

Evaluating Contaminant Removal Rates of Graywater Utilizing a Constructed Wetland Treatment System

Jesse Bergdolt and Sybil Sharvelle

Department of Civil and Environmental Engineering, Colorado State University

Abstract. Increasing efforts to conserve water resources has prompted the suggestion of using treated graywater (all wastewater except toilet and kitchen sink) to supplement domestic water use for irrigation and toilet flushing. Constructed wetlands can offer a cost efficient method for onsite treatment of graywater and its reuse as irrigation water. Although constructed wetlands have been proven to be effective for removing a variety of contaminants in other wastewater streams, there has been little research conducted to determine their effectiveness for removal of graywater contaminants. This study aims to research the effectiveness of using a constructed wetland as a treatment system for graywater. The research will determine the specific removal rates of graywater contaminants using the wetland treatment system constructed at Colorado State University and ultimately determine the viability of the reuse of graywater as irrigation water. The experimental method involves monitoring specific water quality constituents under varying Hydraulic Loading Rates (HLR) to evaluate the removal rates of the wetlands. This system will be evaluated using biological oxygen demand (BOD), total solids (TS), and total nitrogen (TN). Additional analysis considerations include the effects of graywater reuse on municipal water demands, wastewater treatment demands, and health and safety concerns.