

innovative turf solutions

3318 Glenmont, Cincinnati, OH 45248
Cell: 513-317-8311 Fax: 513-672-9633
www.innovativeturfsolutions.com

Flocculants for Storm Water Treatment

Most storm water pollutants are attached to solid particles. Therefore, removing solids from the storm water significantly improves the quality of the discharge. The use of flocculants increases the removal of solids.

Flocculants are substances which cause small particles to stick together thereby forming larger particles which both settle and filter more easily. Additionally, flocculants can encapsulate oils and greases, also allowing these materials to be settled and filtered. A variety of methods are employed to introduce the flocculant into the water. For solid flocculants, which are based on chemically modified clays, the three methods which are most used are: 1) Direct feeding the dry or flocculent/water slurries into the storm water; 2) Introduction of soap-like bricks to retention basins which dissolve away slowly introducing the flocculant over time, 3) Placement of the dry flocculant in a permeable bag which will slowly allow the flocculant to disperse into the water. Frog Environmental has used method 3 to significantly improve storm water quality of some customers by treating surface sheet flows.

Attached below is a photograph of a 5 foot long by 2.5 inch diameter flocculant sock which holds approximately 5 lbs of dry flocculant. The yellow material allows water to moisten the dry flocculant held inside and slowly releases the flocculant into the storm water.



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Below is a table of results comparing before and after a scrap metal recycling client began using flocculants upstream of their clarifier.

Parameter	EPA Benchmark	Sample results before flocculant use		Sample results after flocculant use	
		10/5/11	02/27/12	03/25/12	04/13/12
pH	6 – 9	7.25	6.42	6.56	6.53
Specific Conductance	≤ 200 μmohs/cm	490	455	162	90
Total Suspended Solids (TSS)	≤ 100 mg/L	114	170	20	46
Total Organic Carbon (TOC)	≤ 100 mg/L	96	370	16	16
Coefficient of Oxygen Demand (COD)	≤ 120 mg/L	390	740	55	25
Aluminum	≤ 0.75 mg/L	9.4	4.6	0.19	0.4
Copper	≤ 0.0636 mg/L	0.49	0.41	0.051	0.036
Iron	≤ 1.0 mg/L	16	9.5	0.67	0.93
Lead	≤ 0.0816 mg/L	0.6	0.4	0.025	0.022
Zinc	≤ 0.117 mg/L	2.9	1.7	0.14	0.17

The solid flocculants are very low in toxicity, requiring very high concentrations to reach meaningful levels. These high concentrations are difficult to achieve as the sock material limits how much flocculant can be dispersed.