Parameter Brief

StormFilter Performance Summary: CSF Leaf Media

July 16, 2004

The CSF® leaf media has been in use throughout the United States since the Washington County demonstration project in 1992. Manufactured from leaf compost, this media has many properties that lend itself well for the filtration of stormwater runoff. CSF leaf media contains properties to remove total suspended solids, oil and grease, soluble heavy metals and some organics have made it an effective filter media.

In an effort to summarize existing field performance evaluation reports, CONTECH Stormwater Solutions Inc. has provided this performance summary. Table 1 provides a site description and general information regarding the sites analyzed.

Table 1. General Site Description

Site Description	WQ Flow Rate (cfs)	Storm Events	Unit Size	Individual Cart. Flow rate (gpm)	Media	No. of Cart.	Location
Commercial Retail	0.77	3	8 X 16	15	CSF	23	Vancouver, WA
Commercial Retail	0.11	4	6 X 12	10	CSF	5	Salmon Creek, WA
Service Station	0.77	6	8 X 16	15	CSF	23	Bremerton, WA

The Stormwater Management StormFilter® was evaluated in the field using the leaf compost media at an individual cartridge flow rate of between 10 -15 gpm. Thirteen storms were collected and storms in excess of 0.1" precipitation were analyzed. Two of the twelve storms sampled contained less than 0.15" of total precipitation. Table 2 provides a performance summary using aggregate removal method and the non-parametric sign test (SMI 2002, PD-02-001.0).

Table 2. Mean Removal Efficiency Estimate (Aggregate Load)

Analyte	n	Aggregate Load Reduction (%)	One-tailed Sign Test (H0=H1=0.5)
TSS	12	84	R
Total Cu	3	42	I
Total Zn	12	53	R
Diss. Zn	11	37	R
Total P	10	31	R

R – Removal is Significant at 5% or less
I - Insignificant number of data points

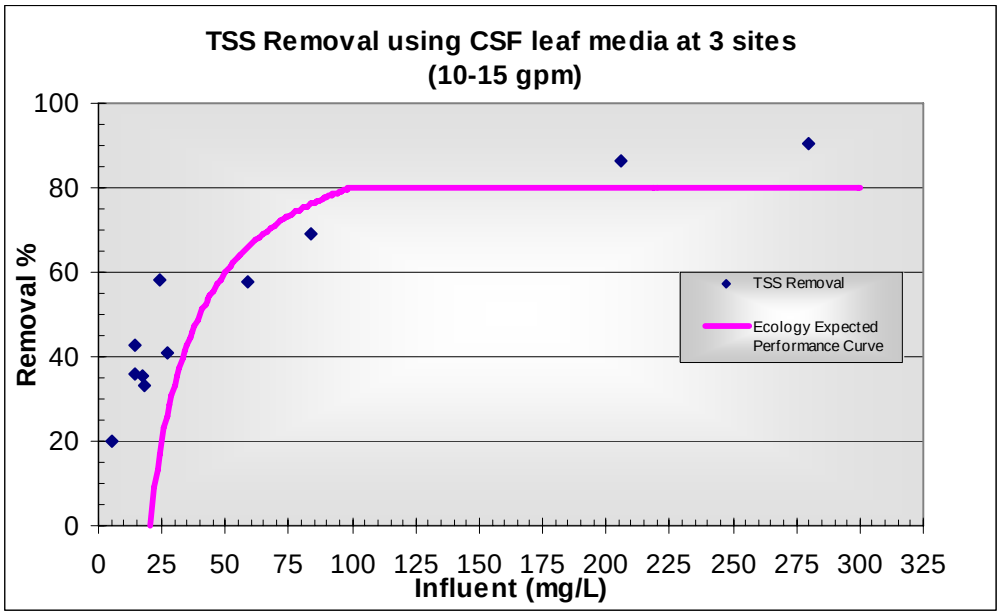

Figure 1. Eleven of twelve data points are plotted. The data indicates that the performance of the StormFilter with CSF leaf media essentially meets the State of Washington Department of Ecology (Ecology) expected performance. One datum is not shown, and had an influent and effluent concentration of 9 mg/L and 16 mg/L, respectively.

