

HOWARD M. ELLIS, D.B.A., QEP

AREAS OF SPECIALIZATION

President of Enviroplan Consulting. 39 years of experience in air quality modeling, air pollution emissions inventory development, developing air pollution compliance strategies, air pollution permitting and air quality and meteorological monitoring.

Senior consultant with 40 years of experience in air pollution emissions inventory development, development and application of atmospheric diffusion models, air pollution permitting, air quality and meteorological monitoring; and development of risk management plans and environmental management systems.

EXPERIENCE

Project Manager and Co-Principal Investigator on numerous projects on behalf of electric power companies for development of State Implementation Plan revisions for demonstrating attainment of the National Ambient Air Quality Standards for ozone and PM2.5, Reasonable Progress Goals for Regional Haze in PSD Class I Areas.

Project Manager and Principal Investigator for BART Determination studies for coal and oil-fired power plants. Work involved conducting the 5-Step process specified in Appendix Y to Part 51—Guidelines for BART Determinations Under the Regional Haze Rule.

Project Manager and Principal Investigator for the American National Standards Institute on development of an accreditation program for validation and verification bodies of GHG emissions. Work involved designing and conducting a survey of major stakeholders in the U.S. relating to GHGs, a review and development of suggested guidance for implementation of applicable GHG standards developed by the International Organization for Standardization, and assisting in development of agreements with GHG programs in the U.S to accept ANSI accreditation for GHG validation and verification bodies.

Project Manager and Co-Principal Investigator on numerous projects for development of State Implementation Plan revisions for demonstrating attainment of the National Ambient Air Quality Standards for ozone and PM2.5 and Reasonable Progress Goals for Regional Haze in PSD Class I Areas including projects in the Chicago-Milwaukee-Racine, Cleveland and Birmingham AL Nonattainment Areas.

Project Manager and Principal Investigator on numerous Prevention of Significant Deterioration studies to obtain construction permits for new simple cycle and combined cycle combustion turbines and coal-fired power plants. Work involved directing and conducting project planning assistance to identify potential pitfalls associated with the project; development of emission inventories and emissions netting analyses to determine applicability for the major source PSD

pre-construction permitting requirements; control technology evaluations to determine Federal BACT and LAER, as well as state control technology requirements; air quality screening modeling and refined modeling for those pollutants subject to PSD review or state modeling requirements including determining impacts in PSD Class I areas to satisfy Federal Land Manager requirements; liaison with the regulatory agencies responsible for issuing the air quality permits; and related permitting assistance.

Project Manager and Principal Investigator on many projects dealing with air pollution emissions inventory development for a large cross section of industrial sources and electric power generating units.

Consultant on atmospheric diffusion modeling to more than 50 electric utility and industrial companies, the U.S. EPA, the Army Corps of Engineers, and several state and local governments for existing and proposed new facilities.

Consultant responsible for developing environmental management systems consistent with the ISO 14001 standards for environmental management systems. Principal investigator in developing environmental management systems at four facilities. Completed training course for certification as auditor of environmental management systems for compliance with the ISO 14001 standard.

Served as Chairman of the ISO 14000 Intercommittee Task Force of the Air and Waste Management Association responsible for the training and dissemination of information on ISO 14000 to the largest professional association in North America devoted to air pollution and waste management with over 16,000 members.

Served as Chairman of the Meteorology Committee of the Air and Waste Management Association (AWMA). Organized and directed an evaluation of the U.S. EPA proposed revisions to the Guideline on Air Quality Models that was conducted by the AWMA Meteorology Committee. Coordinated the committee's review of the Guideline, prepared the final committee position statement, and organized and chaired the committee presentation and panel discussion at the U.S. EPA Modeling Conference to discuss the Guideline.

Served as Chairman of the Meteorology and Modeling Committee of the Technical Advisory Committee to the Allegheny County (Pennsylvania) Department of Health on the development of new air pollution regulations for that county.

Private industry projects have included diffusion modeling studies and associated analyses to aid in developing air pollution regulations for existing power generation facilities within a number of states including Delaware, Colorado, Florida, Illinois, Indiana, Michigan, Missouri, New Jersey, New York, Ohio, Pennsylvania, and Wisconsin.

Participated in particulate deposition monitoring and particle identification and attribution program for coal fired power generation facility.

