

**Invitation for Comments on the “Short List” Candidates for the
Clean Air Scientific Advisory Committee (CASAC) Particulate Matter Review Panel
EPA Science Advisory Board (SAB) Staff Office**

The EPA Science Advisory Board (SAB) Staff Office is forming the **Clean Air Scientific Advisory Committee (CASAC) Particulate Matter (PM) Review Panel (Panel)**. Nominations for technical experts to supplement the existing chartered (statutory) CASAC membership were requested in the *Federal Register* (72 FR 10527) on March 8, 2007. The biosketches for the current members of the chartered CASAC may be viewed at the following URL: http://www.epa.gov/sab/pdf/casac_biosketches_2007.pdf. The CASAC PM Review Panel will be charged with providing advice, information and recommendations to the Administrator of EPA on the scientific and technical aspects of both the primary (health-based) and secondary (welfare-based) air quality criteria and national ambient air quality standards (NAAQS) for airborne PM. Information on the CASAC, the Panel, and the nomination process appear in the above-referenced *Federal Register* notice, which can be accessed via the SAB Web site at URL: http://www.epa.gov/sab/panels/casac_pm_review_panel_2007-.html. Per this *Federal Register* notice, the SAB Staff Office requested nominees for this Panel who are nationally-recognized experts in one or more of the following disciplines:

(a) Atmospheric Science. Expertise in evaluating the physical/chemical properties of particulate matter including transport of PM on urban to global scales, transformation of primary particles in the atmosphere to secondary particles, and movement of PM between media through deposition and other such mechanisms. Expertise in evaluating natural and anthropogenic sources and emissions of PM and resulting ambient levels, pertinent monitoring or measurement methods for PM, and spatial and temporal trends in PM atmospheric concentrations.

(b) Human Exposure and Risk Assessment/Modeling. Expertise in measuring general population exposure to PM and/or in modeling exposure to PM emitted from ambient and indoor sources. Expertise in human health risk analysis modeling for PM related to respiratory, cardiovascular, and other non-cancer health effects as well as cancer. Expertise in characterizing uncertainty in exposure and risk analyses.

(c) Dosimetry. Expertise in evaluating the dosimetry of animal and human subjects, including identifying factors associated with differential patterns of inhalation and/or deposition/uptake in various respiratory tract regions that may contribute to differential susceptibility of sensitive subpopulations and animal-to-human dosimetry extrapolations.

(d) Toxicology. Expertise in evaluating and interpreting experimental laboratory animal studies, including animal models simulating sensitive subpopulations (*e.g.*, children, older adults, individuals with preexisting respiratory or cardiac disease), and *in vitro* studies of the effects of PM on pulmonary and extrapulmonary (*e.g.*, cardiovascular, immunological) endpoints and cancer.

(e) Controlled Human Exposure. Expertise in evaluating and interpreting controlled human exposure studies of the effects of PM on the general population and sensitive subpopulations (*e.g.*, children, older adults, individuals with preexisting respiratory or cardiac

disease). Experts would include physicians with experience in the clinical treatment of cardiopulmonary diseases, including asthma, chronic obstructive pulmonary disease (COPD), and diabetes.

(f) Epidemiology and Biostatistics. Expertise in evaluating epidemiological evidence of the effects of exposures to ambient PM and other major air pollutants (*e.g.*, ozone, SO₂, NO₂, carbon monoxide) on the general population and sensitive subpopulations (*e.g.*, children, older adults, individuals with preexisting respiratory or cardiac disease). Expertise in evaluating a broad range of health endpoints, including mortality and morbidity effects (*e.g.*, respiratory symptoms, lung function decrements, asthma medication use, physiological changes or biomarkers for cardiac changes, cardiopulmonary-related emergency department visits, cardiopulmonary-related hospital admissions, cancer). Expertise in using biostatistical models to interpret epidemiological evidence.

(g) Effects on Visibility Impairment. Expertise in evaluating and interpreting studies of the effects of PM on local visibility impairment as well as regional haze. Expertise would include evaluating visibility trends and conditions in Class I, urban, and non-urban areas, studies of economic value of improving visual air quality, and approaches to assessing public perceptions of visibility impairment and judgments about the acceptability of varying degrees of visibility impairment.

(h) Ecological Effects. Expertise in evaluating the effects of exposure to PM on agricultural crops and natural ecosystems and their components, both flora and fauna, ranging from biochemical/sub-cellular effects on organisms to increasingly more complex levels of ecosystem organization. Appropriate expertise disciplines include: aquatic chemistry; aquatic ecology/biology; limnology; terrestrial ecology; forest ecology; grassland ecology; rangeland ecology; terrestrial/aquatic biogeochemistry; terrestrial/aquatic nutrient cycling; and terrestrial/aquatic wildlife biology and soil chemistry.

(i) Other Welfare Effects. Expertise in evaluating the effects of PM on other public welfare effects, including damage to materials, and also the atmospheric interactions of PM as related to global climate conditions.

(j) Ecosystem Exposure and Risk Assessment/Modeling. Expertise in deposition modeling across a range of scales from local watershed to landscape to continental; static and dynamic ecosystem response models; integrated assessment models; identification of bioindicators useful for tracking ecosystem change; and methods and approaches for estimating damage to ecosystems.

(k) Resource Valuation. Expertise in ecological resource and other welfare effects valuation and/or economic benefits assessment approaches and models.

The SAB Staff Office has identified 55 candidates who have the relevant expertise to serve on the CASAC PM Review Panel. Brief biographical sketches (“biosketches”) on these candidates are provided in the attachment below. *We hereby invite comments from members of the public for relevant information or other documentation that the SAB Staff Office should consider in the selection of this Panel.*

The SAB Staff Office Director makes the final decision about who serves on this Panel, based on all relevant information. This includes a review of the member's confidential financial disclosure form (EPA Form 3110-48) and an evaluation of a lack of impartiality. For the EPA SAB Staff Office, a balanced committee or panel is characterized by inclusion of candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the general charge. Specific criteria to be used in evaluating an individual Panel member include: (a) scientific and/or technical expertise, knowledge, and experience (primary factors); (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a lack of impartiality; and (e) skills working in committees, subcommittees and advisory panels; and, for the Panel as a whole, (f) diversity of, and balance among, scientific expertise, viewpoints, *etc.*

Please e-mail your comments no later than **July 20, 2007** to Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO), at: butterfield.fred@epa.gov.

Attachment

Attachment: CASAC Particulate Matter (PM) Review Panel Short List Biosketches

Adgate, John

University of Minnesota

John L. Adgate is an Associate Professor in the Division of Environmental Health Sciences at the University of Minnesota School of Public Health. His research focuses on improving exposure assessment in epidemiologic studies by documenting the magnitude and variability of human exposure to air pollutants, pesticides, metals, and allergens. His research projects have included evaluation of methods to reduce lead poisoning in the home, exploration of longitudinal exposure to indoor and outdoor air pollutants, and a controlled trial to test an allergen reduction intervention in inner city residences. He has written more than 50 articles and book chapters on exposure assessment, risk analysis, and children's environmental health. He has served on multiple U.S. EPA Science Advisory Panels exploring technical and policy issues related to residential exposure to pesticides, metals, and implementation of the Food Quality Protection Act of 1996, and was a member of the Institute of Medicine's Committee on Research Ethics in Housing Related Health Hazard Research in Children. He served as an elected Councilor of the International Society of Exposure Analysis, and is the recipient of its Joan M. Daisey Outstanding Young Scientist Award. Dr. Adgate received his bachelor's degree in biology from Calvin College, an MSPH in Environmental Science from the University of North Carolina at Chapel Hill School of Public Health, and a PhD in Environmental Health jointly granted by the University of Medicine and Dentistry of New Jersey and Rutgers University.

Ashbaugh, Lowell

University of California, Davis

Dr. Lowell Ashbaugh is an Associate Research Ecologist at the University of California, Davis. He received his B.A. in Physics in 1972 from the University of California, Davis. He went on to receive a M.S. in Environmental Health Sciences from the University of California, Berkeley in 1977, and a Ph.D. in Ecology from the University of California, Davis in 1982. He is a member of the American Geophysical Union, the Air & Waste Management Association, and the American Association for Aerosol Research. Dr. Ashbaugh served on technical committees for the California Regional Particulate Matter Air Quality Study from 1994-2003, the Air Quality Task Force to the Secretary of Agriculture from 1999-2001, and on the Meteorology Subcommittee of the Grand Canyon Visibility transport Commission from 1992-1996. He served as an Associate Editor for the Journal of Environmental Quality from 2000-2002. His expertise is in particle monitoring and analysis, transport and transformation. Dr. Ashbaugh has over 30 years experience in air pollution research. He pioneered the use of backwards air trajectories to statistically analyze the sources and transport patterns of air pollution at remote locations. He has also directed research studies on PM10 production from agricultural activities, and on the resuspension of soil samples onto Teflon® filters for analysis. He has performed research on the emissions of motor vehicles, specifically in relation to their participation in inspection and maintenance programs. In the last two years, Dr. Ashbaugh's funding has come primarily from the IMPROVE program via the National Park Service. He is not the P.I. on the contract, but assembles the data into concentration files and performs data validation prior to distribution to the public. He has also received funding from the U.S. Environmental Protection Agency's (EPA) National Center for Environmental Research (within the Office of Research and Development) as a contract peer reviewer for the Agency's Science to Achieve Results (STAR) program (Topic: "Sources, Composition, & Health Effects of Coarse Particulate Matter"). He is currently a member of the Ambient Monitoring and Reporting Forum of the Western Regional Air Partnership.

Avol, Ed

University of Southern California

Ed Avol is a Professor in the Environmental Health Division of the Department of Preventive Medicine at the Keck School of Medicine at the University of Southern California (USC). He received his B.A. (1973) in Mathematics, with a Minor in Chemistry, from the University of California, San Diego (UCSD) and his M.S. (1974) from the California Institute of Technology (Caltech) in Environmental Engineering Sciences. He is a member of the International Society of Exposure Analysis (ISEA), the Air and Waste Management Association (AWMA), and the American Association for Aerosol Research (AAAR). Professor Avol is a member of the Science Advisory Panel of the Mickey Leland National Urban Air Toxics Research Center (NUATRC), a member of both the (Southern California regional air quality agency) South Coast Air Quality Management District's 2007 Air Quality Management Plan (AQMP) Technical Advisory and General Committees, a member (2004-2005) of the Los Angeles Mayor's No Net Increase Task Force (to assess health impacts and emission reduction strategies for the Port of Los Angeles), a member of the San Pedro Bay (Ports of Los Angeles and Long Beach) Clean Air Action Plan Technical Working Group, and the ISEA Technical Chair for the 2008 Joint ISEA-ISEE Annual Meeting. He is a recipient of the Dr. Zweig Community Health Advocate Award for his work on the California Children's Health Study. Professor Avol's research interests include air pollution exposure assessment and both chronic and acute human respiratory health outcomes. His research has involved controlled chamber exposures of human volunteers to assess acute reversible air pollution respiratory effects in healthy and asthmatic children, adolescents, and adults, long-term community studies to assess chronic respiratory effects in children, and air pollution exposure generation, monitoring, and characterization to quantify and understand ambient pollutant burdens. In the last two years, Professor Avol received funding from the National Institutes of Health and U.S. Environmental Protection Agency for longitudinal health studies to assess intra-community variability in ambient pollution exposure among community residents and to direct Exposure Facility Core efforts in an NIEHS-supported Science Center and NIEHS-EPA supported Children's Center. He has also received funding as part of the Southern California Particle Research Center (a USEPA-supported Center), to assess PAH and PM exposures in Southern California communities of longitudinal health study interest. In addition to his respiratory research, he currently directs research on three cardiopulmonary research efforts (funded by USEPA, NHLBI, and NIEHS), to assess atherosclerosis progression in children, college students, and adults and to investigate the association between cardiovascular health and long-term exposure to ambient PM.

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Bernstein, Jonathan

University of Cincinnati College of Medicine

Dr. Jonathan A. Bernstein is currently a Professor of Clinical Medicine in the Department of Internal Medicine, Division of Immunology/Allergy Section at the University of Cincinnati Medical Center, Director of the Veteran's Administration Hospital Allergy Clinic and Allergy Laboratory and Director of Clinical Research for the Division of Immunology. He received his BA from Kenyon College in 1981 and his MD from the University of Cincinnati College of Medicine in 1985. He completed his residency training in Internal Medicine at the Cleveland Clinic Hospital from 1985-1988 and his Allergy/Clinical Immunology training at Northwestern University from 1988-1990. He has been a faculty member of the University of Cincinnati Department of Internal Medicine, Division of Immunology/Allergy Section since 1990. Dr. Bernstein is actively involved in clinical and translational research, in addition to pharmaceutical research, patient care and teaching. His current research involves the investigation of indoor environmental determinants in the workplace and home that cause or aggravate asthma and rhinitis and investigation of genetic markers that could identify susceptible populations to these exposures. Dr. Bernstein also has extensive experience conducting clinical therapeutic trials and is a DIA certified investigator. He has considerable experience conducting cross-sectional and longitudinal occupational and non-occupational investigations related to asthma and rhinitis. Dr. Bernstein is an authority on seminal plasma hypersensitivity reactions, an under-recognized problem in women. Other research topics of interest include non-allergic vasomotor rhinitis, olfactory receptor polymorphisms, environmental control of indoor allergens, mold assessment and remediation, genetically modified foods and novel therapies for allergies, asthma and other allergic diseases. Dr. Bernstein has published over 90 peer reviewed articles, clinical reviews and chapters on a variety of these topics. Dr. Bernstein is actively involved in the University of Cincinnati Allergy Fellowship Training Program and in the education of residents and medical students. He serves as the Vice-Chairman of the Environmental and Occupational Respiratory Disease Interest section for the American Academy of Asthma, Allergy and Immunology. He is immediate past-chairman of the AAAAI Air Pollution committee and was previously chair of AAAAI Occupational Disease committee. In this capacity he has acted as editor and contributor to a rostrum published in 2004 on the Health Effects of Outdoor Air Pollution and is currently editing a follow-up rostrum on the Health Effects of Indoor Non-Industrial Air Pollutants. He is a member of the ACGIH Bioaerosol committee. He is an Associate editor of the Journal of Asthma and on the reviewer board of the JACI. He reviews manuscripts on a regular basis for the Journal of Allergy and Clinical Immunology, Annals of Allergy, Asthma and Immunology, Journal of Asthma and Chest. In the past two years, Dr. Bernstein's research funding has come primarily from the pharmaceutical industry in addition to a grant from the American College of Chest Physician foundation and a University of Cincinnati Center for Environmental Genetics NIEHS pilot project grant.

