Invitation for Public Comment on the List of Candidates for the EPA Science Advisory Board Hydraulic Fracturing Advisory Panel

November 27, 2012

The U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB) Staff Office announced in a *Federal Register* Notice (Volume 77, Number 162, Pages 50505 – 50506) published on August 21, 2012 that it was seeking public nominations of technical experts to serve on an expert Panel under the auspices of the SAB to provide advice on EPA's research related to hydraulic fracturing. The SAB Staff Office sought public nominations of nationally and internationally recognized scientists and engineers having experience and expertise related to hydraulic fracturing, including but not limited to the following disciplines or areas of experience: natural gas and petroleum engineering and geology; natural gas and petroleum well drilling, completion, testing, and closure; hydrology/hydrogeology; groundwater and surface water fate/transport modeling; geochemistry and analytical chemistry; environmental monitoring; conducting laboratory and/or field-based research in hydraulic fracturing; human health effects and risk assessment; civil and environmental engineering; chemical engineering; drinking water and waste water treatment systems; water quality; and statistics.

The SAB Staff Office Director will make the final decision about who will serve on the Panel based on all relevant information. This information includes a review of the confidential disclosure form (EPA Form 3110-48) and information independently gathered by staff and public comments. For the EPA SAB Staff Office, a balanced 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 a candidate include: a) scientific and/or technical expertise, knowledge, and experience; b) availability and willingness to serve; c) absence of financial conflicts of interest; d) absence of appearance of a lack of impartiality; e) skills working in committees, subcommittees, and advisory panels; and, for the Panel as a whole, f) diversity of scientific expertise and viewpoints.

The SAB Staff Office has identified the following list of candidates for this Panel based on their relevant expertise and willingness to serve. **We hereby invite public comments on the attached List of Candidates that the SAB Staff Office should consider in the formation of this Panel. Comments should be submitted to the attention of Mr. Edward Hanlon, Designated Federal Officer, no later than December 19, 2012. E-mailing comments (hanlon.edward@epa.gov) is the preferred mode of receipt.** Please be advised that comments received are subject to release under the Freedom of Information Act.

Acosta, Daniel

University of Cincinnati

Dr. Daniel Acosta, Jr. is the endowed Carl Chair of Pharmacy at the Winkle College of Pharmacy of the University of Cincinnati. He holds a B.S. in Pharmacy from the University of Texas, and a Ph.D. in Pharmacology/Toxicology from the University of Kansas. Dr. Acosta was the 4th dean of the University of Cincinnati's James L. Winkle College of Pharmacy from 1996 to 2011. He was a member of The University of Texas College of Pharmacy faculty for 22 years where he helped develop a nationally ranked program in toxicology as the first Director of the Toxicology Training Program. Dr. Acosta's research has focused on the development of in vitro cellular models to explore and evaluate the mechanisms by which xenobiotics damage or injure specific cell types of various organs or tissues. More recently, he has worked on the development of primary culture systems of rabbit corneal epithelial cells, conjunctival cells, and iris epithelial cells and primary cultures of rat epidermal keratinocytes as in vitro models to evaluate selected chemicals for ocular and dermal toxicity. Dr. Acosta's laboratory has had extensive experience in in vitro toxicology and in the development of cell culture systems and methods for assessing cytotoxicity. He is very active in pharmacy organizations, such as the American Association of Colleges of Pharmacy and the Accreditation Council for Pharmacy Education. Dr. Acosta serves on several editorial boards of toxicology and in vitro journals, and has been appointed to a number of government and private committees, including: Chairman of the U.S. Food and Drug Administration (FDA) Scientific Advisory Board for the National Center for Toxicology Research; Past Chairman and current member of the Texas A&M External Advisory Board of the National Institute of Environmental Health Sciences (NIEHS) Center for Environmental and Rural Health; a past member of the Board of Scientific Advisors for the Office of Research and Development of the Environmental Protection Agency; a past member of the National Advisory Committee to the Director of the Center for Environmental Health of the Centers for Disease Control and Prevention; a past member of the NIEHS Scientific Advisory Committee on Alternative Toxicological Methods which is advisory to NIEHS and the National Toxicology Program; and a past member of the Expert Committee on Toxicology and Biocompatibility of the United States Pharmacopoeia, 2000-2005. Dr. Acosta was appointed to the Committee on Toxicity Testing and Assessment of Environmental Agents for the National Academy of Sciences, which resulted in two pioneering reports on Toxicology in the 21st Century, 2007-2008. He is Chair of the Board of Directors of Toxicology Excellence in Risk Assessment, a non-profit organization that specializes in helping the public sector and government arena on risk assessment issues in the environment. Dr. Acosta was recently appointed to a three-year term on the Science Board of FDA, which advises the Commissioner on national issues in the areas of drugs, food, and cosmetics. He is the recipient of several awards and honors, including President of the Society of Toxicology (2000-2001), the 2006 Foundation Award in Excellence from the Pharmaceutical Research and Manufacturers of America Foundation, and Fellow of the Academy of Toxicological Sciences. For the past 16 years, Dr. Acosta has not been actively involved in any personal research projects and has not received any research funding from external government or private organizations.

Allen-King, Richelle M.

University of Buffalo, State University of New York

Dr. Richelle M. Allen-King is Professor and Chair of the Department of Geology at the University at Buffalo, State University of New York. She holds a B.A. in Chemistry from the University of California, San Diego, and a Ph.D. in Earth Sciences from the University of Waterloo, Ontario, Canada. Dr. Allen-King's main research interests are in understanding and integrating the basic processes which control the fate and transport of contaminants in the environment, particularly in groundwater. Her research focuses on transport and/or transformation of organic contaminants, including chlorinated solvents, hydrocarbons, and pesticides. Dr. Allen-King's research group is currently engaged in a study which tests how geologic-process based knowledge can improve our understanding of the composition and variability of aquifer properties as they relate to pollutant transport and remediation. She is also interested in transport and transformation of agricultural chemicals within watersheds. In addition to field investigation, Dr. Allen-King's research includes companion laboratory experiments to quantify the fundamental process often using gas chromatography for analysis of the organic compounds of interest. Dr. Allen-King served as National Science Foundation's Program Officer for Hydrologic Sciences between 2010-2011, and was a member of the National Research Council's Committee on Development and Implementation of a Cleanup Technology Roadmap, Committee on Sustainable Underground Storage of Recoverable Water, Committee on the Bioavailability of Contaminants in Soils and Sediments, and their Water Science and Technology Board. She has also served as a member of several U.S. Department of Energy Environmental Remediation review panels, and as an Associate Editor of Water Resources Research. She continues to serve as an Associate Editor of Groundwater. Dr. Allen-King is a Fellow of the Geological Society of America. Her current research is supported by funding from the National Science Foundation and the U.S. Department of Defense's Strategic Environmental Research and Development Program.

Almond, Stephen W.

MeadWestvaco

Dr. Stephen W. Almond is currently the Technical Director for Oilfield Chemicals with MeadWestvaco in Charleston, South Carolina. He holds a B.S. in Chemistry, Physics and Biology from Eastern Oregon State University, and a Ph.D. in Organic Chemistry from Oregon State University. Dr. Almond worked for Halliburton for over 30 years where his research and field application interests in hydraulic fracturing began. Dr Almond is responsible for the development and implementation of new chemical additives/fluid systems into field operations. He has taught the Hydraulic Fracturing and/or Stimulation Chemicals portion of the following schools, Modern Completion Practices, Advanced Engineer-in-Training, FRAC Design, Symposium on Well Completions, Advances in Stimulation Forum, Stimulation Operator Training and several domestic and international courses on stimulation. Dr. Almond served in several capacities for the Society of Petroleum Engineers such as Program Chairman, Technical Editor for Journal of Petroleum technology and Production Facilities Journals, Review Chairman for Production and Facilities Journal and served on numerous program selection committees both domestically and internationally. He has published several articles on various aspects of hydraulic fracturing and fracturing fluids along with holding numerous patents in this area. Dr. Almond worked and gained field experience on both the design and execution globally of hydraulic fracturing treatments which include the areas of Oklahoma, Alabama, Texas, California, West Virginia, New Mexico, Alaska, Poland, Hungary, Norway, Denmark, The Netherlands, Germany, the UK, Australia and Russia. In addition, he worked with the EPA in response to the Leaf v EPA law suit which was a challenge to the hydraulic fracturing of coalbed methane wells in Alabama and the claimed contamination of a family's well water. Dr. Almond has received no external grants from government agencies, private companies, or foundations.

Alshawabkeh, Akram

Northeastern University

Dr. Akram Alshawabkeh is a Geoenvironmental Engineering Professor at the Department of Civil and Environmental Engineering, Northeastern University. He holds a B.E. in Civil Engineering from Yarmouk University, Irbid, Jordan, an M.Sc. in Civil Engineering from Jordan University of Science and Technology (JUST), Irbid, Jordan , and a Ph.D. in Civil and Environmental Engineering from Louisiana State University, Baton Rouge, LA. Dr. Akram Alshawabkeh is the George A. Snell Professor of Engineering at Northeastern University, where he is a geoenvironmental engineering professor in the Department of Civil and Environmental Engineering. He is a fellow of the American Society of Civil Engineering (ASCE) and the Director of the "Puerto Rico Test site for Exploring Contamination Threats (PROTECT)" Superfund Research Program (SRP) Center, funded by the National Institute of Environmental Health Sciences (NIEHS). Dr. Alshawabkeh is an internationally-recognized expert in coupling soil behavior with geochemistry and geomechanics, contaminant fate and transport in soil and groundwater, soil remediation, electrokinetic/electrolytic processes and modeling. His work is summarized in more than 150 publications, including 75+ peer-reviewed journal papers or book chapters that are highly cited. In addition to work funded by NIEHS, he has also led or collaborated on research projects sponsored by the National Science Foundation (NSF), U.S. Army Corps of Engineers, U.S. Department of Energy, and industry. As part of the PROTECT Center that he directs, Dr. Alshawabkeh's current research is focused on assessment of contamination exposure through aquifers in karst regions, potential impacts on public health (specifically preterm birth) and development of remediation strategies. He has a strong service record, led and participated in many research workshops and organized several technical conference sessions and activities. Dr. Alshawabkeh is a former chair of Committee AFP40 "Physiochemical and Biological Processes in Soil" of the Transportation Research Board of the National Academies and is a member of several national and international committees. He is an editorial board member for several journals and was co-chair of the technical program of 2008 Annual Congress of the Geo-Institute of ASCE on "GeoCongress 2008: The Challenge of Sustainability in the Geoenvironment". Dr. Alshawabkeh has a track record of collaboration with government laboratories and industry. Dr. Alshawabkeh's recent research has been supported by grants from the National Science Foundation, National Institutes of Health, and National Institute of Environmental Health Sciences, and various state and local governments, entities, and foundations.

Anderson, Henry A.

