Invitation for Comments on the "Short List' Candidates for the Panel on Multimedia, Multipathway, and Multireceptor Risk Assessment (3MRA) Modeling System
EPA Science Advisory Board (SAB)
May 29, 2003

The EPA Science Advisory Board (SAB) announced in 68 FR 17797-17800, April 11, 2003, that it was forming the Panel on Multimedia, Multipathway, and Multireceptor Risk Assessment (3MRA) Modeling System and requested nominations for potential panel members. Background on the project and details on panel nomination process appear in the abve referenced Federal Register notice and are also available at the SAB website (www.epa.gov/sab).

The Science Advisory Board Staff Office has reviewed the nominations for the Panel, and has identified a list of nominees to a Short List of 35 candidates based on the qualifications and interest of the nominees. Brief biosketches of the candidates on the "Short List" are listed below for comment. We invite comments from the public on these candidates. We welcome information, analysis or documentation that the Board should consider in evaluating the "Short List" remaining candidates.

The SAB Staff Office Director, in consultation with SAB leadership, as appropriate, makes the final decision about who will serve on the panel in the "Panel Selection" phase. In that phase, SAB Staff completes its review of information regarding conflict of interest, possible appearance of impartiality, and appropriate balance and breadth needed to address the charge. They review all the information provided by the candidates, along with any information that the public may provide in response to the posting of information about the prospective panel on the SAB website during the "Short List Phase," and information gathered by SAB Staff independently on the background of each candidate.

Please provide any advice, observations or comments you might think would be helpful in selecting the final candidates no later than June 20, 2003. Please make your comments to the attention of Ms. Kathleen White, Designated Federal Officer. E-mailing comments (white.kathleen@epa.gov) is the preferred mode of receipt. We intend to make final selections by July 3, 2002.

Andrea Boissevain
Ms. Andrea Boissevain is the Principal and Senior Scientist with Health Risk Consultants, Inc., a woman-owned environmental consulting firm in Fairfield, CT. Ms. Boissevain has extensive experience as a risk assessor with skills that range from designing exposure models to managing multi-media quantitative human health assessments for state and federal Superfund sites across the nation. After receiving her Masters in Public Health (Environmental Health Concentration) from Yale University Department of Epidemiology and Public Health in 1984, she worked with a large environmental engineering concern before starting her own firm in 1989.

Ms. Boissevain is currently developing exposure assessment methodologies to evaluate individual exposures to a variety of indoor pollutants, including volatile organic compounds. Several of the sites she is working on are grappling with exposure to soil gas vapors associated

with impacted groundwater. Knowing the science, assessing the health risks, and developing outreach strategies to inform the public are daily challenges she addresses. Risk communication and making science understandable to myriad audiences now comprise a large component of her work. Her basic science background (A.B. Vassar College, Biology) and her pursuit of toxicology (graduate school and beyond) coupled with her love of writing has shaped her firms commitment to communicating with people (clients and the public alike) about the health implications of exposures (both acute and chronic) to hazardous substances.

With respect to funding sources and contract support, HRC serves a variety of private (Fortune 100 firms, engineering and law firms) and public sector clients, most notably the Department of the Navy, US Environmental Protection Agency, the Connecticut Department of Public Health and the Town of Stratford. Ms. Boissevain is a long standing member of the Society for Risk Analysis, American Public Health Association, and the New England Society for Risk Analysis. She also served on panel of experts that employed risk-based principles to screen and prioritize over 2000 state-classified abandoned hazardous waste sites for the Virginia Department of Environmental Quality (VDEQ). A subset of sites were sampled, information collected, and a hazardous ranking scheme developed. The expert panel assembled provided professional judgment in the final priority assignments of the sites to enable VDEQ to assess state [financial] liability for cleaning up abandoned sites.

Linfield Brown

Linfield C. Brown is Professor and former Chairman of the Civil and Environmental Engineering Department at Tufts. Professor Brown earned his BSCE and MS from Tufts and his Ph.D. in Sanitary Engineering at the University of Wisconsin-Madison.

His research has covered a broad range of topics in sampling strategies, flow equalization, oxygen transfer, and most recently, uncertainty analysis in water quality modeling, multi response parameter estimation, and the use of genetic algorithms for model calibration.

Dr. Brown has served as consultant to both industry and government. As a research engineer with the National Council for Air and Stream Improvement (NCASI), he developed their national program in mathematical water quality modeling. While on sabbatical leave at the USEPA Center for Exposure Assessment Modeling (CEAM), he designed and implemented a computational framework for incorporating uncertainty analysis into the water quality model, QUAL2E. He is the author of over 50 technical papers and reports covering the fields of environmental engineering and statistics and has offered over two dozen workshops in the US, Spain, Poland, England, and Hungary on water quality modeling and control. He is co-author of the book Statistics for Environmental Engineers, which describes the practical application of statistics to a variety of environmental engineering problems. He founded and was academic director of an innovative multi-disciplinary Masters program in Hazardous Materials Management, and initiated a similar program in Environmental Science and Management for mid-career professionals, targeted specifically for women and minorities. He received from Tufts, the prestigious Lillian Liebner Award for excellence in teaching and advising. Dr. Brown currently serves as consultant to the Environmental Models Sub-committee of the USEPA Science Advisory Board and is director of the Tufts ABET accredited BSEvE program. In addition to his university support, Dr. Brown receives funding from the New England Water Pollution Control Commission, which, in turn receives that funding from EPA Region I.

John P. Carbone, Ph.D. is currently a senior scientist within the Toxicology Department of the

Rohm and Haas Co., one of the world's largest manufacturers of specialty chemicals. Dr. Carbone received his Ph.D. in endocrine physiology in 1982, his graduate research focused on PCB and PBB effects on thyroid and adrenal function. After a postdoctoral fellowship at Thomas Jefferson University Hospital, Dr Carbone joined the faculty of Thomas Jefferson University Medical school where here participated in teaching, research and grant writing. In 1991, Dr Carbone joined the Toxicology Department at the Rohm and Haas Co. His initial responsibilities included sub-chronic study director. Dr.Carbone migrated toward environmental risk assessment where during the past 11 years he has developed expertise in environmental exposure analysis, specifically fate andtransport modeling of chemicals in the environment.

Dr Carbone participated in the FIFRA Environmental Modeling Task Force where he chaired the statistics subcommittee. In that committee, Dr. Carbone led the development andimplementation of an uncertainty analysis approach for a miltiparametric fate and transport model, PRZM. PRZM models chemical movement via runoff and movement through the vadose zone. In the approach that was developed, uncertainty associated with model parameterization was accounted for by using a sensitivity analysis coupled with a Monte Carlo approach to account for the variability associated with these inputs.

In addition, Dr. Carbone has extensive experience with a variety of both US and European fate and transport models. He also closely monitors endocrine disrupter issues and is a key advisor for the Rohm and Haas Co. regarding the European Chemicals Policy and the Water Framework Directive.

Dr. Carbone is a member of the Society for Environmental Toxicology and Chemistry and also serves on the editorial board of Environmental Toxicology and Chemistry where his expertise is in fate and transport modeling and environmental risk assessment. Dr. Carbone also works with the Alkylphenol Ethoxylates Research Council where he is an active member of the environmental subcommittee.

Dr. Carbone's work is fully supported by the Rohm and Haas Co.

