FAMU - FSU COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
2525 Pottsdamer Street
Tallahassee, Florida

Tag Meeting No. 2

Friday, October 27, 2017
11:30 am – 1:30 pm, Room Building A 127A

Project Title: Electromagnetic Wave-Induced Heavy Metal Removal for Dewatered Biosolids Composting
Tag Members: Joe Dertien, Owete Owete, Chen Lin, Hafiz Ahmad, and Matthew Hendrix
Principle Investigators: Gang Chen, Youneng Tang and Kamal Tawfiq
In Attendance: Chen Lin, Joe Dertien, Owete Owete, Youneng Tang, Wester Henderson, Fude Liu, Runwei Li, Simeng Li, Zhiming Zhang, Yi Xiong, and Gang Chen. Hafiz Ahmad attended the meeting through Gotomeeting.

A website has been developed for this research (http://www.eng.famu.fsu.edu/~gchen/index_files/Page570.htm). 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.famu.fsu.edu/~gchen/index_files/Page570.htm.

2. Heavy Metal Quantification and Removal from Sewage Sludge

3. Heavy Metal Extraction Reagents and Conditions

4. Microwave-Mediated Heavy Metal Extraction

5. Composting after Heavy Metal Extraction

6. Dissemination Plan for this Project

7. Potential Funding Sources for the Continuation of Related Research
- — NSF/CBET/Environmental Engineering
- — EREF

8. Discussion

Discussion:

1. Heavy metal contents in biosolids

Wastewater treatment plants that accept industrial wastewater may contain high levels of heavy metals. Whether Smith Wastewater treatment facility and City of Graceville Wastewater Treatment Plant accept industrial wastewater needs to be clarified. The TAG members will help the PIs to identify the possible industrial discharge to these wastewater treatment facilities.

The TAG members agree that wastewater treatment plants that serve big populated areas or in other words, mainly accept sewage wastewater usually contain less heavy metals.

Dr. Owete will further provide some information on the acceptance of industrial wastewater by the local wastewater treatment plants.

2. Copper and zinc permit

Since copper and zinc concentrations were in the range of a few hundreds of mg/L, the TAG members asked whether there was a permit requirement for the biosolids that contained these metals to be discharged.

We agree with the TAG members and have checked whether there is a permit requirement for copper and lead. We find that the typical permit requirements are 1000 ppm for copper and 2000 ppm for zinc. Our results showed that the sludge had a copper content of 500 mg/kg and a zinc content of 700 mg/kg. Based on the fact that sludge has a density of 721 kg/m^3, the copper and zinc contents are equivalent to 360 mg/L and 500 mg/L, which are in the range of the permit.

3. The S/L ratio of heavy metal extraction

The TAG members discussed the S/L ratios during heavy metal extraction. The laboratory heavy metal extraction was conducted based on the S/L ratio that can generate enough liquid for instrumental quantification.

4. Low pH of the biosolids compost

The low pH may favor the growth of some agricultural products such as blueberries. Therefore, the composted biosolids may have the potential applications for certain agricultural products.