State of Wisconsin Division of Public Health

Dr. Henry A. Anderson holds positions as the State Health Officer, State Environmental and Occupational Disease Epidemiologist, and Chief Medical Officer in the Wisconsin Division of Public Health, Department of Health Services, and adjunct professorships at the University of Wisconsin-Madison, School of Medicine and Public Health, Department of Population Health Sciences, and the University of Wisconsin Institute for Environmental Studies, Center for Human Studies. He holds a B.A. in Biology from Stanford University, and an M.D. from the University of Wisconsin-Madison. Dr. Anderson's expertise includes public health; preventive, environmental, and occupational medicine; respiratory diseases; epidemiology; human health risk assessment; and risk communication. His active research interests include: disease surveillance, childhood asthma, lead poisoning, reproductive and endocrine health hazards, drinking water contaminants, occupational and environmental respiratory disease and sport fish consumption advisory communication. Dr. Anderson served on the U.S. Environmental Protection Agency's (EPA) National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances. He was chair of the Environmental Health Committee of the EPA Science Advisory Board, served on the chartered EPA SAB, and is past Chair of the Board of Scientific Councilors for the National Institute of Occupational Safety and Health. Dr. Anderson has served on five National Academy of Sciences Committees including Toxicity Testing for Assessment of Environmental Agents and just completed service on the Committee, Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater. He was a founding member of the Agency for Toxic Substances and Disease Registry Board of Scientific Councilors (1988-1992). Dr. Anderson serves on the Presidential Advisory Board on Radiation Worker Compensation. He has served on the Armed Forces Epidemiology Board and the Centers for Disease Control and Prevention (CDC)/ National Center for Environmental Health Director's Advisory Committee. Dr. Anderson is a fellow of the Collegium Ramazzini and the American Association for the Advancement of Science. He is associate editor of the American Journal of Industrial Medicine. Dr. Anderson was certified in 1977 by the American Board of Preventive Medicine with a sub-specialty in occupational and environmental medicine and in 1983 became a fellow of the American College of Epidemiology. He is a state government employee and his research has been supported by the State of Wisconsin and grants from U.S. government agencies, primarily U.S. Department of Health and Social Services/Centers for Disease Control and Prevention and the U.S. Environmental Protection Agency.

Armagost, W. Kenneth

Anadarko Petroleum Corporation

Mr. Ken Armagost is a Drilling Engineering Advisor within the Engineering and Technology Group of Anadarko Petroleum Corporation. He holds a B.S. in Chemical Engineering from the Ohio State University. Mr. Armagost has 33 years of experience in the oil and gas industry, including well design, well construction, and drilling and intervention technology development. His work experience includes both domestic and international onshore and offshore well design and construction. In his current role as a Drilling Engineering Advisor, he is a member of several American Petroleum Institute (API) task groups charged with the development of industry well construction and well operation standards. Mr. Armagost has received no external grants from either government agencies, private companies, or foundations.

Arthur, J. Daniel

ALL Consulting

Mr. Dan Arthur is a founding member and President of ALL Consulting. Mr. Arthur holds a B.S. in Petroleum Engineering from the University of Missouri-Rolla. As a recognized authority and with a demonstrated ability to work on committees, groups, and consultation for environmental issues pertaining to unconventional resource development and production, Mr. Arthur recently served as a sub-committee chair to the National Petroleum Council study on North American Gas and Oil Resources requested by the Secretary of Energy. He was selected as a Special Government Employee serving on the Unconventional Resources Technology Advisory Committee of the U.S. Department of Energy that was established pursuant to Section 999D of the Energy Policy Act of 2005. Mr. Arthur has served as the lead researcher on numerous projects involving unconventional resources; environmental considerations pertaining to shale gas development; chemical disclosure, produced water management and recycling; underground injection control (UIC) programs in multiple states and nationally for the U.S. Environmental Protection Agency (EPA); access to federal lands; and low impact natural gas and oil development. He has also managed U.S. Department of Energy (DOE) funded research projects involving the development of best management practices for efficient environmental protection of unconventional resource development and production; research to develop a national primer on coal bed methane (CBM) and a primer for modern shale gas development; research to develop a handbook on the preparation and review of environmental documents for CBM development; and research with the Ground Water Protection Research Foundation (GWPRF) funded by DOE and U.S. Bureau of Land Management involving analysis of produced water management alternatives and beneficial uses of coal bed methane produced water. In addition, he serves as the ALL Consulting Project Manager working with the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission to design, develop, and maintain FracFocus, a nation-wide system for disclosure of chemicals used hydraulic fracturing. While employed with EPA in Region V, Mr. Arthur was a member of the National Mechanical Integrity Test (MIT) Workgroup. As a member of the workgroup, he was responsible for witnessing and evaluating numerous alternative mechanical integrity (MI) testing methods for various types of wells throughout the country. During Mr. Arthur's tenure in the MIT workgroup, he reviewed over twenty (20) proposed alternate MI testing methods and took a lead role in ultimate approval of several tests, including the Oxygen Activation log and the Dual-Completion test. Mr. Arthur has published many articles and reports and has made numerous presentations on environmental, energy, and technology issues related to oil and gas resource development. He is a Professional Engineer and is Certified by the Society of Petroleum Engineers (SPEC). Mr. Arthur's research has been supported by grants from DOE’s National Energy Technology Lab (NETL), the Petroleum Technology Alliance of Canada (PTAC), and the Science and Community Environmental Knowledge (SCEK) Fund.

Bachu, Stefan

Alberta Innovates – Technology Futures

Dr. Stefan Bachu is a Distinguished Scientist at Alberta Innovates – Technology Futures. He holds a Dipl. Eng. in Water Resources Engineering from Bucharest Polytechnic University, Romania, and an M.S. and Ph.D. in Civil Engineering from Technion - Israel Institute of Technology. Since 1977, Dr. Bachu has performed individual and team research in the areas of hydrogeology and contaminant transport; geothermics; reservoir, aquifer and basin analysis and characterization; fluid flow and transport in porous media; and CO_2 geological sequestration. Dr. Bachu has been involved in various research activities related to hydrogeology and subsurface flow of fluids and heat, with application to the Western Canada Sedimentary Basin. For the last two decades he has focused his research interest and efforts on the potential for, and risks of CO_2 storage in geological media as a mitigation strategy for reducing greenhouse gas emissions into the atmosphere. From 1999 to 2008 Dr. Bachu was Senior Advisor for Energy and Carbon Management Geoscience at the Alberta Energy Resources Conservation Board (ERCB). Between 1987 and 2003 he was Head of the Energy Section in the Alberta Geological Survey (currently a Group within ERCB, and previously a department within the Alberta Research Council). Between 2002 and 2005 Dr. Bachu was a member of the Canadian Natural Sciences and Engineering Research Council's Strategic Project Grants Panel for Greenhouse Gas Mitigation, and also contributed as a Lead Author to Chapter 5 on CO_2 Geological Storage of the Intergovernmental Panel on Climate Change Special Report on CO_2 Capture and Storage, in which capacity he co-shares in the 2007 Nobel Peace Prize awarded to IPCC. Between 2005 and 2007 Dr. Bachu represented ERCB on the Interstate Oil and Gas Compact Commission Task Force on CO_2 Storage. In 2007 he served on the Technical Working Group of the Canada-Alberta EcoEnergy Task Force on Carbon Capture and Storage. Between 2009 and 2012 he contributed to the Canadian Standards Association standard on Geological Storage of Carbon Dioxide. Since 2004 Dr. Bachu represents Canada on the Technical Group of the Carbon Sequestration Leadership Forum (CSLF), where he chaired the CSLF Task Force on CO_2 Storage Capacity Estimation and currently chairs the Task Force on Technological Challenges on the Transition from CO_2 - Enhanced Oil Recovery to CO_2 Storage. Currently he is also co-chair of the Expert Panel of the Regulatory Framework Assessment for CO_2 storage in the province of Alberta. Dr. Bachu is a registered Professional Engineer in the provinces of Ontario and Alberta, Canada. His research over years has been supported through research contracts with the Alberta provincial government, the Canadian federal government, and industry. Dr. Bachu has not received research grants from either government agencies, private companies or foundations. He is Associate Editor of the International Journal of Greenhouse Gas Control, and has published 175 papers in journals and conference proceedings, made more than 300 presentations and wrote more than 100 professional reports, of which more than half are on the subject of CO_2 sequestration in geological media.

Bagawandoss, Kesavalu M.

Accutest Laboratories

Dr. Kesavalu M. Bagawandoss serves as the Technical Director for Accutest Laboratories and is the Laboratory Director for the Northern California Laboratory Operations of Accutest Laboratories. He holds a B.S. in Chemistry from Loyola College, University of Madras, Madras, India, an M.S. in Chemistry from Wichita State University, a Ph.D. in Engineering (Environmental Science) from the University of Oklahoma, and a J.D. from Southern University Law Center and is licensed to practice Law in Louisiana. Dr. Bagawandoss was a Senior Associate Editor of the Southern University Law Review. Dr. Bagawandoss serves as a technical resource for the network laboratories as well as technical contact to clients. He serves as a technical liaison to the Marketing group of Accutest Laboratories, and is responsible for the Laboratory's Hydraulic Fracturing and Industrial Initiatives. He was invited as a Subject Matter Expert by the U.S. Environmental Protection Agency (EPA) to present at the EPA's Hydraulic Fracturing Workshop and served as a Theme Lead for the Field and Analytical Challenges session. Dr. Bagawandoss delivers presentations on various topics both nationally and regionally at conferences as well as client specific topics. He served as Co-Chair for the Shale Gas Session and the Forensics Session at the EPA/NELAC Institute (TNI) 2012 conference. Dr. Bagawandoss also serves as a member of the Marcellus Shale Coalition. He has also performed method validations for the EPA Contract Laboratory Superfund Program for various analytical methods. Also, Dr. Bagawandoss designs and develops Analytical Methods and Sampling protocols for client specific needs and applications or regulatory requirements. Dr. Bagawandoss has received no external research grants from either government agencies, private companies, or foundations.

Bair, E. Scott

Ohio State University

Dr. E. Scott Bair is a Professor in the School of Earth Sciences at Ohio State University with a joint appointment in the Department of Civil, Environmental, and Geodetic Engineering. He holds a B.A. in Geology from the College of Wooster (Wooster, Ohio) and M.S. and Ph.D. degrees in Geology from The Pennsylvania State University. Dr. Bair's expertise is in the areas of ground-water flow to wells, subsurface injection of fluid wastes, ground-water flow and contaminant transport modeling, aquifer testing, and geologic controls on regional and local ground-water flow. Dr. Bair is a field-based scientist who uses ground-water flow and contaminant transport models, water chemistry and isotopes, and statistics in his research. Currently, he is examining two paleokarst zones in the Midwest and their impact on the drilling and the efficacy of geothermal wells. Dr. Bair has received grant funding for his research from a variety of federal and state agencies including the National Science Foundation, U.S. Department of Agriculture, U.S. Geological Survey, Ohio Environmental Protection Agency, and Ohio Department of Natural Resources (DNR). At Ohio State, he teaches advanced courses in hydrogeology, petroleum geology, and speleology. For the past 25 years, Dr. Bair has taught professional short courses for the National Ground Water Association. He was the lead author of the Ohio DNR report on the stray gas incident at Bainbridge, Ohio. Previously, Dr. Bair served on advisory panels for the Centers for Disease Control – Agency for Toxic Substances and Disease Registry (modeling contaminant transport at Camp Lejeune, North Carolina, with respect to the cluster of male breast cancer cases), Ohio DNR (Bainbridge stray gas incident), and Ohio DNR (brine disposal task force). In addition, he served on the advisory panel for the U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water 2001 Report to Congress entitled "Study of the Risks Associated with Class I Underground Injection Wells, Class I UIC Program".

Baldassare, Fred

Echelon Applied Geochemistry Consulting

Mr. Fred Baldassare is a Senior Geoscientist and the owner of Echelon Applied Geochemistry Consulting. He holds a B.S. in Geology from the University of Pittsburgh. Mr. Baldassare is an expert in the application of isotope geochemistry to constrain gas origin, and to identify specific sources of stray gas in the environment. He has more than 25 years of experience as a geologist, and 19 years of experience investigating more than 200 incidents of stray gas migration. Mr. Baldassare has helped to pioneer the application and advancement of isotope geochemistry to identify and distinguish the origin of microbial and thermogenic gases in the Appalachian Basin. He previously served as the statewide consultant for the Pennsylvania Department of Environmental Protection (PADEP) for investigating and characterizing source(s) of stray carbon dioxide and natural gases. Mr. Baldassare developed PADEP's guidance document for stray gas incident response and co-authored § 78.89. *Gas migration response*, of Title 25—PA. Code Chpt. 78 of PADEP's Oil & Gas regulations. Mr. Baldassare also served on the technical advisory committee for the Marcellus Shale Coalition (MSC), and was the lead author for the MSC's "Recommended Practices to Respond to Stray Combustible Gas Incidents." Mr. Baldassare has authored and co-authored numerous professional papers for peer reviewed publications and research presentations on the application of isotope geochemistry. He has investigated and been consulted on numerous groundwater issues related to the development and production of the Marcellus Shale Formation as well as other unconventional shale gas plays across the Country. Mr. Baldassare receives no federal research funding.

