



FAMU-FSU Engineering

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

Technical Awareness Group (TAG) Meeting No. 1

Friday, October 26, 2018 1:30 – 2:30 pm EDT

Building A Room A305

2525 Pottsdamer Street Tallahassee, Florida

Project Title: Using Nitrate Produced from Leachate to Control Landfill Odors

TAG Members: Wester Henderson (Hinkley Center for Solid and Hazardous Waste Management), John Schert (Hinkley Center for Solid and Hazardous Waste Management), Ashvini Chauhan (Florida A&M University), Chao Zhou (Geosyntec consultants), Dean Chaaban (City of Tallahassee), Edward A. Bettinger (Florida Department of Health), Joseph B. Cheatham (City of Tallahassee), Joseph Dertien (Florida Department of Environmental Protection), Owete S. Owete (Florida Department of Environmental Protection), Robert J. Wandell (Advanced Fertilizer Systems, LLC), Shanin Speas-Frost (Florida Department of Environmental Protection)

Principle Investigators: Youneng Tang and Tarek Abichou

In Attendance: Comfort Adedeji, Edward A. Bettinger (via GoToMeeting), Chao Zhou (via GoToMeeting), Gang Chen, Liang Li, Owete S. Owete, Runwei Li, Shanin Speas-Frost, Wester Henderson, Youneng Tang, Zhiming Zhang.

Project Summary Presentation by Youneng Tang

The meeting was called to order by Dr. Tang at 1:35 pm. Dr. Tang presented the project overview, which mainly included a problem statement and a proposed solution. There is a need to control the landfill odors, especially in Florida due to disposal of storm and hurricane debris in landfills. The accumulation and degradation of drywall in the landfill leads to odors, mainly caused by the hydrogen sulfide gas. Nitrate generation from landfill leachate is proposed as an inexpensive and sustainable method for suppressing the production of hydrogen sulfide in landfills. Detailed project information is available at <https://ww2.eng.famu.fsu.edu/~ytang/project9.html>

Dr. Tang presented three tasks including: 1) lab-scale landfills setup and hydrogen sulfide monitoring (partially completed), 2) biological transformation of ammonium to nitrate, 3) suppression of hydrogen sulfide generation by applying nitrate to the lab-scale landfills. The research team mainly consists of Dr. Youneng Tang (PI), Dr. Tarek Abichou (co-PI), and Zhiming Zhang (graduate student).



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Group Discussion

Major comments and suggestions from the TAG:

- If ammonium is converted to nitrate and nitrate is used as a preferred electron acceptor to suppress hydrogen sulfide generation, the sulfate in landfill is not removed and hydrogen sulfide generation is still a potential problem. However, the suppression caused by nitrate can slow down the generation of hydrogen sulfide to meet the landfill gas emission requirement.
- As most of the landfills in Florida do not have leachate recirculation systems, point injection of nitrate might not be practical due to the large areas of landfills. However, it is common that the storm debris is disposed in a separate cell in landfills. Point injection of nitrate into this cell may be used.
- The effects of season (temperature), wind and moisture should also be considered in real world applications.
- Dr. David Cooper from University of Central Florida worked on landfill gas emissions and his work would shed light on the current research.
- Florida Department of Environmental Protection allows the odor level to exceed gas emission standards in landfills for a certain period of time after hurricanes, suggesting the difficulty in controlling odors.
- Two landfills in California are considering using nitrate for landfill odor control.

The meeting was adjourned at 2:30 pm, minutes taken and submitted by Zhiming Zhang.