James Carlisle
Senior Toxicologist, Office of Environmental Health Hazard Assessment
California Environmental Protection Agency.
Doctor of Veterinary Medicine, University of California, Davis
Master of Science in Aquatic Pathobiology, University of Stirling, Scotland

Current professional responsibilities include oversight of the:

- Emerging Environmental Challenges Program
- Environmental Indicators Program
- OEHHA California/Baja California Border Environmental Program
- Development of Guidelines and Health Criteria for the Cal EPA Schools Risk Assessment Program

  Oversight of contract research to develop transfer factors for contaminants at school sites.
- Risk Assessment review and oversight for the State Water Resources Control Board, the Integrated Waste Management Board, and local agencies in California

Previously served on the Governor's Panel of Experts in Carcinogen

Identification
Professional activities and responsibilities do not involve external
grant or contract support

Calvin Chien

a. Current position
Senior Environmental Fellow

b. Educational background
B.S.E.(1966), Hydraulin Engg., National Taiwan Cheng Kung Univ,;
M.S.E.(1970), Hydrodynamics, State Univ. of N.Y. at Buffalo;
Ph.D. (1974), Hydrologic System Modeling, SUNY/AB.

c. Area of expertise and research activities
Subsurface Fate & Transport Modeling
Environmental Contamination Investigation and Remediation
Remediation Technology Evaluation

d. Service on other advisory committees, professional societies, especially those associated with issues under discussion in this review

USEPA Science Advisory Board: Environmental Engineering Committee and Environmental Modeling Subcommittee: Involved in the reviews of programs like TRIM, MMSoil, and other major models and modeling related programs between 1993-2001.

e. Sources of recent grant and/or contract support
None.

Peter deFur

Dr. Peter L. deFur is president of Environmental Stewardship Concepts, an independent private consultant, serving as a technical advisor to citizen organizations and government agencies. He is an Affiliate Associate Professor in the Center for Environmental Studies at Virginia Commonwealth University where he conducts research on environmental health and ecological risk assessment. Dr. deFur is President of the Association for Science in the Public Interest (ASIPI) and on the board of the Science and Environmental Health Network (SEHN).

Dr. deFur was previously a senior scientist at the Environmental Defense Fund (now ED) in Washington, DC and held faculty positions at two universities before that. He has extensive experience in risk assessment and ecological risk assessment regulations, guidance and policy. He served on the NAS/NRC various study committees, including the Risk Characterization Committee that released its report, Understanding Risk in June 1996. Dr. deFur served on numerous scientific reviews of EPA ecological and human health risk assessments, including the assessment for the WTI incinerator in Ohio and EPA's Ecological Risk Assessment Guidelines. deFur served on EPA's Endocrine Disruptor Screening and Testing Advisory Committee and is now on EDMVS.

Dr. deFur received B.S. and M.A. degrees in Biology from the College of William and Mary, in Virginia and a Ph.D. in Biology from the University of Calgary, Alberta. He was a postdoctoral fellow in neurophysiology in the Department of Medicine at the University of

Calgary.

Dr. deFur conducts research on the identification of and effects of endocrine disrupting chemicals, particularly in aquatic crustaceans. He is also interested in the effects of low oxygen conditions on aquatic animals and systems in estuaries and coastal environments. deFur also conducts research on precautionary approaches to environmental regulations and on citizen involvement in environmental programs, policies and regulations

Dr. deFur was appointed to BEST of the National Academy of Sciences/National Research Council in 1996. He is on the Advisory Committee to the Board of the Coalition to Restore Coastal Louisiana, and a peer reviewer for professional journals. He has published numerous peer reviewed articles, invited perspectives and review articles for the public on subjects ranging from habitat quality to wetlands, toxic chemical and risk assessment. During the past ten years, Dr. deFur has been extensively involved in scientific research, regulation and policy concerning the generation, release and discharge of dioxin and related compounds. He has published a number of papers on regulation and policy aspects of these compounds, considered in many ways prototype endocrine disruptors. Dr. deFur has been extensively involved in the EPA reassessment of dioxin since 1991. He was a technical advisor to the EPA Superfund Ombudsman office, and is presently technical advisor for the Port Angeles clean_up of the Rayonier mill site, the water quality program in the state of Indiana, and to citizens groups for the Rocky Mountain Arsenal superfund site.

Dr. deFur serves as a technical consultant to citizen organizations that are involved in cleanup actions at contaminated sites around the country

Dr. Joseph DePinto is currently a Senior Scientist at Limno-Tech, Inc. an environmental consulting company specializing in the development and application of water quality and ecosystem models for addressing a myriad of problems in aquatic ecosystems.

He joined LTI in June, 2000 after spending 27 years in academia, including 10 years as Director of the Great Lakes Program at the University at Buffalo. During that time, Dr. DePinto was an active part of the Great Lakes research community and he is continuing in that role at Limno-Tech, Inc. During his professional career, Dr. DePinto has directed projects on such topics as nutrient-eutrophication, toxic chemical exposure analysis, contaminated sediment analysis and remediation, aquatic ecosystem trophic structure and functioning, and watershed, river, and lake modeling.

Recent projects, both prior to and subsequent to joining LTI, that are relevant to the subject SAB panel include (funding source in parentheses): development and application of an integrated exposure model for PCBs in Green Bay, Lake Michigan (EPA-ORD); development and application of sediment and contaminant fate and transport models to assess and evaluate remediation of contaminated sediments in several river systems, including the Buffalo River (EPA-Great Lakes National Program Office (GLNPO)), St. Clair River (Ontario Ministry of Environment), Lower Fox River (Fox River Group), Kalamazoo River (Kalamazoo River Study Group), Niagara River, and Hudson River (EPA-Reg 2 through TAMS); assisted the Delaware River Basin Commission in development of a PCB fate and transport model for application to a TMDL analysis for the Delaware River/Estuary (DRBC); led a team of scientists and engineers at the University at Buffalo in the development of a Geographically-based Watershed Analysis and Modeling System (GEO-WAMS), a Modeling Support System that coupled a Geographic Information System (ARC-INFO) with existing and newly developed watershed and water

quality models (EPA-ORD); development and application of a contaminant fate, transport and bioaccumulation model for Lake Ontario in support of the development of a lakewide management plan (LaMP) and TMDL for that system (EPA-Region 2); and development of an aquatic ecosystem model for Saginaw Bay, Lake Huron to investigate the ecological impacts of zebra mussels on nutrient cycling and primary production and on PCB cycling and bioaccumulation (EPA, ORD and GLNPO).

Three relevant ongoing projects being conducted by LTI with Dr. DePinto as the Principal Investigator are: "Developing a Model Framework for Assessing Ecological Impacts of Water Withdrawals in the Great Lakes Basin" (Great Lakes Protection Fund); "Development of an integrated ecological response model for the International Joint Commission Lake Ontario – St. Lawrence River water levels/flows study" (USACE-IWR); and "Linking a fine scale hydrodynamic model (POM) for Lake Ontario with a course grid toxic chemical exposure model (LOTOX2)" (EPA-GLNPO through University at Buffalo).