Bales, Jerad

U.S. Geological Survey

Dr. Jerad Bales is the U.S. Geological Survey's (USGS) Chief Scientist for Hydrology. He holds a B.S. and M.S. in Civil Engineering from the University of Tennessee, and a Ph.D. in Civil Engineering from the University of Texas, Austin. In his current position, Dr. Bales is responsible for the planning and development of USGS national research programs related to the hydrologic environment; for overseeing research conducted under the mandates of the Water Resources Research Act of 1984; and for leading USGS quality-assurance, technical transfer, and technology development activities for the USGS operational program in water. He serves on a number of external committees including as co-chair of the Subcommittee on Water Availability and Quality (a Federal interagency committee under the National Science and Technology Council's Committee on the Environment, Natural Resources, and Sustainability), Water Sector lead for the U.S. 2013 National Climate Assessment, member of the National Science Foundation's Critical Zone Observatory Advisory Board, and as the USGS representative to the GEO (Group on Earth Observations) Water Theme. Dr. Bales also serves as a member of the Interagency (U.S. Department of Energy; U.S. Environmental Protection Agency; and U.S. Department of Interior) Hydraulic Fracturing Technical Committee, and was responsible for developing water-related aspects of the long-term interagency research plan. Prior to his position as Chief Scientist, Dr. Bales was Director of the USGS North Carolina Water Science Center in Raleigh, NC. Concurrent with his position with the USGS, he served as Adjunct Professor at the Department of Geography at the University of North Carolina at Chapel Hill, and Visiting Assistant Professor in Forestry and Environmental Studies at Duke University, Durham. Dr. Bales has been principal investigator or Co-PI on numerous water-resources investigations throughout the U.S., as well as internationally. His research has covered a broad range of ground- and surface-water issues, and has been funded by more than 20 different Federal, State, and local agencies, with core grant research support primarily from the USGS. Dr. Bales has authored more than 120 articles and technical reports, and has received numerous awards for his government service with USGS, including the U.S. Department of the Interior Superior Service Award in 1992.

Bank, Tracy

University of Buffalo

Dr. Tracy Bank is a research assistant professor in geology at University of Buffalo and is also a faculty participant at the Oak Ridge Institute for Science and Education (ORISE) National Energy Technology Laboratory in Pittsburgh. She holds B.S. degrees in Geology and Chemistry from St. Francis Xavier University, an M.S. in Economic Geology from UNLV, and a Ph.D. in Geochemistry from Virginia Tech University. Dr. Bank was a post-doc in the Environmental Sciences Division at Oak Ridge National Lab where she received the division award for outstanding post-graduate research. She has been an Assistant Professor at the University at Buffalo since 2007. Dr. Bank's research focuses on the behavior of heavy metals in geological environments, both as environmental concerns and as mineable resources. Her research on the Marcellus Shale has been supported by both government agencies as well as by private industry. Dr. Bank's research on the extractability of metals from the Marcellus Shale is currently funded through contract with the Department of Energy; she has received no external grants from either government agencies, private companies, or foundations. Her Marcellus Shale research has resulted in more than a dozen presentations at professional meetings, two publications, and three completed graduate theses. Dr. Bank was a presenter and theme lead at the EPA's chemical and analytical methods technical workshop for the hydraulic fracturing study held in Washington DC in 2011.

Barry, Terence

AquaMost

Dr. Terence Barry is a Senior Scientist and Director of the Laboratory of Fish Endocrinology and Aquaculture in the Department of Animal Sciences at the University of Wisconsin – Madison. Dr. Barry is also Co-Founder and Chief Science Officer (CSO) for AquaMost, Inc. He holds a B.S. in Zoology from the University of Wisconsin – Madison, an M.S. in Zoology from the University of Hawaii & Hawaii Institute of Marine Biology, and a Ph.D. in Endocrinology and Reproductive Physiology from the University of Wisconsin – Madison. Prior to co-founding AquaMost, he owned and managed one of the largest private fish hatcheries in the state of Wisconsin. Dr. Barry has worked for over 30 years as an academic research scientist. He has successfully administered multiple projects (e.g., staffing, research protections, budget), collaborated with other researchers, and produced peer-reviewed publications. Most of his earlier research focused on fish physiology and toxicology, and he recently was funded by a U.S. Environmental Protection Agency STAR grant to evaluate the fate and effects of steroid hormones associated with concentrated animal feeding operations (CAFOs) on the environment. Although he still maintains a laboratory at the University of Wisconsin (and has students conducting research in fish toxicology), Dr. Barry has been working essentially full-time for the Aquamost since 2008. Dr. Barry has led the Research & Development efforts of AquaMost since its inception, and has a deep practical knowledge of advanced water purification technologies. AquaMost is a start-up technology company that manufactures and sells an advanced water purification device used to remediate wastewater from hydraulic fracturing operations. Aquamost has deployed large-scale devices of this technology on field sites in the Permian and Barnett basins in Texas and will soon conduct additional field trials in the Marcellus basin in PA and the Williston basin in ND. Dr. Barry is currently the Principal Investigator on a Phase 2 Small Business Innovation Research grant from the National Institutes of Health (NIH) National Institute of Environmental Health Sciences (NIEHS). The goal of the project is to study the effects of AquaMost's technology on remediating groundwater contaminated with Methyl tertiary-butyl ether. Dr. Barry was a Peace Corps Volunteer (Samoa, 1977-1980), an East-West Center Scholar (Honolulu, HI), and a Fulbright Scholar (U. Tokyo, Japan).

Benjamin, Mark M.

University of Washington

Dr. Mark M. Benjamin is a professor in the Environmental Engineering and Science Program of the Department of Civil and Environmental Engineering at the University of Washington, where he has been on the faculty since 1977. Dr. Benjamin received his B.S. in Chemical Engineering from Carnegie-Mellon University in 1972, his M.S. in Chemical Engineering from Stanford University in 1973, and his Ph.D. in Environmental Engineering from Stanford University in 1978. Dr. Benjamin is an expert in physical/ chemical treatment processes in general, with long-term research interests in the behavior of natural organic matter (NOM) and its removal from potable water sources, and in the development of adsorption-based processes for removal of metals, NOM, and other contaminants from solutions. For the past 15 years, a major focus of Dr. Benjamin's work has been membrane treatment of drinking water, and in particular, approaches for interfering with membrane fouling by NOM. In addition to the topics noted above, Dr. Benjamin has published research on conventional coagulation and filtration processes, diffusion dialysis, and mineral dissolution kinetics. His work has been recognized by a Fulbright fellowship and several awards for best publications in various journals, and three of his students have won awards for best doctoral thesis in environmental engineering. In addition to his research activities, Dr. Benjamin has served on the Board of Directors of the Association of Environmental Engineering and Science Professors (AEESP), has written a widely adopted graduate-level textbook on Water Chemistry (McGraw-Hill, 2002), and has recently completed a textbook on Physical-Chemical Treatment of Water with Professor Desmond Lawler of the University of Texas, to be published by Wiley (2013). He has twice held five-year appointments to endowed Chairs, and was the AEESP Distinguished Lecturer for 2009-10. Dr. Benjamin's research has been supported by grants from both government agencies and private foundations, with core grant research support primarily being from the federal government (U.S. Environmental Protection Agency, National Science Foundation, and the Office of Naval Research), with additional grant support from foundations.

Bloomfield, Peter

North Carolina State University

Dr. Peter Bloomfield is a Professor of Statistics at North Carolina State University (NCSU). He holds a B.Sc. in Mathematics and a Ph.D. in Statistics from the University of London. Dr. Bloomfield has held faculty positions at Imperial College and Princeton University before joining NCSU in 1983. He specializes in statistical methods for analyzing time series data, and has particular interests in geophysical and financial data and nonlinear statistical models for univariate and multivariate responses. Dr. Bloomfield has authored and coauthored numerous scientific publications including book chapters, journal articles, and non-refereed publications. He is a Fellow of the Royal Statistical Society since 1969, and a Member and Fellow of the American Statistical Association as well as the Institute of Mathematical Statistics. He has served as Associate Editor of Technometrics, of the Journal of the American Statistical Association, and of the SIAM Journal of Scientific and Statistical Computing. He has served on committees and panels of the Institute of Mathematical Statistics, the American Statistical Association, the National Research Council, and the National Aeronautics and Space Administration. Dr. Bloomfield also contributed to reports of the Intergovernmental Panel on Climate Change (IPCC). He is the author of a book on the frequency-domain analysis of time series, now in its second edition, and co-author of a book on statistical methods based on least absolute deviations. Dr. Bloomfield has twice taken extended leaves to work on financial models at a major financial institution. His research is not currently funded by external research grants from government agencies, private companies, or foundations.

Bohlen, Steven

U.S. Department of Energy

Dr. Steven Bohlen is Deputy Program Director for Energy and Environmental Security, Office of Strategic Outcomes at Lawrence Livermore National Laboratory, where he helps represent the Global Security Directorate in Washington D.C. and develops programs in energy and environmental security. He also works with the Institute for Gas Drilling Excellence (IGDE) to develop Standards of Excellence in partnership with industry and flagship non-governmental organizations. The IGDE brings together large natural gas developers in the Marcellus region with other stakeholders to develop strong environmental guidelines and best management practices standards for shale gas development in Pennsylvania, along with a rigorous third-party verification procedure. Dr. Bohlen holds an A.B. in Liberal Arts from Dartmouth College, and an M.S. in Geology and a Ph.D. in Geology and Geochemistry from The University of Michigan. An earth scientist, he has served science and society as a prominent researcher, professor, and senior manager. As President and CEO of Joint Oceanographic Institutions from 2000-2008, Dr. Bohlen strengthened the systems engineering and naval architecture capabilities of the organization and led the global effort in scientific ocean drilling through the Integrated Ocean Drilling Program and the development of the National Science Foundation's Ocean Observatories. From 1995 through 2000, he was Associate Chief Geologist for Science at the U.S. Geological Survey where he was responsible for the scientific priorities and funding of the broad portfolio of USGS research, including the National Earthquake Hazards Reduction, Climate Change, Global Energy, and Minerals Resource programs. Dr. Bohlen was a Consulting Professor at Stanford University from 1988-1995 and a tenured professor at Stony Brook University from 1982-88. Dr. Bohlen's research on the formation, evolution, and stabilization of continental crust of the Earth and in marine geology and geophysics has led to a comprehensive understanding of how the Earth works. Dr. Bohlen's 25 years of research is widely cited, and he is among a select group in ISI's Web of Science of Highly Cited Researchers in the field of Geoscience (atmosphere, ocean, and solid Earth). In decades past, Dr. Bohlen's research was funded through grants from federal government agencies, almost exclusively the National Science Foundation. Dr. Bohlen is currently in a leadership position with no research components or responsibilities.

Bolich, Richard E.

State of North Carolina Department of Environment and Natural Resources

Mr. Rick Bolich is a Hydrogeologist for the State of North Carolina Department of Environment and Natural Resources (NCDENR). He holds a B.S. in Geology from the University of Miami, and an M.S. in Geology from North Carolina State University. Mr. Bolich has over 25 years of experience in the private and public sectors, and has experience in petroleum exploration and crystalline bedrock hydrogeology. His current position as the Senior Hydrogeologist in the NCDENR Division of Water Quality's Aquifer Protection Section provides technical support to all regulatory program areas to help insure that North Carolina's rules and programs result in protection of the state's groundwater resource. Previously, Mr. Bolich served as President of Geo-Solutions, Inc. in Raleigh, NC, Project Hydrogeologist for RUST Environment and Infrastructure, Inc., and Staff Hydrogeologist for Metcalf & Eddy, Inc. He has served as a member of other local technical advisory committees such as the Wake County groundwater study technical advisory committee. Mr. Bolich's research has been supported by various state and federal grants, however Mr. Bolich's position with the state of North Carolina is funded by state appropriated funds; Mr. Bolich has received no external research grants from private companies or foundations.

