**NO_x, Fine Particle and Toxic Metal Emissions from the Combustion of Sewage Sludge/Coal
Mixtures: A Systematic Assessment.**

Quarterly Report # 10

January 1, 2003 – March 31, 2003

By

Jost O.L. Wendt

June 2, 2003

DE-F26-00NT40838

Department of Chemical and Environmental Engineering
University of Arizona
Tucson, AZ 85721

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ABSTRACT

This research project focuses on pollutants from the combustion of mixtures of dried municipal sewage sludge (MSS) and coal. The objective is to determine the relationship between 1) fraction sludge in the sludge/coal mixture, and 2) combustion conditions on a) NO_x concentrations in the exhaust, b) the size segregated fine and ultra-fine particle composition in the exhaust, and c) the partitioning of toxic metals between vapor and condensates phases, within the process.

SUMMARY OF PROGRESS DURING THE LAST QUARTER.

Very little new research was accomplished on the project during the period January 1, 2003 and March 31, 2003. This was because most of the needed research had been completed, and essentially all of the experimental data has been obtained. Metal partitioning for MSS and MSS+coal has been determined. Results have been published. The data showed that the co-combustion of MSS plus coal could lead to health hazardous emissions of sulfated zinc. These emissions were less hazardous when either coal or MSS were burned alone.

Work has been completed on completing the staging configuration for the staged combustion runs. Because of the low heating value of MSS, O₂ enrichment will be required. A burner suitable for stabilizing the co-combustion of a MSS/pulverized coal under staged conditions, with O₂ assist in the first stage, has been developed and tested for pulverized coal without MSS. The few final experiments remaining will be completed within the next two months.

We expect work on this project to be completed by August 31, 2003.