Environmental Technology Verification (Summary) Report

Stormwater Source Area Treatment Device
CrystalStream Model 1056
Griffin, Georgia
Search: "CrystalStream Model 1056 ETV Verification" on the web

CrystalStream Technologies

REMOVAL RESULTS	
89%	SUSPENDED SEDIMENTS
98%	SAND SIZE PARTICLES
40%	PHOSPHORUS
50%	NITRITES
25%	NITRATES
13%	TKN

The following data and evaluation has been taken from the Verification Report and Joint Verification Statement published by the Environmental Protection Agency (EPA) and NSF International, operator of the Water Quality Protection Center (WQPC). These results are posted on the EPA s website at the above URL.

Independent third-party testing was performed on a CrystalStream Model 1056 Water Quality Vault treating approximately 4 acres including a highway, other roadways and parking areas in Griffin, Georgia known as the TEA-21 Project Area. Testing consisted of 15 qualifying events recording flow data and collecting samples using automated composite sampling. These samples were evaluated by Event Mean Concentration (EMC) and Sum of Loads (SOL) analysis. All testing was subject to QA/QC audits as well as an audit of the overall management plan.

The CrystalStream device for this project is engineered to target the most common pollutants found in urban runoff including trash and debris, sediment, oil and hydrocarbons, and vegetative materials that contribute to over-nutrification. This device was sized to meet the hydrology provided for the site and to provide removal rates meeting the local and federal guidelines for urban runoff. The engineering staff at CrystalStream will answer any questions you have related to the design and application of this technology.

The table below summarizes the removal rates for the pollutants evaluated in this study. The removal rates are based on the sum of loads calculations and the preferred SSC testing method to determine suspended sediment removal over the entire range of particle sizes. The results track with the suspended sediment removal estimates produced in CrystalStream's engineering department which are based on the particle size distribution and flow rates for this site.

Event No.	Date	Runoff Vol.	SSC Inlet	SSC Outlet	Phospho-rus Inlet	Phospho-rus Outlet	Nitrate Inlet	Nitrate Outlet	Nitrite Inlet	Nitrite Outlet	TKN Inlet	TKN Outlet
1	3/26/03	13,800	16	22	0.00	0.02	0.056	0.075	0.002	0.002	0.127	0.138
2	5/5/03	32,900	1,215	28	0.16	0.04	0.055	0.027	NA	NA	0.357	0.384
3	1/25/04	2,890	NA	NA	0.01	0.00	0.007	0.013	0.000	0.000	0.031	0.029
4	4/13/04	20,240	26	20	0.05	0.04	0.061	0.061	0.003	0.001	0.405	0.337
5	4/26/04	10,600	21	12	0.02	0.02	0.019	0.017	0.002	0.002	0.124	0.141
6	4/30/04	16,600	21	13	0.01	0.02	NA	NA	NA	NA	0.083	0.069
7	6/25/04	4,265	5	4	0.01	0.01	NA	NA	NA	NA	0.082	0.046
8	6/28/04	9,730	17	4	0.01	0.01	0.028	0.017	ND	ND	0.097	0.089
9	6/30/04	44,800	14	13	0.12	0.09	0.034	0.026	ND	ND	0.373	0.336
10	7/12/04	9,040	17	6	0.02	0.01	0.024	0.020	0.002	0.000	0.106	0.098
11	7/17/04	9,700	9	6	0.02	0.01	0.053	0.035	0.002	0.000	0.121	0.121
12	7/25/04	22,400	33	10	0.04	0.02	0.067	0.047	ND	ND	0.373	0.261
13	8/5/04	15,400	150	4	0.03	0.01	0.078	0.042	0.003	0.001	0.270	0.154
14	8/12/04	17,100	46	11	0.02	0.02	0.050	0.026	ND	ND	0.086	0.086
15	8/21/04	5,870	12	3	0.01	0.01	0.020	0.012	0.001	0.001	0.069	0.049
Total			1,602	157	0.52	0.32	0.55	0.42	0.016	0.008	2.703	2.340
Removal Rate				89%		40%		25%		50%		13%

Note: Samples were split and the total suspended sediments were measured by both the TSS test method and the SSC test method. Both methods attempt to measure the suspended solids in mg/L, to determine the sediment removal rates for the device. The SCC method was determined to be the most representative for measuring Total Suspended Sediments (TSS), per the preliminary report (Quoting verbatim): The data show that laboratory precision was generally maintained throughout the course of the verification program with the exception of one nitrate sample and TSS samples. The TSS data showed lower precision, with some of the precision data outside the RPD limits established in the test plan. For many TSS samples, the data were skewed by low and not detected concentrations.

The significance of an 89% removal efficiency for the entire range of sediments and the supporting flow data underscore the strength of the CrystalStream Strategy of on-line treatment. Larger intensities resulting from higher flows carry the bulk of the pollutant load and performance over the entire range of storms is critical to success in gross pollutants removal. The smaller storms with low intensities carry small amounts of pollutants that are not targeted by water quality vault systems. In addition, the unit was cleaned on a regular basis as is required by federal and state ordinance to assure effectiveness. CrystalStream Technologies is committed to external and internal testing on an ongoing basis with an emphasis on proper application and site-specific engineering.

PERFORMANCE TESTING

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