



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: MD1061

Title: Sustainable Oil and Grease Removal from Stormwater Runoff Hotspots using Bioretention

Focus Categories: Non Point Pollution, Water Quality

Keywords: Water Quality, Storm Water Management, Oil and Grease, Runoff

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Congressional District: 5th

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Abstract

Oil and grease pollution from urban stormwater runoff represents an important and growing water quality problem with a substantial national impact as a nonpoint source pollutant. Controlling oil and grease discharges from automotive-intensive "hotspots" such as parking lots and commercial properties (in particular gasoline filling stations and vehicle maintenance areas) has significant potential for reducing the total amount of oil and grease discharged in urban stormwater runoff to rivers, estuaries, and oceans. This work will specifically focus on the removal and biodegradation of oil and grease in a modified bioretention system. Bioretention systems are soil- and plant-based stormwater management facilities employed to filter and treat runoff from developed lands. With proper selection of bioretention media, moisture levels, and flow path, these systems can be engineered to capture and mineralize oil and grease pollution.

Specifically, a modification to include an appropriate surface mulch layer will be evaluated for its capacity to capture oil and grease and promote microbial mineralization of the trapped contaminants, thereby removing oil and grease pollutants from the system as carbon dioxide and microbial cells. In addition, other key factors that will be addressed include optimization of mulch characteristics and the impact of variable and regular wet/dry periods on oil and grease biodegradation. Based on an overall analysis of project results, recommendations on bioretention application, design, operation, and maintenance will be made. These recommendations will lay the groundwork for future pilot- and field-scale studies on oil and grease removal in bioretention systems.