Boufadel, Michel

New Jersey Institute of Technology

Dr. Michel Boufadel is a Professor of Environmental Engineering and the Director of the Center for Natural Resources Development and Protection at the New Jersey Institute of Technology, Newark, NJ. He holds a B.S. in Civil Engineering (Hydraulics) from the Jesuit University at Beirut, Lebanon, and an M.S. and Ph.D. in Environmental Engineering from the University of Cincinnati. Dr. Boufadel is a Professional Engineer (Environmental Engineering) in New Jersey and Pennsylvania, and a Professional Hydrologist (hydrogeology) as accredited by the American Institute of Hydrology. His area of expertise is Environmental Hydrology and Hydraulics, where he develops methods to understand the behavior of complex hydrologic and environmental systems. Dr. Boufadel has research funding from the National Oceanic and Atmospheric Administration to investigate the persistence of the Exxon Valdez oil spill, from the U.S. Coast Guard to evaluate the impact of the Deepwater Horizon spill in the Gulf of Mexico, and from the William Penn Foundation to investigate the impact of the hydrofracturing on groundwater quality. He is co-Editor of a Special Issue on Shale Gas in the Journal of Environmental Engineering, American Society of Civil Engineers (ASCE). Dr. Boufadel is Associate Editor in two Journals: Journal of Water Quality, Exposure and Health, and Journal of Environmental Engineering, ASCE. He served on the EPA Science Advisory Board to evaluate the EPA plan on assessing the impact of hydrofracturing, and he is serving on the National Research Council committee on the impact of the Deepwater Horizon spill on the Gulf of Mexico ecosystem. Dr. Boufadel is author of numerous articles in publications such as Nature Geoscience, Environmental Science and Technology, and Journal of Geophysical Research. He is also co-Editor on a recent Special Issue of the Journal of Environmental Engineering (ASCE) on shale gas.

Boyer, Elizabeth

Pennsylvania State University

Dr. Elizabeth Boyer is an Associate Professor of Water Resources in the Department of Ecosystem Science and Management at the Pennsylvania State University. She serves as Director of the Pennsylvania Water Resources Research Center, and as Assistant Director of Penn State Institutes of Energy & the Environment. Prior to her current position, Boyer served on the faculty at the State University of New York at Syracuse and at the University of California at Berkeley. She holds a B.S. degree in Geography from the Pennsylvania State University, and M.S. and Ph.D. degrees in Environmental Sciences from the University of Virginia. Dr. Boyer's research explores coupled hydrological and ecological processes in watersheds that affect water quality and quantity. She is particularly interested in how human activities and environmental variability influence status and trends in streams, rivers, and coastal waters. Dr. Boyer is a member of the American Geophysical Union, American Water Resources Association, American Society of Limnology and Oceanography, and the Society for Freshwater Science. She has Chaired the American Geophysical Union's technical committee on Water Quality, and has Chaired the international Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology and Geochemistry. Dr. Boyer's current research focuses on quantifying impacts of acidic deposition and mercury deposition on water quality (funded by the Pennsylvania Department of Environmental Protection and the U.S. Environmental Protection Agency); characterizing carbon and nitrogen cycling in watersheds (funded by the National Science Foundation and by the U.S. Department of Agriculture); and understanding impacts of shale gas development on water resources (funded by the U.S. Forest Service).

Brantley, Susan L.

Pennsylvania State University

Dr. Susan L. Brantley is Distinguished Professor of Geosciences in the College of Earth and Mineral Sciences at Penn State University, where she is also the Director of the Earth and Environmental Systems Institute. She has been on the faculty at Penn State since 1986. Dr. Brantley holds an A.B. in Chemistry and an M.A. and Ph.D. in Geological and Geophysical Sciences, all from Princeton University. Dr. Brantley's career as a geochemist focuses on the chemistry of natural waters both at the surface of the earth and deeper in the crust. Dr. Brantley and her research group investigate chemical, biological, and physical processes associated with the circulation of aqueous fluids in shallow hydrogeologic settings. She has published more than 160 refereed journal articles and 15 book chapters. Professor Brantley is a fellow of the American Geophysical Union (AGU), the Geological Society of America (GSA), the Geochemical Society, the European Association of Geochemistry, and the International Association for GeoChemistry. She was president of the Geochemical Society from 2006 to 2008. Professor Brantley was awarded the Arthur L. Day Medal from the Geological Society of America in 2011, the Presidential Award from the Soil Science Society of America in 2012, and an honorary doctorate from the Paul Sabatier University (Toulouse III, France) in 2012. Dr. Susan L. Brantley was appointed to the U.S. Nuclear Waste Technical Review Board on September 21, 2012, by President Barack Obama. Also in 2012, she was elected to membership in the U.S. National Academy of Sciences. Dr. Brantley's research has been supported by grants mostly from the Pennsylvania State University and from federal government agencies (National Science Foundation, U.S. Department of Energy, and National Aeronautics and Space Administration). She has mentored students funded by those agencies as well as a student who was awarded a U.S. Environmental Protection Agency Science to Achieve Results (STAR) Fellowship. For a few years early in her career, she was funded by the American Chemical Society Petroleum Research Fund and the Gas Research Institute and was hosted for two sabbaticals at the U.S. Geological Survey in Menlo Park, CA. With respect to issues related to hydraulic fracturing, Dr. Brantley currently holds funding from the National Science Foundation to develop an online database of water quality in areas in the northeast experiencing rapid unconventional shale gas development.

Bratton, Thomas R.

Schlumberger Technology Corporation

Mr. Thomas R. Bratton is currently a Scientific Advisor for Schlumberger Technology Corporation. He is also associated with the Colorado School of Mines serving on the advisory board of different research consortia doing research in the development of both conventional and unconventional oil and gas reservoirs. Mr. Bratton holds a B.S. in Physics from Nebraska Wesleyan University and an M.S. in Experimental Atomic Physics from Kansas State University. He has worked for Schlumberger for 35 years in numerous capacities spanning research to field operations while integrating geophysics, petrophysics and geomechanics with drilling, completion and reservoir engineering. Mr. Bratton is a Professional Geophysicist registered by the Texas Board of Professional Geoscientists. His research has been supported by funding from Schlumberger and contractual sources of funding from Schlumberger's customers. Mr. Bratton has not received any external research grants from either government agencies or foundations.

Brooks, Bryan W.

Baylor University

Dr. Bryan W. Brooks is Professor in the Department of Environmental Science and Institute of Biomedical Studies, and Director of the Environmental Health Science Program at Baylor University. He holds a B.S. and M.S. in Biological Sciences from the University of Mississippi and a Ph.D. in Environmental Science from the University of North Texas. Dr. Brooks joined the faculty of Baylor University in 2002. His research focuses on environmental, aquatic and comparative toxicology and pharmacology, sustainable molecular design, developing approaches to define risks of contaminants of historical and emerging concern, water reuse, and the ecology and toxicology of harmful algae blooms, particularly Prymnesium parvum (a.k.a. Golden Algae, or the Texas Tide). Dr. Brooks' research has been supported by grants from government agencies, with core grant research support primarily being from the federal government (e.g., U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration), with additional grant support from state and local governments, industry, and foundations. He has specifically studied water quality questions related to natural resource extraction of Marcellus and Barnett Shale. Dr. Brooks is a member of a hydraulic fracturing working group and coauthor of an issue statement on toxicology and hydraulic fracturing for the Society of Toxicology. He is coordinating development of an international workshop on exposure pathways and environmental quality implications of natural gas development for the Society of Environmental Toxicology and Chemistry. Dr. Brooks is an Associate Editor of Science of the Total Environment and Integrated Environmental Assessment and Management.

Brown, Glenn O.

Oklahoma State University

Dr. Glenn O. Brown is Regents Professor and Graduate Coordinator, of Biosystems and Agricultural Engineering at Oklahoma State University. He holds a B.S. from Arizona State University, and M.S. and Ph.D. degrees from Colorado State University, all in Civil Engineering. Dr. Brown specializes in environmental impact analysis and has a total of 40 years of education and experience. He teaches and conducts research in fluid mechanics, hydraulics and groundwater pollution. A licensed Professional Engineer, he has been elected a Fellow in the American Society of Biological and Agricultural Engineers, and is a Diplomate, Water Resources Engineer in the American Society of Civil Engineers. Dr. Brown has significant research and industrial experience in hydrogeology, contaminant transport and fate, fracture transport, environmental engineering, and water quality. In addition to his current appointment, he has held positions at Sandia National Laboratories, Colorado State University, Gulf Oil Corporation, and the U.S. Bureau of Reclamation. At Gulf, he conducted environmental assessment field studies for coal mines in nine states. At Sandia, Dr. Brown conducted extensive laboratory actinide transport column experiments on fractured rock that supported the successful permit for the Waste Isolation Pilot Plant. At OSU he has been Principal or Co-Principal Investigator on 38 research grant projects funded by the National Science Foundation, the U.S. Department of Energy, the U.S. Geological Survey, the U.S. Department of Agriculture, the U.S. Environmental Protection Agency and other organizations. Previous research has included methods for interpreting rock core tomography to quantify mineral and porosity distributions. Recent research has investigated the use of engineered filter media to improve storm water quality. That effort has combined laboratory characterization of materials, prototype field installations, and finite element modeling to quantify the impact on flow and solute transport resulting from the variability in the filter media. Dr. Brown has authored 162 journal articles, book chapters, proceedings papers and technical reports. Those works cover a broad range of topics in hydrology including historical research on Henry Darcy. Finally, Dr. Brown's contribution to University, Federal, State, and professional society committees has been recognized with several awards and citations. He was the founder and Chair of the Oklahoma Water Research Symposium, until stepping down last year. After partnering with the Governor's Water Conference, the Symposium has grown to an annual attendance of over 400 hundred scientists, agency staff and private citizens.

Brownawell, Bruce J.

State University of New York, Stony Brook

Dr. Bruce J. Brownawell is an Associate Professor at the School of Marine and Atmospheric Sciences at Stony Brook University, and is a member of the University's Groundwater and Waste Reduction and Management Institutes. He also directs the Trace Organic Chemical Mass Spectrometry Laboratory. He received his B.S. in Chemistry at DePaul University and his Ph.D. from the MIT/Woods Hole Oceanographic Institution in Chemical Oceanography, and has experience serving on scientific technical advisory committees related to Superfund site assessments and remediation, and on multi-disciplinary review panels for a variety of programs, including the National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program. Dr. Brownawell is an environmental organic chemist, with expertise in the detection, and sources and fate of organic contaminants in natural waters and wastewater treatment systems. Much of his research in recent years has involved development and application of new HPLC-MS methods to characterize the trace level occurrence and fate of more polar contaminants such as steroidal estrogens, pharmaceuticals, and metabolites of personal care products. Dr. Brownawell is an expert on the analysis and fate of surfactants, with current work on the fate of oil spill dispersants in coastal seawater, and other cationic, nonionic, anionic surfactants and their metabolites in wastewater treatment plants, sewage sludge, biosolids, receiving waters and sediments. He has developed and taught graduate level courses on Organic Contaminant Hydrology, Groundwater Hydrology, Bioremediation, and Organic Geochemistry. Dr. Brownawell's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (NIEHS Superfund Research Program) and a current grant from the Gulf of Mexico Research Initiative.

Bruckner, James V.

