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METHODS DEVELOPMENT FOR ENVIRONMENTAL CONTROL BENEFITS ASSESSMENT

Volume IV

MEASURING THE BENEFITS OF AIR QUALITY IMPROVEMENTS IN THE SAN FRANCISCO BAY AREA

by

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USEPA Grant # R805059-01-0

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OTHER VOLUMES IN THIS SERIES

volume 1, Measuring the Benefits of Clean Air and Water, EPA-230-12-85-019.

This volume is a nontechnical report summarizing recent research for EPA on methods development for better estimates of economic benefits from environmental improvement. The report..presents the basic economic concepts and research methods underlying benefits estimation as well as a number of case studies, including several from other volumes of this series. Finally, it offers insights regarding the quantitative benefits of environmental improvement.

Volume 2, Six Studies of Health Benefits frcmAir Pollution Control, EPA-230-12-85-020.

This volume contains six statistical epidemiology studies. They show that large associations between health and current levels of air pollution are not robust with respect to the statistical model specification either for mortality or morbidity. They also find that significant relationships, mostly small, occasionally appear.

Volume 3, Five Studies on Non-Market Valuation Techniques, EPA-230-12-85-021.

This volume presents analytical and empirical comparisons of alternative techniques for the valuation of non-market goods. The methodological base of the survey approach - directly asking individuals to reveal their preference in a structural hypothetical market - is examined for bias, replication, and validation characteristics.

Volume 5, Measuring Household Soiling Damages from Suspended Particulate: A Methodological Inquiry, EPA 230-12-85-023.

This volume estimates the benefits of reducing particulate matter levels by examining the reduced costs of household cleaning. The analysis considers the reduced frequency of cleaning for households that clean themselves or hire a cleaning service. These estimates were compared with willingness to pay estimates for total elimination of air pollutants in several U.S. cities. The report concludes that the willingness-to-pay approach to estimate particulate-related household soiling damages is not feasible.

Volume 6, The Value of Air Pollution Damages to Agricultural Activities in Southern California, EPA-230-12-85-024.

This volume contains three papers that address the economic implications of air pollution-induced output, input pricing, cropping, and location pattern adjustments for Southern California agriculture. The first paper estimates the economic losses to fourteen highly valued vegetable and field crops due to pollution. The second estimates earnings losses to field workers exposed to oxidants. The last uses an econometric model to measure the reduction of economic surpluses in Southern California due to oxidants.

Volume 7, Methods Development for Assessing Acid Deposition Control Benefits, EPA-230 -12-85-0 25.

This volume suggests types of natural science research that would be most useful to the economist faced with the task of assessing the economic benefits of controlling acid precipitation. Part of the report is devoted to development of a resource allocation process framework for explaining the behavior of ecosystems that can be integrated into a benefit/cost analysis, addressing diversity and stability.

Volume 8, The Benefits of Preserving Visibility in the National Parklands of the Southwest, EPA-230-12-85-026.

This volume examines the willingness-to-pay responses of individuals surveyed in several U.S. cities for visibility improvements or preservation in several National Parks. The respondents were asked to state their willlingness to pay in the form of higher utility bills to prevent visibility deterioration. The sampled responses were extrapolated to the entire U.S. to estimate the national benefits of visibility preservation.

Volume 9, Evaluation of Decision Models for Environmental Management, EPA-230-12-85-027.

This volume discusses how EPA can use decision models to achieve the proper role of the government in a market economy. The report recommends three models useful for environmental management with a focus on those that allow for a consideration of all tradeoffs.

Volume 10, Executive Summary, EPA-230-12-85-028.

This volume summarizes the methodological and empirical findings of the series. The concensus of the empirical reports is the benefits of air pollution control appear to be sufficient to warrant current ambient air quality standards. The report indicates the greatest proportion of benefits fran control resides, not in health benefits, but in aesthetic improvements, maintenance of the ecosystem for recreation, and the reduction of danages to artifacts and materials.

DISCLAIMER

This report has been reviewed by the Office of Policy Analysis, U.S. Environmental Protection Agency, and approved for publication. Mention in the text of trade names or commercial products does not constitute endorsement or recommendation for use.

ABSTRACT

This study reports the results of using two alternative methods of measuring benefits of air quality changes in the San Francisco Bay Area; both methods are based on the hypothesis that benefits are measured by willingness to pay. In one method, property values were used to infer willingness to pay for air quality. In the other method, willingness to pay was obtained directly from a survey.

Pollution was shown to have a statistically significant negative effect on property values. Willingness to pay obtained from the survey was shown to be correlated with visibility and health effects (as defined by the PSI index). Both methods resulted in an estimate of average benefits per household of about $80 annually for a 30 percent improvement in air quality; this represents an annual total benefit of about $130 million for a 30 percent improvement for the Bay area (using 1977-1978 air quality conditions as a base and 1978 socioeconomic conditions and property values).

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