

QUARTERLY PROGRESS REPORT

January 2005 - March 2005

PROJECT TITLE: Research Advancing the Management of Construction and Demolition Debris in Florida

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COMPLETION DATE: December 31, 2005 **PHONE NUMBER:** (352) 392-0846

Work Accomplished during this reporting period:

Task 1: Hydrogen Sulfide Production and Control from C&D Debris Landfills

Based on the observation of hydrogen sulfide concentration profiles in the Keene Road Landfill, laboratory cover columns were built to test the ability of different cover materials to remove H₂S. Four laboratory-scale columns were constructed using PVC pipes. Figure 1 presents a schematic of a typical cover soil column. A PVC slide cap was affixed to the bottom of each column and a stainless steel valve was installed on the slid cap for H₂S diffusion. A MASTERFLEX pump was connected between a Tedlar bag containing H₂S gas and the stainless steel valve to pump H₂S into the cover soil column. A 15-cm deep layer of crushed glass was placed at the bottom of each column to uniformly distribute the pumped H₂S. Geotextile was placed on top of the glass layer to keep the cover material from falling into the glass layer. Each column was filled with 50-cm of cover soil. Six sampling tubes were installed into from the bottom to the top of the cover material in intervals of 10-cm. The height of column headspace is 10 cm.

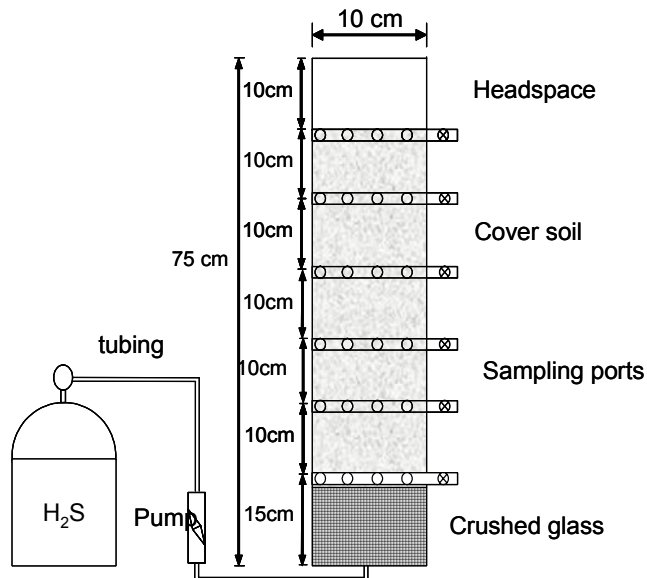


Figure 1. Schematic of Lab Cover Soil Columns

The cover soil columns have been tested for one month using different concentrations of H₂S with various pumping rates. Figure 2 shows some preliminary results of the H₂S concentration profiles in the column using sand as the cover material. The H₂S concentrations decrease with the increasing depth of cover soil, from approximately 3,000 ppm at the bottom to 10 ppm on the surface of the 50-cm depth of cover material. The surface H₂S concentration depends on the bottom H₂S concentration. As shown in Figure 2, the high bottom H₂S concentrations resulted in high surface H₂S concentrations. To show the low concentrations of H₂S in the top layer of cover soil, a log scale axis was used in Figure 3.

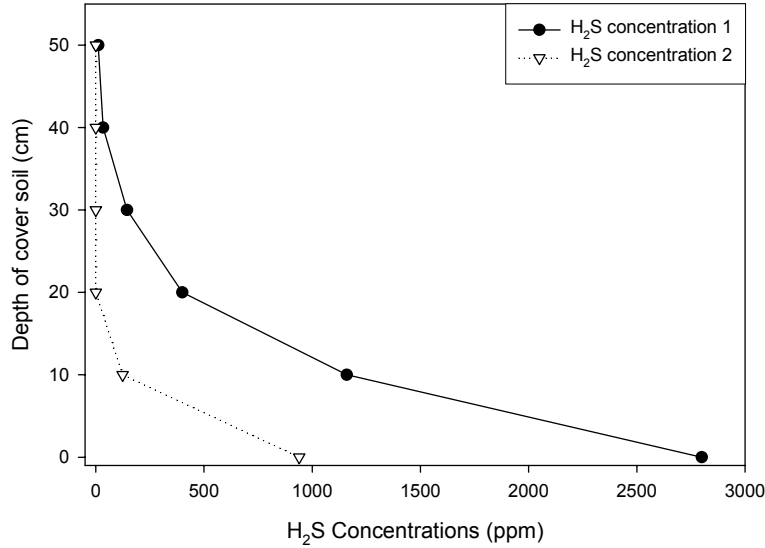


Figure 2. H₂S concentration profiles in the sand cover soil column

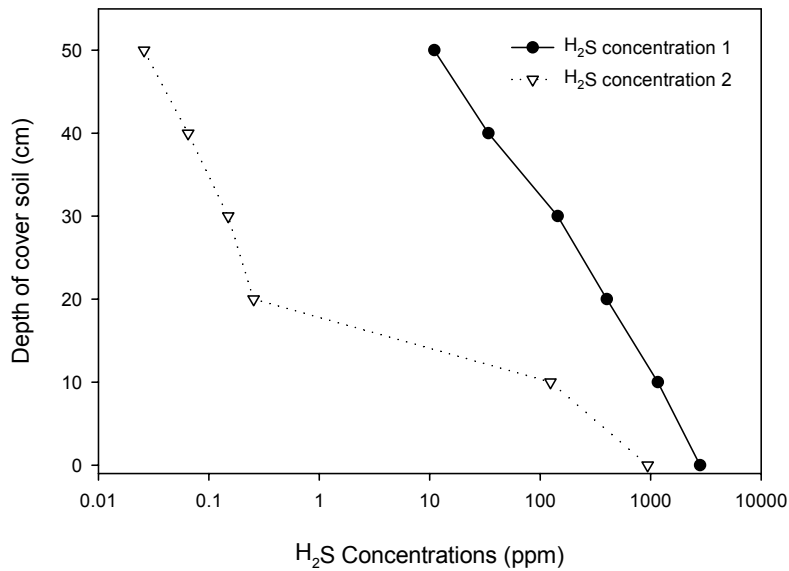


Figure 3. H₂S concentration profiles in the sand cover soil column (Log Scale)

Task 2: Engineered Wood in Mulch

Engineered wood samples have been collected. Sample preparation and leaching tests are in progress.

Task 3: Recycling of Portland Cement Concrete

Input and support from Florida concrete recyclers is vital to the success of this project. In order to establish contact with the concrete recyclers, a trip was made to visit nine nonpermitted concrete recyclers around the state and one limestone aggregate mine in south Florida to determine some background information not readily available from any central agency. These facilities are not required to become permitted as a C&D debris recycling facilities because they only process clean concrete and, often, asphalt pavement. These facilities recycle between 80,000 and 200,000 tons per year. Some facilities, however, did not keep track of the amount of material that they recycle and could not provide this data. Most accepted material from building demolitions and construction projects as well as roads, bridges, sidewalks, and curbs. This initial contact has provided some initial data as well as initiating a dialog between the concrete recyclers and this project.

Technical Advisory Meetings:

A meeting was held on January 28, 2005. This meeting will be held in conjunction with the "Simulated Landfills for Assessing the Leachate Quality Impacts from Co-Disposal of Hazardous Constituents" Technical Advisory Meeting. The presentation is available on the project website: <http://www.ees.ufl.edu/homepp/townsend/research/CDManage/default.asp>.