**ANNUAL PROJECT REPORT**
**AS OF DECEMBER 1998**

1. PROJECT SPONSOR:

The Cincinnati Gas & Electric Company
139 East Fourth Street
Cincinnati, Ohio 45202

2. PROJECT MANAGER:

Bruce W. Lani
Dravo Lime Company
Project Manager
Telephone: (412)777-0723

3. OCDO GRANT NO: CDO/D-922-6

4. PROJECT UPDATE ___OR
FINAL REPORT ___X__

5. PROJECT TITLE: Simultaneous $SO_2$ / $NO_x$ Removal Testing and Toxics Characterization

6. PROJECT TERM: FROM January 1, 1994 TO December 31, 1996

7.

| PROJECT | NAME | COST-SHARE |
|---|---|---|
| CO-SPONSORS | OCDO | $319,363 |
| | CG&E | $4,950 |
| | DLC | $469,955 |
| TOTAL PROJECT COST: | | $794,268 |

## I. ABSTRACT

8. OBJECTIVES:

The Clean Air Act Amendments (CAAA) of 1990 mandate a substantial reduction of sulfur dioxide emissions from coal-fired electric generating units. The CAAA also requires the achievement of both NO and certain air toxics reductions. In the case of some boilers, the reductions of NO must be achieved by 1995, while other units will not be effected until the end of the century.

Due to the impact of this legislation on utilities utilizing high sulfur coal, Dravo Lime Company has developed the Thio$NO_x$ process for NO reduction. The process requires the addition of ferrous chelates to the liquor of the Thiosorbic FGD system. The ferrous chelates absorb the NO in the flue gas without hindering the absorption of $SO_2$. Thus, this process for $NO_x$ control has several advantages over other post combustion processes when a wet FGD system is existing or planned. Scrubbing equipment utilized for $SO_2$ removal also removes the NO, thereby eliminating additional capital costs for the new function. This compares favorably against selective catalytic reduction (SCR) which requires a separate reactor and a relatively expensive catalyst. Since the same equipment is utilized to remove both $SO_2$ and NO, the operating costs will be minimal when compared to those processes which require additional equipment to achieve the necessary removals.

Previous work funded by the U.S. Department of Energy has proven that the Thio$NO_x$ process is technically feasible for boilers burning high sulfur coal such as that found in Ohio. The major obstacle for the commercialization of the process is an economical method of regeneration for converting the ferric chelates to the reactive ferrous chelates.

9. WORK DONE AND CONCLUSIONS:

The combined findings of bench scale scrubber evaluations and abbreviated pilot scale scrubber studies concluded that the methods of iron chelate regeneration which were evaluated were either ineffective, cost prohibitive, or contaminated the chemistry of the scrubbing liquor. The goal of 60% $NO_x$ removal was not achieved as a result of mass transfer limitations. It is DLC's recommendation that further effort devoted toward the development of this process is not warranted at this time. The Milestone Report which details the bench and pilot scale testing has been issued as the closing document for this project.

10. PLANS FOR COMING YEAR:

Project has been terminated.

## II. HIGHLIGHTS/ACCOMPLISHMENTS

11.

Testing at the Miami Fort pilot plant has demonstrated that the ferrous chelate technology is capable of removing 99% $SO_2$ and 50% NOx.

## III. ARTICLES/PRESENTATIONS

12. None