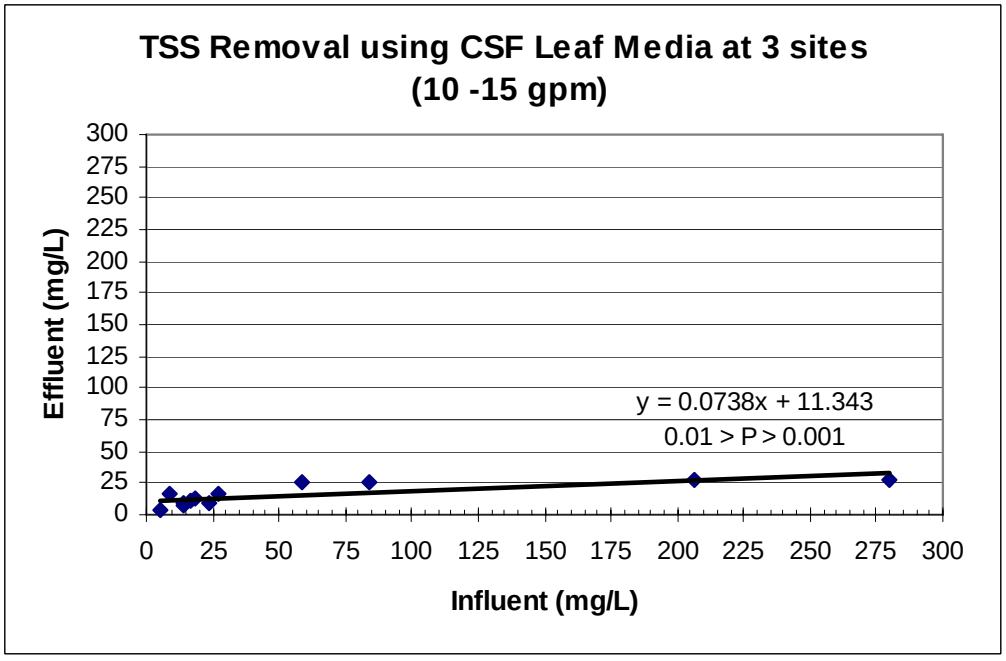

Figure 2. The linear regression shows that the removal efficiency for a CSF leaf media StormFilter operating between 10-15 gpm can achieve a mean of 92% efficiency. The data also suggest an effluent concentration of approximately 25 mg/L for concentrations greater than 50 mg/L.

References:

Stormwater Management Inc. (2001) Stormwater Sampling - StormFilter Performance Results: Burwell/Straley's Union 76 Station Bremerton, Washington (6 storms). Portland Oregon. Author

Stormwater Management Inc (SMI). (2003). University Inn at Salmon Creek Field Evaluation: Stormwater Management StormFilter with CSF Leaf Media (Report No. PE-03-004.1). Portland, Oregon: Author.

Stormwater Management Inc (SMI). (2002). Stormwater Management Performance Summarization Guidelines (Report No. PD-02-001.0). Portland, Oregon: Author.

Stormwater Management Inc (SMI). (2003). Heritage Marketplace Field Evaluation: Stormwater Management StormFilter with CSF Leaf Media (Report No. PE-03-001.2). Portland, Oregon: Author.

Stormwater Management Inc (SMI). (2004). Lake Stevens North Field Evaluation: Stormwater Management StormFilter with ZPG Media (Report No. PE-04-001.0). Portland, Oregon: Author.

Unified Sewer Agency of Washington County. (1992). CSF® Leaf Treatment Systems Three Year Performance Summary. Hillsboro,OR. Author.