Dr. DePinto has also participated in several workshops and advisory panels relevant to the topic. He participated in the SETAC Pellston Conference on "Criteria for Persistence and Long-Range Transport of Chemicals in the Environment," in1998; was a Peer Reviewer for EPA, ERL-Duluth,on the Dioxin Aquatic Risk Assessment Report, (July 1993 - October, 1993); invited expert review panel member, "Workshop on Application of 2,3,7,8-TCDD Toxicity Equivalence Factors to Fish and Wildlife," EPA-sponsored workshop, Chicago, IL (January 20-22, 1998); invited member of Model Evaluation Group (MEG) for the Contamination Assessment and Reduction Project (CARP) of the New York/New Jersey Harbor Estuary Program (Oct. 2000 – present); commissioned reviewer, "Florida Pilot Mercury Total Maximum Daily Load (TMDL) Study" report prepared by Tetra Tech, Inc. for Florida Dept. of Environmental Protection documenting modeling work with E-MCM (April, 2000); is a member of the International Joint Commission, Council of Great Lakes Research Managers; and is an Associate Editor of the Journal of Great Lakes Research and Chair of the Publications Committee of IAGLR.

Dr. DePinto received his PhD in Environmental Engineering in 1975 from the University of Notre Dame, Notre Dame, Indiana. His studies have led to over 100 publications and the direction of more than 45 Master's theses and 12 Ph.D. dissertations

Alan Eschenroeder

Dr. Eschenroeder serves on the faculty of Harvard School of Public Health and operates an independent consulting firm. He received both his BME and PhD degrees in engineering at Cornell University. He has performed numerous risk assessments and has developed novel multimedia modeling techniques both for health and climate change investigations. His current area of research focuses on exposure analyses for contaminants emitted during military actions in the Middle East conflicts. In addition to serving EPA as a peer reviewer over recent decades, he has served and chaired various National Academy of Science special committees and subcommittees (see CV for details). His most recent grant support has come from the US Agency for International Development, the China Project at Harvard, and the United Nations fund for reparations. Current support for consulting work derives from the law firm of Broiles and Timms, LLP on behalf of a private industrial client involved in litigation.

During the decade following his education and military service, he implemented computer-based tools in the field of hypersonic fluid dynamics to provide design inputs for space and defense applications. Using some of these same techniques he began the development of

simulation models tracing the evolution of photochemical smog. This modeling work subsequently evolved into multimedia descriptions of contaminant fate and transport in air, water, soil and biota, as applied to exposure and health risk assessment. Examples of his recent research interests include: greenhouse gas tradeoffs in waste management, comparative health risks of rural burning versus controlled combustion of domestic waste in Slovakia, health impacts of mobile sources in China and the addition of socioeconomic influences to health risk assessments and life cycle analyses.

Jeffrey Foran

Dr. Foran is a broadly trained environmental scientist with expertise in toxicology, human and ecological risk assessment, and science-policy. He holds a Ph.D. in Environmental Sciences from the University of Florida, an M.S. in Biology from Central Michigan University, and a B.S. in Biology from the University of Michigan. Dr. Foran has served as a Scientist with the National Wildlife Federation, as Associate Professor at the George Washington University School of Medicine and Health Sciences, as Executive Director of the ILSI Risk Science Institute in Washington, D.C., and as Director of the UW-Milwaukee WATER Institute. Currently, he is President of Citizens for a Better Environment (CBE), is a private consultant for foundations
and non-profit NGOs, and provides litigation support. He also holds an adjunct faculty position at the University of Michigan School of Natural Resources and Environment.

Dr. Foran is a member of both Tau Beta Pi (Engineering Honorary) and Sigma Xi (Scientific Research Honorary), he is a member of the Board of Directors of the Einstein Institute for Science, Health, and the Courts, and is President of the World Council of the Society of
Environmental Toxicology and Chemistry (SETAC). He has served as an advisor and consultant to numerous organizations including the U.S./Canadian International Joint Commission, the Organization for Economic Cooperation and Development (OECD), the World Health Organization, the International Program on Chemical Safety (IPCS), the U.S. Environmental Protection Agency, Centers for Disease Control and Prevention, the U.S. General Accounting Office, and the U.S. Dept. of Defense.

Robert Giraud

a. Current position

Senior Consultant, Environmental Engineering, DuPont Engineering Technology

b. Educational background

B.S. Chemical Engineering, Tulane University, 1980; Master's, Chemical Engineering, Tulane University, 1983

c. Area of expertise and research activities

Hazardous Waste Regulatory Compliance, Industrial Nonhazardous Waste Management, Hazardous Waste Combustion Technology, Multimedia Human Health Risk Assessment, Pollution Prevention

d. Service on other advisory committees, professional societies, especially those associated with issues under discussion in this review

FACA – Industrial Nonhazardous Waste Focus Group 1997 – 2003; Ad hoc chemical industry technical review team – review and comment on EPA "Screening Level Ecological Risk Assessment Protocol", 2000; Waste Minimization and Combustion Coalition technical team – review and comment on EPA "Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes, 1994

e. Sources of recent grant and/or contract support

DuPont employee 1980 – present

Barbara Harper

Current position: Partner and senior scientist with AESE, Inc. We are a small consulting firm providing technical support only to Tribes (we have no non-tribal clients) in toxicology, subsistence exposure scenarios, multipathway/multimedia/multicontaminant risk assessments, contamination of subsistence resources, Superfund cleanup and regulatory oversight, geology, public health, cultural risk, tribal regulatory standards, and related matters. Dr. Harper also has an adjunct research associate professor at Oregon State University.

Education: Dr. Harper is a board-certified toxicologist. She received her PhD in zoology (genetics) from the University of Texas at Austin in 1974.

Area of expertise and research activities: Dr. Harper is a toxicologist and risk assessor with special expertise in developing exposure factors for tribal risk assessments that reflect traditional lifeways and use of subsistence resources.

Advisory Committees, professional societies: Dr. Harper has been involved in many of the tribal advisory committees used by EPA, and has provided training on risk assessment to many tribal groups dealing with EPA models. She is also on the SAB Drinking Water Committee. She belongs to the Society for Risk Analysis, SETAC, Am. Anthropology Society (Council for Nutritional Anthropology), the Society for Ethnobiology, and other groups not related to the topic under review.

Recent grant and contract support: All of our company support is via contracts with Indian Tribes. In addition, Dr. Harper recently received an EPA-STAR grant though Oregon State University for research on tribal exposure scenarios and exposure factors. These factors are based on traditional lifeways and native diets, and are used as inputs into risk assessment models such as the one under review. Because tribal lifeways are different from the suburban lifestyles that the EPA default exposure factors were developed for, we focus on ensuring that tribal-appropriate exposure factors are used in risk assessments related to contamination of tribal resources and exposure of tribal members

Bruce Hope

Bruce Hope is with the Oregon Department of Environmental Quality (DEQ), where he serves as a senior environmental toxicologist for the Land Quality Division. His is presently involved with preparation of sediment evaluation guidance for use by DEQ project managers and with developing an aquatic food web biomagnification model for mercury target analysis as part of the Willamette River TMDL process. He is also responsible for reviewing and commenting on human health and ecological risk assessments prepared by contractors for specific cleanup sites, confirming remedial action levels, and evaluating remedial alternatives for various media (soil,

water, air, sediment, groundwater). Other assignments have included drafting risk assessment rule language required by Oregon's revised cleanup law, developing guidance (human health, ecological, probabilistic) needed for effective implementation of these new rules, and leading the State's efforts to implement probabilistic human health assessments and population-level ecological assessments. In 2000-01, he was on leave from DEQ as an American Association for the Advancement of Science (AAAS) risk policy fellow at the U.S. Department of Agriculture in Washington DC, where he worked on food safety and microbial risk issues.

