CONTAMINANT DETENTION IN HIGHWAY GRASS FILTER STRIPS

Introduction. This technical summary describes the key findings of a WSDOT project entitled "Contaminant Detention in Highway Grass Filter Strips". The objective of the project was to generate a data base regarding the fate and transport of stormwater contaminants through vegetated highway shoulders. This information was used to assess the contaminant removal potential of these highway appurtenances, to gain a better understanding of contaminant removal mechanisms, and to supply data that can be used in assessing applicability to NPDES criteria.

Research Approach. A full-scale field site was designed and constructed along SR 8 in Western Washington. Three test plots were constructed and filled with non-soil compost, on-site native soil, and topsoil. Samples were collected over a 17- month period that represented direct highway runoff and surface and subsurface runoff from each test plot. The samples were quantified for metals, nutrients, suspended solids, and organic carbon. A second sampling period was initiated in November 1997 and was concluded in January 1998 to obtain additional information on metal and suspended solids retention.

Conclusions and Recommendations. The three test plots exhibited good solids retention with an overall average of 72 percent. No significant difference in solids retention was observed between test plots. Total petroleum hydrocarbon retention in each test plot was excellent; with only four occurrences of TPH values greater than 1 mg/L in the test plot discharge over the duration of the study. Metal concentration data yielded anomalous results in that the metal concentrations exiting the test plots were often greaten than those entering. The metal concentrations were, nonetheless, quite low; the overall average for Pb, for example, was 0.0086 mg/L. Based on results of the second sampling period, it was concluded that the *appearance* of a metal concentration increase from the filter strip influent to the discharge was the result of the slot drain collection system inadvertently trapping sediment. This resulted in low suspended solids and metal concentration in the aqueous phase samples that were used to define the test plot influent. Based on the overall performance of the filter strips, a vegetated highway shoulder that meets the criteria set forth in the WSDOT Highway Runoff Manual should afford reasonable reductions in metal, suspended solids, and TPH concentration in a very cost effective manner.

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