University of Georgia

Dr. James V. Bruckner is currently a Professor of Pharmacology and Toxicology in the Department of Pharmaceutical and Biomedical Sciences of the College of Pharmacy of the University of Georgia (UGA). He holds a B.S. in Pharmacy and a M.S. in Toxicology from the University of Texas in Austin, and a Ph.D. in Toxicology from the University of Michigan. Dr. Bruckner organized and directed the UGA Interdisciplinary Toxicology Graduate Program in Toxicology for 15 years. Prior to that time he held a tenured faculty position at the University of Texas Medical School at Houston. Dr. Bruckner's primary areas of expertise are general toxicology, toxicokinetics (TK) and human health risk assessment. His primary research focus is on the toxicology and TK of volatile organic chemical contaminants of drinking water, drug-chemical interactions at environmental exposure levels, metabolic and toxicokinetic bases for susceptibility of children to chemicals, and physiological modeling of solvents and pyrethroid insecticides. The relevance of experimental designs to health risks of "real life" chemical exposures is of particular interest to Dr. Bruckner. His research funding for toxicology studies of problems of national concern from the past 35 years has consistently come from federal agencies including the U.S. Environmental Protection Agency (EPA), the U.S. Department of Energy, the Centers for Disease Control, and the U.S. Air Force (USAF), and a contract from the Pyrethroid Working Group (PWG). Dr. Bruckner has published more than 200 journal articles, book chapters and abstracts. Many of these papers focus on the toxicology, TK and PBPK modeling. He has served on a variety of expert panels and committees for the EPA, the National Institute of Environmental Health Sciences, National Aeronautics and Space Administration, USAF, Agency for Toxic Substances and Disease Registry/CDC, the U.S. Food and Drug Administration, and National Academy of Sciences (NAS). Dr. Bruckner's NAS appointments have included, among others, the Committees on Safe Drinking Water, Pesticides in Diets and Infants and Children; Acute Exposure Guideline Levels; Health and Safety Consequences of Child Labor; Use of Third Party Pesticide Toxicity Research with Human Participants; and Contaminated Drinking Water at Camp Lejeune. Such work has frequently involved assessment of health risks to populations living in the proximity of military chemical and nuclear disposal sites (e.g., Camp Lejeune, NC; Fort Detrick, MD; Savannah River site, SC). Dr. Bruckner is currently a member of the American Conference of Governmental Industrial Hygienists Threshold Limit Value (ACGIH TLV) chemical substances panel and the NAS Committee on Toxicology.

Burnett, David

Texas A&M University

Mr. David Burnett is the Director of Technology for the Global Petroleum Research Institute (GPRI) and Research Project Coordinator for the Department of Petroleum Engineering at Texas A&M University. He holds a B.S. and an M.S. in Chemistry from Sam Houston State University and an MBA from Pepperdine University, Los Angeles California. He recently served as the Managing Partner for a U.S. Department of Energy (DOE) Project on Field Testing of Environmentally Friendly Drilling Systems. This is a multi-million dollar joint partnership among university/industry and government organizations dedicated to reducing the impact of oil and gas operations in environmentally sensitive areas. For the past 10 years, Burnett has led Texas A&M's integrated research program on desalination and reuse of produced water and hydraulic fracturing flowback brine from gas shale operations. He received the 2006 Hearst Energy Award for Technology in the oil industry and his research team received Gulf Publishing's 2008 World Oil Awards (environmental, health and safety). Mr. Burnett receives funding from the Houston Advanced Research Center Environmentally Friendly Drilling Program, the Research Partnership to Secure Energy for America (RPSEA), the Department of Energy National Energy Technology Laboratory (DOE-NETL), the New York State Energy Research Agency, and GPRI. The GPRI project receives funding from ExxonMobil, Shell, and Total, with Texas A&M University as the Administrator of Contracts. The GPRI joint venture is designing new types of offshore marine seismic sending units to replace environmentally troublesome air guns.

Buscheck, Timothy E.

Chevron Energy Technology Company

Mr. Timothy E. Buscheck is a Chevron Fellow and Consulting Hydrogeologist in the Health, Environment and Safety Department of Chevron Energy Technology Company. He has 33 years of oil industry experience. He holds a B.S. in Chemical Engineering from Lafayette College, and an M.S. in Geological Engineering from the University of California, Berkeley. He is the Program Leader for Corporate Remediation Strategic Research, and provides consulting to Chevron Operating Companies on site assessments and remediation for downstream and upstream facilities throughout the United States and internationally. Mr. Buscheck's expertise is contaminant hydrogeology, chemical fate and transport, site characterization, groundwater remediation, and isotope fractionation. He leads research to apply molecular biological tools, useful to measure transformation of contaminants and assist remediation. Mr. Buscheck has been a leader on the American Petroleum Institute's Soil and Groundwater Task Group since 1986. He has collaborated with the U.S. Environmental Protection Agency (EPA) and the California State Water Resources Control Board for more than 20 years, teaching numerous regulatory classes and short courses. He has provided peer review for EPA guidance documents, and has collaborated with Dr. John Wilson and Dr. Fran Kremer of EPA's Office of Research and Development. Mr. Buscheck has authored papers and guidance documents on Compound Specific Isotope Analysis (CSIA). He presents papers on isotope fractionation. Mr. Buscheck has applied CSIA to distinguish subsurface methane sources at contaminant sites and demonstrate contaminant biodegradation. This experience is very relevant to hydraulic fracturing because isotope fractionation will see increasing applications for shale gas as a tool to distinguish between thermogenic gases produced from different sources. Mr. Buscheck has received no external research grants from government agencies, private companies, or foundations.

Chambers, Janice

Mississippi State University

Dr. Janice Chambers is a William L. Giles Distinguished Professor and Director of the Center for Environmental Health Sciences in the College of Veterinary Medicine at Mississippi State University. She is originally from Berkeley, California, and holds a B.S. in Biology from the University of San Francisco and a Ph.D. in Animal Physiology from Mississippi State University. Dr. Chambers has experience in pesticide toxicology with major emphases on the effects of pesticides on the nervous and endocrine systems, on the metabolism of pesticides, mechanisms by which pesticides cause toxicity, on the levels of exposure of people to pesticides, and on predicting the effects of mixtures of pesticides. She also has research interests in health disparities/minority health and in development of antidotes to nerve agents. Dr. Chambers has received board certification in toxicology through both the American Board of Toxicology and the Academy of Toxicological Sciences. She is serving or has served on the executive boards of several scientific organizations, the National Research Council Committee on Toxicology, and the two toxicology certification organizations. She has also served on several advisory and review panels, including study sections for the National Institutes of Health (NIH) and the Scientific Advisory Panel for the Federal Insecticide, Fungicide, and Rodenticide Act for the U.S. Environmental Protection Agency (EPA) and the Human Studies Review Board for EPA. She has been the Principal Investigator for a number of federally-funded competitive grants from EPA, NIH, and the U.S. Department of Defense primarily, and has published over 120 articles in scientific journals, edited books and book chapters, and over 270 abstracts from conference proceedings.

Charnley, Gail

HealthRisk Strategies

Dr. Gail Charnley is a toxicologist specializing in environmental health risk assessment and risk management science and policy, and a Principal at HealthRisk Strategies. She holds an A.B. in Biochemistry from Wellesley College and a Ph.D. in Toxicology from the Massachusetts Institute of Technology. Dr. Charnley has 30 years of experience in the biological, chemical, and social policy aspects of environmental and public health protection, writing and speaking extensively on issues related to the roles of science and democracy in environmental and public health decision-making. Her consulting practice, HealthRisk Strategies, provides independent scientific and policy analysis of issues relating to the assessment, management, and regulation of public health risks from chemical exposures. Dr. Charnley has been engaged in numerous scientific service activities, including the National Academy of Sciences' Board on Environmental Studies and Toxicology and Committee on Toxicity Testing and Assessment of Environmental Agents (Tox21), the National Toxicology Program's Report on Carcinogens Committee, the U.S. Army Science Board, the Society for Risk Analysis (president and Fellow), the Environmental Law Institute's Board of Trustees, and Yale School of Public Health (lecturer). She was executive director of the Presidential/Congressional Commission on Risk Assessment and Risk Management, and served as acting director of the National Academy of Sciences' Toxicology and Risk Assessment Program. Dr. Charnley receives no federal research funding.

Clark, Corrie E.

Argonne National Laboratory

Dr. Corrie E. Clark is an Environmental Policy Analyst and Sustainable Systems Engineer, and the Natural Resource Economics and Systems Analysis Team lead for the Environmental Science Division at the U.S. Department of Energy's Argonne National Laboratory. She holds a B.S. in Chemical Engineering from the University of Virginia, and an M.S.E. and Ph.D. in Environmental Engineering from the University of Michigan. Dr. Clark develops interdisciplinary solutions that combine engineering, finance, and policy to solve complex environmental challenges. Her expertise includes developing tools for cost-benefit analysis, multi-media probabilistic environmental models, and life cycle analysis to inform energy and environmental policy. Dr. Clark's research interests are on environmental issues related to oil, gas, and geothermal energy production, and she has been working on produced water issues in the oil and gas industry including hydraulic fracturing since 2008. Her work in this area was nominated by the Society of Petroleum Engineers for consideration for the 2012 Cedric K Ferguson Medal, which recognizes professional achievement in petroleum engineering. Dr. Clark's research has been supported by the federal government (U.S. Department of Energy); she has received no external grants from either government agencies, private companies, or foundations.

Cline, Scott Bradley

U.S. Internal Revenue Service

Dr. Scott Bradley Cline is both a Geological and Petroleum Engineering consultant and Lead Engineer for the U.S. Internal Revenue Service. He holds a B.S. in Geological Science from Pennsylvania State University, an MBA from Oklahoma City University, and both M.S. and Ph.D. in Petroleum Engineering from the University of Oklahoma. Dr. Cline began his career in 1976 for Gulf Oil Corporation (now Chevron) and later worked as geophysicist, geologist, petroleum engineer, and senior manager for several oil and gas companies based in Houston and Oklahoma City. His experience spans the full range of upstream oil and gas operations from initial exploration techniques and drill site selection, drilling, well construction issues, completion methods, reservoir optimization and reserve estimation. He was involved in the early study of horizontal drilling and has published and presented on a wide range of oil and gas topics. His 1999 Ph.D. dissertation explored emerging issues of reserve analysis and flow behavior in horizontally drilled wells in fractured and anisotropic reservoirs. Dr. Cline's current's focus is on assessing potential hydraulic fracturing risks to underground sources of drinking water , mitigation of drilling and well construction related methane migration problems and regulations. Dr. Cline regularly reviews and critiques scientific research reports, interviews scientists regarding the most cutting edge oil and gas exploration and production advances, performs scientific assessments of petroleum resources and performs well production and completion optimization studies. Dr. Cline is also a frequent public speaker, candid commentator and writer on shale gas development issues. He has recently served as a subject matter contributor at the 2011 U.S. Environmental Protection Agency technical sessions on well construction and operations in Arlington, VA, the Province of Quebec's Office of Public Hearings on the Environment (BAPE) and testified before the N.Y. State Assembly Energy and Environmental Committees on hydraulic fracturing. Dr. Cline receives no external research grants from government agencies, private companies, or foundations.

