

FAMU – FSU COLLEGE OF ENGINEERING DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

2525 Pottsdamer Street Tallahassee, Florida



Tag Meeting No. 1 Friday, January 24, 2014 11:30 am – 1:30 pm, Room Building A 127A

Agenda

Project Title: Aerated Recirculation and Pressurized Suspended Fiber Biofiltration for the Treatment of Landfill Leachate

Tag Members: Peter Grasel, Lee Martin, John Hallas, Brian Lee Moody and Hafiz Ahmad **Principle Investigators:** Gang Chen and Kamal Tawfiq

A website has been developed for this research (<u>www.eng.fsu.edu/~gchen</u>). All the information regarding this project has been uploaded to this site to facilitate the dissemination of the research discovery.

Agenda

1. Project Overview

Detailed information is available at http://www.eng.fsu.edu/~gchen

2. Experimental Setup



3. Aerated Leachate Recirculation Investigation

After aeration, landfill leachate collected from the Leon County Landfill will be pumped to the bioreactor from the storage reservoir. Leachate aeration will be achieved in the storage reservoir with air supply controlled by a mass-flow controller (with targeted dissolved oxygen levels of 2

mg/l to 6 mg/l). Considering the possible organic leaching from the solid waste in the bioreactor, the leachate may be recirculated for a couple of months until obvious decrease of organic contents can be observed. Then, an aliquot will be introduced to the next treatment step and the other aliquot will be aerated and recirculated. For this part of the research, dissolved oxygen (DO), pH, oxidation/reduction potential (ORP), BOD₅, and ammonium, nitrate and iron concentrations will be monitored for the leachate before recirculated into the bioreactor and after getting out of the bioreactor.

4. Pressurized Suspended Fiber Biofiltration Performance Evaluation

The custom-made pressurized suspended fiber biofilter will have a volume of 35 L with a height to diameter ratio of 1:1.66 (height = 50 cm and diameter = 30 cm). In the pressurized suspended fiber biofilter, polypropylene fibers will be arranged to be suspended in the column. Two water rubber bags will be arranged on two side of the column, each with a capacity of 8 L. During the operation, the water bags will first be filled with water and compressed air will be supplied to the biofilter, which can be controlled by a mass-flow controller. A DO probe will be installed to monitor oxygen concentration in the biofilter. With the ongoing of the biofiltration and building up of the pressure, water will be withdrawn decrementally from the water bags to release the pore space and reduce the pressure. Organic decomposition and iron oxidizing will be monitored in the biofilter.

5. Dissemination Plan for this Project

6. Potential Funding Sources for the Continuation of Related Research

7. Discussion