Brook, Robert

University of Michigan

Robert Brook is currently an Assistant Professor of Medicine at the University of Michigan in the Division of Cardiovascular Medicine (since 1999). Dr. Brook received his undergraduate degree from Michigan State University (B.S. Physiology) in 1991 and his M.D. from the University of Michigan in 1995. He completed residency in Internal Medicine at Northwestern Memorial Hospital (1995-8) and a Fellowship in Vascular Medicine, Hypertension, and Hyperlipidemia at the University of Michigan (1998-1999). He became a Diplomate in Vascular Medicine (American Board of Vascular Medicine) in 2005. Dr. Brook's research is in clinical-physiological and translational vascular biology, hypertension and atherosclerosis. His main theme of research since 1999 has been the effect of particulate matter air pollution (in controlled exposure protocols, panel studies, epidemiological studies) on cardiovascular health outcomes and its biological impact (surrogate physiological markers) on blood vessel function, atherosclerosis, and cardiovascular risk factors. The studies have investigated the mechanisms of air pollution-mediated cardiovascular toxicity involving endothelial dysfunction, hypertension, vasoconstriction, atherosclerosis, oxidative stress, and metabolic abnormalities. Dr. Brook has parallel research interests in the mechanisms of human obesity-related hypertension, endothelial dysfunction, and the effects of passive tobacco smoke. His clinical expertise is in cardiovascular disease prevention, including directing a tertiary referral hypertension, hyperlipidemia, vascular medicine, and atherosclerosis clinic in the out-patient University of Michigan Hospital cardiology clinics. Dr. Brook is a member of the American Society of Hypertension (1999), the Council for High Blood Pressure Research, American Heart Association (2002), the National Lipid Association (2006), and a Fellow of the Society for Vascular Medicine and Biology (2002). He is an active committee member of the American Heart Association Council on Epidemiology and Prevention, and an Editorial Board Member of the Archives of Internal Medicine. He serves as an external advisory panel member to the University of Rochester Particulate Matter Environmental Protection Agency (EPA) Center grant and the University of Louisville National Institutes of Environmental Health (NIEHS) Program Project Grant on the Cardiovascular Toxicity of Environmental Aldehydes (A. Bhatnagar). He is an ad hoc reviewer for >15 journals including Circulation, Hypertension, Archives of Internal Medicine, Atherosclerosis Thrombosis and Vascular Biology, Environmental Health Perspectives, and the American Journal of Respiratory and Critical Care Medicine. Dr. Brook has received funding from the Environmental Protection Agency (2002-STAR-G1) investigating the mechanisms of air pollution-induced cardiovascular toxicity in controlled human exposures studies. He has funding from the Electric Power Research Institute in a study investigating the effect of ambient and personal exposure to particulate matter on vascular health and from the Health Effects Institute in a study researching the effect of exposure to particulate matter on coronary perfusion. He is a co-investigator on a protocol funded by the NIEHS (PARTNERS PAR-05-168) investigating mechanisms of air pollution-mediated hypertension and insulin resistance. In addition, he is the Principal Investigator or co-investigator on several small pharmaceutical sponsored research protocols (Novartis, Pfizer, TAP).

Buckley, Timothy

The Ohio State University

Dr. Timothy J. Buckley is an associate professor and Chair of the Division of Environmental Health Sciences at The Ohio State University (OSU) College of Public Health. Dr. Buckley received his PhD in Environmental Science from Rutgers University (1991), a Masters of Health Science in Industrial Hygiene from the Johns Hopkins Bloomberg School of Public Health (1986), and BS in Chemistry from St.

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John's University (Collegeville, MN; 1981). Dr. Buckley is a certified industrial hygienist and has been elected to leadership positions among his professional associations including chair of the American Industrial Hygiene Association's Biological Monitoring Committee and Academic Counselor of the International Society of Exposure Analysis. Dr. Buckley has also been an active member of the American Conference of Governmental Industrial Hygienists (ACGIH) since 1986. Dr. Buckley's research expertise is in human exposure assessment as applied in risk assessment and epidemiology. This expertise is formed from 21 years of experience spanning his doctoral work (5 years), followed by five years as a research scientist with EPA's National Exposure Research Lab, and another eleven years in academia. Prior to his move to OSU, Dr. Buckley was on the faculty at the Johns Hopkins Bloomberg School of Public Health for nine years. Throughout his research career, Dr. Buckley has focused on methods, measurements, and models for assessing human exposure to contaminants in the community and work environments as a basis for assessing the public health threat and developing strategies for prevention. Dr. Buckley's current research is focused on the impact of air pollution on susceptible populations including urban economically disadvantaged communities, inner-city asthmatic children, nursing mothers and their infants, and communities in close proximity to heavily trafficked urban arterials. He has published over fifty peer-reviewed research articles on these and other topics. Dr. Buckley has served on the U.S. EPA's Science Advisory Board (SAB) Exposure and Human Health Committee since 2001 and has been an ad hoc member of the Board of Scientific Counselors (BOSC), and served as an external reviewer for the Health Effects Institute (HEI). While at John Hopkins he served on the Faculty Advisory Board for the Center for a Livable Future for nine years. During his tenure with the US EPA, Dr. Buckley received awards for his role and efforts in the National Human Exposure Assessment Survey (NHEXAS) and the Lower Rio Grande Environmental Exposure Study. His published research was recognized in 1996 with a US EPA Scientific and Technology Achievement Award and again in 1999 by the Walter G. Berl Award given the Johns Hopkins Applied Physics Laboratory. Dr. Buckley's funded research is transitioning from his work at Johns Hopkins to his new appointment at OSU. Currently funded grants and contracts include air pollution monitoring to support community environmental justice concerns and the use of biological monitoring to assess exposure to polycyclic aromatic hydrocarbons. When he left Johns Hopkins almost two years ago, active research included 1) an EPA PM Center grant, 2) assessment of transportation-related air toxics on an urban community, 3) investigation of the role of indoor and outdoor PM air pollution and an intervention on childhood asthma in the urban community, and 4) a pilot study considering the partitioning of air toxics into human milk among inner-city nursing mothers.

Cascio, Wayne

East Carolina University

Wayne Cascio, MD, FACC, FAHA is Professor and Chief of Cardiology at East Carolina University where he and his colleagues are studying the effects of particulates on vascular adenosine receptor signaling and ischemia/reperfusion in animal models. Dr. Cascio is a co-investigator in studies examining the health effects of traffic related particles, environmental stresses on vulnerable populations, the engineering of nanoparticles for delivery of NO, and stem cell transdifferentiation. Dr. Cascio serves as a consultant to NHLBI, NIEHS, and EPA. The focus of his early career was in the field of the electrophysiology of ischemic myocardium, while over the last 8 years he has concentrated on environmental cardiology. Dr. Cascio has a BA from Johns Hopkins University, and an MD from the University of Maryland at Baltimore (1980). He completed a medicine residency and cardiology fellowship at the University of North Carolina at Chapel Hill, and received post-doctoral training in electrophysiology at the University of Bern, Switzerland. He is board certified in internal medicine and cardiology and remains clinically active. Dr. Cascio is a Fellow of the American Heart Association, a Fellow of the American College of Cardiology, a member of the American Public Health Association, Heart Rhythm Society, Clinical Electrophysiology Society, Association of Professors of Medicine, Association of Professors of Cardiology and Sigma Xi.

Chen, Lung-Chi

NYU School of Medicine

Dr. Lung-Chi Chen is an Associate Professor in the Department of Environmental Medicine at the New York University (NYU) School of Medicine. He is also the Director of NYU's Inhalation Toxicology Laboratory. Dr. Chen received his Bachelor degree in Public Health from National Taiwan University in 1976, his M.S. in Environmental Health Sciences from NYU in 1978, and Ph. D. in Environmental Health Sciences from NYU in 1983. He was an Assistant Professor at Drexel University and a Research Scientist at Massachusetts Institute of Technology before his current appointment at NYU. He is a member of the Society of Toxicology (SOT), the American Thoracic Society (ATS), the Association of American Association for the Advancement of Sciences (AAAS), and the American Association of Aerosol Research (AAAR). Currently, Dr. Chen is the Vice-President of the Inhalation and Respiratory Specialty Section of the SOT. Dr. Chen is an internationally recognized expert on inhalation toxicology, and has extensive experience in the measurement of cardiopulmonary effects of inhaled pollutants. He also is recognized as an expert in the generation and characterization of exposure atmospheres, and in the performance of toxicology studies using all routes of exposure, primarily those involving inhalation exposure. He has served on a number of national and international advisory committees and study sections in his areas of expertise. These include National Research Council's Committee on Beryllium Alloy Exposures in Military Aerospace Application; UC Davis EPA San Joaquin Valley Health Effects Research Center's (SAHERC) External Scientific Advisory Panel; NIEHS's ONES Award review committee, NIEHS Superfund program review committee; NIEHS's Special Emphasis review Panel on Environmental Cardiovascular Disease; as a reviewer of the Taiwan National Science Council's Nanoscience and Nanotechnology Program; as a reviewer of the United Kingdom Natural Environmental Research Council's Environmental Nanoscience Initiative; US Army Medical Research Institute of Chemical Defense Research Program Review Panel; and as a reviewer of EPA's Impact of Manufactured Nanomaterials on Human Health and the Environment Program. Dr. Chen is a contributing author of EPA's 2004 Air Quality Criteria Document for Particulate Matter. Dr. Chen is the author of over 120 research papers and book chapters dealing with the mechanisms underlying the adverse cardiopulmonary effects resulting from inhalation exposure to occupational and environmental air pollutants. His research approach is to systematically dissect the role that physico-chemical properties of these pollutants play in the exposure, uptake at sites of deposition in the respiratory tract and translocation to the heart, as well as in the development, progression, and resolution of cardiopulmonary diseases. In the past two years, Dr. Chen has received peer-reviewed research funding from National Institutes of Health (Long term cardiovascular effects of inhaled nanoparticles; Air Pollution Exposure and Atherosclerosis and Blood Pressure: Vascular Mechanisms), Health Effects Institute (Health Risks of PM Components: Subchronic effects of concentrated ambient air PM), and Research Management Group (Comparative cardiovascular effects of environmental tobacco smoke and ambient fine particulate matter).

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Croes, Bart

California Air Resources Board

Mr. Bart Croes is currently Chief, Research Division, California Air Resources Board and director of the State's health, exposure, atmospheric processes, emission control, and economics research programs for air pollution. This includes responsibility for setting California ambient air quality standards. An atmospheric scientist with a background in air quality simulation modeling and a P.E. in Chemical Engineering (California), his former responsibilities include California's air-quality measurement network design, data management and data analysis programs, and evaluation of the environmental fate of non-oxygenated and ethanol alternatives to MTBE in gasoline (1998-2000). Mr. Croes was the program manager for the 1997 Southern California Ozone Study (SCOS97-NARSTO), the SCOS97-NARSTO Aerosol Program and Radiation Study, California's Particulate Matter Research Program, the California Acid Deposition Monitoring Program, atmospheric chemistry and modeling research, and California Clean Air Act ozone transport research (1992-1998). Mr. Croes holds advanced degrees with an M.S. (Chemical Engineering) from the University of California at Santa Barbara, 1983, and a B.S. (Chemical Engineering) from the California Institute of Technology, 1979. He is Public Sector Co-Chair for the NARSTO Executive Assembly and former member of the National Research Council Committee on Research Priorities for Airborne Particulate Matter (1998-2004). Mr. Croes has been a peer reviewer for the National Research Council, the U.S. EPA, and numerous journals, and received the Editors' Citation for Excellence in Refereeing from the Journal of Geophysical Research (1997). He has published peer-reviewed articles on air quality simulation modeling, emission inventory evaluation, reactivity-based VOC controls, acid deposition, the weekend effect for ozone and PM, PM data analysis and trends, and diesel particle traps. Mr. Croes receives no grant or other contract support funding. (2004)

Dominici, Francesca

Johns Hopkins University

Dr. Francesca Dominici is Professor of Biostatistics in the Bloomberg School of Public Health at Johns Hopkins University, with a joint appointment in the Department of Epidemiology. Dr. Dominici received her B.S. (1993) in Statistics at the University La Sapienza, Rome, Italy and her PhD (1997) in Statistics at the University of Padua, Italy. She is currently the coordinator of the Environmental Biostatistics and Epidemiology Group (formed in 2002), initiating various collaborations across several divisions in the Johns Hopkins Medical Institutions. Dr. Dominici was a recipient of the Walter A. Rosenblith New Investigator Award (1999), Three-Year Fellowship from the Health Effects Institute, the Young Investigator Award from the American Statistical Association Section of Statistics in Epidemiology (2001), and was the Key note speaker at Royal Statistical Society, London, UK in 2002. In 2005, Dr Dominici was made a Fellow of the American Statistical Association, and was also a Fellow in the Johns Hopkins Center of Excellence in Public Health Tracking, Centers of Disease Control. She was a recipient of the Mortimer Spiegelman Award, Statistics Section of the American Public Health Association (2006). In 2007 she has been awarded with Gertrude Cox Award, Washington DC Chapter of the American Statistical Association and RTI International, and with the Myrto Lefkopoulou Distinguished Lectureship Award from the Department of Biostatistics at Harvard University. Dr. Dominici has been involved on projects based on the interface between the methodological development of hierarchical models and their applications to multi-level data. She has extensive experience on the development of statistical methods and their applications to clinical trials, toxicology, biology, and environmental epidemiology. She has previously developed hierarchical models for synthesizing evidence from several clinical trials that compare the effectiveness of different treatments, and a variety of forecasting multi-stage models for combining information in biology. Dr. Dominici has led the development of statistical and epidemiological methods for data analysis and interpretation of the NMMAPS and the Medicare data bases which include air pollution, mortality and morbidity data for nearly all urban centers in the U.S. She has developed statistical methods for: 1) estimating relative rates of mortality associated with exposure to air pollution and temperature for the 90 largest US counties, for several geographical regions and for the nation; 2) investigating the extent of heterogeneity of air pollution health effects across locations and its sources; and 3) characterizing of the high risk population for air pollution-related mortality. Dr. Dominici has participated on several Advisory Panels and consulted with various groups regarding the health effects of air pollution including the National Academy of Science Committee to assess potential health effects from exposures to PAVE PAWS low-level phased-array radiofrequency energy in Cape Cod, MA (2002-2005); the External Advisory Board, University of Washington Seattle, Department of Environmental and Occupational Health Sciences, MESA Air Pollution Study (2005-2015); the National Academy of Science Committee on Research Priorities for Airborne Particulate Matter (2002); the Clean Air Act Advisory Board of the EPA (2002); the Pacific Business Group on Health: The 1998 Asthma Outcome Survey; and the Kaiser Permanente: Morbidity and Mortality Associated with Air Pollution Among Kaiser Permanente California Members. In 2005, she gave testimony to the Maryland State Committee on House Economic Matters and the Maryland State Committee on Education, Health, and Environmental Affairs on Health Effects of Particulate Matter and Ozone. In her field of research, Dr. Dominici has been an active leader in several professional organizations including the American Statistical Association, International Biometrics Society (Program Committee member, and Chair of Junior Researcher Workshop 2002), and the International Society for Environmental Epidemiology. Dr. Dominici has served as Editor of the American Journal of Epidemiology, Statistical Methodology Area, May 2002-April 2007, and also been a peer reviewer on articles for such journals as American Journal of Epidemiology, Biometrics, Biostatistics, Environmental Health Perspectives, Epidemiology, Journal of the American Statistical Association, Journal of the Royal Statistical Society, Journal of the American Medical Association, and Science. She has also participated in Ad Hoc Review of Proposals for the Environmental Protection Agency, the Health Effects Institute, Boston, MA, the National Institutes of Health (NIH), and the National Institute of Environmental Health Sciences (NIEHS). In the last two years, Dr. Dominici has received funding from the National Institutes of Health (NIH) for work on statistical methods for environmental epidemiology, and the effects of zinc intake on the development of early childhood. She has also received funding from EPA as the Director of the Risk Assessment section of the Johns Hopkins PM Research Center, for collaboration on a report regarding dose-response extrapolation approaches to human health risk assessments of environmental contaminants, and for statistical methods for ozone and mortality. She is also currently being funded by a subcontract with Yale University for a larger, national assessment of the health effects of ozone. Through the Health Effects Institute, Dr Dominici received funding for the APHENA project, which combined European and North American analyses of air pollution and health effects.