Coleman, Nancy Pees

Environmental Consultants

Dr. Nancy Pees Coleman is a Principal for Environmental Consultants in Oklahoma City. She holds a B.S. in Environmental Health from Old Dominion University, an MPH in Environmental Health from University of Oklahoma, and a Ph.D. in Environmental Health/Toxicology from University of Oklahoma Health Sciences Center. Dr. Coleman is an Environmental Toxicologist and public health professional with 30 years experience in risk assessment for environmental media. She has conducted risk assessment evaluation for both conventional and unconventional oil and natural gas exploration and production sites, petroleum refinery operations, smelters and other types of sites. She provides toxicological services to a major natural gas production company, and has been involved in development of criteria for selection of environmental acceptable hydraulic fracturing chemicals, risk evaluation of mixed production fluid releases and potential effects on soil, surface water and groundwater resources, and evaluation of produced water quality data. Dr. Coleman's area of research activity includes the potential effects of chemicals utilized in the production of oil and natural gas on surface and groundwater resources, variability of naturally-occurring substances in domestic wells, and risk evaluation of contaminants on potential drinking water supplies. Dr. Coleman has presented papers on several aspects of oil and natural gas exploration and production activities related to water quality, air quality, chemical disclosure, and produced water quality. She presented a paper at the U.S. Environmental Protection Agency's Chemical and Analytical Workshop for the Hydraulic Fracturing Study. Prior to entering consulting, Dr. Coleman was the toxicologist and epidemiologist for the Oklahoma Department of Environmental Quality and its predecessor, the Environmental Division of the Oklahoma State Department of Health (1985 - 1994). She has served on the faculty of the Department of Environmental and Occupational Health of the University of Oklahoma Health Sciences Center. She also has served as a sanitarian and as a laboratory manager for an environmental laboratory (1978 - 1985). Dr. Coleman has received no external grants from either government agencies, private companies, or foundations; her research is funded by contractual sources through Environmental Consultants. She has served on the Oklahoma Corporation Commission Risk Task Force, Mid-Continent Oil and Gas Association Glycol Dehydration Study Committee, STAPPA Air Toxics Review Committee, and several committees for the Oklahoma State Department of Education regarding science education. She is a member of the American Conference of Governmental Industrial Hygienists and a diplomat in the American Academy of Sanitarians.

Collins, James W.

Independent Consultant

Mr. James W. Collins is an independent oil and gas consultant. He holds a B.S. in Petroleum Engineering from the University of Missouri School of Mines and Metallurgy. Mr. Collins is a well-known, highly respected professional engineer who, since his retirement in 1994, has been an oil and gas consultant providing expertise to a number of entities including the State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER), the U.S. Environmental Protection Agency (EPA), the Environmental Defense Fund, the Independent Petroleum Association of America, and oil and gas companies. Prior to that, Mr. Collins was employed in the oil and gas industry for approximately 30 years where he worked in the oil field as a Production Engineer and on a variety of state and federal environmental and regulatory issues affecting the oil and gas industry. Mr. Collins is a founding member and former Chairman of STRONGER, a non-profit organization that has received grant funding from EPA, U.S. Department of Energy, and the American Petroleum Institute. STRONGER is a multi-stakeholder work group that develops and continually updates national environmental guidelines for state oil and gas and environmental regulatory programs. Mr. Collins participates in multi-stakeholder review teams for evaluation of state programs against those guidelines to recommend program improvements. These activities included the development of hydraulic fracturing guidelines for state programs and focused reviews of six states' hydraulic fracturing programs against those guidelines. In addition, Mr. Collins has managed the development of several operational environmental guidance documents, produced by an American Petroleum Institute Committee he chaired, relating to Oil & Gas waste disposal and well abandonment. He has served on a number of state boards, committees, inter-state commissions (Interstate Oil and Gas Compact Commission & STRONGER), foundations, and a nation-wide Ground Water Protection Council (GWPC). He also was a member of the GWPC. In addition, he has been a Society of Petroleum Engineers Distinguished Lecturer and Lecturer Emeritus as well as a member of EPA National Drinking Water Advisory Council and EPA Federal Advisory Committee on Underground Injection Regulations. Mr. Collins' activities has been supported through contractual sources of funding.

Corra, John

Wyoming Department of Environmental Quality

Mr. John Corra is Director of the Wyoming Department of Environmental Quality (DEQ). He holds a B.S. and M.S. in Engineering from Montana Tech of the University of Montana. Mr. Corra has been intimately involved with every groundwater and surface water issue that has been directly and indirectly tied to oil and gas development within the State of Wyoming. He has over 40 years of experience in the natural resource extractive business, serving in capacities ranging from engineering to managing to regulating. Mr. Corra's most recent assignments have included appointments by two Governors to lead the Wyoming Department of Environmental Quality. In that capacity, he has been intimately engaged with oil and gas development and regulation, including responding to adverse circumstances in that arena. Mr. Corra is knowledgeable and experienced regarding issues related to environmental issues related to fracking. He has succeeded at building partnerships with citizens, industry, federal agencies and diverse special interest groups to produce significant change and environmental improvement while enabling the responsible development of the state's natural resources. These efforts have been demonstrated by significant increases in natural resource production over the past 9-plus years while also creating stronger environmental standards that in some cases are models to other states. In addition, performance in the areas of regulation, compliance and remediation has improved, as has DEQ's service levels in a period where the environmental challenges have been significant. Mr. Corra has had a successful career leading and managing mining and processing organizations and has demonstrated the capability to achieving high performance via technical innovation, organizational development and employee involvement. He has a strong technical and operating background, success in engaging employees and other business stakeholders to create positive change and an ability to work with diverse interests to reach consensus on important issues. Mr. Corra has received no external research grants from either government agencies, private companies, or foundations.

Curtright, Aimee

RAND Corporation

Dr. Aimee Curtright is a physical scientist in the Pittsburgh office of the RAND Corporation, where she has worked since 2007. She became the Associate Research Department Director for RAND's Department of Engineering & Applied Sciences in September 2012. She holds a B.S. in Chemistry from the University of Miami, and a Ph.D. in Chemistry from University of California, Berkeley. Dr. Curtright has broad expertise in energy policy and technology assessment. Recent and ongoing studies include an assessment of the greenhouse gas implications of renewable biomass energy and analyses of the environmental and security implications of the Army's Net Zero Energy and Water programs at installations. For the past three years, Dr. Curtright has followed the local and regional dialogue on the potential environmental implications of shale gas extraction. This has included attending a wide range of meetings and conferences on shale gas issues, and interviewing technical experts in academia, industry, environmental NGOs, and Pennsylvania government agencies. She was the organizer and technical lead for a conference on the technical, legal, and regulatory challenges to using coal mine drainage for hydraulic fracturing, sponsored by the Marcellus Shale Coalition and held in the Pittsburgh office of the RAND Corporation. The meeting was attended by nearly 100 regional technical, legal, and policy experts and resulted in a published conference proceedings, for which she was lead author. Dr. Curtright is also the principal investigator for an ongoing RAND-funded study surveying the range of potential external costs of shale gas extraction in Pennsylvania. The study identifies external costs, estimates damages, and proposes mitigation strategies for the Commonwealth. The study will go into peer review early September 2012. Prior to joining RAND, Dr. Curtright was a postdoctoral research fellow in Carnegie Mellon University's Department of Engineering and Public Policy, where she studied the technical and economic feasibility of large-scale solar photovoltaics. Other past experience includes a fellowship at the National Academies' Board on Energy and Environmental Systems and research in microbattery fabrication at the U.S. Naval Research Lab. Dr. Curtright's research has been supported by funding from RAND Corporation's contracts with the U.S. Federal Government; she has received no external grants from either government agencies, private companies, or foundations.

Daniels, Eric J.

Chevron Energy Technology Company

Dr. Eric Daniels is a Senior Staff Research Hydrogeologist with Chevron's Energy Technology Company. He holds a B.S. from State University of New York, Binghamton, and an M.S. and Ph.D. from University of Illinois, Champaign-Urbana, all in Geology. Dr. Daniels has 20 years experience working with drilling, completion, facilities and remediation engineers to reduce the environmental footprint and impacts at Chevron upstream and downstream operations, and helps to solve oilfield well and reservoir production problems. He integrates technical expertise from several disciplines, including geochemistry, hydrogeology and mineralogy, and applies a broad knowledge of analytical and experimental data evaluation techniques and collaborative work with engineering experts, to develop practical solutions. Dr. Daniels' primary research activities are focused on three areas: a) Development of recommended practices and guidance for groundwater protection activities and environmental stewardship in Shale Gas assets. These include groundwater baseline characterization and monitoring programs; potential site impact assessments and site conceptual model framework development; production well integrity monitoring; hydraulic fracturing water management and environmental footprint reduction strategies; technologies for assessing hydrogeology and contaminant fluid fate & transport in fractured rock media; b) Research & Development, technical consultation and strategic guidance for groundwater remediation at marketing, chemical, refining and upstream facilities throughout the United States and internationally; and c) Recommended practices for use and evaluation of formation rock mineralogy and water chemistry data and geochemical reaction modeling to solve oilfield reservoir and well performance problems. Dr. Daniels' research has been supported by funding from Chevron; Dr. Daniels has received no external research grants from government agencies, foundations, or private companies other than Chevron.

Davis, Charles

EnviroStat and University of Nevada, Las Vegas

Dr. Charles Davis is President and Principal Statistician of EnviroStat in Las Vegas, NV and is currently a Visiting Associate Professor in the Department of Mathematical Sciences at the University of Nevada, Las Vegas. He holds a Bachelors degree in Music Education, an M.A. in Mathematics and Statistics and a Ph.D. in Statistics, all from the University of New Mexico. He was an Associate Professor in the Mathematics Department of the University of Toledo in 1985 when a colleague introduced him to issues and research needs in the application of statistics in environmental regulation. Dr. Davis wrote papers, including the chapter "Environmental Regulatory Statistics" in the *Handbook of Statistics 12: Environmental Statistics* (1994). He spent a sabbatical year (1990-91) in Las Vegas as a visiting scientist with Lockheed Environmental Systems and Technologies, which at the time provided research support to the U.S. Environmental Protection Agency's (EPA) Environmental Monitoring Systems Laboratory. Shortly thereafter Dr. Davis established EnviroStat and left academia for the free-lance consulting world. Since 1999 he has been providing statistical support for environmental and industrial hygiene monitoring and characterization efforts at the Nevada National Security Site (formerly Nevada Test Site) and elsewhere for the U.S. Department of Energy (DOE). In addition, during recent years he has contributed to projects related to the development and validation of improved characterization and monitoring technologies and systems funded by DOE, U.S. Departments of Defense and Homeland Security, and EPA. Dr. Davis' statistical research interests are motivated by problems arising in these areas; these include balancing false positive and negative decision rates while taking into account the numbers of measurements involved in a monitoring event or characterization study and, most recently, developing statistical treatments for censored data ("nondetects") using realistic distributional assumptions rather than those commonly used. Dr. Davis' research has been funded by EnviroStat; he has received no external research grants from government agencies, private companies, or foundations.

Davis, Thomas L.

Colorado School of Mines

Dr. Thomas L. Davis is a Professor of Geophysics at Colorado School of Mines and Director of the Reservoir Characterization Project (RCP), an industry-funded consortium now in its 27th year. He holds a B.E. in Geological Engineering, Geophysics option, from the University of Saskatchewan, an M.S. in Geophysics from the University of Calgary, and a Ph.D. in Geophysical Engineering from the Colorado School of Mines. The RCP is a research consortium whose mission is to develop and apply 4-D, 9-C seismology and associated technologies to effectively model complex reservoirs. For over 20 years, the RCP has been developing and applying new reservoir modeling and simulation techniques, incorporating multidisciplinary reservoir technologies and enhancing and improving hydrocarbon recovery. Dr. Davis receives no funded research from any other sources other than through the RCP. Dr. Davis is active in the Society of Exploration Geophysicists (SEG) as an organizer for technical conferences, workshops and continuing education programs and has served as SEG's Second Vice President, Technical Program Chairman, and Distinguished Lecturer. He received the C.J. Mackenzie Award from the Engineering College of the University of Saskatchewan, the Milton B. Dobrin Award from the University of Houston, and the Dean's Excellence and Melvin F. Coolbaugh Memorial Awards from the Colorado School of Mines. Dr. Davis was a co-recipient of the best poster award of the SEG in 2009 for a presentation on multicomponent seismic applications to tight gas fractured reservoir characterization and the southwest section of the American Association of Petroleum Geologists in 2011 on CO_2 flood monitoring in Postle Field, Oklahoma.