Directed large scale field studies and research programs to quantify the most extreme vertical dispersion rates governing plume dispersion based on remote plume sensing data and air quality and meteorological monitoring data. He has developed models for plume transport in complex terrain based on aerial tracer studies. He has also participated in the development of models for treating building-effect downwash and fumigation due to gradient onshore flows from water bodies. He has served as a consultant to various electric utilities on studying the variability in SO₂ emission rates from coal-fired power plants and on developing proposed compliance methods for SO₂ emission limits.

Directed a study for the Chemical Manufacturers Association (now American Chemistry Council) on analysis of data from bagging of equipment leaks for more than 20 chemical plants to develop more accurate procedures for estimating fugitive emissions from equipment leaks.

Testified at numerous public hearings and administrative proceedings representing clients as an expert witness on air quality modeling, PSD permitting and all aspects of compliance with air pollution regulations.

Responsible for developing risk management plans and the five year updates to these plans to satisfy requirements under Section 112(r) of the 1990 Clean Air Act Amendments including hazard assessments, emergency response program development and prevention programs.

Responsible for administrative oversight and general management of contracts for state and local air pollution control agencies including those in the states of New Jersey, Pennsylvania, Indiana, Kentucky and Alaska to prepare air pollution construction permits and operating permits for large cross sections of industry.

Project manager for contract with state air pollution control agency in the Southeast to operate the majority of the state's air quality monitoring program including 19 continuous monitors for ozone, NO_x, SO₂, and CO; 19 PM₁₀ monitors; 29 PM_{2.5} monitors; and 60 air toxics samplers for metals, PUF, VOC, lead and carbonyl. Work involved full operation and maintenance, data analysis and reporting as well as quality control activities and performance audits.

Consultant to the Massachusetts State Highway Department as expert witness on air pollution emissions estimation and air quality modeling in litigation involving the Central Artery highway project -- the largest current public transportation project in the U.S.

Consultant to The Port Authority of New York and New Jersey on air pollution emissions estimation, air quality modeling and transportation consistency determinations required under the Clean Air Act for new transportation project. Work has included the JFK Airport Light Rail Access System and the redesign of Jamaica Station.

Consultant to various state transportation agencies to estimate emissions and predict air quality impacts using various emissions and air quality models.

Senior Reviewer for the design, supply and operation of PSD and other air quality and meteorological monitoring networks.

Consultant on development of Compliance Assurance Monitoring plans to satisfy Title V operating permit requirements.

Consultant on community right-to-know reporting of toxic chemical releases as required under Section 313 of the Superfund Amendments and Reauthorization Act Title III. Designed release estimation procedures and conducted seminars for chemical company personnel on these procedures.

Consultant on designing programs for equipment leak testing and mass emissions sampling from equipment components. Participated in EPA and Chemical Manufacturers Association meetings on developing protocols for equipment leak testing. Organized technical sessions and conferences at which equipment leak testing procedures and results were presented.

PUBLICATIONS

Ellis, H.M., "U.S. EPA's New NAAQS and Implementation Rules, Their Impact on Electric Power Companies and Suggestions for How to Respond", Presented at the Energy and Environment Conference, Phoenix, AZ, February, 2011.

Ellis, H.M., Pan, S., Pinto, A.A, Shannon (Handley), J.C., and White, T.L. (2009) "Summary of State Activities Including Control Strategies and Modeling Plans to Attain the New 24-Hour PM2.5 NAAQS". Presented at the EUEC Energy and Environment Conference, Phoenix, AZ, February 2-4, 2009.

Ellis, H.M., Manousos, P., Pan, S., and White, T.L. (2009) "Electric Power Company Strategy for Attaining the 24-Hour PM2.5 NAAQS by using the U.S. EPA Exceptional Events Rule". Presented at the EUEC Energy and Environment Conference, Phoenix, AZ, February 2-4, 2009.

Ellis, H.M., Handley, J.C., Pinto, A.A., White, T.L. (2007) "Changes in State and Local Air Pollution Compliance Practices Due to Increased Title V and Other Permit Recordkeeping and Reporting Requirements". Presented at the Air & Waste Management Association 100th Annual Meeting, Pittsburgh, PA, June 22-24, 2007.

