Quarterly Report of

EVALUATION OF THERMAL PROCESSES FOR CCA WOOD DISPOSAL IN EXISTING FACILITIES

To
Florida Center for Solid and Hazardous Waste Management
Contract No. 00053522
Project No. 00050891

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Quarterly Report (June – August 2005)

In this reporting period, we continued with the experiments started in the earlier reporting period (Mar – May 2005). Experiments were carried out at 1100 ^{o}C to evaluate various sorbent materials for their capability in reducing ash leachability as well as to characterize the crystalline speciation. A portion of the residual was leached using the toxicity characteristic leaching procedure (TCLP) as per US EPA SW 846 Method 1311. This leaching test is used to determine whether a solid waste is a hazardous waste or not for its toxicity characteristic. The TCLP leachate was digested as per US EPA SW 846 Method 3010A. A portion of residue was digested for the total metal content analysis using US EPA SW 846 Method 3050B (Solid Digestion of sediments). All digested samples were analyzed using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES). X-Ray Diffraction (XRD) analysis of the residue was conducted to determine the crystalline speciation of the products. Due to unforeseen delays caused by instrument malfunction (furnace and power supply), analysis for this batch has been delayed.

The results obtained to date have led the research team to the development of a strategy for handling the CCA-treated wood disposal issue. Figure 1 shows the conceptual diagram of the proposed thermal system based on the schematic of a section of a cement kiln. Different sorbents will be provided at different stages of combustion to effectively bind the CCA metals. The more refractive chromium and copper will remain in the bottom ash and potentially bind with alumino-silicate which is a major constituent of coal ash. Meanwhile, volatile arsenic will vaporize from the fuel matrix and be chemisorbed by calcium-based cement dust present in the system. Based on that, work has been done on the design of an experimental system to simulate the operation mode in practical combustion systems. Figure 2 shows the schematic of the proposed bench scale incineration system. Sorbents screened from Phase 1 will be used with CCA-treated wood to evaluate their effectiveness in suppressing volatilization and leaching of CCA metals in this reactor.

Website Development

A project website was developed during the reporting period Dec 04 – Feb 05 **t**o make the information related to this project accessible to general public. Information related to this project is updated periodically and new sections related to technology and website search have been added to it in this reporting period. The website can be accessed at http://combustcca.ees.ufl.edu .

Work to be accomplished in the next quarter (September – December)

- Completion of analysis of 3rd batch of Phase 1 experiments
- Final Design of combustion system for Phase 2
- Phase 2 Experiments

Presentations:

1. On May 5, the research team presented the research results, titled “Use of Sorbent Technology to Prevent Leaching of Arsenic, Chromium and Copper in Combustion Environments”, at the Annual Meeting of the Florida Section American Chemical Society held at Orlando, FL.
2. The research team also presented “Use of Sorbent Technology to Prevent Leaching of Arsenic, Chromium and Copper in Combustion Environments” at the International Symposium on the Role of Adsorbed Films and Particulate Systems in Nano and Biotechnologies held in Gainesville, FL on August 24.
3. The joint TAG meeting was held in Town of Medley on August 18, where we exchanged knowledge learned from the study with industrial and governmental representatives.
4. The research team held a conference call with California Association of Winegrape Growers on June 30 to discuss potential solutions to the disposal of CCA vinesticks that California winegrape growers are facing nowadays.