DeGeorge, Joseph J.

Merck Research Laboratories

Dr. Joseph J. DeGeorge was hired by Merck in 2004 as Vice President of Global Safety Assessment. Since his appointment, he has increased responsibility and has been named Global Head of Safety Assessment and Laboratory Animal Resources for Merck Research Laboratories as of September 2010 with global responsibility for non-clinical safety testing and evaluation in support of pharmaceutical development. Dr. DeGeorge holds a B.S. in Biology from the State University of New York-Albany, and a Ph.D. in Pharmacology from the State University of New York/Upstate Medical Center. At Merck, he has served on or chaired committees on drug discovery, drug candidate selection, early and late development, and post marketing safety. In addition to his position with Merck, Dr. DeGeorge also serves as the PhRMA Coordinator for the International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) Safety Topics and has participated in development of numerous ICH Safety Guidance's as a chair or member of Safety and Multidisciplinary ICH Expert Working Groups. Before working at Merck, Dr. DeGeorge served as Vice President of Preclinical Safety Evaluation at Novartis Pharmaceuticals and as the Global Chair for the Research and Development Safety Assessment Committee, with responsibility for first in human studies. Prior to Novartis, he worked at the U.S. Food and Drug Administration (FDA) from 1989-2002, where he was the Associate Director for Pharmacology and Toxicology in the Center for Drug Evaluation and Research (CDER) from1996-2002 and was responsible for pharmacology and toxicology policy development and implementation. During his tenure at FDA he served on numerous policy and technical committees: Chair for CDER's Carcinogenicity Assessment Committee, CDER's Pharmacology and Toxicology Coordination Committee, the preclinical lead for the FDA Genomics and Proteomics Task Force, as a member of the International Life Sciences Institute (ILSI) Risk Science Institute Thresholds Assessment Committee, the ILSI-Health and Environmental Sciences (HESI) Alternatives to Carcinogenicity Testing Committee and the ILSI-HESI Emerging Issues Committee, as CDER's technical representative to the Presidential Commission on Risk Assessment and CDER's lead to the National Institute of Environmental Health Sciences -National Toxicology Program Academia, Industry, and Government Partnership for the Evaluation and Validation of Transgenic Models for Carcinogenicity Testing, and as CDER's ICH Safety Coordinator and lead for many Safety Expert Working Groups. Prior to joining FDA, Dr. DeGeorge was a Senior Staff Fellow at the National Institutes of Health, National Institute on Aging, Laboratory of Neurosciences, where he worked on development of in vivo functional and structural brain imaging probe. He completed his postdoctoral training as a Fellow at the University of North Carolina, Chapel Hill, NC with a joint appointment at Burroughs Wellcome Research Institute, Research Triangle Park, NC, where he focused on neural cell to cell signaling and second messenger systems. Dr. DeGeorge's current research funding is solely from Merck in support of pharmaceutical development.

Dixon, Philip M.

Iowa State University

Dr. Philip M. Dixon is University Professor of Statistics in the Department of Statistics at Iowa State University. He has courtesy appointments in the Graduate Fields of Ecology and Evolutionary Biology, Bioinformatics and Computational Biology, and Veterinary Preventative Medicine. He holds an A.B. in Biology from the University of California Berkeley, and an M.S. in Statistics and Ph.D. in Ecology and Evolutionary Biology from Cornell University. Dr. Dixon's research focuses on developing and using statistical methods to answer, or better answer, interesting questions in biology. Recent projects in his research group include developing models to integrate multiple sources of information about Mourning Dove population trends, using nonparametric smoothing to speed up 2D Monte-Carlo estimates of uncertainty and variability in risk, and developing regression trees for habitat occupancy when detection of individuals is not perfect. Dr. Dixon's research has been supported by grants from the National Science Foundation, the U.S. Department of Agriculture, the U.S. Geologic Survey, and the National Institutes of Health, and private organizations. He teaches various courses in statistical methods both for graduate students in statistics and for graduate students in other fields. Dr. Dixon has supervised 1 B.S. Honor's student, 24 M.S. students, and 8 Ph.D. students. He has published over 130 refereed manuscripts in both statistical and subject-matter journals and currently serves as an Associate Editor for Environmetrics. Papers that Dr. Dixon has co-authored have won the Best Basic Science paper in Veterinary Medicine (2002) and the Frank Wilcoxon prize for best practical application paper in Technometrics (2010). He has been awarded the 1996 Distinguished Achievement Medal by the section on Statistics and the Environment of the American Statistical Association, is a Fellow of the American Statistical Association, and is an Accredited Professional Statistician.

Ducoste, Joel

North Carolina State University

Dr. Joel Ducoste is a Professor in the Civil, Construction, and Environmental Engineering Department at North Carolina State University. He holds a B.S. (1988) and M.Eng. (1989) in Mechanical Engineering from Rensselaer Polytechnic Institute, and a Ph.D. in Environmental Engineering (1996) from the University of Illinois at Urbana-Champaign. Dr. Ducoste is a national and international recognized expert in modeling water and wastewater treatment processes using Computational Fluid Dynamics (CFD). His current research interests include physico-chemical processes in water treatment, computational fluid dynamics modeling, solid/liquid separation processes, chemical and UV disinfection, advance oxidation, water/wastewater process optimization, and wastewater sewer collection system sustainability. Dr. Ducoste has served on advisory committees such as the American Water Works Association (AWWA) Particulate committee, AWWA project advisor for research projects funded by AWWA, National Science Foundation (NSF) graduate fellowship awards committee, and International Population Balance Model scientific and organizing committees. Dr. Ducoste's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from federal and state and local government (National Science Foundation, U.S. Environmental Protection Agency, U.S. Department of Energy), Water Research Foundation, Water Environment Research Foundation, and North Carolina State University Water Resources Research Institute, with additional grant support from state and local governments, industry, and foundations. He has also served on the North Carolina House of Representatives Special Committee on Offshore Energy Exploration Study. Dr. Ducoste currently serves as an Associate Editor for American Association of Civil Engineers (ASCE) Journal of Environmental Engineering and is a board member of the North Carolina Fulbright Association and the U.S. Environmental Protection Agency Science Advisory Board Drinking Water Committee. He also serves on the Water Environment Federation (WEF) FOG Sewer Collection sub-committee. Dr. Ducoste is a member of AWWA, WEF, International Ultraviolet Association (IUVA), and Association of Environmental Engineering and Science Professors.

Dunn-Norman, Shari

Missouri University of Science and Technology

Dr. Shari Dunn-Norman is Associate Professor and Head of Petroleum Engineering at Missouri University of Science and Technology. She holds a B.S. in Petroleum Engineering from the University of Tulsa, and a Ph.D. in Petroleum Engineering from Heriot-Watt University, Edinburgh, Scotland. After working in both domestic and international assignments for the Atlantic Richfield Companies (ARCO), Dr. Dunn-Norman joined Herriot-Watt University to finish her Ph.D., developing a computational model of well completion design. Since that time, her research has focused on well construction for the protection of underground sources of drinking water, CO_2 injection design, hydraulic fracturing and offshore operations. She has published numerous papers related to area of review for Class 2 injection wells, hydraulic fracturing, and has co-authored a book on well construction. Dr. Dunn-Norman's research has been supported by grants from both government agencies and private companies, with core research support primarily coming from the U.S. Department of Energy and the American Petroleum Institute. Dr. Dunn-Norman has served as the Chair of the Professionalism Committee for the Society of Petroleum Engineers and currently serves on the Drilling Engineering review committee. She served on the U.S. Environmental Protection Agency (EPA) Science Advisory Board 2011 Ad Hoc Panel to review EPA's draft Hydraulic Fracturing Study Plan. Dr. Dunn-Norman currently teaches well completions for hydraulic fracturing for Petroleum ETC, a private corporation that operate events worldwide on topics ranging from multiphase pumping, multiphase metering, fracturing to reservoir engineering.

Dzombak, David A.

Carnegie Mellon University

Dr. David Dzombak is the Walter J. Blenko, Sr. University Professor of Environmental Engineering in the Department of Civil and Environmental Engineering at Carnegie Mellon University, Pittsburgh, PA. He is also Director of the Steinbrenner Institute for Environmental Education and Research at Carnegie Mellon. Dr. Dzombak holds a B.S. in Civil Engineering from Carnegie Mellon University, a B.A. in Mathematics from Saint Vincent College, an M.S. in Civil-Environmental Engineering from Carnegie Mellon University, and a Ph.D. in Civil-Environmental Engineering from Massachusetts Institute of Technology. The emphasis of his research and teaching is on water quality protection and restoration. Dr. Dzombak's professional interests include: aquatic chemistry; fate and transport of chemicals in surface and subsurface waters; water and wastewater treatment; soil and sediment treatment; hazardous waste site remediation; river and watershed restoration; energy and environment; population and environment; and public communication of environmental science and engineering. He has published numerous articles in leading environmental engineering and science journals; book chapters; articles for the popular press; and three books (Surface Complexation Modeling: Hydrous Ferric Oxide, Wiley, 1990; Cyanide in Water and Soil, CRC/Taylor&Francis, 2006; Surface Complexation Modeling: Gibbsite, Wiley, 2010). Dr. Dzombak's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (National Science Foundation, U.S. Department of Energy,U.S. Environmental Protection Agency), with additional grant support from industry, and foundations. Dr. Dzombak also has a wide range of consulting experience. He served on the EPA National Advisory Council for Environmental Policy and Technology, Environmental Technology Subcommittee (2004-2008); as chair of the National Research Council Committee on the Mississippi River and the Clean Water Act (2005-2007); as chair of the National Research Council Committee on U.S. Army Corps of Engineers Water Resources Science, Engineering, and Planning (2010-2012); and as an Associate Editor of Environmental Science & Technology (2005-2012). He is a registered Professional Engineer in Pennsylvania, a Board Certified Environmental Engineer by the American Academy of Environmental Engineers, a Fellow of the American Society of Civil Engineers, a Fellow of the Water Environment Federation, and a member of the National Academy of Engineering.

East, Loyd

Halliburton Energy Services

Mr. Loyd East is Product Manager for Halliburton's Coiled Tubing Fracturing Services and is involved in development of effective and efficient fracture stimulation processes for vertical and horizontal well completions globally. He holds a B.S. in Agricultural Engineering from Texas A&M University. Mr. East has published over 40 articles with 5 articles appearing in trade journals and is currently an author and co-editor of an upcoming book entitled Completion Practices for Horizontal Wells. He currently holds over 20 patents related to well completion, reservoir monitoring, and well stimulation processes. Mr. East's technical and innovation contributions resulted in Halliburton being recipient of 2010 and 2011 World Oil Awards for Best Completion Technology. He is a 30-year member of the Society of Petroleum Engineering and has previously served as Technical Advisor for well completions, Sr. Instructor for Production Enhancement Technology and Manager of Industry Training at Halliburton's Energy Institute. Mr. East currently manages a team involved in the development, commercialization, execution and training for newly developed stimulation processes deployed globally. Mr. East receives no federal research funding.