Ellis, H.M., Yousuf, A.A., Bent, A., Roy, Seema, Thotakura, R., Ogunsola, F. (2004) "Projected PM2.5 Attainment Status of Each County in the U.S. and Strategies for Dealing with Nonattainment Designations and With the Proposed Interstate Air Quality Rule". Presented at the Air & Waste Management Association 97th Meeting, Indianapolis, IN, June 22-24, 2004.

Ellis, H.M., Thotakura, R., Pan, S., Hirtler, M. (2004) "Permitting Practices, Resources and Performance of State Air Pollution Control Agencies". Presented at the Air & Waste Management Association 97th Annual Meeting, Indianapolis, IN, June 22-24, 2004.

Yousuf, A.A., Hydari, N.H., Earls, P.A., Ellis, H.M. (2003) "Second Annual Survey of the Most Recent BACT/LAER Determinations for Combustion Turbines by State Air Pollution Control Agencies". Presented at the Air & Waste Management Association 96th Annual Meeting, San Diego, CA, June 22-26, 2003.

Dittenhoefer, A.C., Ellis, H.M., Yousuf, A.A., Hydari, N.H., Bent, A. and Roy, S. (2003) "Projected Attainment Status of Each County in the U.S. with the PM_{2.5} National Ambient Air Quality Standards Based on 1999-2001 Monitoring Data and Strategies for Dealing with Nonattainment Designations". Presented at the Air & Waste Management Association 96th Annual Meeting, San Diego, CA, June 22-26, 2003.

Ellis, H.M., Hirtler, M.F., and Dittenhoefer, A.C. (2002) "New Developments Impacting Air Pollution Construction Permitting for New Combustion Turbines", EM Magazine, July 2002.

Ellis, H.M., and Lippincott, B. (2002) "Survey of the Difficulty of Obtaining Environmental Permits for the Construction and Operation of New Power Generation Capacity in 28 States". Presented at the Air & Waste Management Association 95th Annual Meeting, Baltimore, MD, June 24-28, 2002.

Hydari, N.H., Yousuf, A.A. and Ellis, H.M. (2002) "Comparison of the Most Recent BACT/LAER Determinations for Combustion Turbines by State Air Pollution Control Agencies". Presented at the Air & Waste Management Association 95th Annual Meeting, Baltimore, MD, June 24-28, 2002.

Ellis, H.M., Hydari, N.H., Yousuf, A.A. and Bent, A. (2002) "Projected PM_{2.5} Attainment Status of Each County in the U.S. Based on 1999-2000 Monitoring Results and Projected Impact on Existing and Proposed New Electric Power Generation Facilities". Presented at the U.S. Dept. of Energy National Energy Technology Laboratory Conference "PM_{2.5} and Electric Power Generation: Recent Findings and Implications", Pittsburgh, PA, April 9-10, 2002.

Ellis, H.M., Hirtler, M.F., and Dittenhoefer, A.C. (2001) "Impact of New Regulatory and Technological Developments on Obtaining Air Pollution Construction Permits for New Combustion Turbines for Electric Power Generation and Strategies for Dealing with These Developments". Presented at the Air & Waste Management Association 94th Annual Meeting, Orlando, Florida, June 24-28, 2001.

Ellis, H.M. and Ritz, P. (2001) "Bench Marking Survey of State Air Pollution Control Agencies on the Resources Required to Conduct Air Quality Monitoring Programs". Presented at the Air & Waste Management Association 94th Annual Meeting, Orlando, Florida, June 24-28, 2001.

Ellis, H.M., Dittenhoefer, A.C. and Fridley, W. (1998). "Developing Environmental Management Systems Based on ISO 14000 Principles for Companies in the Metals Industries: Why and How". Presented at Air & Waste Management Association Specialty Conference on Environmental Innovations in the Metals Industry", Pittsburgh, PA, March 1998.

Ellis, H. M., Plante, V., Arruda, C. (1995) "Successful Service Support Strategies for 40CFR75 CEM Systems", Presented at Air & Waste Management Association International Conference: Continuous Compliance Monitoring Under the Clean Air Act Amendments, Chicago, IL, October 25-27, 1995.

Ellis, H. M. (1997) "The Compliance Assurance Monitoring Rule: A Summary", Environmental Manager, November, 1997.