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Flagan, Richard C.

California Institute of Technology

Dr. Richard Flagan is the McCollum/Corcoran Professor of Chemical Engineering and Professor of Environmental Science and Engineering at the California Institute of Technology, where he also serves as Executive Officer for Chemical Engineering. He received his B.S. in Mechanical Engineering from the University of Michigan, and his S.M. and Ph.D. from the Massachusetts Institute of Technology, also in Mechanical Engineering. Professor Flagan's research focuses on aerosols. His laboratory has performed many chamber studies of secondary organic aerosol formation and transformations. Another focus of his research for the past decade has been the development of quantitative assessments of climate forcing by aerosols, both direct forcing due to scattering and absorption radiation, and indirect forcing through the nucleation of cloud droplets. Flagan is also probing the distribution of airborne allergens, and has identified mechanisms that enable allergens associated with large pollen grains to enter the air in particles that are small enough to penetrate into the lower airways when inhaled, thereby providing a mechanism that may explain the association between pollen allergens and asthma. Central to all of these studies has been Flagan's contributions to the state of the art for aerosol measurements. Early in his career, Flagan and collaborators developed the first cascade impactor that was capable of separating particles throughout the ultrafine size range, and applied this instrument to identification of chemical contributions to visibility degradation. Flagan invented the scanning mobility particle sizer (SMPS) that has become the standard method for measurement of size distributions in the of submicron particles, and has contributed numerous other instruments. Flagan has published over 250 scientific papers, a textbook: *Fundamentals of Air Pollution Engineering*, and has 16 patents. Professor Flagan has served as the President of the American Association for Aerosol Research, and is currently the Editor in Chief of its journal, *Aerosol Science and Technology*. He has served on numerous National Research Council committees, currently the Committee on a Single Unit of Measure for Biological Aerosols; previously the Committee on the Chemical Stockpile Disposal Program, Board on Army Science and Technology, and Committee on Particulate Control Technology, among others. He has also served on the Research Screening Committee of the California Air Resources Board. He has received numerous awards for his aerosol research including the Fuchs Award (American Association for Aerosol Research, Gesellschaft für Aerosolforschung, and Japan Association for Aerosol Science and Technology) in 2006, and the American Chemical Society Award for Creative Advances in Environmental Science and Technology in 2007. Professor Flagan's recent research support has come from the National Science Foundation and Office of Naval Research (aerosol/cloud interactions and radiative forcing), Environmental Protection Agency and Department of Energy (chamber studies of secondary organic aerosol formation), NOAA (aerosol/cloud interactions in a polluted urban environment - Houston), Ayrshire and Wallis Foundations, and the Philip Morris External Research Program (pollen fragmentation leading to the release of pollen allergen in respirable aerosols, and the link between those fragments and asthma exacerbations).

Frey, H. Christopher

North Carolina State University

Dr. H. Christopher Frey is a professor of environmental engineering in the Department of Civil, Construction, and Environmental Engineering at North Carolina State University. He has a B.S. Mechanical Engineering from the University of Virginia (1985), M.E. Mechanical Engineering from Carnegie Mellon University (1987), and a Ph.D. in Engineering and Public Policy from Carnegie Mellon University (1991). Dr. Frey is an internationally-recognized expert regarding quantification of variability and uncertainty in emissions, air quality, exposure, and risk analysis. He is an expert in sources and emissions of multiple pollutants, including particulate matter. He is also an expert in environmental systems modeling, with particular focus on characterizing uncertainty in coupled models, such as for the source-to-outcome continuum. His research includes measurement and modeling of emissions, quantification of human exposures using probabilistic exposure models, and assessment of uncertainties in integrated assessment models. Dr. Frey is co-author, with Alison Cullen, of *Probabilistic Techniques in Exposure Assessment* (Plenum: New York, 1999). Dr. Frey is the immediate past president of the Society for Risk Analysis. In 1999 he received SRA's Chauncey Starr Award and in 2006 he was selected as a Fellow of SRA. He is active in the Air & Waste Management as faculty advisor of the NCSU student chapter and past chair of the EE-1 Health Effects and Exposure Committee. He has served on numerous national and international committees, including: (a) a National Research Council committee on the effect of changes in New Source Review; (b) as one of seven members of EPA's FIFRA Scientific Advisory Panel; (c) as a consulting member of an EPA Science Advisory Board subcommittee on residual risk; (d) on a World Health Organisation IPCS working group on probabilistic exposure assessment; (e) as a peer reviewer of the FAO/WHO exposure guidelines for microbial risk and a member of the drafting group for the guidelines on risk characterization; (f) as a lead author on a chapter regarding uncertainty for the Intergovernmental Panel on Climate Change greenhouse gas emission inventory good practice guidance released in 2006; (g) as a lead author for the NARSTO emission inventory assessment document; and (h) as a contributing member of the current NARSTO multi-pollutant assessment in the area of risk analysis. Dr. Frey has been an invited presenter at numerous workshops, including the U.S. EPA Workshop on Carbonaceous Particulate Matter Science Assessment, held in Research Triangle Park, NC on January 14, 2004 and at EPA and SOT workshops on probabilistic risk analysis. He has organized and delivered numerous workshops on probabilistic exposure assessment and related topics, primarily at SRA. In the past two years, Dr. Frey has received funding for externally sponsored research projects at NC State from: (a) U.S. Department of Energy, National Energy Technology Laboratory, via Carnegie Mellon University for modeling and evaluation of clean coal technologies; (b) National Science Foundation for grants to conduct research on measurement and modeling of activity, fuel use, and emissions of light duty gasoline vehicles and construction vehicles; (c) U.S. Environmental Protection Agency via Allion Science and Technology, Inc for Review and Recommendation of Methods for Sensitivity and Uncertainty Analysis for the Stochastic Human Exposure and Dose Simulation (SHEDS) Models; (d) National Oceanic and Atmospheric Administration to support participation in the NARSTO Emission Inventory Assessment; (e) U.S. Environmental Protection Agency STAR grant via University of North Carolina at Chapel Hill, for Regional Development, Population Trend and Technology Change Impacts on Future Air Pollution Emissions; (f) Texas Transportation Institute via Clean Air Technologies International, Inc for Measurement and Analysis of Gasoline-Fueled Passenger Vehicle Emissions on Dirt versus Paved Roads and During Idling; (g) North Carolina Department of Transportation for measurement of activity, fuel use, and emissions of construction vehicles; (h) U.S. Department of Transportation via Center for Transportation and the Environment for development of a Best Practices Guidebook for Greenhouse Gas Reductions in Freight Transportation; (i) U.S. Environmental Protection Agency via NC Solar Center for a Truck Anti-Idling Demonstration Project; and (j) U.S. Environmental Protection Agency for an Intergovernmental Personnel Act (IPA) agreement to support a 12 month sabbatical from NC State to the National Exposure Research Laboratory from August 16, 2006 to August 15, 2007. In addition to the sponsored research projects, other forms of

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external funding include service as a Special Governmental Employee (SGE) to the EPA's FIFRA Scientific Advisory Panel from April 2004 to August 2006, and honoraria or consulting fees from Exponent, Inc. for participation in an FDA-sponsored workshop on peer review, SAIC for peer review of a USDA risk assessment, and Eastern Research Group for peer review of an EPA draft document on emission factor uncertainty.

Geyh, Alison

Johns Hopkins University

Dr. Alison Geyh is an assistant professor in the Department of Environmental Health Sciences with a joint appointment in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health. Dr. Geyh received her B.S.(1986) in chemistry from Columbia University and Ph.D.(1993) in physical organic chemistry from Brandeis University. She was a research associate at the Harvard School of Public Health in the Department of Environmental Health until 1998. She then worked at the Health Effects Institute before joining the faculty at Johns Hopkins University in 2000. She is a member of the International Society for Exposure Analysis, the Air & Waste Management Association, and the American Chemical Society. Dr. Geyh's research focuses on the assessment of environmental and occupational exposure to air pollutants, with a specific emphasis on particulate matter. Her research is also directed at understanding the health effects of these exposures. She has conducted research to evaluate the impacts of exposure to ambient fine particles on exacerbations of symptoms of congestive heart failure, assessed the exposure and health effects of particulate matter as well as other pollutants for workers involved in the clean up and recovery effort at the World Trade Center disaster site, and participated in the development of a new method for the measurement of personal exposure to ambient fine particles. In the last two years, Dr. Geyh has received funding from the National Institutes for Health to conduct research on exposure to airborne chemicals implicated in the risk of developing bladder cancer. She has pilot funding from the National Institute of Environmental Health Sciences to examine exposure to airborne manganese, and to diesel particulate matter. She has received funding from EPA as the PI of the exposure assessment core of the Johns Hopkins Particulate Matter Research Center to evaluate differences in chemical composition of particulate matter from samples collected across the United States. Dr. Geyh currently serves as a member of the Member of the Maryland Department of the Environment, Air Quality Control Advisory Council. She is an external advisory committee member for the University of Southern California NIEHS/EPA Children's Environmental Health Center; and is a member of the New York City, Department of Health and Mental Hygiene Science Advisory Board for the World Trade Center Health Registry. She served as a Member of the National Research Council Committee on State Practices in Mobile Source Emissions Standards from 2004 – 2006.

Godleski, John

Harvard University

Dr. Godleski is currently Associate Professor of Pathology at Brigham and Women's Hospital, Harvard Medical School, and holds the same position in the Department of Environmental Health at Harvard School of Public Health (HSPH). At Brigham and Women's Hospital, Dr. Godleski is Director of Pulmonary Pathology, and at HSPH, he leads an active research program in inhalation toxicology of ambient air particles with focus on both pulmonary and cardiovascular effects. He holds an MD degree from University of Pittsburgh School of Medicine, with post graduate studies in Pathology at Massachusetts General Hospital, and at Harvard School of Public Health in Physiology and Toxicology. He has served on numerous NIH and EPA grant review panels, and holds membership in the American Thoracic Society, International Academy of Pathology, Air and Waste Management Association, and others.

Goldberg, Mark

McGill University

Dr. Mark Goldberg is Professor in the Department of Medicine, McGill University, is a member of the Division of Clinical Epidemiology and the Division of Experimental Medicine, Department of Medicine, McGill University. He is also an associate member of the Joint Departments of Epidemiology and Biostatistics and Occupational Health, Department of Oncology, and the McGill School of the Environment, McGill University, and is a Medical Scientist, Royal Victoria Hospital, McGill University Health Centre. Dr. Goldberg is a member of the International Society for Environmental Epidemiology. He received in 1991 his Ph.D. in epidemiology and biostatistics from McGill University. Dr. Goldberg's expertise is in occupational and environmental epidemiology, and his research interests include the short- and long-term effects of air pollution on health and occupational and environmental causes of cancer, particularly breast cancer in women. Dr. Goldberg serves currently as a member of the Health Canada Science Advisory Board and the Health Canada Pest Management Advisory Council, and he has served as a member on three U.S. Institute of Medicine's expert committees: "Veterans and Agent Orange: Sixth Biennial Update" (2006-7), "Committee on the future of the Air Force Health Study Vietnam veterans cohort study" (2004-5), and "Committee on Gulf War and Health: A review of the literature on pesticides and solvents" (2004-5); and one US National Research Council expert panel: "Human Health Risks of Trichloroethylene" (2004-5). Dr. Goldberg is on the editorial board of Reviews on Environmental Health and is a consulting editor for Archives of Environmental and Occupational Health. Dr. Goldberg receives salary support as an Investigator from the Canadian Institutes of Health Research. In the last two years, Dr. Goldberg has received support to conduct research from the Quebec Breast Cancer Research Foundation for a study on gene-environment interactions in postmenopausal breast cancer and from the Canadian Institutes of Health Research for a longitudinal study of the health effects of air pollution, a study of traffic-related air pollution and socioeconomic gradients in the incidence of cancer, and a cohort study of cancer incidence and mortality among adults from long-term exposure to outdoor air pollution studies on the chronic and acute effects of air pollution on health. He has also received contracts from Health Canada to conduct a number of studies on air pollution and is a collaborator on a study on radiotherapy in cancer, a cohort study of stroke and heart disease, and a study in research in palliative care.

