface scums along with oil and grease are also removed. After filtering through the compost media, the filtered water is channeled into a collection pipe or discharges to an open channel drainageway.

Compost filters act as mechanical filters to remove fine sediments, as ion exchangers to remove solubilized ionic pollutants such as metals, as molecular absorption sites to remove organics, and provide biological substrate to aid in microbial degradation of organic compounds such as oil and grease. Compost filters are not intended for use as stormwater detention systems.

There are two main configurations for compost filters. The larger, stand-alone unit (open) is set into the surrounding soil and stormwater flows are routed across its surface, where infiltration occurs. The smaller unit, constructed from standard size precast concrete vaults (drop-in), is installed in-line with tight line (non-perforated) storm drains. Maintenance proved to be problematic with the open unit; therefore, only drop-in units are included in this BMP for possible use in Idaho.

As with other filtration systems, including sand and peat filters, sediments will accumulate on the filter surface, thus slowing the infiltration capacity of the filter. To reduce sediment loading, the compost filters are designed with sediment forebays and upstream sediment trapping facilities such as trapped catch basins and sedimentation manholes.

Limitations	Drainage area – 1 ac.	Max slope – N/A
	Minimum bedrock depth - N/A	Minimum water table – N/A
	NRCS soil type – N/A	Freeze/thaw – fair
	Drainage/flood control – no	

Targeted Pollutants

- Sediment-95%
- Phosphorus- 45%
- Trace Metals
- Bacteria
- Hydrocarbons

Removal Efficiencies

The CSF has been shown to consistently remove in excess of 85% of the oil and grease entering the filter and 82% of the heavy metals. Phosphorus removal rates vary greatly according to the loadings. In general, data shows good performance with total phosphorus but poor performance with dissolved (soluble) phosphorus. For total phosphorus, the CSF performs best during the first flush flows when total phosphorus loading rates are their highest, yielding removal efficiencies as high as 77%. Based on 2 years of data, the overall total

phosphorus removal rate was approximately 40% (plus or minus 10%). For soluble phosphorus, study data show that compost filters actually release soluble phosphorus, rather than absorb it. For this reason, they are not recommended in areas with a phosphorus problem.

**Design
Parameters**

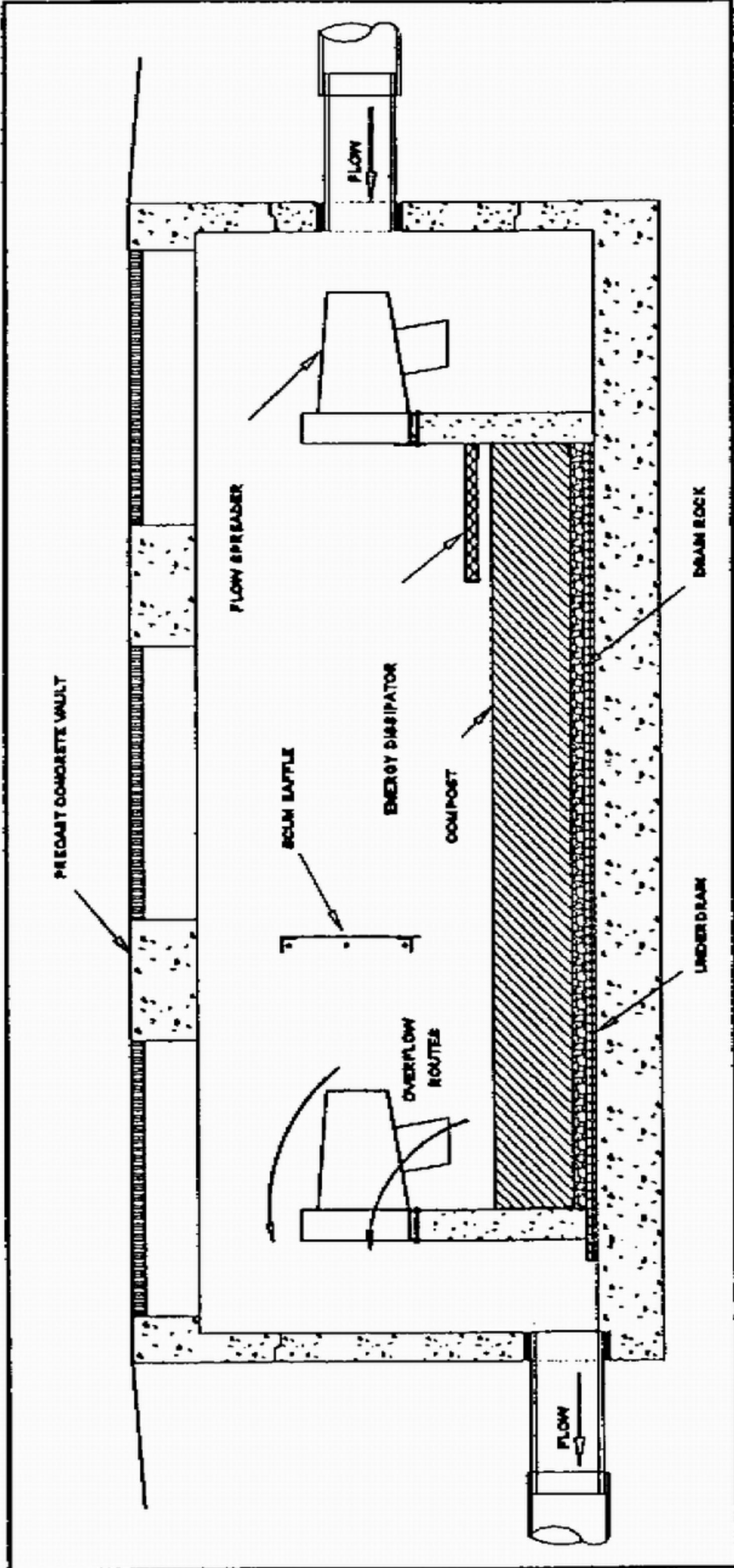
Both the open and drop-in units are designed with overflows. Overflows operate when the inflow rate is greater than the filtration capacity. The flow capacity of the filter is exceeded when the flow into the filter exceeds the design level or sediment accumulation has reduced the filter's infiltration capacity.

The drop-in unit requires a minimum distance of 2.2 feet between the elevation inverts of the inlet and outlet pipes. In addition, there should be at least 2.5 feet between the elevation invert of the inlet pipe and the top of the drop-in unit. Drop-in units can be specified with traffic bearing lids to enable them to be installed directly into a paved area.

Maintenance

Compost filters are a relatively new technology (about 3 years), and precise maintenance procedures are still being refined. The drop-in filters are sized for an annual maintenance that involves replacing the compost and cleaning out the sediment from the inlet bay. The sediment in the inlet bay is removed and disposed of in a manner similar to street catch basin maintenance.

The inclusion of the CSF system in this guidance manual is merely to illustrate different forms of media filtration for stormwater and does not in any way constitute a product endorsement.



Drop-In Unit - Compost Stormwater Filter Schematic
 U.S. Patent No. 5,322,629