Bench Marking Survey of State Air Pollution Control Agencies on the Resources Required to Conduct Air Quality Monitoring Programs

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Prepared by Dr. Howard M. Ellis, QEP, and Phillip A. Ritz
Enviroplan Consulting
81 Two Bridges Road
Fairfield, NJ 07004

ABSTRACT

This paper reports on a bench marking survey conducted of nine state air pollution control agencies on the resources required to conduct their air quality monitoring programs. The paper is directed to managers and personnel operating government air quality monitoring programs.

While private industry frequently uses bench marking surveys to compare their costs and performance with other companies and industries, this methodology is rarely used to help air pollution control agencies assess their cost effectiveness in achieving their goals.

The survey consisted of seven questions focusing on operations for the year 1999:

1. Number of monitors operated and sampling frequency

2. Frequency of scheduled and unscheduled site visits by monitor type

3. Frequency of calibrations and quality control performance checks

4. Travel distance and travel time to monitor sites

5. Type of calibrators used for continuous gas analyzers

6. Resources required to operate and maintain, quality assure and process data from the monitoring program

7. Ideas the state agency has implemented or is considering implementing for improving the efficiency and effectiveness of the state air quality monitoring program

Survey responses are summarized and analyzed to compare resources devoted in terms of number of equivalent continuous air quality monitor-years of operation per equivalent full time person-year. Because some state agencies outsource their laboratory analyses, all responses were adjusted to exclude the equivalent full time person-years devoted to laboratory analyses.

The monitoring conducted by each state in 1999 including the new $PM_{2.5}$ air quality monitoring initiated by states in that year was translated into the number of equivalent continuous SO_2 air quality monitor-years of operation. This was done using Enviroplan's experience since 1974 with over a hundred air quality monitoring networks in operation and maintenance, quality assurance and data processing including operating a large state $PM_{2.5}$ monitoring program. Our data base of direct labor hours required to operate each type monitor was applied to the number, period and sampling frequency actually used in 1999 for each monitor type to determine the number of equivalent continuous SO_2 air quality monitor-years of operation.

Survey results show a wide variation in the resources used by the nine states with the least efficient state requiring four times the resources of the most efficient state in conducting the required air quality monitoring.

The average resources required vary from 0.59 equivalent continuous SO_2 air quality monitors operated per full time person to 2.40 equivalent continuous SO_2 air quality monitors operated per full time person with an average of 1.54 equivalent continuous SO_2 air quality monitors operated per full time person. Ideas offered by state agencies for improving the cost effectiveness of their monitoring programs are discussed. Observations and conclusions with associated limitations of the survey are presented.