Prior to joining DEQ in 1995, he was a consultant in the private sector managing preparation of human health and ecological risk assessments for commercial and government clients at CERCLA, RCRA, and BRAC sites throughout the U.S. and Pacific Rim. He has also served on several U.S. EPA advisory panels including: a Scientific Advisory Panel addressing probabilistic analyses under the Federal Insecticide, Fungicide, and Rodenticide Act, the Science Review Board for the Food Quality Protection Act, a peer review workshop on the Process for Conducting Probabilistic Risk Assessment for Superfund and a Risk Assessment Forum workshop on probabilistic assessments. He has written peer-reviewed and technical publications on toxicology, risk assessment, and geochemistry, and has a special interest in exposure modeling. Dr. Hope is an adjunct faculty member at Oregon Health & Science University (Oregon Graduate Institute, School of Nursing), Concordia University, and Portland State University. He holds M.S. and Ph.D. degrees in biology (aquatic toxicology) from the University of Southern California and a B.A. degree from the University of California (Santa Barbara). He is presently supported exclusively by employment with the State of Oregon. There is no current grant support and recent contract activity has been limited (<$2000/yr) to the U.S. Army ARAMS program

Michael Lakin
Dr. Michael L. Lakin
Principal, EnSIGHT, LLC
B.S. Biochemistry, UCDavis
Ph.D. Environmental Toxicology and Pharmacology, UCDavis

Risk Assessment, Toxicology, Regulatory Toxicology, Multimedia Modeling to support Risk-Based Decisions

Cal EPA, Regulatory Structure Update, Waste Classification and Disposal Requirements Advisory Group

No Grants or General Support Contracts

All work conducted by EnSIGHT is conducted under contract. All contracts are with Privat parties, typically from fortune 1000 companies. The only work performed which was related top waste classification is my participation in the evasluation of the Californenia proposed risk-based waste classification rule. In that instance EnSIGHT was retained by the California Business Council, who inturn was reimbursed by several industry consortia of companies which included the petroleum industry, chemical industry and the energy-utility industry.

Guy R. Lanza is a Professor of Microbiology and Director of the Environmental Sciences Program at the University of Massachusetts at Amherst, and Director of the Graduate Program in Environmental Toxicology and Risk Assessment. Dr. Guy R. Lanza has been involved in research, teaching, curriculum development, and consulting in several areas of the environmental sciences including ecotoxicology, environmental impact assessment, applied and environmental microbiology, aquatic ecology, and water quality for more than 30 years.

He has completed studies to develop and implement novel methods for measuring and monitoring ecotoxicological effects in soil, water, and sediments, including sediment microbial enzyme activity tests for detecting toxicant impacts. He has also directed several research projects on bioremediation and phytoremediation strategies suitable for hazardous waste sites. Dr. Lanza has also done research on the ecology of infectious diseases and is currently involved in environmental impact assessments of several major hydroelectric dam projects in Asia and Africa. Dr. Lanza is Senior Science Editor of the International Journal of Phytoremediation (CRC Press - Taylor Francis) and is an Editor of the journal Ethics In Science and Environmental Politics.

He has a Ph.D. in Biology/Environmental Microbiology from Virginia Polytechnic Institute and State University and is a Fellow of the American Academy of Microbiology. Dr. Lanza's current/recent research has been funded by grants from the Massachusetts Department of Environmental Management, and from university research grants.

Leonard Levin
Position: Technical Leader, EPRI; Program Manager, EPRI Program in Air Toxics Health and Risk Assessment; Issue Leader, Environmental Mercury

Education: Ph.D. (Univ. of Maryland); M.S. (Univ. of Washington); B.S. (MIT)

Expertise: Environmental modeling; environmental fluid dynamics (air and water flow and cycling); human exposure and risk analysis; trace substance dynamics

Service: Peer reviewer: EPA Mercury Study Report to Congress; EPA Mercury Research Strategy; US DOE Waste Management Strategy; U. California at Berkeley Advisory Panel on Environmental Management curriculum; Air & Waste Management Association. Section President, Society for Risk Aaalysis. Invited lecturer, Society for Environmental Toxicology and Chemistry. Review panel on mercury monitoring, SETAC. Review panel on air toxics monitoring, U.S. EPA. Many others.

Support: primarily EPRI base funding. Awardee, U.S. DOE NETL contract, October 2002. Awardee, State of Wisconsin Focus on Energy program, 2002. Peer reviewer, American Chemistry Council. (2003)

Igor Linkov
Dr. Linkov is a Senior Risk Assessor and Team Leader with ICF Consulting, Inc. Dr. Linkov has a BS and MSc in Physics and Mathematics (Polytechnic Institute, Russia), a MS equivalent in Engineering and Public Policy (Carnegie-Mellon University), and a PhD in Environmental, Occupational and Radiation Health (University of Pittsburgh). He completed his postdoctoral training in Biostatistics and Toxicology at Harvard University.

He has more than 13 years of experience in performing cutting edge ecological and human health risk assessments and environmental investigations for contaminated sites in the U.S.A and internationally. Dr. Linkov's skills include project probabilistic modeling, human health and ecological risk assessment, guidance development, risk communication, litigation support, policy analysis, toxicology and biostatistics. He has also developed software for environmental modeling, decision support and risk assessment. His current research interests include developing risk-based approaches to environmental decision making. He has published widely on environmental policy, environmental modeling, and risk analysis, including four books and over 60 scientific papers. He has organized and directed five international conferences on ecological risk assessment, on comparative risk assessment, on the role of risk assessment in addressing bioterrorism, on contaminated forests, and on air pollution.

Dr. Linkov serves as a Scientific Advisor to the Toxic Use Reduction Institute, a position that requires nomination by the Governor of Massachusetts. Dr. Linkov is President-Elect for the Society for Risk Analysis-New England. He also chairs the Ecological Risk Assessment Specialty group for the Society for Risk Analysis and participates in several SRA and SETAC Committees. Dr. Linkov has served on various review and advisory panels for the US and international agencies. He is currently managing a probabilistic ecological risk assessment for a Superfund site for the US Army as well as several projects for EPA/ORIA and EPA/OST/HECD that involve advanced statistical analyses and modeling. Dr. Linkov is also developing models and software to incorporate habitat quality and spatial scales into ecological risk assessment for the US Army, American Chemistry Council and NOAA.

Randy Maddalena

Randy Maddalena, Ph.D., is a Scientist in the Exposure and Risk Analysis Group within the Environmental Energy Technologies Division at Lawrence Berkeley National Laboratory. He received his BS in Environmental Toxicology (1992) and his Ph.D. in Agricultural and Environmental Chemistry (1998) from the University of California, Davis.

The primary focus of his research is development, evaluation and application of models that predict chemical fate in multiple environmental media (air, water, soil, vegetation, sediment) and chemical exposures through multiple pathways (drinking water, food, feed, indoor air) for both human and ecological receptors. He also develops tools and methods for performing probabilistic risk assessment and sensitivity analysis applied to complex regulatory models. His most recent work combines the use of models and experimental data to investigate how vegetation influences the environmental fate and transport of semivolatile organic pollutants and how the uptake of these pollutants into ecological or agricultural food chains might contribute to dietary exposures.

