

Public Abstract

First Name:Liu

Middle Name:

Last Name:Cao

Adviser's First Name:Enos

Adviser's Last Name:Inniss

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2014

Department:Civil Engineering

Degree:MS

Title:SEDIMENTATION ENHANCEMENT BY FABRIC INCLINED SETTLING SCREEN TO DECREASE DISINFECTION BY-PRODUCT FORMATION POTENTIAL

The objective of this research is to develop a simple and innovative technology that effectively lowers chemical concentrations to meet Environment Protection Agency (EPA) drinking water regulations. This study focuses on fabric inclined settling screen development for application to small community drinking water treatment systems to help them with compliance, particularly with disinfection by-products (DBPs) through enhanced solids contact. The technology developed combines fabric filters with the traditional inclined plate concept. Fabric material performance and serviceability was first checked by exposure to a drinking water treatment environment and then measuring turbidity, total dissolved organic carbon, and UV254. The study suggests a product like Pureflo (a polyester) is the more appropriate material in acidic and neutral conditions and one like Surefil (rayon/polyester blend) is the more appropriate material in basic conditions. The Pureflo product was used in bench scale systems to determine performance of the designed fabric inclined settling screen. Experiments with different coagulants, different angle, and different layers of fabric screens was conducted. A pilot scale system was set up in Vandalia, MO to test the feasibility of the fabric screen of turbidity, TOC, UV254, and TTHM removal. Results indicated that screens made from pureflo with angles from 30o through 70o under acidic condition have positive effects on sedimentation enhancement.