

Transport, Treatability, and Toxicity of Highway Storm Water Discharged to Receiving Waters Across Louisiana

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Problem

Storm water from transportation land uses is a complex mixture of heavy metals, particulate matter, and organic/inorganic compounds, which vary significantly in quantity during a single storm event. Management of transportation-related storm water discharges is particularly challenging in a state with a disproportionate amount of elevated structures over water. Louisiana has one of the largest elevated roadway areas of any state, with over 80 percent of that area located over water. In light of the Phase II regulations of the National Pollutant Discharge Elimination System (NPDES), issues associated with the transport, treatability, and toxicity of

highway storm water discharged to receiving waters across Louisiana must be examined.

Objective

The primary objectives of this research are 1) characterization of highway storm water, based on hydrology, pollutant loadings, and rainfall quality, 2) comparison of standard tests for storm water characterization, 3) quantification of pollutant loadings as a function of hydrologic parameters and traffic characteristics, and 4) assessment of treatment alternatives.



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Interstate highway over Cross Lake



Stormwater treatment pond at highway interchange

Description

The treatment of highway storm water is a unique challenge for Louisiana. To date, no defensible work at a national or regional level has been undertaken to quantify toxicity of storm water loadings from transportation land uses or to document toxicity reductions enabled by the treatment alternatives considered in this project.

Three experimental sites have been selected, designed, and equipped for this project: a site near Shreveport at the I-220 bridge over Cross Lake, a site in Baton Rouge at the I-10 bridge over City Park Lake, and a site in New Orleans at the I-10/I-610 junction over the 17th Street Canal.

The first 12 months of the project will be dedicated to an investigation of the hydrology and storm water transport/toxicity at all sites. Study of treatment alternatives will be performed during the latter 12 months of the project. Assessment of treatment alternatives will take place at the sites where treatment infrastructure is already in place: the Cross Lake site (sedimentation-clarification) and the City Park Lake site (clarification-adsorption-filtration).

Implementation Potential

This research will determine the quality of storm water runoff from Louisiana highways. This information will be correlated with site hydrology and traffic indices. An engineering assessment of regionally appropriate treatment alternatives will be provided.