Dr. Maddalena is a Co-chair of the Society of Environmental Toxicology and Chemistry (SETAC) Advisory Group on Fate and Exposure Modeling where he serves as an Editor of the Fate and Exposure Modeling column in the SETAC Globe. He is also a member of the International Society of Exposure Analysis and a member of the SAB's Integrated Human Exposure Committee. He receives funding from the EPA's National Exposure Research Lab for research on fate and exposure models; the DOE's Fossil Energy Program for experimental work on plant uptake of petroleum related hydrocarbons; and from the EPA's Office of Air Quality Planning and Standards for his work on the TRIM.FaTE model. Dr. Maddalena also recently completed a project funded by the EPA's Office of Emergency and Remedial Response where he

developed a standardized approach for constructing inputs to probabilistic risk assessment models.

Alan Maki

Alan W. Maki received his BSc. in Fisheries Biology from the University of Massachusetts, his MSc. in Environmental Toxicology from the University of North Texas, and holds a Ph.D. in Wildlife and Fisheries Management from Michigan State University. He is currently Senior Environmental Advisor for ExxonMobil Production Company and is responsible for providing advice and consultation concerning the environmental consequences of oil and gas exploration and production activities. He previously worked at ExxonMobil Biomedical Sciences in East Millstone, New Jersey and with the ExxonMobil Safety, Health and Environment Department in Houston, Texas. He served as Senior Environmental Scientist for Exxon in Alaska from 1985 to 1991 managing numerous environmental programs in the Prudhoe Bay oil field and along Alaska's North Slope. Following the Exxon Valdez oil spill, he was responsible for managing Exxon's wildlife rescue rehabilitation program and for organizing the company's scientific assessment of ecological damage and recovery.

Dr. Maki has authored and co-authored over 250 publications and reports and 6 books on numerous aspects of environmental quality, fate and effects of chemicals in the environment, ecological risk assessment, toxicology and aquatic biology.

Active in a wide range of professional organizations, Dr. Maki is a former member of the Environmental Protection Agency - Science Advisory Board and has served on numerous advisory panels for EPA Office of Research and Development. He is former President of the Society of Environmental Toxicology and Chemistry, and has served on National Academy of Science panels concerned with the assessment and management of ecological risks, and a panel to review environmental contamination issues in Western Europe.

Dr. Maki's work is fully supported by ExxonMobil.

David Merrill

Mr. Merrill, a Principal at Gradient Corporation, has 15 years of experience in negotiating technically sound and cost effective solutions to environmental contamination problems. His expertise includes directing large-scale, multi-disciplinary risk assessments, multimedia chemical fate and transport modeling, complex data analysis, and database design for systems such as landfills, lagoons, chemical plants, MGPs, river systems, and groundwater contaminant plumes. With his extensive risk assessment experience and strong engineering background, he has negotiated risk-based cleanup levels and remedial strategies, interpreted complex site investigation data into effective conceptual site models, and evaluated many types of contaminant transport conditions, including multimedia transport in water, sediments, and air. He has worked extensively with PCBs, solvents, metals and NAPLs and has served as an expert on cases involving PRP cost allocation disputes. Mr. Merrill has prepared technical comments on behalf of industry and trade organizations on Agency regulations including the PCB Megarule and multimedia modeling and risk assessment aspects of the LDR and the HWIR Rules.

All of Mr. Merrill's professional work is performed for Gradient. Gradient's client base includes Fortune 500 companies, law firms, trade associations, and to a lesser extent state and

local municipalities and regulatory agencies. Over the last two years Mr. Merrill's clients have included law firms representing individual companies and PRP groups, trade associations, chemical companies, natural gas pipeline and oil companies, energy generation companies, and the U.S. EPA. Mr. Merrill received his B.S. in Soil and Water Science from the University of California at Davis, and his M.S. in Agricultural Engineering (Civil/Environmental Engineering focus) from Cornell University where he also completed the coursework and qualifying exams toward a doctorate degree.

Ishwar Murarka

a. Current position

Chief Scientist and President of Ish Inc. – a minority owned environmental consulting business. Visiting research associate at the University of Illinois in Chicago.

b Educational background

Ph.D. Soil Science and Statistics (1971), MBA. Management Science (1974)

c. Area of expertise and research activities

Environmental Science and Technology topics pertaining to:

- Management of solid and liquid wastes,
- Characterization and Assessment of contaminated sites
- In-situ Treatment Technologies (e.g. Chemical oxidation)
- Remediation/restoration of impacted land, groundwater, and sediments.

My research activities cover transport, transformation, and fate of metals and organic compounds in the land and water environments.

d. Service on other advisory committees, professional societies, especially those associated with issues under discussion in this review

I serve on the External Advisory Committee of the Institute for Environmental Science & Policy for University of Illinois in Chicago.
I serve as Peer Reviewer on Mercury Studies for EPA
I continue to be a consultant for the EPA Science Advisory Board.
Involved in US Experts Panel for an USAID project in India

e. Sources of recent grant and/or contract support

I have research granted/funding from USDOE/CBRC, EPRI, GTI, and NYGAS.
I also receive contract support on projects involving characterization and remediation of contaminated sites from various utility companies (e.g., Duke Energy, NYSEG, RG&E, Consumers Energy, Georgia Power, We Energy, First Energy, NISOURCE, SCANA, etc.

Paul Price

Mr. Price is a modeler and researcher on exposures to chemicals. He is a director of The LifeLine Group, a non-profit corporation developing software for the assessment of exposure to pesticides and other substances. Mr. Price has more than 20 years of experience in assessing exposure to chemicals for industry, government, and trade associations. He has authored over 20 articles on exposure and risk assessment. Areas of interest include Monte Carlo modeling, dose

reconstruction, aggregate and cumulative risk, consumer products and pesticide exposures. Mr. Price has a Masters degree in Civil Engineering (University of Maryland, 1979) and a Bachelors degree in Chemistry (University of Maryland, 1974). Mr. Price has served on advisory boards for EPA, The State of California, and the Army Corp of Engineers.

The LifeLine Group is funded by contracts and grants from USEPA, the American Chemistry Council, Health Canada, and the Department of Defense. Current projects include the modeling of aggregate and cumulative exposures to pesticides, exposures to pesticides in tribal communities, and the development of models of uncertainty and variability in exposure to riot control agents in crowds.

Bradley Sample

Dr. Sample is an ecotoxicologist with over 10 years of experience as an ecological risk assessor and wildlife ecologist focusing on large, complex sites. As a Principal Technologist, he leads risk assessment projects for both state and federal government and industry and serves as CH2M HILL's Southwest Regional ecological risk assessment leader.

Dr. Sample has assisted clients with Federal and State agency liaison and guidance documents, risk management, ecological risk assessment strategy, and risk management planning. He specializes in wildlife toxicology of organic and inorganic contaminants, contaminant bioaccumulation, foodweb and ecological modeling, probabilitistic risk assessment, data analyses, and biota sampling, applied statistics, and experimental design. He has extensive experience in evaluation of ecological risks from metals, chlorinated organics, and petroleum compounds. His background covers entomology, ornithology, and mammalogy, in addition to statistics and experimental design.