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Gordon, Terry

NYU School of Medicine

Dr. Gordon holds the rank of Professor of Environmental Medicine at the NYU School of Medicine. He has a Ph.D. degree in toxicology from MIT, and was appointed to the faculty of the Department of Environmental Medicine in 1989. Dr. Gordon currently is the Director of Pulmonary Toxicology; this research core integrates studies primarily in respiratory toxicology, including respiratory immunotoxicology. Dr. Gordon has served as an ad hoc member of grant review panels and/or site visit teams for NIEHS, NIAID, NCCR, DOD, Bureau of Mines, and the U.S. EPA. He currently serves as Chair of the ACGIH Threshold Limit Value committee, a volunteer organization that publishes occupational exposure levels that are used as workplace safety guidelines throughout the world. Dr. Gordon is an active member of the Society of Toxicology (SOT), and has served on the Program Committee (2002-2005), the Placement Service (1998-2001), and as President of its Inhalation Specialty Section during 2002-2003. He has served as a consultant/author to the U.S. EPA on issues of pulmonary toxicology related to the development of various documents, including the Criteria Document on Particulate Matter. Dr. Gordon's broad research interest is in inhalation toxicology. The major focus of his research lab is the identification and understanding of the role of genetic host factors in the pathogenesis of the adverse pulmonary effects produced by inhaled environmental and occupational agents. Because inter-individual responses to inhaled particles and gases varies so greatly in both human subjects and test animals, Dr. Gordon has hypothesized that genetic susceptibility factors play a major role in environmental and occupational lung disease. In collaboration with a number of investigators in the department, his laboratory uses classic murine genetics models, computational genomics, and DNA microarrays to identify genes involved in the acute response as well as in the development of tolerance to repeated exposure to inhaled toxicants. Dr. Gordon also plays a major role in the PM research program at NYU and was among the first researchers to use concentrator technology to study the adverse cardiopulmonary effects of ambient PM. He has also led a large collaborative effort amongst the original 5 PM Centers to evaluate the in vitro and in vivo toxicity of size-segregated PM collected in the U.S. and Europe.

Grantz, David

University of California

Dr. David Grantz is Director of the University of California, Kearney Agricultural Center, Plant Physiologist and Extension Air Quality Specialist at U.C. Riverside, and Adjunct Professor in the School of Chemistry of the Autonomous University of Queretaro, Mexico. Dr. Grantz received his Ph.D. from the University of Illinois at Urbana-Champaign in Plant Physiology (1983), his M.Sc. from the University of California at Riverside in Plant Sciences (1979) and his A.B. from the University of California at Santa Cruz (1973). He was a Post-Doctoral Research Associate at Stanford University (1983-1985) and the Golda Meier Fellow at Hebrew University of Jerusalem (1986). Dr. Grantz has expertise in whole plant ecological physiology, particularly plant water use, oxidant impacts, and air pollutant deposition. He performs research and educational activities in the areas of air quality and pollutant impacts on vegetation. He has conducted monitoring and characterization of particulate matter violations and developed mitigation measures for fugitive dust in arid regions of California. He has conducted research on integrated plant responses to ozone and other environmental factors associated with climate change, at levels of biological organization from isolated plant organs, to whole plants and extensive plant canopies. Grantz was named Early Career Scientist of the Year (1990) by USDA Agricultural Research Service, Pacific West Area, for studies on water use and yield in sugarcane. He is a member of the American Society of Plant Biologists, the Ecological Society of America, and the Crop Science Society of America. Dr. Grantz served as a principal author of the preceding EPA Criteria Document on Particulate Matter (Welfare Effects) and of the most recent California Air Resources Board Technical Support Document on ozone (Vegetation Effects). He has participated in several national workshops to review ozone impacts on vegetation, and has served as Associate Editor of the Journal of Environmental Quality and Crop Science. He is a member and Chair-Elect of the international project on Ozone Effects on Vegetation (Regional Agricultural Experiment Station Project NE-1013). Within the past two years Dr. Grantz has received travel and research support from the University of California UC MEXUS program for work on air pollution associated with brick kilns in central Mexico, and research support from the U.C. Agricultural Experiment Station for research on particulate matter (fugitive dust) and ozone impacts on vegetation. During this period he has not accepted funding from extramural sources.

Green, Mark

Desert Research Institute

The nominee is employed as a Research Professor at the Desert Research Institute. He is also a member of the graduate faculty at the University of Nevada – Reno. The nominee has a B.S. in Atmospheric Science and Oceanic Sciences from the University of Michigan, M.S. in Meteorology from the University of Utah and a Ph.D. in Atmospheric Sciences from the University of California at Davis. Dr. Green has over 25 years experience in the fields of air pollution and meteorology. His research has concentrated on determining the causes of haze in both remote and urban areas, in characterization and source attribution of atmospheric aerosols, and characterization of atmospheric transport and dispersion. He was DRI's Principal Investigator for numerous current and past visibility and particulate matter related studies, including the Project MOHAVE and BRAVO regional visibility studies, the Columbia River Gorge Air Quality and Visibility Study, the Las Vegas Valley Visibility and PM2.5 Study, the Las Vegas Valley Carbon Source Apportionment Study, and the Western Regional Air Partnership Causes of Haze Assessment. Dr. Green served as a member of the Meteorology Subcommittee, Grand Canyon Visibility Transport Commission (GCVTC), providing substantial portions of the subcommittees' analyses and reports. He has also contributed to EPA guidance documents for PM2.5 monitoring. The nominee has been active in the Air & Waste Management Association serving as chair or co-chair of the visibility committee for 6 years and will be the technical co-chair of the upcoming visibility specialty conference.

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Gundel, Lara

Lawrence Berkeley National Laboratory

Dr. Lara Gundel is a Staff Scientist in the Indoor Environment Department of the Environmental Energy Technologies Division of Lawrence Berkeley National Laboratory, University of California, Berkeley, 94720. She received a B.S. in Chemistry from Valparaiso University in 1967 and a Ph.D. in physical chemistry in 1975 from the University of California, Berkeley, California. She is a member of the American Association for Aerosol Research and has served on its board and as its treasurer. She has expertise in atmospheric science and exposure assessment, as well as working knowledge of current issues in epidemiology and environmental toxicology. Dr. Gundel has served on expert panels for review of the EPA's PM-related RFAs and the Chemical Speciation Network for Particulate Matter. She has also participated in NIH-sponsored planning workshops for the Children's Health Study and Initiatives in Exposure Biology and NASA's Environmental Sentinels panels. Her research in environmental physical chemistry focuses on heterogeneous processes in the atmosphere and indoor environments, including the dynamic behavior of gas/particle mixtures, secondary organic aerosol formation, chemical and physical characterization of combustion and ambient PM, as well as optical, thermal and chromatographic methods for complex mixtures that include polar organic constituents. She holds three patents for development of artifact-free instrumentation for carbonaceous PM and one for miniature PM samplers. She is currently leading efforts to develop low-cost miniature detectors for both gaseous and particulate air pollutants, for use in population-based exposure assessment and cell exposure systems. In the last two years Dr. Gundel has received funding from the California Tobacco Related Disease Research Program to develop and validate low-cost tools for assessing exposure to secondhand tobacco smoke, the Innovative Clean Air Technology Program of the California Air Resources Board and the California Energy Commission for development of a low-cost real-time monitor for PM, and the FAA for assessment of sensor technology for aircraft cabin air quality.

Helble, Joseph

Dartmouth College

Joseph J. Helble is Professor and Dean of the Thayer School of Engineering at Dartmouth College. Prior to joining Dartmouth as Dean in 2005, he served as a faculty member and Chair of the Department of Chemical Engineering at the University of Connecticut (UConn), and was also a member of the UConn Environmental Engineering faculty. His research is primarily in the area of air pollution, with specific activities and interests in combustion-derived particulate matter formation and control, mercury, trace metal and air toxics air pollutants, air quality modeling, ambient particulate matter structure, carbon dioxide capture, and particle coalescence. He also initiated a program to produce biodiesel fuel from waste vegetable oil on the UConn campus. Dr. Helble is the author of 100 publications, primarily in the air pollution field, and is a member of the editorial board of the journals Fuel Processing Technology and Environmental Engineering Science. From 2004-2005, Dr. Helble was the holder of the Revelle Fellowship in Global Stewardship from the American Association for the Advancement of Science (AAAS). As the Revelle Fellow, he spent a year working on environmental and technology policy issues in the office of U.S. Senator J. Lieberman. Prior to joining the UConn faculty in 1995, Dr. Helble spent 8 years at Physical Sciences Inc., a small business specializing in environmental and energy technology research and development. He also spent a fellowship period at U.S. EPA headquarters in Washington D.C as a science and policy fellow of AAAS, and received the Barnard Award from AAAS for his work on dioxin as an EPA Fellow in 1993. Dr. Helble is active in the American Association of Aerosol Science, the American Chemical Society, where he is currently Program Chair of the Fuel Chemistry Division for the 2007 national ACS meetings, the American Society for Engineering Education (ASEE), and the science policy fellowship program of AAAS. He has served on EPA Science Advisory Board panels on air toxics and the first draft report on the environment, and on numerous NSF advisory and review panels in environmental engineering and in combustion. He recently served on the NSF Committee of Visitors (COV) reviewing the combustion program within the NSF Engineering Directorate. Dr. Helble is an elected member of the Connecticut Academy of Science and Engineering. He is a 1982 summa cum laude B.S. graduate of Lehigh University in chemical engineering, and a 1987 chemical engineering Ph.D. graduate of the Massachusetts Institute of Technology. His current research is supported by the Department of Energy, NASA, and an EPA STAR graduate fellowship granted to one of his students.

Hopke, Philip

Clarkson University

Dr. Philip K. Hopke is the Bayard D. Clarkson distinguished professor at Clarkson University and the director of the Center for Air Resources Engineering and Science. Professor Hopke is the immediate past president of the American Association for Aerosol Research and was a member of the National Research Council's congressionally mandated Committee on Research Priorities for Airborne Particulate Matter and the Committee on Air Quality Management in the United States. He is a member of the National Research Council's U.S. Committee on Energy Futures and Air Pollution in Urban China and the United States. Professor Hopke received his B.S. in Chemistry from Trinity College (Hartford) and his M.A. and Ph.D. degrees in chemistry from Princeton University. After a post-doctoral appointment at M.I.T., he spent four years as an assistant professor at the State University College at Fredonia, NY. Dr. Hopke then joined the University of Illinois at Urbana-Champaign and subsequently came to Clarkson in 1989 as the Robert A. Plane Professor with a principal appointment in the Department of Chemistry. He has served as dean of the Graduate School, chair of the Department of Chemistry, and head of the Division of Chemical and Physical Sciences before he moved his principal appointment to the Department of Chemical Engineering in 2000.

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Johnson, Philip

Independent Consultant

Philip Johnson is an independent environmental health consultant and a Ph.D. candidate at Yale University. He most recently worked as a senior public health scientist and program manager at NESCAUM (a clean air association of the Northeast states), focusing on air pollution exposure, health effects, and risk. Johnson received his B.A. from Northwestern University (1991), Master in Public Health (M.P.H.) from Yale University School of Medicine (2000), and Master in Environmental Science (M.E.S.C.) from Yale University School of Forestry & Environmental Studies (2000). He is a member of the American Association for the Advancement of Science (AAAS) and the International Society for Environmental Epidemiology (ISEE). Mr. Johnson served on the NESCAUM Toxics and Public Health Committee from 2002-2007, where he coordinated NESCAUM's assessment of the PM_{2.5} NAAQS review process. He contributed to EPA's recent review of the NAAQS process. Johnson's expertise is in exposure assessment, risk analysis, and epidemiology. His research has involved assessing emerging air pollution exposure risks such as in-cabin commuter trains, residential outdoor wood boilers, and outdoor recreational activity in public lands. His research also has involved the analysis of ambient air quality standard setting metrics for PM_{2.5} and the development of demographic and exposure indicators of susceptibility that take into account micro-scale population characteristics and activity patterns. Johnson's recent research involves assessing the potential health threat of carbonaceous PM_{2.5} and evaluating characteristics of transient (hourly) PM_{2.5} measurement data. In the last two years, while at NESCAUM Johnson received funding from the New York State Energy Research and Development Authority (NYSERDA) Environmental Monitoring, Evaluation, & Protection program as the co-PI for a study of carbonaceous PM_{2.5}, including an assessment of exposure and health effects in New York State. He has received funding from the Mid-Atlantic/Northeast Visibility Union (MANE-VU) as the PI for a study evaluating susceptible populations engaged in outdoor activity on public lands. While at Yale, he has received financial support from the Yale Institute for Biospheric Studies and from Yale University College of Arts and Sciences to support dissertation research in environmental health and risk management.

Kleinman, Michael T.

University of California, Irvine

Michael T. Kleinman is a Professor of Community and Environmental Medicine at the University of California, Irvine. He is an inhalation toxicologist and has been studying the health effects of exposures to environmental contaminants found in ambient air for more than 30 years. He holds a MS in Chemistry (Biochemistry) from the Polytechnic Institute of Brooklyn and a Ph.D. in Environmental Health Sciences from New York University. He is a Professor and Co-Director of the Air Pollution Health Effects Laboratory in the Department of Community and Environmental Medicine at University of California, Irvine. Prior to joining the faculty at U.C.I. in 1982, he directed the Aerosol Exposure and Analytical Laboratory at Rancho Los Amigos Hospital in Downey, CA. He has published more than 95 articles in peer-reviewed journals dealing with environmental contaminants and their effects on cardiopulmonary and immunological systems. He has directed more than 50 controlled exposure studies of human volunteers and laboratory animals to ozone and other photochemical oxidants, carbon monoxide, ambient particulate matter and laboratory-generated aerosols containing chemically or biologically reactive metals such as lead, cadmium, iron and manganese. He recently served on two National Academy committees to examine issues in protecting deployed US Forces from the effects of chemical and biological weapons. Dr. Kleinman's current studies focus on neurological and cardiopulmonary effects of inhaled particles, including nanomaterials and ultrafine, fine and coarse ambient particles in humans and laboratory animals. His current studies have demonstrated that inhalation of combustion-generated particles can promote airway allergies and accelerate the development of cardiovascular disease and that these effects may be associated with organic and elemental carbon components of the ultrafine fraction of the ambient aerosol. His studies have also demonstrated that inhalation of ambient particles is associated with persistent inflammation in the brain and that particles associated with manganese can alter dopamine and serotonin levels in the brain and can cause changes in nerve structure during brain development. Dr. Kleinman has previously served on the U.S. EPA Science Advisory Board' Clean Air Scientific Advisory Committee (CASAC) Ozone panel and currently serves as the Chair of the California Air Quality Advisory Committee.

Koutrakis, Petros

Harvard University

Dr. Petros Koutrakis is Professor of Environmental Sciences and Director of the Exposure, Epidemiology and Risk Program at Harvard University. He received his M.S. (1982) and Ph.D. (1984) in environmental chemistry from the University of Paris. His research interests include human exposure assessment, ambient and indoor air pollution, environmental analytical chemistry, and environmental management. He has served as: the Technical Editor-In-Chief of the Journal of the Air and Waste Management Association (AWMA); a consultant to the EPA Science Advisory Board, including service on the previous CASAC Particulate Matter (PM) Review Panel and chair of the EPA Review Panel for Research Proposals on Ambient Particle Modeling; a member of the National Research Council (NRC) PM committee; and an advisor to the International Monitoring of Protected Visual Environments (IMPROVE), Pan American Health Organization (PAHO), World Health Organization (WHO), and the United Nations Environment Program (UNEP). Dr. Koutrakis is the PI of the EPA/Harvard Center on particle health effects; Co-PI on a NIEHS Program projects (Cardiac effects of air pollution). In addition, he is the PI of exposure assessment and air quality studies funded by EPA, HEI, EPRI, API, and DOE.

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Leikauf, George

University of Pittsburgh

George Leikauf, Ph.D., is currently a Professor of Environmental and Occupational Health, University of Pittsburgh. He received his baccalaureate (AB) in 1973 in Biological Sciences from the University of California, Berkeley, CA, and his Masters of Science (MS) in 1978 and Doctorate (Ph.D) in 1981 in Environmental Health Sciences from New York University Medical Center, New York, NY. He received postdoctoral training from 1981- 1985 CA in Respiratory Cell and Molecular Biology at the Cardiovascular Research Institute, University of California, San Francisco. He has expertise in the adverse health effects of particulate matter, ozone, and other criteria pollutant and has published extensively over the last 25 years on the cellular and subcellular mechanisms of respiratory diseases including asthma, acute lung injury, chronic obstructive disease, and cystic fibrosis. He is currently a member of the National Advisory Environmental Health Scientific Council for the National Institutes of Environmental Health Sciences. In the past he has served as the Chair of the Lung Injury Repair and Remodeling study section for the NIH, and has served on more than 30 study sections for the USEPA and NIH. He is an Associate Editor of the American Journal of Respiratory Cell and Molecular Biology and is on the editorial boards of several other scientific journals. He is a member of the American Thoracic Society and the American Physiological Society.

Lioy, Paul J.

UMDNJ - Robert Wood Johnson Medical School

Dr. Lioy, Professor of Environmental and Community Medicine, UMDNJ-RWJMS, is the Director of the Exposure Measurement and Assessment Division, and he and Dr. P. Georgopoulos are Directors of the Center for Exposure and Risk Modeling. His expertise includes human exposure to environmental and occupational pollution, multi-media exposure issues for metals and pesticides, research on air pollution theory of exposure to dose relationships, and participation in study exposure and/or effects of pollution on human health in urban and non-urban areas, and controlled environments. He has over 180 peer reviewed papers, and has been and is a member of numerous editorial boards. Dr. Lioy is a member of the U.S. EPA Science Advisory Board, the National Research Council Committee on Particles, the Collegium Ramazzini, and International Joint Commission Air Quality Board for U. S. and Canada. He is President of the International Society of Exposure Analysis and was its 1998 recipient of the Wesolowski Award for Human Exposure Research.

Lippmann, Morton

New York University School of Medicine

Dr. Lippmann is a Professor of Environmental Medicine at the New York University (NYU) School of Medicine. He holds a Ph.D. (NYU, 1967) in Environmental Health Science, an S.M. (Harvard University, 1955) in Industrial Hygiene, and a B.Ch.E. (The Cooper Union, 1954) in Chemical Engineering. At NYU, he directs a research program on Human Exposure and Health Effects, and the EPA-supported Particulate Matter Health Effects Research Center. He has been the recipient of numerous awards for his research and contributions in aerosol science and pulmonary physiology, human exposure assessment and dosimetry, chemical transformations in the atmosphere, population studies of exposure-response relationships in occupational and community cohorts, and factors affecting the toxicity of airborne fibers. Much of this research has been focused on specific chemical agents, notably ozone, sulfuric acid, and asbestos. Dr. Lippmann is a past President of the International Society of Exposure Analysis (1994-1995), past Chairman of: the American Conference of Governmental Industrial Hygienists (1982-1983); the EPA Science Advisory Board's Executive Committee (2000-2001); EPA's Advisory Committee on Indoor Air Quality and Total Human Exposure (1987-1993); and EPA's Clean Air Scientific Advisory Committee (1983-1987). He has also chaired and been a member of numerous National Research Council committees, including committees on the airliner cabin environment and the health of passengers and crew, synthetic vitreous fibers, measurement and control of respirable dust in mines, indoor pollutants, toxicity data elements, and in-vivo toxicity testing of complex mixtures. His publications include over 290 research and review papers in the scientific literature and two reference texts on environmental health science.

Lipsett, Michael

California Department of Health Services

Dr. Michael Lipsett is Chief of the Exposure Assessment Section in the Division of Environmental and Occupational Disease Control in the California Department of Health Services (CDHS). He also holds the rank of Associate Clinical Professor at the University of California, San Francisco School of Medicine. Dr. Lipsett received an A.B. degree in biochemistry from the University of California, Berkeley (1972) and a J.D. degree from Berkeley's Boalt Hall School of Law (1976). He received his M.D. degree from the University of California, San Diego School of Medicine in 1980. Dr. Lipsett is board-certified in Public Health and General Preventive Medicine. From 1987 to 2003, Dr. Lipsett was responsible for developing the medical foundations for California's ambient air quality standards, including particulate matter, ozone, and other gaseous pollutants. With colleagues at CDHS and the California Office of Environmental Health Hazard Assessment, he conducted critical reviews of clinical, epidemiological, and experimental research, which provided the basis for pollutant-specific, health-based recommendations to the California Air Resources Board (ARB). In 2002, he received a Gold Superior Achievement Award (In recognition of exceptional contribution and service to state government) for his work on California's PM10 and PM2.5 annual average standards. In addition, he has designed and conducted air pollution epidemiological studies, including time-series studies of mortality and morbidity, as well as panel studies involving asthmatics and individuals with cardiovascular disease. He has served on a variety of local, state, and national committees focusing on the impact of air pollution on human health, including the ARB's Research Screening Committee (1999-2006), which provides technical guidance to

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California's air pollution research program, and the American Heart Association's Expert panel on Population and Prevention Science (2003-04), which developed that organization's first white paper on air pollution and cardiovascular disease. He has also served on several panels reviewing research proposals for the U.S. Environmental Protection Agency (EPA) and the Health Effects Institute. He was recently a member of the EPA's Board of Scientific Counselors, Particulate Matter and Ozone Subcommittee. Although Dr. Lipsett has received research funding from the EPA (most recently for a study of particulate matter and heart rate variability), he has never received salary support from that agency. He is currently principal investigator of an ARB-funded study of the long-term effects of air pollution among a cohort of over 100,000 women in California, and is a co-investigator at the U.C. Berkeley Center for Children's Environmental Health, funded jointly by the National Institute for Environmental Health Sciences and the EPA. Other recent support includes funding from the U.S. Centers for Disease Control and Prevention for a study of respiratory health among adolescents at the U.S.-Mexico border.

London, Stephanie

National Institute of Environmental Health Sciences

Dr. London obtained her A.B., M.D. and Dr.P.H. in Epidemiology from Harvard University. She completed a residency in internal medicine at the Massachusetts General Hospital and a residency in Occupational and Environmental Medicine at Harvard. She was an assistant professor at the University of Southern California School of Medicine from 1989 through 1995 where she was part of a small team of investigators who founded a landmark study of health effects of air pollution in school children known as the Children's Health Study. She came to the National Institute of Environmental Health Sciences in 1995 and received tenure in 2001. She is currently a senior investigator in the Epidemiology Branch with a joint appointment in the Laboratory of Respiratory Biology. Her work focuses on genetics and interactions between genetics, diet and environmental pollutants in relation to asthma and chronic obstructive pulmonary disease. Dr. London served as the federal chair of the Asthma Working Group of the National Children's Study. This committee drafted hypotheses for the study which were kept in the final study plans. She has also served on the International Program Committee of the American Thoracic Society and is active in various leadership committees of the Environmental and Occupational Health Assembly of the American Thoracic Society. She served as a Councilor of the International Society for Environmental Epidemiology and was on the organizing committee for the 2007 International Meeting to be held in Mexico City.

Malm, William

NPS

Dr. William C Malm is employed by the National Park Service in the Air Resources Division as a research physicist in charge of the visibility/particulate research and monitoring program. He is also an affiliate scientist in the Cooperative Research Institute for Research at Colorado State University. He has previously worked as an Environmental Protection Agency (EPA) research scientist and as a professor of environmental science at Northern Arizona University, Flagstaff, Arizona. He received his B.S. degree in physics and a minor in mathematics from Mankato State University in 1965 and his M.S. and Ph.D. degrees in physics from the University of North Dakota (1968) and the University of Missouri (1972), respectively. He is a member of the Air and Waste Management Association (AWMA), the American Geophysical Union (AGU), and the American Association for Aerosol Research (AAAR). In each of these associations he has served as an organizing chair for special sessions and as a guest editor for the Journal of Geophysical Research (JGR) and the Journal of the Air and Waste Management Association (JAWMA). He is also a topic editor for environmental monitoring for the Encyclopedia of Earth. He has received a number of awards for outstanding lectures and various research activities. Dr Malm's expertise is in the general area of visibility and related topics. He has designed and built instrumentation to measure the effects of atmospheric aerosols on the scenic qualities of landscape features, as well as their optical and chemical properties. He formulated radiation transfer algorithms that allow pictorial visualization of aerosol scattering and absorption effects on scenic landscape features. He pioneered studies of visibility perception that elicited human responses, in terms of both psychophysical and value assessment, to changes in scenic quality as a function of aerosol optical properties. He has initiated and carried out large field campaigns to better characterize aerosol physical and optical properties, especially as they relate to aerosol hygroscopic properties, and to assess the relative contribution of various source types to visibility impacts in a number of national parks and wilderness areas. He has also pioneered a number of back-trajectory receptor modeling methodologies that allow estimates of the relative contribution of source areas to aerosol concentrations or visibility effects at selected receptor sites. Many of the results from this work has been incorporated into the Interagency Monitoring of Protected Visual Environments (IMPROVE) program and the EPA Regional Haze Rule (RHR). Dr Malm is currently a member of the IMPROVE steering committee and the lead science advisor. The operation of the IMPROVE monitoring network is funded by the National Park Service, United States State Forest Service, United States Fish and Wildlife Service, and the Environmental Protection Agency. Dr Malm is also currently the principal investigator on a Joint Fire Science Program (JFSP) research project titled "Characterizing Particulate Matter Emissions by Wildland Fires Relevant to Visibility Impairment and PM Non-Attainment" in support of the needs of wildland fire managers and policy makers in determining the contribution of biomass burning to PM_{2.5} and visibility on a regional basis.

Middleton, Paulette

Panorama Pathways

Dr. Paulette Middleton has 30 years experience leading air quality and related environmental programs that inform policy using integrated modeling, stakeholder consensus building and diverse communication strategies. For example, she developed and applied a number of urban aerosol dynamics models; was a leader on the modeling team that created the Regional Acid Deposition Model (RADM); extended RADM to include aerosol dynamics - DAQM (Denver Air Quality Model) and applied DAQM to studies of visibility in the Front Range of Colorado; led the development and application of the integrated assessment of scenarios (i.e., linking air quality to economic, environmental and social impacts and driving forces using a variety of modeling approaches) for visibility protection in the Western US as the cornerstone of the Grand Canyon Visibility Transport Commission efforts; created and applied a Visibility Assessment Screening Technique to illustrate differences in visibility changes resulting from SO₂ and NO_x emission reductions in different areas of the US; modified and applied ICST and related models to explore the impacts of chemical by-products in the vicinity of point sources; led the design of integrated analysis systems applied to air quality and climate related problems; was lead author of many air quality modeling and application reviews; and has been serving as an expert

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advisor to a number of programs using integrated modeling systems as well as individual air quality models. Middleton's EPA Science Advisory Board service includes: Current Member of the Scientific and Technological Achievement Awards (STAA) Subcommittee; Member of the REM Guidance Review Panel; Chair of the Air Quality Modeling Subcommittee (AQMS) evaluating EPA's assessment of the benefits and costs of the Clean Air Act; Member of the Environmental Modeling Committee responsible for the recent review of the National Air Toxics Assessment, which included an evaluation of mercury and toxic VOC risk assessment; Member of the Research Strategy Advisory Committee, which provided direction to EPA on critical research needs; Member of the Clean Air Science Advisory Committee during its review of earlier ozone and fine particulate matter standards; and Member of the Environmental Futures Subcommittee developing guidelines for EPA foresight. Dr. Middleton has been director of the NSF and NASA funded Global Emissions Inventory Activity (GEIA) Center since GEIA's inception in 1990 (<http://www.geiacenter.org/>). In 2002, she created Panorama Pathways (<http://PanoramaPathways.net/>) and since then has been a Special Advisor, providing advice on adequacy of air quality modeling and developing issue papers to help inform policy for several groups, including Environmental Defense, Western Resource Associates, Yellowstone Coalition, Northern Cheyenne Indian tribe, EPA Region 8, Colorado Department of Public Health & the Environment; U.S. Department of Justice; and State of New Jersey, Division of Law. She also was lead author on a US-AID-funded assessment of the development of renewable hydrogen in the US and around the world and is an elected member of the Board of Directors for the American Solar Energy Society, representing the Sustainability Division of that society. She works with Aspen Hill Films (<http://AspenHillFilms.com/>) on informational videos about renewable energy and the environment and with Positive Pace (<http://PositivePace.com/>) on positive news about world progress, and leads the Sustainable America: Spotlight Colorado Green Team. Previously she held research, program development and leadership/executive positions at the National Center for Atmospheric Research, Atmospheric Sciences Research Center at the State University of New York at Albany, Science & Policy Associates, Inc, and RAND. She received her PhD in chemistry in 1973 from the University of Texas. Dr. Middleton's current source of funding is from the National Science Foundation, NASA, Environmental Defense, and the Northern Cheyenne Indian Tribe.

Miller, Frederick J.

Independent Consultant

Fred J. Miller, Ph.D. is currently an independent consultant in dosimetry and inhalation toxicology. From February, 1991 until April, 2005 he was employed in various capacities at the CIIT Centers for Health Research (CIIT) and its predecessor organization, the Chemical Industry Institute of Toxicology, serving most recently as Vice President for Research. Dr. Miller received a B.A. and M.S. in Statistics from the University of Wyoming. In 1968, he began a career as a commissioned officer in the U.S. Public Health Service (PHS). As a mathematical statistician involved with the design and analysis of studies on the effects of air pollutants on animals, Dr. Miller became interested in the use of such studies for assessing human health risks. He was assigned to the U.S. Environmental Protection Agency (EPA) when it was created in 1970. In 1971, he received an EPA long-term training award, which led to his doctoral research on the transport and removal of ozone in the lungs of animals and man. He received a Ph.D. in Statistics from North Carolina State University in 1977. Dr. Miller is interested in developing and implementing research strategies and projects that permit increased utilization of animal toxicological results to evaluate the likelihood of human risk from exposure to inhaled chemicals. His primary research interests include pulmonary toxicology, respiratory tract dosimetry of gases and particles, lung physiology and anatomy, extrapolation modeling, and risk assessment. He is internationally recognized for his research on the dosimetry of reactive gases. Dr. Miller is active in professional societies and consulting on environmental health issues. The author or co-author of more than 150 publications, Dr. Miller received a number of Scientific and Technical Achievement awards from EPA and is the recipient of the PHS' Outstanding Service Medal.

Moore, Jr., Charles Thomas (Tom)

Western Governors' Association

Mr. Tom Moore coordinates technical activities for the Western Regional Air Partnership, a state/tribal/federal land manager/EPA membership organization providing regional air quality technical and planning support for addressing the planning and ongoing implementation requirements of the EPA Regional Haze rule and related air quality issues. He works for the Western Governors' Association; the WRAP air quality project supports the portion of the WGA mission to develop policies and carry out programs in the areas of natural resources, the environment, human services, economic development, international relations and state governance. He is a member of the Air & Waste Management Association. He has a B.S. in Physical Geography (1989) from Arizona State University in Tempe, with an emphasis on meteorological and glacier field studies, and climate data analysis projects. He has lead numerous air pollution monitoring studies and analysis projects, held management positions in state and local government, and has worked as an environmental consultant. Before joining the WGA in 2002, he designed and managed air quality monitoring and analysis activities for the Arizona Department of Environmental Quality, where he led the development and implementation of the haze monitoring networks in both urban and remote areas throughout the state. Tom has also worked for the Western States Air Resources Council, the regional association of state air quality agencies for 15 western states. As a WESTAR representative from 1996-98, he served on the Science and Technical Support Workgroup of the EPA CAAAC's Subcommittee On The Joint Implementation of Ozone and PM NAAQS and Regional Haze rule. He served as the Arizona DEQ representative to the IMPROVE Steering Committee 1999-2001, on the Phoenix (AZ) Metropolitan Area Visibility Index Oversight Committee, and the Stakeholder Advisory Group for the Arizona Regional Haze State Implementation Plan Development process, both 2001-02. Mr. Moore's technical coordination and management work for the members of the WRAP Board, committees, forums, and workgroups is funded by an EPA grant to the WGA. The consensus technical work products of the WRAP members are available at: www.wrapair.org <<http://www.wrapair.org>>. The primary technical analysis activities managed by Mr. Moore include regional gridded photochemical aerosol modeling and analysis, preparation and use of emissions inventories for all pollutants and source sectors, monitoring data analysis, visibility source apportionment, control strategy analysis and preparation, and interpretation of technical data for State, Tribal, and/or Federal Implementation Plan development.

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Norbeck, Joseph

University of California, Riverside

Joseph M. Norbeck Yeager Families Professor of Engineering Director Environmental Research Institute University of California, Riverside Joseph (Joe) Norbeck is the Yeager Families Professor of Engineering and the Founding Director of the University of California Riverside's Environmental Research Institute (ERI). ERI is a newly formed multi-disciplined research organization that integrates much of the environmental research and technology efforts within the UCR campus. Prior to accepting this appointment, Professor Norbeck was the Founding Director of the Bourns College of Engineering-Center for Environmental Research and Technology (CE-CERT). CE-CERT is a cooperative research center within the College of Engineering and the largest research center at UCR. The Center's research agenda includes development of future emission control technology, advanced vehicle technology and systems, renewable and alternative fuels, atmospheric processes and modeling, and environmental policy. Dr. Norbeck was elected as a Fellow of the American Association for the Advancement of Science in 1998. He received the Clean Air Award from the South Coast Air Quality Management District in 1995, the Valley Group Award for Excellence in Environmental Research, and the Riverside Regional Leader of the Year Award in 1998. He is a member of several national and international committees and has published over 100 papers on the topics of air quality, renewable fuels and vehicle emissions.

Ondov, John

University of Maryland.

Dr. John M. Ondov is a professor in the Department of Chemistry and Biochemistry at the University of Maryland, College Park Campus (UMCP). He received his BS in chemistry in 1970 and Ph.D. in Chemistry from the University of Maryland in 1974, and subsequently served as a senior scientist and PI on projects involving characterization of particulate emissions from fossil-fueled power plants and emerging DOE fossil energy technologies for the Lawrence Livermore National Laboratory until 1982. During this time, he was considered DOE's top expert in this area. He worked as an Environmental Scientist for the Martin Marietta Corporation (now Lockheed Martin) for two years before joining the UMCP faculty in 1984. Dr. Ondov's expertise encompasses measurement of aerosol particle composition and size distributions, multivariate receptor modeling, and instrument and receptor model development for understanding the sources and fate of urban aerosol particles. He was the principle architect and lead PI of the Baltimore Supersite Project. In the mid 1980's, Dr. Ondov lead the development of ultra sensitive enriched-rare-earth (stable) isotope and Ir tracer technologies for tracing the movement and fate of anthropogenic atmospheric particles and definitive source and exposure apportionment' and elucidated the fine structure of urban atmospheric aerosols and their utility in high-temperature combustion source apportionment as revealed through highly size-resolved measurements of elemental aerosol particle constituents. As a co-PI of the EPA-funded Aerosol Over Lakes and Oceans (AEOLOS) project he made advances in measurements, parameterizations, and modeling of dry particle deposition to natural waters. Subsequently he developed the Semicontinuous Elements in Aerosol Sampler (SEAS) used to make 30-minute metals analyses at 4 US (3 EPA) "Supersites" and demonstrated the pseudo-deterministic receptor model (PDRM) for determining emission rates, time dependent meteorological dispersion factors and ambient air contributions of pollutants from individual stationary sources. He as served as vice chairman of the Maryland Department of Environment's Air Quality Advisory Committee for the last decade, an of has been a member for approximately 20 years. He teaches atmospheric, analytical, and environmental chemistry at the University of Maryland. In the last two years he has received funding from the EPA-funded Johns Hopkins University Particle Center for whom he is tasked with characterizing the sources of particles associated with exposures leading to health outcomes to be revealed through epidemiological modeling; the US EPA Supersites program for preparation of review manuscripts; the US DOE National Energy Technology Laboratory for elucidation of sets of intrinsic tracer species optimized for apportioning contributions to air-borne particles and their constituents from individual coal-fired power plants using highly time-resolved SEAS data our PDRM approach; and lastly, has received funding from the National Institute for Standards and Technology (NIST) for development of methods and standards for radiopharmaceuticals and weapons-derived radionuclides for homeland security issues.

Oberdörster, Günter

University of Rochester

Dr. Günter Oberdörster is Professor in the Department of Environmental Medicine and Head of the Division of Respiratory Biology & Toxicology at the University of Rochester and Director of the University of Rochester Ultrafine Particle Center. He is known for his research on the effects and underlying mechanisms of lung injury induced by inhaled non-fibrous and fibrous particles, including extrapolation modeling and risk assessment. His research on with ultrafine particles influenced the field of inhalation toxicology, raising awareness of their unique toxicological potential. He has extensive expertise in the toxicology and health effects of air pollutants, their risk assessment and toxicokinetics. Dr. Oberdörster earned his D.V.M. and Ph.D. (Pharmacology) from the University of Giessen in Germany. He has served on national and international committees, among others: NIEHS study sections, EPA's Science Advisory Board committees, Board of Scientific Counselors of the National Toxicology Program, NRC's Committee on Toxicology, TLV Committee of the American Conference of Governmental Industrial Hygienists, several working groups of the Intl. Agency for Research on Cancer (IARC), WHO consultancies, IUPAC Commission on Toxicology, ad hoc Expert Group on Chemicals Bureau of the European Commission, and advisory panel of the German Research Association. He has served on EPA's Clean Air Scientific Advisory Committee (CASAC) and on NRC's Committee on Research Priorities for Airborne Particulate Matter. Sources of his present grant support include EPA, NIEHS and International Carbon Black Association.

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Ostro, Bart

California Environmental Protection Agency

Dr. Bart Ostro is currently the Chief of the Air Pollution Epidemiology Unit in the Office of Environmental Health Hazard Assessment within the California Environmental Protection Agency. His primary responsibilities are to formulate the Agency's recommendations for state ambient air quality standards and to investigate the potential health effects of criteria air pollutants. His previous research on mortality and morbidity effects of air pollution, has contributed to the determination of federal and state air pollution standards for ozone and particulate matter. Dr. Ostro was also a co-author of the EPA regulatory impact analysis that was a basis for the federal ban of lead in gasoline. He has served as a consultant with several federal and international institutions including the World Health Organization and the World Bank, and with several foreign governments including Mexico, Indonesia, Italy, the European Union, Thailand, and Chile. Dr. Ostro served on the National Academy of Sciences' Committee on Estimating the Health Risk Reduction Benefits of Proposed Air Pollution Regulations, and is on the Scientific Oversight Committee for ATHENA (Air Pollution Health Effects in Europe and North America) for the Health Effects Institute. Dr. Ostro received an M.A. (1972) and a Ph.D. (1976) in Economics from Brown University, and a Certification in Environmental Epidemiology from the State of California in 1988. He has published over 60 articles on air pollution epidemiology and environmental economics in peer reviewed journals. Dr. Ostro's current research interests involve conducting epidemiologic studies on the mortality and morbidity effects of criteria air pollutants, examining the health effects of traffic, and quantifying the health benefits and associated uncertainties related to air pollution control.

Phalen, Robert F.

University of California, Irvine

Dr. Robert F. Phalen is a Professor of Community and Environmental Medicine, in the College of Medicine, at the University of California, Irvine. As the Director of the Air Pollution Health Effects Laboratory in the College of Medicine for over 30 years, Dr. Phalen has been involved in the conduct of dozens of toxicology studies of inhaled air-pollutant particles and gases. These studies have involved analyses of about 30 measures of pulmonary injury in five mammalian species, including rats, guinea pigs, ferrets, pigs and dogs. In addition, the laboratory has been associated with several human studies. These studies have elucidated the many factors associated with particles that have significant adverse health effects. Also, as a Professor of Occupational Health, for more than 20 years, Dr. Phalen has developed expertise with respect to the composition of hazardous dusts, their particle size characteristics, and the exposure factors that can produce both acute and chronic diseases in workers. His research has also addressed lung defenses that prevent disease, and their changes upon exposure to air pollutants. Dr. Phalen is an expert on inhaled air pollutants and the factors that determine whether or not the lung defenses are adequate. He has published well over 100 scientific papers and book chapters relating to this research. Aerosol science is another area of Dr. Phalen's specialty and expertise, reflecting his research for more than 30 years. This specialty involves study of the basic physical nature of particles, their measurement, classifications, persistence in the air and their deposition behavior upon inhalation. Dr. Phalen is also a leader in establishing the current scientific basis for establishing dust sampler designs for the purposes of defining hazards. His chairmanship of the ACGIH (American Conference of Governmental Industrial Hygienists) Air Sampling Procedures Committee involved him in introducing the modern concepts of inhalable, thoracic and respirable fractions of airborne dusts. Dr. Phalen's books, including *Methods in Inhalation Toxicology and Inhalation Studies: Foundations and Techniques*, cover relevant aerosol properties, basic lung structure and function, animal models, study designs, and other topics central to the field of understanding inhaled substances. Dr. Phalen has also been involved since 1973 in computer modeling to describe and predict the deposition and clearance of inhaled aerosols for purpose of evaluating human risks for occupational and environmental aerosols. He was awarded a large federal grant to improve and develop such models, and has served on the NCRP (National Council on Radiation Protection) Lung Model Task Group. Dr. Phalen has participated in the scientific process of reviewing and recommending air quality criteria for the U.S. EPA and has presented invited congressional testimony which supported the reauthorization of the Clean Air Act. As a University teacher he has organized and taught courses on Environmental Toxicology, Inhalation Toxicology, Aerosol Science, Air Pollution Toxicology and other related topics. As the publications and colloquia he has written and led testify, Dr. Phalen has an internationally recognized and respected reputation and expertise in particulate matter. In the period 2000 to present, Dr. Phalen has received relevant support as a Principal Investigator from: U.S. EPA (Dosimetry Core Leader, S. California Center for Particulate Matter, \$369,121); U.C. Tobacco Related Disease Research Program (Quantification of Lung Doses from Inhaled Tobacco Smoke, \$426,228); Charles C. Stocking Trust Endowment (Children at Risk – Air Pollution Hazards, \$100,000); CDC/NIOSH (Frontiers in Aerosol Dosimetry Research Conference, \$7,000); and funding for organizing/conducting international conferences on Particulate Air Pollution & Human Health from CDC/NIOSH, and U.C. Tobacco Related Disease Research Program (totaling \$27,000). He has recently served on several advisory committees/boards, including The UCLA & University of Rochester PM Centers, The American Association for Aerosol Research, and The National Research Council (committee on aerosol bioterrorism interventions).