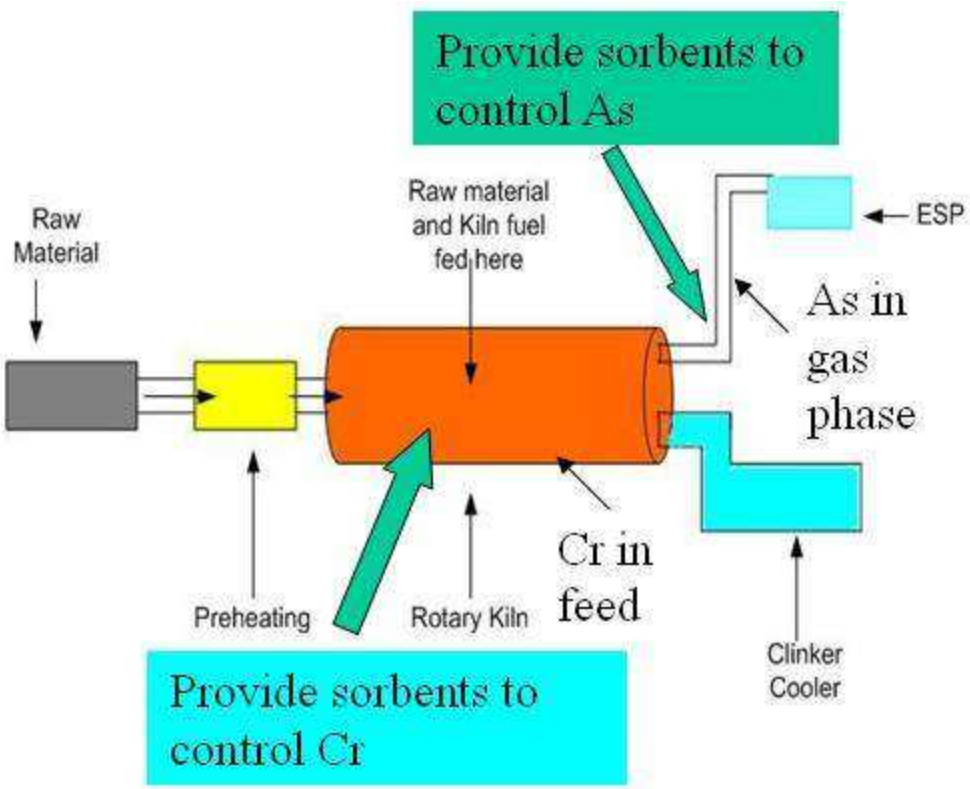

Figure 1: Conceptual Diagram of Proposed Thermal System

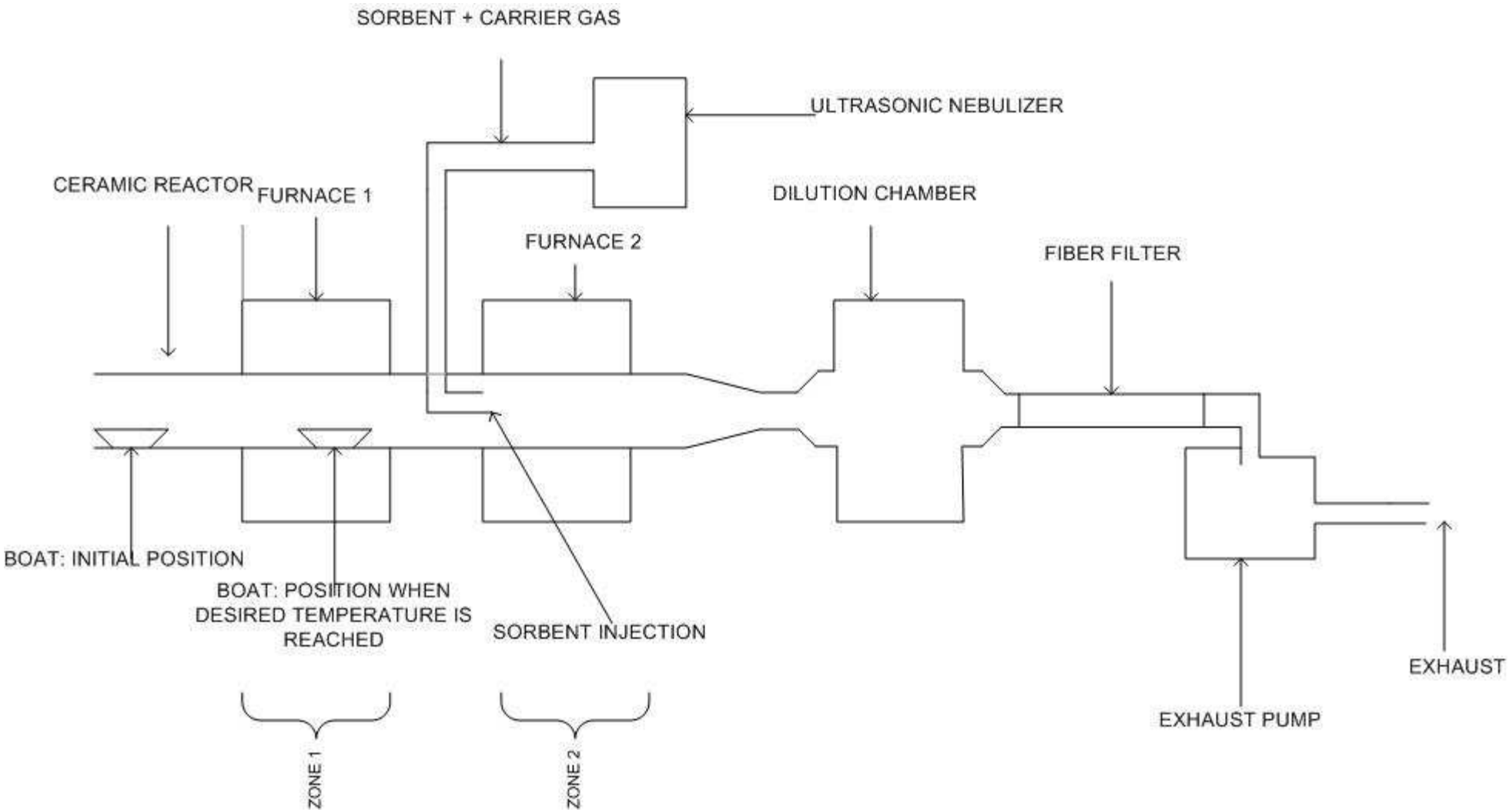

Figure 2: Schematic of Phase 2 Incineration System

Table 1- Timeline for completion of major milestones

Key Milestones	2004				2005												2006	
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
TAG Meeting		•										•						
Task 1 – Inventory of Existing Wood-Fired Capable Facilities	•	•	•															
Task 2 – Survey of Available Pollution Control Technologies						•	•	•	•	•	•							
Task 3 – Evaluation of Potential Materials for Preventing Arsenic Leaching from Incineration Product			•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Evaluation of Data	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Preparation & Peer Review of Final Report																	•	•
Submittal of Final Report																		•

The shaded boxes represent the work done as against the total work