He serves on the steering committee and developed the wildlife exposure model for the EPA's Ecological Soil Screening Levels (EcoSSLs). He is currently developing the wildlife modeling component and over-seeing software development for the Army Risk Assessment Modeling System (ARAMS). He has conducted risk assessments in support of CERCLA and RCRA, and worked on projects for the numerous federal clients (US Army, Navy, Air Force, Coast Guard, US EPA, and US DOE) and private clients (Unocal and Chevron). Dr. Sample is a co-author of a book on ecological risk assessment at contaminated sites, and currently serves on the editorial board of the journal Environmental Toxicology and Chemistry. Elected to the Board of Directors of the Northern California Chapter of the Society for Environmental Toxicology and Chemistry in 2001, he currently serves as the chapter Vice-President. Due to Dr. Sample's expertise, he has twice been invited to serve on peer-review committees for the ecological risk assessment and bioaccumulation modeling components of the U.S. EPA's Hazardous Waste Rule.

Mitchell Small

Mitchell Small is the H. John Heinz III Professor of Environmental Engineering in the Departments of Civil & Environmental Engineering and Engineering & Public Policy at Carnegie Mellon University. He joined Carnegie Mellon in 1982 following completion of his Ph.D. in Environmental & Water Resources Engineering from the University of Michigan. At Carnegie Mellon, Professor Small serves as the Associate Department Head for Graduate Education in the Department of Engineering & Public Policy. He has also worked as a

consulting engineer, with Hydroscience, Inc., from 1975-1978.

Mitchell Small's research involves mathematical modeling and statistical evaluation of environmental quality, exposure and risk. He has developed methods for statistical modeling of variability and uncertainty for air, soil, surface-water and ground-water problems. His recent work has evolved to consider the impact of human risk perception and behavior in integrated exposure assessment, and has included collaboration with statisticians, toxicologists, economists, and behavioral and decision scientists. Current applications include the study of regulations and risk communication for drinking water utilities, contaminated site and soil remediation, and decision support for environmentally sustainable products and infrastructure. Support for this research has come from a number of government agencies and private industry, including a National Science Foundation Presidential Young Investigator Award from 1986-1991.

Professor Small has been active in providing advice to the US Environmental Protection Agency as a member of the Science Advisory Board (SAB) Environmental Engineering Committee (1985-1991) and currently as Chair of the SAB Environmental Modeling Committee. He was a charter member of the EPA ORD Board of Scientific Counselors (BOSC) from 1996-2002, and participated on a number of National Research Council (NRC) study panels, most recently the NRC Committee on Risk Characterization and the Committee on Environmental Remediation at Naval Facilities, helping to formulate the Committee's vision for its recently released report on "adaptive site management." He currently serves as an associate editor for the journal Environmental Science & Technology, with particular responsibility for the Policy Analysis section. He recently completed an assignment as an elected Councilor of the Society for Risk Analysis (SRA), and remains active with the SRA as a member of the planning committee and white paper collection editor for its upcoming World Congress on Risk. A full CV for Dr. Small is available at http://www.epp.cmu.edu/people/EPP_faculty.html.

Current research projects are supported by the US EPA Office of Research and Development, the National Science Foundation, the David and Lucile Packard Foundation, and the Vira I. Heinz Endowment through the funding of the H. John Heinz III Professorship of Environmental Engineering at Carnegie Mellon University.

Doug Smith

Douglas G. Smith, Sc.D. is a Principal Scientist in ENSR's Risk Assessment group with degrees in Environmental Health Sciences (specializing in Air Pollution and Industrial Hygiene) and Physics. He has 28 years of experience in risk assessment of toxic airborne materials, including atmospheric transport and diffusion modeling, with applications to environmental siting and permitting.

Most recently, Dr. Smith has also led more than a dozen multi-pathway risk assessment projects in support of RCRA permitting and strategic planning for chemical industry members who use incinerators, or boilers and industrial furnaces (BIFs) for waste disposal and energy recovery. These projects are active in U.S. EPA Regions 2, 3, 4, 5, and 6 and have included supporting applications or updates for permits in New York, New Jersey, Ohio, Pennsylvania, Illinois, Georgia, Kentucky, Tennessee, W. Virginia, Louisiana, and Texas. In early 2000, Dr. Smith presented ENSR's team findings in response to an EPA request for an independent external peer review of their "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Dr. Smith has also provided expert testimony on several other occasions for chemical industry clients in toxic tort proceedings and has authored more than 25 publications and technical presentations on hazardous air pollutants, modeling issues and

accidental releases. His Sc.D. and M.S. degrees in Environmental Health Sciences are from Harvard University School of Public Health, and his A.B. in Physics is from Franklin and Marshall College.

In addition, Dr. Smith has provided expert advice and support to clients in the chemical and pharmaceutical industries on exposure and risk analysis, as well as emergency response planning, preparedness and communication requirements for effective risk management programs. This support has included overall program design, as well as training and auditing for OSHA's Process Safety Management (PSM) rule, and U.S. EPA's Risk Management Planning (RMP) rule.

Dr. Harlee Strauss is the President of H. Strauss Associates, Inc. (HSAI), a consulting firm she founded in 1988. Dr. Strauss works on a broad range of projects, from site specific human health risk assessments, to in-depth evaluations of the toxicity of individual chemicals, to the development of frameworks for risk assessment. Current contract support (ultimately from EPA) includes technical team leadership for the human health risk assessment of the GE/Housatonic River Site/Rest of River. Other recent consulting work, for both private and public sector clients, includes conducting site specific human health risk assessments and providing expert witness and litigation support services. In 1994-95, Dr. Strauss initiated and, for its first year lead, a multimillion dollar study to investigate the potential links between the environment and breast cancer on Cape Cod, Massachusetts.

Dr. Strauss earned a Ph.D. in molecular biology from the University of Wisconsin - Madison in 1979 and an A.B. in chemistry from Smith College in 1972. She was a postdoctoral fellow in biology at MIT (1979-81, sponsored by the NIEHS) and a Congressional Science Fellow sponsored by the Biophysical Society (1981-83).

Dr. Strauss has served on several EPA Peer Review Committees, including the Evaluation of PCBs in the Hudson River, Drake Chemical Site Incinerator, and Proposed Bioaccumulation Testing Evaluation Framework for Determining the Suitability of Dredged Material to be Placed at the Historic Area Remediation Site (HARS) in Region 2.. She was an invited participant in EPA's "Exposure Factors Handbook Workshop" in July, 1993.

Dr. Strauss served as a member of the U.S. Army Science Board from 1994-2001, and participated in studies regarding lead-based paint, groundwater and soil remediation at Army facilities, Chem/Bio Weapons Defense, and the Range Rule (pertaining to unexploded ordinance). She also participated in the toxicology and risk characterization subcommittees for the Office of Research and Standards, MA Department of Environmental Protection revision of risk assessment guidance under the Massachusetts Contingency Plan in the early 1990's and numerous workshops on biotechnology risk assessment and regulatory policy, including the EPA Workshop on Large Scale Field Trials (1991), EPA Biotechnology Monitoring Workshop (1988), and Keystone Biotechnology Forum (1986-1988). Dr. Strauss served on the advisory committee for the Society for Risk Analysis Workshop "Key Issues in Carcinogen Risk Assessment Guidelines." She is a community member of the Restoration Advisory Board of the U.S. Army's Soldiers Systems Center (Natick Labs) and an elected Town Meeting member in Natick Massachusetts.