Pinkerton, Kent

University of California

Dr. Pinkerton is a Professor of the Department of Pediatrics in the School of Medicine and Professor of Anatomy, Physiology and Cell Biology in the School of Veterinary Medicine at the University of California, Davis (UCD). He is also the Director of the Center for Health and the Environment, Associate Director of the Western Center for Agricultural Health and Safety at UC Davis, and Associate Director of the San Joaquin Valley Aerosol Health Effects Center. Dr. Pinkerton received his B.S. in Microbiology with a minor in Chemistry from Brigham Young University in 1974; his M.S. in Pathology from Duke University in 1978; and his Ph.D. in Pathology from Duke University in 1982. He was a Research Associate in the Division of Allergy, Critical Care and Respiratory Medicine at Duke University Medical Center in 1982, and he remained at Duke University until 1986 as an Assistant Medical Research Professor in the Department of Pathology. Dr. Pinkerton began teaching at UCD in 1986. Dr. Pinkerton's research has focused on the respiratory system and health. General themes addressed: (1) mechanisms of particulate toxicity, (2) effects of oxidant gases on lung injury and repair, (3) effects of environmental pollutants on lung development and immune responses during perinatal life, (4) mechanisms of tobacco smoke-induced lung inflammation and (5) diet, chemotherapeutic agents and inhibitors of

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inflammation to reduce tumor risk in an animal model of tobacco-induced lung disease. He has published over 160 articles in peer-reviewed, scientific journals, texts, and encyclopedias on those subjects. Dr. Pinkerton has served on numerous advisory committees and other professional societies. He is a member of the American Association for the Advancement of Science, the American Association of Veterinary Anatomists, the American Thoracic Society, the Microscopy Society of America, and the Society of Toxicology. Between 2000 and 2005, Dr. Pinkerton served as a consultant to the Southern California Particle Center and Supersite (SCPCS), a consortium of scientists for UCLA, USC, Caltech, Rancho Los Amigos, UC Irvine and UC Riverside (and not UC Davis) to study the health effects of airborne particles. From 2002-2003, he was a member on the Admissions Advisory Council for the School of Veterinary Medicine at UC Davis, and from 2002 to 2005, he served as the Chair for the Regents' Scholarship Advisory Committee. In 2004 and 2005, he also became the Program Chair-Elect of the Environmental and Occupational Health Assembly for the American Thoracic Society. Dr. Pinkerton continues to be a member of the Chemical Safety Advisory Committee, Environmental Health & Safety, at UC Davis; serves on the Editorial Board for the Journal of Inhalation Toxicology; member of the Nanoscience and Nanotechnology Steering Committee; and member of Academic Planning – Public Health Initiative Workgroup at the School of Veterinary Medicine, UC Davis. Beginning in 2007, Dr. Pinkerton will also serve as the Assembly Chair of the Environmental and Occupational Health Assembly for the American Thoracic Society. During the past two years, Dr. Pinkerton's major sources of funding have come from the National Institutes of Health (NIH), US Environmental Protection Agency (USEPA), and Philip Morris External Research Group. Specifically, Dr. Pinkerton has examined the mechanisms of particulate toxicity in the lungs of neonatal rats following short and long-term exposure to iron/soot or coal fly-ash particles in the presence or absence of ozone, funded by the USEPA; studied the effects of exposure to environmental tobacco smoke (ETS) on the maturation and function of the lung airways during fetal and early postnatal development in monkeys, funded by NIH; developed a well-characterized model of tobacco smoke-induced lung inflammation associated with the onset of metaplastic changes in the rodent by identifying molecular as well as cellular biomarkers associated with inflammation that may be responsible for those cellular transformations leading to pulmonary and cardiovascular change, funded by Philip Morris; and tested the hypothesis that inhaled nanomaterials cause respiratory effects in the form of oxidative stress and inflammation, funded by USEPA.

Pope, C. Arden

Brigham Young University

C. Arden Pope III is the Mary Lou Fulton professor of economics at Brigham Young University. He has a Ph.D. from Iowa State University (1981) where he studied economics and statistics. He has had appointments at Iowa State and Texas A&M Universities and has been an IPH Fellow and visiting scientist in Environmental Health and Public Policy at the Harvard School of Public Health (1992/93). He has conducted research dealing with a variety of natural resource and environmental economics issues. Most of his research over the last 20 years has focused on evaluating health effects and externality costs of air pollution. He has conducted or collaborated on many of the key, pioneering studies of health effects of short- and long-term exposures to air pollution, has played prominent roles in reviewing and interpreting this literature, and is one of the world's most widely cited and recognized air pollution experts. Dr. Pope has been the recipient of the Thomas T. Mercer Joint Prize from the American Association for Aerosol Research and The International Society for Aerosols in Medicine and various other awards. Dr. Pope has served on various scientific advisory panels and committees, including member of scientific advisory panel, Leland National Urban Air Toxics Research Center; member of scientific advisory committee, National Research Center for Environmental Lung Disease, National Jewish Medical and Research Center; chair of scientific advisory committee, EPA PM Center, Harvard School of Public Health; member of scientific advisory committees for EPA PM Centers at Harvard, NYU, Johns Hopkins, and Rochester; member of the Health Effects Institute's International Scientific Oversight Committee; and member of the executive committee of the Thrasher Research Fund. Dr. Pope's recent research has been supported by funding from the Health Effects Institute (HEI), the National Institute of Environmental Health Sciences (NIEHS), and a Mary Lou Fulton Professorship.

Portnoy, Jay

U. Missouri-Kansas City School of Medicine

Jay M. Portnoy, M.D. is Chief of Allergy, Asthma & Immunology at the Children's Mercy Hospitals & Clinics. He also is Professor of Pediatrics at the University of Missouri-Kansas City School of Medicine. He received his bachelor's degree from the University of Michigan in Ann Arbor in 1976 and he attended medical school at the University of Missouri-Columbia where he received an MD in 1980. He did his pediatric residency at Children's Mercy Hospital in Kansas City from 1980 to 1983. Following that, he did a two-year Fellowship in Allergy/Immunology at the University of Michigan in Ann Arbor. Following that he moved back to Kansas City to join the faculty at Children's Mercy Hospital. He is certified by the American Board of Pediatrics and the American Board of Allergy and Immunology and he is a Fellow of the American Academy of Allergy, Asthma & Immunology and he is president-elect of the American College of Allergy, Asthma & Immunology. Dr. Portnoy's primary area of research includes basic work on the nature of and the growth conditions that foster the production of fungal allergens. He also has published articles evaluating the health effects of indoor mold exposure and has developed protocols for the measurement of mold in residential and school environments. Dr. Portnoy also initiated an asthma disease management program that closely integrated environmental assessment into asthma disease management. As a consequence of this novel approach, the Program received the National Leadership award from the EPA in April 2005 and the Making a Difference award from the Allergy and Asthma Network/Mother's of Asthmatics also in 2005. During the last few years he has received a grant from HUD to evaluate and remediate indoor environmental problems in low-income housing and a grant from the Robert Wood Johnson Foundation to develop the asthma disease management program. Other funds come from a school district in central Kansas City for our program to help the facilities managers implement the EPA's tools for schools program and we received a grant from the Clorox Corporation to study various methods for remediation of mold-contaminated homes. Dr. Portnoy currently serves on the FDA Allergenic Products advisory committee through CBER.

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Samet, Jonathan M.

Johns Hopkins University

Jonathan M. Samet, M.D., M.S. is Professor and Chairman of the Department of Epidemiology of the Johns Hopkins Bloomberg School of Public Health. Dr. Samet received a Bachelor's degree in Chemistry and Physics from Harvard College, an M.D. degree from the University of Rochester School of Medicine and Dentistry, and a Master of Science in epidemiology from the Harvard School of Public Health. He is trained as a clinician in the specialty of internal medicine and in the subspecialty of pulmonary diseases. From 1978 through 1994, he was a member of the Department of Medicine at the University of New Mexico School of Medicine where most recently he was Professor and Chief of the Pulmonary and Critical Care Division in the Department of Medicine. At Johns Hopkins, he chairs the Department of Epidemiology and is Director of the Institute for Global Tobacco Control and Co-Director of the Risk Sciences and Public Policy Institute. His research has addressed the effects of inhaled pollutants in the general environment and in the workplace. Dr. Samet has written widely on the health effects of active and passive smoking and served as Consultant Editor and Senior Editor for Reports of the Surgeon General on Smoking and Health, including the 1985, 1986 and 1990 reports, receiving the Surgeon General's Medallion in 1990 for these contributions. He is Senior Scientific Editor for the next two reports, one on active smoking and the other on passive smoking. He was Chair of the 2002 Working Group for The International Agency for Research on Cancer (IARC) that prepared new monographs on active and passive smoking. He also edited and contributed to the monographs of the National Cancer Institute on Smoking and Tobacco Control. He has served on the Science Advisory Board for the U.S. Environmental Protection Agency and was Chairman of the Biological Effects of Ionizing Radiation Committee VI of the National Research Council. For the National Research Council, he is presently Chairman of the Committee on Research Priorities for Airborne Particulate Matter and of the Board on Environmental Studies and Toxicology. He has been President of the Society for Epidemiologic Research and of the American College of Epidemiology. He is a past Editor of the American Journal of Epidemiology and is currently Editor of Epidemiology. He was elected to the Institute of Medicine of the National Academy of Sciences in 1997.

Schwartz, Joel

Harvard University

Dr. Joel Schwartz is a Professor in the Departments of Epidemiology and Environmental Health at the Harvard School of Public Health, and in the Department of Medicine at Harvard Medical School. He is also a faculty member in the Environmental Biostatistics Program at the School of Public Health. Dr. Schwartz received his B.A. (1969) and Ph.D. (1980) from Brandeis University. He is a member of the International Society for Environmental Epidemiology, and the American Thoracic Society. Dr. Schwartz served as a member of the Center for Disease Control's Committee on Preventing Childhood Lead Poisoning from 1994 to 2002, and as a member of two National Research Council Committees (Committee on Assessing Lead Exposure in Critical Populations, Committee on Environmental Epidemiology). Dr. Schwartz was a recipient of a John D. and Catherine T. MacArthur Fellowship, and a World Congress Award from the International Union of Environmental Protection Associations. His expertise is in epidemiology, biostatistics, and cost benefit analysis. Dr. Schwartz's major subject matters include air pollution and lead. His research has involved cross-sectional, time-series, cohort and panel studies of the acute and chronic health effects of air pollution, including both respiratory and cardiovascular endpoints, and he has a particular interest in questions of susceptibility. In the last two years, Dr. Schwartz received funding from the National Institutes for Health (NIH) for environmental biostatistics, for studies of aeroallergen exposure and asthma, for studies of lead, for a study of the association between particulate air pollution and heart attacks, and for a study of socioeconomic gradients in breast cancer. He has received funding from EPA as the PI for Epidemiology of the Harvard PM Research Center, and from the Health Effects Institute (HEI) for the APHENA project, which aims to combine North American and European time series analyses of air pollution, morbidity, and mortality.

Shaw, Bryan

Texas A&M University

Bryan W. Shaw, Ph.D. is Associate Professor, Biological & Agricultural Engineering Department, and Associate Director of the Center for Agricultural Air Quality Engineering & Science, Texas A&M University. He received his Bachelor of Science (1988) and Master of Science (1990) degrees in Agricultural Engineering from Texas A&M University and his Ph.D. (1994) in Agricultural Engineering from the University of Illinois at Urbana-Champaign. Dr. Shaw teaches and conducts air quality research on topics including evaluation of sampler performance, development of accurate emission factors for feed and grain handling, emissions from cattle feed yards, design of pollution abatement equipment, and fugitive dust emissions from field operations. Dr. Shaw currently serves on the US-EPA Science Advisory Board: Environmental Engineering Committee, Integrated Nitrogen Committee, and Risk and Technology Review Committee. He has been appointed to serve a second term on the USDA Agricultural Air Quality Task Force advising the Secretary of Agriculture on air quality issues impacting agriculture. Dr. Shaw recently spent one year working with USDA-NRCS as Special Assistant to the Chief under an Interagency Personnel Agreement. In this role he provided national leadership in the development of policies and programs to address agricultural air quality concerns.

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Sioutas, Constantinos

University of Southern California

Constantinos Sioutas, ScD, is Professor of Civil and Environmental Engineering at USC. He is also the Co-Director of the Southern California Particle Center (SCPC), established in late 1999 by the US EPA, a leading Center in the nation for the study of the nature and health effects of airborne PM. Dr. Sioutas holds a BS in Mechanical Engineering (1986) from the Aristotle University of Thessaloniki, Greece, a MS in Mechanical and Aerospace Engineering from the University of Minnesota (1988), and a doctorate degree in Environmental Science and Engineering from Harvard University (1994). Dr. Sioutas' research is focusing on developing technologies for measuring the physico-chemical characteristics of air pollutants and determining their toxic properties, including the VACES- Particle Concentrators and the SKC Sioutas personal samplers. Since 1993, Dr. Sioutas has authored over 140 peer-reviewed publications, and holds 13 U.S. patents in development of aerosol instrumentation. His work has been cited in over 2,000 refereed articles. He is a Fulbright Fellow (1986), a recipient of the 3M Circle of Technical Excellence Award (1991), a recipient of the USC School of Engineering Outstanding Research Faculty Award (2000), and a member of the Air Quality Advisory Committee on PM for the State of California (as of 2001).

Smith, V. Kerry

Arizona State University

Dr. V. Kerry Smith is University Distinguished Professor and Director, Center for Environmental and Resource Economic Policy in the Department of Agricultural and Resource Economics at North Carolina State University as well as a University Fellow in the Quality of the Environment Division of Resources for the Future. Since October 2000 he has been a member of the U.S. EPA's Advisory Council on Clean Air Compliance Analysis and in 2001 he was a member of the Arsenic Rule Benefits Review Panel of EPA's SAB. Dr. Smith received his A.B. and Ph.D. in Economics from Rutgers University. He presented the Frederick V. Waugh Lecture for the American Agricultural Economics Association (AAEA) in 1992 and at the 2002 AAEA annual meeting he was named an AAEA Fellow. In 2004 he was elected a member of the National Academy of Sciences. Dr. Smith is a member of the American Economic Association, the Southern Economic Association, the Association of Environmental and Resource Economists, and several other professional associations. He has also held editorial positions with the Journal of Environmental Economics and Management, Land Economics, Review of Economics and Statistics, and other professional journals. His research interests include non-market valuation of environmental resources, role of public information in promoting private risk mitigation, non-point source pollution and nutrient policy, and the linking of ecological and economic models.

Suh, Helen

Harvard University

Dr. Helen Suh is an Associate Professor in the Department of Environmental Health at the Harvard School of Public Health. Dr. Suh received her S.B. (1985) in Biology from the Massachusetts Institute of Technology and her MS and Sc.D. in Environmental Health from the Harvard School of Public Health. She is a member of the International Society for Environmental Epidemiology. Dr. Suh is currently a member of the National Academy of Sciences Committee on Mortality Risk Reduction Benefits from Decreasing Tropospheric Ozone Exposures. Her expertise is in air pollution exposure assessment, indoor air pollution, acute and chronic impacts of air pollution on cardiovascular health. Dr. Suh's research has involved exposure and health panel studies, with particular interest in how exposures impact confounding, measurement error, and susceptibility. She is an advisor on environmental health issues for the Korean Advanced Institute for Science and Technology and was previously a member of the Committee on Chemical Exposures for the Longitudinal Cohort Study of Environmental Effects on Child Health and Development (2001-2003). In the last two years, Dr. Suh received funding from the National Institutes for Health (NIH) for environmental health sciences as the PI for the Exposure Core part of a Program Project on Particulate Exposures and Cardiovascular Health. Suh has also received from the Environmental Protection Agency as the PI of GIS-based spatial modeling for a chronic epidemiology study of particles and as the PI for exposure of the Harvard PM Research Center.

