3rd QUARTERLY PROGRESS REPORT

April 1, 2017 to Jun 30, 2017

PROJECT TITLE: Novel Geotextile Mat Tailored to Reduce Odor Emission (H2S) from Landfills

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COMPLETION DATE: September 30, 2017   **PHONE NUMBER: 352-846-1039**

PROJECT WEB SITE: https://faculty.eng.ufl.edu/david-mazyck/hinkley_center_project/

Work accomplished during this reporting period:
The work proposed by quarter is shown in Table 1.

Table 1. Tasks per month for project

Task Month	1	2	3	4	5	6	7	8	9	10	11	12
Project Management	■	■	■	■	■	■	■	■	■	■	■	■
Sample Production	■	■	■									
Sample Characterization			■	■								
H$_2$S Testing					■	■	■	■				
Mechanism Analysis									■	■	■	
Project Reporting and TAG Meetings						■						■

H2S Testing

H2S test stand was built and calibrated with 450PPM of H2S gas.

Figure 1: H$_2$S experimental apparatus

The performance of untreated and treated ACs as H$_2$S adsorbents were tested using the breakthrough capacity measurement procedures. The samples of the breakthrough curves are presented when the sample started removing H$_2$S until its breakthrough or the first 120 minutes,

as shown in Figure 2. The main adsorption of H_2S occurs within the first 10 to 15 minutes. Thereafter, the rate of H_2S removal becomes slower, but continued steadily for an extended time.

(Due to file size limitation, images were removed from this file. Please email DMazyck@UFL.edu or Reggie17r@UFL.edu for the complete file)

Figure 2: 100 PPM results

Table 1. H_2S breakthrough time and sorption capacity.

Sample	C:Fe Mass Ratio	Breakthrough Time (min)	Sorption Capacity (µg H_2S/g AC)
AC_{Virgin}	-	781	2297
FeAC-1	50:1	133	382
FeAC-2	20:1	119	342
FeAC-3	10:1	348	1021
FeAC-4	5:1	372	1088

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Figure 3: 500ppm results

Table 2. H_2S breakthrough time and sorption capacity.

Sample	C:Fe Mass Ratio	Breakthrough Time (min)	Sorption Capacity (µg H_2S/g AC)
AC_{Virgin}	-	91	511
FeAC-1	50:1	111	622
FeAC-2	20:1	74	415
FeAC-3	10:1	137	789
FeAC-4	5:1	142	821

Work planned for the next reporting period:

The plan for Q3 is focus on H2S uptake measurements for samples produced at higher temperatures which are expected to enhance the iron chemistry.

Metrics:

Name	Rank	Department	Professor	Institution
Morgan Hull	Undergraduate Student	Environmental Engineering	Mazyck	University of Florida
Rachel Liu	Master Student	Environmental Engineering	Mazyck	University of Florida
Regina Rodriguez	PhD Student	Environmental Engineering	Mazyck	University of Florida

The work was presented at the AWMA (Air and Waste Management Association) conference for June 2017.

Stakeholder Working Group Meeting: