



Figure 1. Map of Chattanooga's service vehicle parking and processing facility (City Wide Services, CWS). The arrow depicts the storm water outfall location, CWS Outfall #2, where the Filtrexx® Filtration system was installed to filter urban storm water pollutants.

According to the USEPA, sediment, oil, grease, nutrients, bacteria, and heavy metals are some of the typical pollutants found in urban and suburban stormwater runoff originating from parking lots, roadways, lawns and gardens, pet waste, and roof shingles (USEPA, 2003). These pollutants are carried into streams, rivers, and lakes causing severe degradation of drinking and recreational water supplies as well as the water quality necessary to support aquatic life. Several bench scale experiments have been conducted to quantify the performance of Filtrexx® FilterSoxx™ on the removal of these common urban and suburban stormwater pollutants, including fine sediments (clay and silt), petroleum hydrocarbons (PHC), phosphorus (P), nitrogen (N), bacteria (total coliform, E. coli),

and heavy metals (copper, cadmium, chromium, nickel, lead, zinc). These experiments indicated considerable removal efficiencies by Filtrexx® FilterSoxx™: 65 and 66% for clay and silt particulates, respectively; 84, 99, and 43% for motor oil, diesel fuel, and gasoline, respectively; between 14 and 28% for soluble phosphorus (P); 15% for ammonium nitrogen (N); 71 and 73% for total coliforms and E. coli, respectively; and between 37 and 71% for heavy metals.

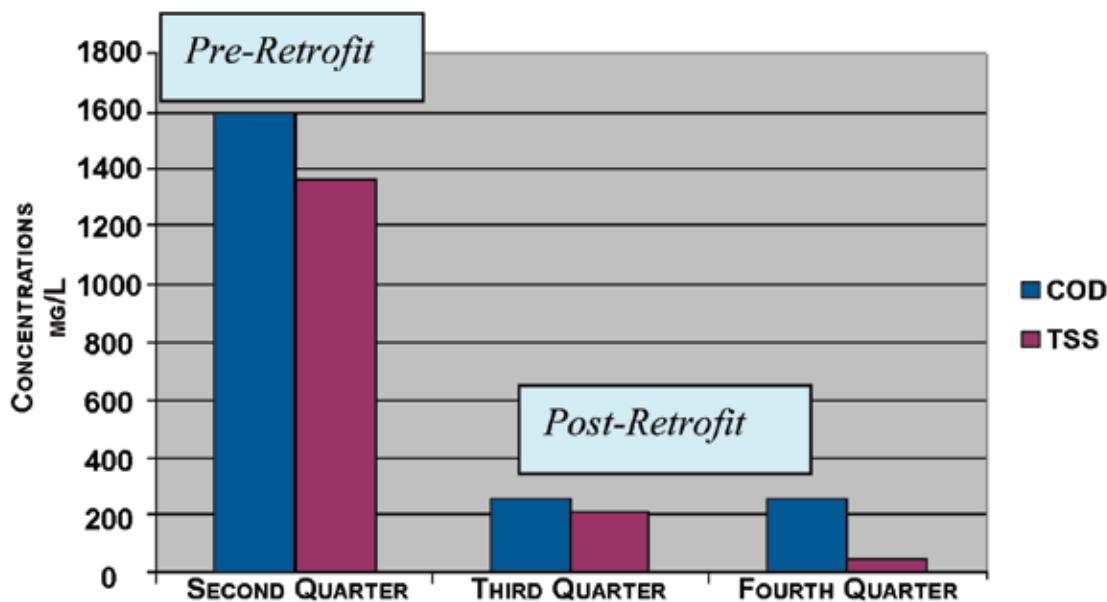
However, field scale testing of Low Impact Development (LID) Integrated Management Practices (IMP), such as Filtrexx® FilterSoxx™, is necessary to augment and validate these bench scale research studies. In April 2007, the City of Chattanooga, TN, implemented field scale testing of FilterSoxx™ using a Filtrexx® Filtration system as a LID IMP to evaluate their performance in urban runoff pollution filtration applications. The City's Water Quality Program has been monitoring the practicality and performance of retrofitting existing stormwater systems by installing a Filtrexx® Filtration system across a stormwater outfall draining 5.5 acres of the City's service vehicle parking and processing facility (Figures 1 and 2). Quarterly stormwater quality sampling and analysis is currently being conducted by the City of Chattanooga's Water Quality Program and is scheduled to be conducted annually in perpetuity according to their NPDES storm



Figure 2. Filtrexx® Filtration system was installed April 20th, 2007, to evaluate their performance on chemical oxygen demand (COD), total suspended solids (TSS), and oil and grease in the storm water effluent from CWS Outfall #2.

water permit. Stormwater pollutants analyzed include: total suspended solids (TSS), oil and grease, chemical oxygen demand (COD), ammonium-N (NH<sub>4</sub>-N), organic-N, total kjeldahl-N (TKN), metals (arsenic, beryllium, cadmium, chromium, copper, lead, nickel, zinc), hardness, and specific organic pollutants.

**Figure 3. COD and TSS concentrations before (pre-retrofit, 2nd quarter) and after (post-retrofit, 3rd and 4th quarter) Filtrexx® Filtration system installation.**



**Table 1. Analytical results of COD, TSS, and oil and grease in effluent from CWS Outfall #2 before retrofit and after retrofit with Filtrexx® Filtration system.**

Analysis	2-1-2007 (Pre-retrofit)	6-8-2007	8-30-2007	12-13-2007	% Reduction
Chemical Oxygen Demand (COD)	1600 mg/L	259 mg/L	255 mg/L	125 mg/L	92
Total Suspended Solids (TSS)	1370 mg/L	208 mg/L	38.7 mg/L	18.7 mg/L	99
Oil & Grease	107 mg/L	27.3 mg/L	N/A	N/A	74

#### References Cited

USEPA. 2003. Protecting Water Quality from Urban Runoff. [http://www.epa.gov/owow/nps/toolbox/other/epa\\_nps\\_urban\\_facts.pdf](http://www.epa.gov/owow/nps/toolbox/other/epa_nps_urban_facts.pdf). Accessed on April 1st, 2008.

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[www.filtrexx.com](http://www.filtrexx.com) | [info@filtrexx.com](mailto:info@filtrexx.com)