

THE STEUBENVILLE COMPREHENSIVE AIR MONITORING PROGRAM

U.S. Department of Energy Supports Air Quality Studies to Assess Airborne Fine Particle Levels and Link to Personal Exposure

PRIMARY PROJECT PARTNERS

CONSOL Inc.

Library, Pennsylvania
(Main performer)

Harvard School of Public Health

Cambridge, Massachusetts
(Major subcontractor)

Ohio Coal Development Office

Columbus, Ohio
(Major co-funding)

PROJECT LOCATION

Steubenville, Ohio

PM_{2.5} is the term given to airborne particles that have a diameter on average of 2.5 micrometers or smaller in size. These tiny particles, so small that 30 side-by-side would barely equal the width of a human hair, have come under the regulatory microscope in recent years. The U.S. Environmental Protection Agency (EPA) has revised air quality standards to limit these tiny particles, and state regulators face the likelihood of having to limit these particles as well. But scientists are still unsure of the link between levels of these microscopic particles floating in the outside air and the amount humans actually are exposed to while inside their homes.

To help evaluate this link, the U.S. Department of Energy (DOE) and the Ohio Department of Development's Coal Development Office (OCDO) have implemented an air monitoring program to compare outside air with the air people in the Steubenville, Ohio, area breathe in their homes. CONSOL Inc. is implementing the program for DOE and OCDO.

The Steubenville Comprehensive Air Monitoring Program (SCAMP) will measure concentrations and compositions of PM_{2.5}, as well as coarser particles, other priority gaseous pollutants, and local weather readings. A variety of natural and manmade sources, such as forest fires, motor vehicle exhaust, erosion of the earth's crust, and production of electric power from fossil fuels, can produce fine particles.

EPA standards for fine particulate matter could ultimately require that state governments implement compliance plans that reduce the level of particles emitted from stationary and mobile sources. Therefore, it is critical for state and federal environmental agencies to determine which pollutants have the most significant impact on human health and the environment so that emissions of those pollutants or their precursors can be reduced.

The 1998 National Research Council review of EPA's PM_{2.5} program underscored the need for additional study of ambient air quality and human health. As part of an effort to gain a better understanding of the chemical constituents of ambient PM_{2.5} and other pollutants (gases, pollen, etc.), DOE launched a two-year air



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American Iron and Steel Institute

Washington DC (co-funding)

American Petroleum Institute

Washington DC (co-funding)

Electric Power Research Institute

Palo Alto, California (co-funding)

National Mining Association

Washington DC (co-funding)

Franciscan University

Steubenville, Ohio (researcher)

Saint Vincent College

Latrobe, Pennsylvania (researcher)

Ohio University

Athens, Ohio (researcher)

Wheeling Jesuit University

Wheeling, West Virginia (researcher)

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monitoring program targeting $PM_{2.5}$ and other pollutants in the Ohio River Valley. The primary monitoring site for the Upper Ohio River Valley Project is in Pittsburgh, Pa., 40 miles east of Steubenville. Three additional monitoring sites are located to the south and southwest of Pittsburgh. In 1999, the National Research Council recommended that DOE's air-monitoring program in the Ohio River Valley would be strengthened if it were expanded to include a personal exposure study; this recommendation paved the way for SCAMP.

DOE is supporting the outdoor portion of SCAMP, which includes measuring $PM_{2.5}$ and co-pollutants at a central urban site, four remote sites, and outside the homes of people who have agreed to participate in the research project. The indoor analysis, funded by OCDO and the other industrial partners, is being performed mainly by the Harvard University School of Public Health under subcontract to CONSOL. This study will measure the same pollutants inside the homes of participants, and will collect data from personal samplers worn by the participants. The personal samplers will be worn by a panel of older adults during the winter and summer of 2001. An additional panel of older adults may be monitored in the summer of 2001.

Specifically, the study's results will be used to:

- Determine how the concentration and composition of $PM_{2.5}$ and co-pollutants vary with location, time, season and weather conditions
- Establish the correlation between ambient $PM_{2.5}$ concentrations and compositions, and those experienced by "at risk" groups (children and older adults); and
- Provide a comprehensive database of $PM_{2.5}$ and related data for use in epidemiological studies, long-range transport studies, and State Implementation Program development.



NETL manages both the Steubenville Program and the Upper Ohio River Valley Project. Although the two projects operate independently, ambient air quality data from each project will be made readily available to the other through each project's technical advisory committee. This will facilitate the interpretation of data by both sets of researchers. The combined data will also be available to the EPA and other researchers as a basis for future health-related studies.