

**OHIO COAL DEVELOPMENT OFFICE
ANNUAL PROJECT ABSTRACT
AS OF DECEMBER 2004**

1. **PROJECT SPONSOR:**
CONSOL Energy Inc.
Research & Development
4000 Brownsville Road
South Park, PA 15129-9566
2. **PROJECT MANAGER/TITLE:**
Steve Winter/Chemist
3. **OCDO GRANT NO.** CDO/D-98-2
4. **PHONE:** 412-854-6625
EMAIL: stevewinter@consolenergy.com
5. **PROJECT TITLE:** Characterization of Personal Exposure to PM_{2.5}, PM₁₀, and Gaseous Priority Pollutants in Steubenville, OH
6. **PROJECT TERM FROM:** 2/1/99 **TO:** 6/30/05
7. **PROJECT UPDATE** --OR-- **FINAL REPORT**
8. **BUDGET:**

<u>CO-SPONSORS NAME</u>	<u>COST-SHARE</u>
OCDO	\$ 600,000
CONSOL ENERGY Inc.	\$ 100,000
DOE	\$ 600,000
EPRI	\$ 672,722
API	\$ 115,818
NMA	\$ 100,000
AISI	\$ 100,000
 TOTAL PROJECT COST:	 <u>\$2,288,562</u>

ABSTRACT

The goal of the project is to clarify the current understanding of the effect of fine particulate matter on human health. Compliance with the proposed PM_{2.5} ambient air quality standards could impact the generation of electricity by coal-fired power plants, including Ohio coal markets, without the benefit to human health that the new standard was set to achieve. The results of this study will help to define the relationship between ambient concentrations and human health exposure to PM_{2.5} and gaseous co-pollutants.

The indoor air quality and personal exposure to fine particulate matter (PM_{2.5}) and gaseous co-pollutants will be measured for individuals and their living environments in the Steubenville, OH, area. The program includes particle characterization and statistical data evaluation. The study will be performed concurrently with a study of the outdoor

ambient air quality in the Steubenville area. The combined results will be used to make a comprehensive database for use in source apportionment, toxicology studies, and long-range transport modeling.

9. OVERVIEW OF PROJECT & OBJECTIVES:

The Steubenville Comprehensive Air Monitoring Program (SCAMP) is a five-year research program aimed at addressing the uncertainties regarding fine particulate matter. The sampling program was comprised of two overlapping and interdependent sampling programs focused on measuring fine particulate and gaseous pollutants. The sampling programs were conducted during the years 2000 through 2002. The first program sampled the outdoor ambient air at a central ambient monitoring station. The second program was an exposure study conducted inside the homes, directly outside the homes, and in the personal breathing space of ambulatory elderly adults and elementary school age children in and around the Steubenville, Ohio area.

10. WORK TO DATE & CONCLUSIONS:

All of the sampling and the majority of the sample analyses are complete.

Data reduction and data analysis is nearing completion.

SCAMP is in the reporting phase of the program.

11. PLANS FOR COMING YEAR:

Dan Connell of CONSOL Energy R&D will give an oral presentation on the elemental composition of PM_{2.5} collected during SCAMP at the Air & Waste Management Association's 98th Annual Conference and Exhibition. The conference will be held June 2005 in Minneapolis, Minnesota.

CONSOL Energy R&D will host a final project advisory committee meeting and project wrap up meeting to present the final SCAMP results and conclusions to the funding agencies. Tentative plans are to have the meeting in late Spring 2005.

CONSOL Energy R&D plans to submit one additional journal article to discuss the elemental composition of PM_{2.5} collected during SCAMP.

The Harvard School of Public Health plans to submit a series of three to four publications discussing the results from the adult and children's exposure studies and the concurrent heart rate study.

The project will be completed and the final reports will be submitted.

12. HIGHLIGHTS/ACCOMPLISHMENTS:

CONSOL Energy R&D analyzed approximately 3000 Teflon filters from the outdoor ambient and indoor and personal air sampling programs for total elements by Dynamic Reaction Cell ICP-MS.

Three SCAMP journal articles were accepted for publication in the *Journal of the Air and Waste Management Association (JAWMA)*.

13. ARTICLES/PRESENTATIONS:

Dan Connell of CONSOL R&D, submitted the proceedings paper "*The Steubenville Comprehensive Air Monitoring Program (SCAMP): An Overview Of Outdoor Ambient Results*" in addition to giving an oral presentation at the June 2004 Air & Waste Management Meeting in Indianapolis, Indiana.

Dan Connell made a presentation on the outdoor ambient air-monitoring program of SCAMP at the 2004 Ohio Air Quality and Coal Research Symposium. The Ohio University hosted the symposium on December 2-3, 2004 in Athens, Ohio.

Dan Connell and Steve Winter of CONSOL Energy R&D gave the lecture "*The Steubenville Comprehensive Air Monitoring Program (SCAMP): A Case Study in Exposure*" at the University of Pittsburgh's Graduate School of Public Health on November 16, 2004.

Three SCAMP journal articles were accepted for publication in the *Journal of the Air and Waste Management Association (JAWMA)*. Dan Connell of CONSOL Energy R&D was the primary author of all three publications. The publications are as follows.

The Steubenville Comprehensive Air Monitoring Program (SCAMP): Overview and Statistical Considerations

The Steubenville Comprehensive Air Monitoring Program (SCAMP): Associations Among $PM_{2.5}$, Co-Pollutants, and Meteorological Conditions

The Steubenville Comprehensive Air Monitoring Program (SCAMP): Analysis of Short-Term and Episodic Variations in $PM_{2.5}$ Concentrations Using Hourly Air Monitoring Data

Informational copies of the three accepted SCAMP journal articles were sent to John Bachmann at U.S. EPA in advance of the finalization of the $PM_{2.5}$ criteria document, which was scheduled to be issued by October 29, 2004.