William Stubblefield

Dr. William Stubblefield is a senior environmental toxicologist with Parametrix, Inc. in

Corvallis, Oregon; he also holds a courtesy faculty appointment in the Department Molecular and Environmental Toxicology at Oregon State University.

Dr. Stubblefield has more than 15 years of experience in environmental toxicology, ecological risk assessment, water quality criteria derivation, and aquatic and wildlife toxicology studies. He has authored more than 50 peer-reviewed publications and technical presentations in the areas of aquatic and wildlife toxicology and environmental risk assessment. He is a co-editor of a recently published book entitled, "Re-evaluation of the State of the Science for Water Quality Criteria," that specifically examines the issues and approaches to be used in the evaluation of environmental impacts associated with contaminants in multiple media. Dr. Stubblefield's research efforts have looked at the fate and effects of metal and hydrocarbon contaminants in the environment and the relationships between these contaminants in the water/sediment/soil compartments.

He has also investigated food chain concerns through research efforts such as the investigation of metals transfer in resident aquatic and terrestrial organisms on Alaska's North Slope. His most recent research uses a combination of laboratory and field methods to investigate the effects of storm water-associated short-term pulse exposures of metals to aquatic organisms and examines the fate and disposition of storm water-associated metals in natural systems.

About 70% of Parametrix projects are funded by municipal and other government agencies the remainder are industrial clients. Funding for the majority of Dr. Stubblefield's metal related work comes from industrial trade associations or not-for-profit research organizations working in cooperation with U.S. EPA. Dr. Stubblefield is an active member of the Society of Environmental Toxicology and Chemistry, where he serves as the Society's vice-president, member of the Board of Directors, chairman of the Publications Advisory Council, chairman of the SETAC's Metals Advisory Group, past member of the Editorial Board for Environmental Toxicology and Chemistry, and 2002 annual meeting co-chair. He has been an invited participant at a number of scientific and regulatory conferences, served on U.S. EPA peer-review panels, and frequently acts as a technical reviewer for a number of scientific publications.

Dr. Stubblefield has a Ph.D. in Environmental Toxicology from the University of Wyoming, a M.S. degree in Toxicology/Toxicodynamics from the University of Kentucky, and a B.S. in Biology from Eastern Kentucky University.

Neil Sturchio

a. Current Position:

Professor of Geochemistry and Head, Department of Earth and Environmental Sciences, University of Illinois at Chicago (UIC); Director, UIC Environmental Isotope Geochemistry Lab.

b. Education Background:

Ph.D., Earth and Planetary Sciences, Washington University, 1983
B.S. (honors), Earth Sciences, Fairleigh Dickinson University

c. Areas of Expertise and Research Activities

Geochemistry of natural waters, environmental isotope geochemistry, mineral-water interface geochemistry, application of stable isotope measurements to assessment of biodegradation of

chlorinated solvents and perchlorate, environmental forensics, application of synchrotron radiation to studies of mineral-water interfaces and trace element speciation

d. Service on Relevant Committees
Proposal Review Panel for DOE Environmental Management Science Program, May 2002
On the editorial boards of the journals Chemical Geology and Environmental Forensics.

e. Sources of recent grant and/or contract support
U. S. Department of Energy
U. S. National Science Foundation
U. S. Department of Agriculture
National Aeronautics and Space Administration (May 2003)

Dr. Daniel Tessier is an Assistant Professor in the Division of Environmental & Occupational Health Sciences, School of Public Health, University of Illinois, Chicago. He has held this position since 2000, and his specific responsibilities are research and teaching in the areas of environmental and occupational toxicology.

Dr. Tessier's educational background includes a B.S. in analytical chemistry and an M.S. and Ph.D. in Pesticide Toxicology, all from the University of Massachusetts - Amherst. His thesis and dissertation research was under Dr. J. Marshall Clark, on the genotoxicity and immunochemical analysis of environmental breakdown products of an herbicide, alachlor, which is a common ground and surface water contaminant. Dr. Tessier received postdoctoral training under Dr. Fumio Matsumura at the University of California -Davis. His research there on the molecular and cellular toxicology of endocrine disrupting pollutants was supported by a National Institutes of Health Training Fellowship.

Dr. Tessier has expertise in the areas of molecular and cellular toxicology as it relates to adverse effects of chemical exposures to humans, and the movement and fate of pesticides and other chemicals in the environment. His current research activities are focused on the molecular and cellular toxicology of endocrine disrupting pesticides and of metals. The endocrine disrupter research is aimed at understanding mechanisms of hormonal carcinogenesis that may be influenced by some environmental pollutants. The metals research is focused on these hazards as factors in the development of occupational asthma among welders. Dr. Tessier has research funding from the National Office of the American Lung Association, the University of Illinois Office of the Vice Chancellor for Research and the Illinois Education and Research Center. Dr. Tessier has served on the Grant Review Panel of the EPA STAR Program (Extramural Grants: Novel Mechanistic Approaches in Human Health Risk Assessment 2001), but has not served on other advisory committees to date.

Thomas Theis

Professor Thomas L. Theis is Professor of Civil and Materials Engineering and Director of the Institute for Environmental Science and Policy at University of Illinois at Chicago, a center that focuses on the development of new cross-disciplinary research initiatives in the environmental area. He was most recently at Clarkson University, where he was the Bayard D. Clarkson Professor and Director of the Center for Environmental Management.

Professor Theis received his doctoral degree in environmental engineering, with a

specialization in environmental chemistry, from the University of Notre Dame. His areas of expertise include the mathematical modeling and systems analysis of environmental processes, the environmental chemistry of trace organic and inorganic substances, interfacial reactions, subsurface contaminant transport, hazardous waste management, industrial pollution prevention, and industrial ecology. He has been principal or co-principal investigator on over forty funded research projects totaling in excess of eight million dollars, and has authored or co-authored over one hundred papers in peer reviewed research journals, books, and reports.

He is a member of the USEPA Science Advisory Board (Environmental Engineering Committee), is past editor of the Journal of Environmental Engineering, and serves on the editorial boards of The Journal of Contaminant Transport, and Issues in Environmental Science and Technology. From 1980-1985 he was the co-director of the Industrial Waste Elimination Research Center (a collaboration of Illinois Institute of Technology and University of Notre Dame), one of the first Centers of Excellence established by the USEPA. In 1989 he was an invited participant on the United Nations' Scientific Committee on Problems in the Environment (SCOPE) Workshop on Groundwater Contamination, and in 1998 he was invited to by the World Bank to assist in the development of the first environmental engineering program in Argentina. Among his current projects is the Environmental Manufacturing Management Program, one of the Integrative Graduate Education Research and Training (IGERT) grants of the National Science Foundation, which involves research on industrial pollution prevention problems emphasizing a systems approach.

Louis Thibodeaux

Louis Joseph Thibodeaux is currently the Jesse Coates Professor in the Gordon A. and Mary Cain Department of Chemical Engineering, College of Engineering, Louisiana State University, Baton Rouge, LA.

His terminal degree is a Ph.D. in chemical engineering and presently his teaching, research and service is dominated by the field of environmental chemodynamics. Another name is chemical fate and transport in multimedia compartments of the natural environment. Current areas of research expertise include chemical release processes to water from sediment beds and to air from soil-like dredged materials as well as chemical releases to water and air from environmental dredging activities. The key area of educational expertise is the textbook entitled: ENVIRONMENTAL CHEMODYNAMICS in its 2nd Edition, published by J. Wiley(NY) in 1996. It is used by practitioners worldwide and by numerous universities in engineering, environmental chemistry, geosciences and other environment oriented academic departments. Although he is the Emeritus Director of the USEPA funded South and Southwest Hazardous Substance Research Center, head quartered at LSU and Directed by Danny D. Reible.