Thurston, George

New York University

Dr. Thurston is an Associate Professor at the New York University School of Medicine's Department of Environmental Medicine. He conducts epidemiological research into the human health effects of air pollution. He received his Bachelor of Science in Environmental Engineering from Brown University, and his Masters and Doctorate in Environmental Health Sciences from Harvard University's School of Public Health. Dr. Thurston has published widely in the scientific literature on the assessment of exposures to ambient air pollution and their human health consequences. He has served as the Director of the NYU-NIEHS Community Outreach and Education Program (1995-2004), and as Deputy Director of NYU's EPA Particulate Matter (PM) Health Effects Center (2002-2005). In 1999, Dr. Thurston was honored by the local organization "Orange Environment" for his continuing efforts to promote the translation of environmental science information for the education of the public. As part of his community service outreach, he has appeared on numerous national and international TV shows, including on C-Span, CNN, C-NBC, and NBC to discuss air pollution-related issues such as asthma, the Kuwait War fires, and the World Trade Center disaster. Dr. Thurston has also testified before both the U.S. Senate and the U.S. House of Representatives on multiple occasions regarding the potential human health effects of air pollution in the U.S. In addition, Dr. Thurston has actively participated in multiple professional organizations, including serving as an Associate Editor of the International Society of Exposure Analysis' "Journal of Exposure Analysis and Environmental Epidemiology", and serving as a co-organizer and host of the International Society for Environmental Epidemiology's annual meeting held in New York City during August, 2004.

Attachment: CASAC Particulate Matter (PM) Review Panel Short List Biosketches

Turner, Jay

University of California

Dr. Jay Turner is an Associate Professor of Chemical Engineering at Washington University in St. Louis. He holds a joint appointment in Civil Engineering and is a founding member of the Environmental Engineering Program faculty. Professor Turner earned B.S. and M.S. degrees from UCLA (1987) and a D.Sc. from Washington University (1993), all in Chemical Engineering. Following his M.S. studies, he spent two years at the University of Duisburg, Germany, where he was a DAAD Fellow. Following his D.Sc. studies, Dr. Turner spent eight months on assignment with the Federal Highway Administration, U.S. DOT, as an Air Quality Specialist. He subsequently joined the Washington University faculty in 1994 as an Assistant Professor of Engineering & Policy. Dr. Turner's research focuses on air quality characterization and control with emphasis on field measurements to support a variety of applications in the atmospheric science, regulation and policy, and health studies arenas. He is currently the Principal Investigator of the St. Louis – Midwest Fine Particulate Matter Supersite; this work and related air quality studies are funded by EPA/OAQPS, EPA/Region VII, CENRAP, LADCO/Midwest RPO, Missouri DNR, and EPRI. Turner is funded by Missouri DNR to operate a UV-DOAS to characterize at high time resolution formaldehyde and other gaseous components of interest. He is also Principal Investigator of the EPA-funded National Water Resources Capacity Development Project and serves as Education Associate Director for the NSF-funded Engineering Research Center (ERC) on Environmentally Beneficial Catalysis which is headquartered at the University of Kansas. Dr. Turner has served on several state and local air quality-related advisory committees, and served on the Science and Technical Support Workgroup of the FACA Subcommittee for Ozone, Particulate Matter, and Regional Haze Implementation Programs. He is a member of the American Association for Aerosol Research, (AAAR), the Air & Waste Management Association (AWMA), and the American Institute of Chemical Engineers (AIChE).

Turpin, Barbara

Rutgers University

Dr. Barbara Turpin is a Full Professor at Rutgers, The State University of New Jersey. Her appointments are in the Department of Environmental Sciences and Rutgers Cooperative Extension. She is also a member of the Environmental and Occupational Health Sciences Institute. She is a member of the graduate faculty in Environmental Sciences and in Atmospheric Sciences and serves on the New Brunswick Faculty Council and the Executive Council of the Graduate School (Rutgers). Dr. Turpin has a B.S. in Engineering from the California Institute of Technology (1984) and a Ph.D. in Environmental Science and Engineering from OGI at the Oregon Health Sciences University (1990). She conducted postdoctoral research at the University of Minnesota Particle Technology Laboratory and began a faculty appointment at Rutgers in 1994. Dr. Turpin's research expertise is in atmospheric fine particulate matter (PM), with emphases in the areas of secondary organic aerosol (SOA) formation, measurement of particulate organics, and PM exposure assessment. Her current research includes investigating SOA formation through cloud processing and exploring exposure issues pertaining to the use of ambient PM as a surrogate for exposure in PM epidemiology. She has more than 60 peer-reviewed publications, several with over 100 citations. Dr. Turpin served on the World Health Organization's (WHO) International Agency for Research on Cancer (IARC) Advisory Group to initiate IARC Monographs on Air Pollution (2004). She was a contributor to the US Environmental Protection Agency's (EPA) 1996 and 2004 Air Quality Criteria Documents for Particulate Matter, and an invited participant in EPA's Particulate Matter Research Needs Workshops (1996, 1999). She has served as Conference Chair (2003) and as a Board Member (1997-2000) for the American Association for Aerosol Research (AAAR). Dr. Turpin is a member of the External Advisory Board for AIRE (a major Atlanta Epidemiology Study; 2000-present). She chaired a workshop entitled "Chemical Characterization of Atmospheric Organic Aerosols in Support of Health Studies" (Electric Power Research Institute, Palo Alto, CA, 1998), and was an invited participant in the Health Effects Institute's (HEI) Workshop on PM Exposure Assessment (National Academy of Sciences, Washington, DC, 1997). Dr. Turpin has been a featured speaker at conferences on atmospheric science (e.g., Gordon Research Conference on Biogenic Hydrocarbons, Ventura, CA, 2007; Gordon Research Conference on Atmospheric Chemistry, Big Sky, MT, 2005) and particulate matter health effects (Particulate Matter: Atmospheric Sciences, Exposure and the Fourth Colloquium on PM and Human Health, Pittsburgh, PA, 2003). She is a member of the American Association for Aerosol Science and the International Society of Exposure Analysis (ISEA). Over the last two years, Dr. Turpin received funding from US EPA, National Oceanic and Atmospheric Administration (NOAA), and National Science Foundation (NSF) to study various aspects of atmospheric aqueous-phase chemistry leading to SOA formation. She also has EPA funding for a train noise exposure study, and EPA and NJ Department of Environmental Protection (DEP) funding for the training of state/local agency personnel in air pollution measurement. She has NJ DEP support for the operation of a Photochemical Assessment Monitoring (PAM) site, and minor funding from the Water Resources Research Institute (particle and gas phase nitrogen deposition to an urban wetland) and the Meadowlands Commission (baseline air quality evaluation).

Valberg, Peter

Gradient Corporation

Dr. Peter Valberg is Principal and Senior Health Scientist at Gradient Corporation, Cambridge, MA, where he prepares public health analyses in the areas of inhalation toxicology and human health risk assessment. He is a full member of the American Association for Aerosol Research, the Society of Toxicology, the Health Physics Society, and the International Society for Environmental Epidemiology. Dr. Valberg holds M.S., M.A., and Ph.D. degrees from Harvard University. His postdoctoral training included alveolar macrophage function (NHLBI), pulmonary pathology (University of Vermont), Analytical Light Microscopy (Woods Hole Marine Biological Laboratory), and Advanced Risk Assessment (University of Cincinnati). His expertise and interests are in the areas of respiratory physiology, inhalation toxicology, laboratory animal toxicology, airborne particulate exposure assessment, and cancer risk assessment. Dr. Valberg was a member of the National Academy of Sciences "Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations," which led to the NAS/NRC report: "Estimating the Public Health Benefits of Proposed Air Pollution Regulations." Dr. Valberg's scientific research and consulting work (including the last two years) has been supported by both non-profit and for-profit entities, and some of this work has focused on the toxicology of airborne particles. Gradient Corporation is an environmental consulting company that prepares health-risk, exposure-assessment, and regulatory-impact analyses to both regulated industries and regulating agencies.

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Vedal, Sverre

University of Washington

Dr. Sverre Vedal is currently Professor in the Department of Environmental and Occupational Health Sciences, Division of Occupational and Environmental Medicine, at the University of Washington School of Public Health and Community Medicine. Dr. Vedal is a pulmonary physician and an epidemiologist. He received his Doctor of Medicine degree from the University of Colorado and his Master of Science (M.Sc.) degree in epidemiology from the Harvard University School of Public Health. He worked for 18 years as an academic pulmonologist at the University of British Columbia in Vancouver, and then 3 years at the National Jewish Medical and Research Center in Denver, Colorado before joining the faculty at the University of Washington in 2004. Dr. Vedal was a member of the EPA Science Advisory Board's Clean Air Scientific Advisory Committee (CASAC) until 2003 and then served on the CASAC Particulate Matter Review Panel until 2006. He now serves on the CASAC Ozone Review Panel. Dr. Vedal serves as a standing member of the Review Committee of the Health Effects Institute (HEI) and chaired the review committee for the HEI-funded National Morbidity, Mortality, and Air Pollution Study (NMMAPS) and the HEI committee that reviewed the revised time series analyses of EPA selected studies. He served as a member of the Air Quality Management in the U.S. Committee of the National Research Council and now serves on the Institute of Medicine Committee on Evaluation of the Veterans Administration's Presumptive Disability Decision-Making Process. Dr. Vedal's research interests are in the health effects of air pollution and in occupational lung disease. He is currently working on incorporating source-oriented approaches to specifying exposure to ambient air pollution in epidemiological studies, and on identifying effects of long-term exposure to components and sources of particulate matter on cardiovascular disease.

White, Ronald

Johns Hopkins University

Ronald H. White is Associate Scientist in the Department of Epidemiology at the Johns Hopkins University Bloomberg School of Public Health in Baltimore, Maryland, where he serves as Deputy Director of the Risk Sciences and Public Policy Institute. He previously served as Assistant Executive Director, Education, Research, and Community Affairs at the National Osteoporosis Foundation and in several positions at the American Lung Association National Office, culminating in Assistant Vice President, National Policy. He earned his Master of Science in environmental studies from Antioch University, and his Bachelor of Science in environmental science from Clark University. Prior to joining the American Lung Association, he was senior transportation/air quality planner and then public participation coordinator for air quality planning at the Tri-State Regional Planning Commission in New York. Mr. White currently serves as a member of the External Science Advisory Committee for the National Environmental Respiratory Center, and has served as a member of the National Research Council Committee on Research Priorities for Airborne Particulate Matter, and as a consultant to the EPA Clean Air Scientific Advisory Committee for the Particulate Matter NAAQS review. He has also served as a member of the Integrated Human Exposure Committee of the EPA Science Advisory Board, as well as on the EPA Blue Ribbon Panel to review the use of oxygenates in gasoline. He serves as project director for a U.S. Environmental Protection Agency contract with Johns Hopkins University to prepare a report "State of the Science: Low Dose-Response Extrapolation Approaches".

White, Warren H.

University of California - Davis

Dr. Warren White is currently a Professional Researcher in the Crocker Nuclear Laboratory of the University of California at Davis. He was formerly a Visiting Professor at the Crocker Nuclear Laboratory. Prior to that, he was a Sr. Research Associate at Washington University in St. Louis. He is a member of the American Mathematical Society (AMS) and the Air & Waste Management Association (AWMA). Dr. White's areas of expertise involve mathematics, atmospheric chemistry and optics, and aerosol science, with specific interests in trend analysis, attribution of effects to emissions, and the sensitivity of empirical models to measurement uncertainties. Dr. White has served the AWMA on the Publications and Visibility Committees and as past Chair of the St. Louis Air Pollution Control Association. He has also served as Coordinator of the Symposium on Plumes and Visibility, Grand Canyon. Dr. White holds both a Ph.D. and M.S. in mathematics from the University of Wisconsin, in 1964 and 1967, respectively. He received his B.S. from the California Institute of Technology in 1963. Dr. White has worked with EPA on committees and panels, namely: Clean Air Science Advisory Committee (CASAC), 1996-2000; Review Panel for PM Air Quality Criteria Document, 1994-96, 2000-03; CASAC National Ambient Air Monitoring Strategy (NAAMS) Subcommittee, 2003; Subcommittee on Particle Monitoring, 1998-2003, Review Panel for NOx Criteria Document, 1990-94; and Subcommittee on Visibility, 1987-89. He has served on the following committees of the National Research Council (NRC): Haze in National Parks and Wilderness Areas, 1990-93; Committee on Meteorological Prediction, Analysis, and Research, 1990-94; Committee to Assess the North American Research Strategy for Tropospheric Ozone (NARSTO) Program, 1997-2002; and Committee on Research Priorities for Airborne Particulate Matter, 1998-2003. Dr. White has worked under a contract from National Park Service to Crocker Nuclear Laboratory to operate the IMPROVE monitoring network and also on a cooperative agreement between EPA and Washington University to operate St. Louis-Midwest PM Supersite. He has been a consultant to the Electric Power Research Institute (EPRI) on analysis of monitoring data from Atlanta, and to Environ Corp. on a test of source apportionment with simulated data. (2004)

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Wyzga, Ronald

Electric Power Research Institute

Dr. Ronald Wyzga is Technical Executive in the Air Quality Health Effects program area of the Environment Sector. He received an AB degree in mathematics from Harvard College in 1964 and an M.S. degree in statistics from Florida State University in 1966. He also received a Sc.D. degree in biostatistics from Harvard University in 1971. Dr. Wyzga has authored an extensive list of publications on his research. His current research activities focus on understanding the relationship between health effects and air pollution, an area in which he has worked for over 30 years. Dr. Wyzga is particularly interested in the design, conduct, and interpretation of epidemiological studies that examine this relationship. He is also interested in health risk assessment methods. Dr. Wyzga has studied the relationship between health effects and air pollution since he joined EPRI in 1975. In addition, he has worked on methods to attach economic values to air pollution damage and effects. Dr. Wyzga has served on, and has chaired, several committees for the EPA Science Advisory Board and National Academy of Sciences. He has also served on advisory oversight committees for several research programs on the health effects of air pollution. In 1990, Dr. Wyzga was elected a Fellow of the American Statistical Association by his peers. Prior to joining EPRI, he worked at the Organization for Economic Cooperation and Development (OECD) in Paris, where he co-authored a book on economic evaluation of environmental damage. Dr. Wyzga is employed directly by EPRI and receives no income/support from grants or contracts.