Ellis, H.M., and Lackaye, R. (1989) "Estimating Fugitive Emissions of Volatile Compounds from Equipment Leaks", JAPCA, Vol. 39, No. 12, December 1989.

Ellis, H.M., Logan, M., and Chiu, C. and Tufts, S.A., PPG Industries (1984) "Investigation of Plume Dispersion Using Lidar Plume Measurements." Presented at 77th Annual Meeting of the Air Pollution Control Association, San Francisco, California, June 1984.

Ellis, H.M., Greenway, A.R., and Duplak, E., (1982) "Summary of the Federal Emissions Trading Policy Statement." Journal of the Air Pollution Association, August 1982.

Ellis, H.M. (1982) "Evaluation of Prediction Models for the Avon Lake Power Plant Under Unstable Meteorological Conditions". Third Joint Conference on Applications of Air Pollution Meteorology, January 12-15, 1982, San Antonio, Texas. Published by the American Meteorological Society, Boston, Massachusetts.

Ellis, H.M. and Liu, P.C. (1981) "Review of the Performance of the RAM Model in Predicting Highest Measured Concentrations." Journal of the Air Pollution Control Association, Vol. 31, No. 2, February 1981, pp 148-152.

Ellis, H.M. and Greenway, A.R. (1981) "The Prevention of Significant Deterioration of Air Quality - Summary of the Final Federal Regulation," Journal of the Air Pollution Control Association, Vol. 31, No. 2, February 1981, pp 136-138.

Ellis, H.M. and Liu, P.C., Enviroplan, Inc., and Runyon, C., Ohio Edison Co. (1980) "Comparison of Predicted and Measured Concentrations for 58 Alternative Models of Plume Transport in Complex Terrain," 72nd Annual Meeting of the Air Pollution Control Association, Cincinnati, Ohio, June 1980.

Ellis, H.M., Liu, P.C., and Dalzell, G. (1980) "Comparison Study of Measured and Predicted Concentrations with the RAM Model at Two Power Plants Along Lake Erie," Second Joint

Conference on Applications of Air Pollution Meteorology, New Orleans, Louisiana, March 24-27, 1980.

Ellis, H.M. and Liu, P.C. (1980) "Discussion - An Air Quality Performance Assessment Package," Atmospheric Environment, Vol. 14, 1980, pp 1113.

Ellis, H.M., Liu, P.C., Bittle, C.R., and Deland, R., Enviroplan, Inc., Lyons, W.A., Mesomet, Inc., and Parker, K., Wisconsin Power & Light Co. (1979) "Development and Validation of a New Prediction Model for Treating Gaussian Dispersion, Aerodynamic Downwash, and Fumigation Due to Lakeshore Meteorology," Fourth Symposium on Turbulence, Diffusion and Air Pollution, January 15-18, 1979, Reno, Nevada.

Ellis, H.M. and Liu, P.C. (1977) "Comparison of Maximum Measured and Maximum Predicted SO₂ Concentrations with the U.S. EPA Single Source (CRSTER) Model," 70th Annual Meeting of the Air Pollution Control Association, Toronto, Ontario, Canada, June 20-24, 1977.

Ellis, H.M., Guise, D., and Liu, P.C. (1975) "Predicting SO₂ Impact from 1000-MW Power Plant," Power, July 1975.

Ellis, H.M. and Keeney, R.L. (1972) "A Rational Approach to Governmental Decisions Concerning Air Pollution," Journal of Systems Engineering, Vol. 3, No. 1, Summer 1972.

PROFESSIONAL CERTIFICATION

Qualified Environmental Professional, Certificate No.7990037, Institute of Professional Environmental Practice

EDUCATION

B.S., Electrical Engineering, Massachusetts Institute of Technology

M.B.A., Harvard Graduate School of Business Administration

D.B.A., Harvard University. Doctoral dissertation concerned with development of rational approaches to government decisions concerning air pollution.

Training course to become a certified auditor of ISO 14000 environmental management systems

AFFILIATIONS

Former Member Editorial Review Board, EM Magazine, Former Chairman, ISO 14000 Intercommittee Task Force, Air and Waste Management Association, Former Chairman, Air Toxics Source Emissions Characterization Committee, Air and Waste Management Association, Former Chairman, Critical Review Subcommittee of Publications Committee, Air and Waste Management Association, Former Chairman, Meteorology Committee, Air and Waste Management Association