Professor Thibodeaux has served on advisory committees for the USEPA, USACE, DOD, DOE, NRC and the private sector; all being related to environmental chemodynamic issues. He is a member of the Env. Div. of the Amer. Chem. Soc., Society of Env. Tox. and Chemistry and the Env. Div. of the Amer. Inst. Chemical Eng.

Professor Thibodeaux is fully employed by LSU doing research and teaching both graduate and undergraduate students. He also serves on the editorial board of several environmental journals and is presently receiving grant and/or contract support on four research projects from the USEPA and the USACE. Through the cooperative agreement USEPA/LSU in the S/SW Haz Res. Ctr., ORD Wash, DC. he receives research project funds. He also receives

research funds from the US Army Corp. Engineers; the group is ERDC or Waterway Experiment Station, Vicksburg, MS.

Curtis Travis

Dr Curtis Travis has more than 25 years experience in the energy and environmental business sector and has published widely in the areas of environmental policy, molecular biology, and risk analysis. He holds a B.S. and M.S. in Mathematics from California State University (Fresno) and earned a Ph.D. in Applied Mathematics from the University of California (Davis). He is an internationally recognized expert in the field of risk analysis, and was the founding Director of the Center for Risk Management at Oak Ridge National Laboratory, where he was employed for 18 years.

He has worked in many areas of risk analysis including multimedia modeling, food chain uptake, pharmacokinetics, interspecies extrapolation, dose-response, and risk policy. Recently, he has worked on the cleanup of DOE hazardous waste sites, risk assessment for antimicrobial drug use in animals, and security issues related to food infrastructure in the United States.

Dr. Travis has authored over 270 publications, 8 books, and is on the editorial board of seven international journals. He has served on numerous National Academy of Science panels and governmental and private advisory boards. He is a past President and Fellow of the International Society of Risk Analysis and served as Editor-in-Chief of Risk Analysis: An International Journal for 17 years.

Dr. Travis is a private consultant with his own firm, Quest Technologies. Almost all his work is for government agencies: the Department of Energy, the Food and Drug Administration, and the Department of Agriculture. He has received no financial support from EPA in the past 10 years, other than in a review capacity.

Noel Urban

N.R. Urban is currently associate professor in Environmental Engineering at Michigan Technological University where he has been on the faculty since 1995. He received a B.A. in Russian Language and Culture and a B.S. in Environmental Engineering from Syracuse University in 1979. His M.S. and Ph.D. degrees were obtained at the University of Minnesota in the Dept. of Civil and Mineral Engineering. N.R. Urban is a biogeochemist focusing on major element cycles, nutrients, trace metals and radionuclides in lake and wetland environments. Recent research support has come from NSF, NOAA, New York City Dept. Environmental Protection, Headstart Child-Development Center, and the Michigan Great Lakes Protection Fund.

Gary Walter

Dr. Gary Walter is a Principal Scientist with the Center for Nuclear Waste Regulatory Analysis (CNWRA) at the Southwest Research Institute (SWRI). The CNWRA is a FFRDC funded by the Nuclear Regulatory Commission. The primary mission of the CNWRA is to provide the Nuclear Regulatory Commission with support for resolving technical issues related to the national geologic repository for high-level nuclear waste. The CNRWA investigates fundamental physical, chemical and geologic processes related to quantitative risk assessment for the repository. Dr. Walter's performs analyses of hydrogeologic issues related to the fate and transport of radioactive isotopes including numerical modeling of groundwater flow and

transport. The CNWRA also supplies its expertise in hydrology, geology, and geochemistry to industrial and governmental clients in areas not related to the national high-level nuclear waste repository.

From 1983 to 2002, Dr. Walter was a Principal with Hydro Geo Chem, Inc., a private consulting firm providing services in the areas of environmental site investigation, fate and transport analysis, and environmental remediation. At Hydro Geo Chem, Dr. Walter managed various projects related to soil and groundwater contamination by volatile and semi-volatile organic compounds (including chlorinated and petroleum hydrocarbons) and metals. This work included developing numerical models for simulating the reactive transport of metals, simulating groundwater transport of biodegradable organic compounds, and vapor-phase transport of organic compounds. His recent research activities have included developing models to simulate heat and mass transport as part aerobic landfill stabilization, analysis of techniques for measuring landfill gas generation rates, and vapor-phase contaminant transport beneath landfills.

Dr. Walter holds a Ph.D. in Hydrology from the University of Arizona and M.A. in Geology from the University of Missouri-Columbia. He is a registered geologist in Arizona, California, and Wyoming, and a Registered Hydrogeologist in Washington. He is a 25-year member of the American Geophysical Union. He served as a technical advisor to the National Research Council subcommittee to review Swedish plans for high-level nuclear waste disposal. His current work at the CNWRA is funded primarily by the Nuclear Regulatory Commission. His past work with Hydro Geo Chem was funded by a variety of industrial and governmental clients that included FMC Corporation, cities of Tucson and Phoenix, Arizona, and the Venezuelan national oil company.

Stephen Washburn

Mr. Washburn is a Principal at ENVIRON International Corporation. He has an M.S. in Chemical Engineering from the Massachusetts Institute of Technology and a B.S.E. in Chemical Engineering from Princeton University, and has over seventeen years of consulting experience in risk-based engineering and risk assessment, with special emphasis on site remediation and air-related issues. Mr. Washburn's experience at hazardous waste or industrial sites includes remedial design, remedy selection, human health and ecological risk assessment, the development of site investigation strategies, and litigation support. He has conducted risk assessments and remedy evaluations at Superfund and RCRA sites across the U.S. He is also a nationally recognized expert in the evaluation of combustion facilities, and has provided expert testimony in the areas of risk assessment, incineration, and hazardous waste management. Except for expert review activities, all of Mr. Washburn's work is performed on behalf of ENVIRON, whose clients include private sector companies, public sector agencies, and citizen's organizations. Over the past two years, Mr. Washburn's clients have included private industry (including DuPont); the federal government (including the U.S. Army); foreign governments (including the Israel Ministry of the Environment); local municipalities (including the City of Philadelphia); and financial institutions (including Deutsche Bank).

Mr. Washburn was selected by U.S. EPA to serve on the external expert peer review panels for the Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, and for the multimedia, multi-pathway, and multiple receptor risk assessment (3MRA) model developed for the Hazardous Waste Identification Rule (HWIR). He was one of nine scientists selected by the American Society for Testing and Materials (ASTM) to provide training to state regulatory agencies and Puerto Rico on Risk-Based Corrective Action (RBCA)

at petroleum hydrocarbon sites, and assisted in the development of RBCA programs in over ten states. The U.S. Army Environmental Center has designated Mr. Washburn as a Subject Matter Expert (SME) in the areas of risk assessment and decision analysis, and has assisted in the technical peer review of over a dozen active and inactive Army installations. He was also a member of the Risk Assessment Subcommittee of the Pennsylvania Science Advisory Board, which was established to encourage Brownfield development in Pennsylvania.