Economides, Michael

University of Houston

Dr. Michael J. Economides is a Professor at the Cullen College of Engineering, University of Houston, teaching both Chemical and Petroleum Engineering. He holds a B.S. and M.S. in Chemical Engineering from the University of Kansas, and a Ph.D. in Petroleum Engineering from Stanford University. Dr. Economides is a chemical and petroleum engineer and an expert on energy geopolitics, and Managing Partner of Dr. Michael J. Economides Consultants, Inc. with a wide range of industrial consulting, including major retainers by several Fortune 500 companies and national oil companies. He is the Editor-in-Chief of Energy Tribune (www.energytribune.com) and Editor-in-Chief of the peer-reviewed Journal of Natural Gas Science and Engineering. Technically, he casts a commanding figure in petroleum and natural gas reservoir and production engineering. With 15 textbooks and almost 300 journal papers and articles, his works are referenced by almost all practitioners in the field. In the relatively recent past he has served as Senior Technical Advisor to China's CNOOC Ltd. and subsidiary China Oilfield Services Limited, to China's Sinopec on gas exploitation, including shale, to ENI, Italy's main petroleum multinational company and for more than 5 years to Yukos and Sibneft, Russia's major petroleum companies. During 1997 and 1998 Dr. Economides was in Venezuela as the Senior Advisor on Production Technology for PDVSA, the national oil company of Venezuela. His latest wide appeal books are From Soviet to Putin and Back: The Dominance of Energy in Today's Russia (2008), Energy: China's Choke Point (2009), Energy and Climate Wars (2010), The Energy Imperative (2010) and America's Blind Spot (2012). Dr. Economides receives Grants and consulting income primarily from ENI, Italy; Sinopec, China; Santos, Australia; and Cadre Proppants, USA, as well as from smaller companies, governments and universities such as Technion University in Israel, Tenaris tubulars in Argentina and Noble Resources in the U.S.

Edstrom, Robert

Minnesota Department of Transportation

Dr. Robert Edstrom is the Minnesota Department of Transportation Chief Toxicologist. He holds a B.A. in Biology from St. Cloud State University, an M.S. in Environmental Chemistry from the College of William and Mary, and a Ph.D. in Chemical Oceanography from the School of Marine Science of the College of William and Mary. Dr. Edstrom specialized in the measurement of anthropogenic organic chemicals in environmental samples and evaluation of their fate, effects, and transport in the environment. As Chief Toxicologist, Dr. Edstrom's research interest areas support the Department through studying the fate, effects, and migration of organics and metals from products, beneficial reuse materials, and new processes associated with transportation infrastructure construction and maintenance activities. These material assessments include analysis of field monitoring data and using screening models to evaluate the environmental performance of chemical components in products and waste materials. Dr. Edstrom is currently a panel member of the Transportation Research Board, National Cooperative Highway Research Program (NCHRP) 20-83(7) panel for "Sustainable Transportation Systems and Sustainability as an Organizing Principle for Transportation Agencies". Dr. Edstrom has received no external research grants from either government agencies, private companies, or foundations.

Ellison, Timothy

ExxonMobil Upstream Research Company

Dr. T. K. (Tim) Ellison is the Well Injection Design/Operations Advisor at the ExxonMobil Upstream Research Company (URC). Dr. Ellison holds a B.S. from the University of Missouri-Rolla, and an M.S. and Ph.D. from the University of Illinois at Urbana-Champaign, all in Chemical Engineering. As a Senior Technical Professional Advisor in the ExxonMobil upstream, he supports ExxonMobil's worldwide operations in the area of injection well design and operations, and advises on the direction of injection research at URC. Dr. Ellison has extensive background and expertise in both subsurface and reservoir engineering, and has spent most of his career leading research teams in the upstream research organization to address specific technical challenges, either in the area of injection, or in the area of unconventional resource development (both heavy oil and shale gas), funded either directly by ExxonMobil business units, or through internally funded research budgets. He led the well injection team from its inception in 2005 through 2011 to progress injection technology, and apply that technology to 50+ projects across the upstream in areas of injection well design, surveillance, and problem mitigation. A key element that Dr. Ellison and his team addressed in the design of injection wells (water, waste, and drill cuttings) was the prediction of the extent of fractures that are formed during long-term injection processes, often providing key fracture containment predictions that were used in the regulatory process to permit injection wells across the globe (including both a Class I disposal well and a Class I hazardous waste disposal well in the US). In addition to his injection work, he also led a research/operations team to develop a novel decision process ("CompleteSuccess") for completion selection in a large Middle East natural gas field. Previously he led research teams to develop the next generation recovery technologies for ExxonMobil Canadian bitumen assets (primarily Cold Lake), the Orinoco Belt (Venezuela) extra heavy oil Cerro Negro development, and the low permeability California diatomite. Similar to the more recent injection leadership, these previous projects all required geomechanics expertise, either fracturing (diatomite, Cold Lake) or compaction (Cerro Negro). Currently, in addition to his injection well advisory role, Dr. Ellison is an advisor on an integrated research project targeting ExxonMobil shale gas resources, also leads a small team that is specifically addressing initial production optimization in overpressured shale gas reservoirs, and most recently leads a small virtual team at URC to address induced seismicity due to injection. His operational experience includes a short assignment as the Reservoir Engineer on the South Midway Sunset steamflood (1991-1992) at the Mobil office in Bakersfield, California. He joined Mobil's Dallas Research Lab (later Mobil E&P Technology Center) in 1985, working in the area of phase behavior before moving into his long association with heavy oil enhanced oil recovery, working initially on oxygen fireflooding. Dr. Ellison has received no external grants from either government agencies, private companies, or foundations.

Ellsworth, Stuart

Colorado Oil and Gas Conservation Commission

Mr. Stuart Ellsworth is an Engineering Manager with the Colorado Oil and Gas Conservation Commission (COGCC). He holds a B.S. in Civil Engineering from the University of Colorado, and a B.S. in Geology from Western Michigan University. He and his staff review drilling permits, completion reports, workover plans, cement bonding, casing repairs, plugging and abandonment procedures for COGCC regulation approval, and consult with operators on well spacing orders and reservoir economics. With thirty-three years of industry experience, Mr. Ellsworth has implemented a variety of oil and gas programs including the Wattenberg Bradenhead Testing Program, East Mamm Creek Study, and the Adena Field Inactive Well Monitor Program. Prior to working for the COGCC, he worked for engineering and oil and gas companies. He is a Colorado Professional Engineer and a Licensed Geologist. Regarding grant funding, COGCC receives a Underground Injection Control program grant from the U.S. Environmental Protection Agency (EPA) to administer a Class II well permitting program. Mr. Ellsworth has received no external grants from either government agencies, private companies, or foundations.

Elsworth, Derek

Pennsylvania State University

Dr. Derek Elsworth is a Professor of Energy and Geo-Environmental Engineering at the Pennsylvania State University. He holds a B.S. in Engineering Geology from Portsmouth Polytechnic, England, an M.S. in Engineering Rock Mechanics from Imperial College, London, and a Ph.D. in Engineering from University of California, Berkeley. He is the co-founder of the Center for Geomechanics, Geofluids and Geohazards (G3) at Penn State – a center for multidisciplinary studies in rock and fluid physics. Dr. Elsworth has 30 years of, teaching, research and consulting experience in computational mechanics, flow and transport in fractured media and rock mechanics. His current research interests relate to the mechanical and transport characteristics of fractured rocks, with application to geothermal energy, the deep geological sequestration of radioactive wastes and of CO_2 and unconventional resources. His particular interest is in understanding the evolution of the mechanical and transport characteristics of reservoirs/aquifers and caprocks/aquicludes related to both resource recovery and groundwater protection including the effects of induced seismicity. His areas of expertise include groundwater hydrology, mathematical modeling, poromechanics, coupled processes, contaminant hydrology, mining engineering, petroleum engineering, and fracture hydrology. Dr. Elsworth is the author of more than 150 publications in refereed journals, one authored book and two edited books. In the last five years he has given 90 invited, plenary and keynote addresses, worldwide. Dr. Elsworth is an active consultant and advisor to government and industry. These assignments relate to understanding the consequences of complex coupled processes on the long-term performance of radioactive waste repositories and high-pressure high-temperature petroleum and geothermal reservoirs. Dr. Elsworth serves on the editorial boards of various national and international journals. His research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (National Science Foundation and the U.S. Department of Energy), with additional grant support from state governments, industry, and foundations.

Ensor, Katherine Bennett

Rice University

Dr. Katherine Bennett Ensor is Professor of Statistics at Rice University where she serves as the chair of the Department of Statistics and director of the Center for Computational Finance and Economic Systems (CoFES). She also serves as the faculty director of the Professional Science Masters program in Environmental Analysis and Decision Making. Dr. Ensor holds a B.S.E. and M.S. in Mathematics from Arkansas State University and a Ph.D. in Statistics from Texas A&M University. She develops innovative statistical methods related to dependent and complex systems with specific expertise in stochastic modeling, simulation, time series and spatial-temporal processes. One of Dr. Ensor‘s principal areas of application is energy and the environment and more recently, the health impact associated with air pollution. Additionally she has strong expertise in general environmental modeling, energy production and pricing, risk management, and finance. Dr. Ensor has served on the Board of Directors of the Institute for Mathematics and Its Applications (IMA), and has lead or served on key review panels for the National Science Foundation (NSF). She has served on multiple editorial boards and most recently on the Encyclopedia of Environmetrics, 2nd edition. For the past ten years she has served as co-Principal Investigator on the highly successful NSF Vertical Integration of Research and Education training program at Rice University. She currently receives research funding from the NSF, Rice University, Houston Endowment, and the Korean National Oil Company and has received funding in recent years from the Army Research Office, the CITI innovation fund and the National Library of Medicine. She is an elected fellow of the American Statistical Association and has been recognized for her leadership, scholarship and mentoring.

Erb, James E.

Independent Consultant

Mr. James E. Erb is an Independent Consultant in the oil and gas industry. He holds a B.S. in Civil Engineering from Drexel University. Mr. Erb is a nationally recognized professional engineer who, since his retirement from state government in 2004, has been an oil and gas consultant to a number of entities regarding oil and gas related issues. Prior to that, he was employed with the Pennsylvania Department of Environmental Protection that included 20 years as the Director of the Bureau of Oil and Gas Management, 6 years as Regional Water Quality Manager, 4 years as Operations Chief in the Division of Water Supply and Sewerage, and 2 years as a Sanitary Engineer. As Director of Pennsylvania's oil and gas regulatory program, Mr. Erb's responsibilities included the planning, development, implementation, coordination and evaluation of the statewide oil and gas regulatory, conservation and environmental programs to facilitate the safe exploration, development and recovery of the Commonwealth's oil and gas resources. The scope of those activities included drilling, completion, operation, compliance inspection and plugging of oil, gas, storage, coalbed methane and disposal wells. Mr. Erb is a founding member and former Chairman of State Review of Oil and Natural Gas Environmental Regulations, Inc. (STRONGER), a non-profit organization which has received grant funding from the U.S. Environmental Protection Agency, the U.S. Department of Energy, and the American Petroleum Institute. STRONGER is a multi-stakeholder work group that develops and continually updates national environmental guidelines for state oil and gas and environmental regulatory programs. Mr. Erb facilitates multi-stakeholder review teams for evaluation of state programs against those guidelines to recommend program improvements. These activities included the development of hydraulic fracturing guidelines for state programs and focused reviews of six states' hydraulic fracturing programs against those guidelines. In addition, Mr. Erb has authored or coauthored more than 30 publications - the majority of which relate to state oil and gas exploration and production environmental issues. He has served on a number of state boards, committees, inter-state commissions (Interstate Oil and Gas Compact Commission & STRONGER), foundations, and a nation-wide ground water council (GWPC). He also was a member of the Ground Water Protection Council. Mr. Erb has received no external grants from either government agencies, private companies, or foundations.

Fassett, Gordon

HDR Engineering, Inc.

Mr. Gordon W. (Jeff) Fassett, P.E., is currently a Vice-President and leader of the Water Rights Program for HDR Engineering, Inc., a national architectural/engineering firm headquartered in Omaha, Nebraska, and located in Cheyenne, Wyoming office. He holds a B.S. in Civil Engineering from the University of Wyoming. Mr. Fassett has over 35 years of experience in private and public sector water resources engineering, hydrology, and water rights policy and law, working in surface and groundwater resources, including 13 years as the State Engineer for the State of Wyoming. He is an expert in water resources engineering, policy and water law matters with a focus on State, Federal and Interstate Water Compact laws; in primarily in areas west of the Mississippi River. Mr. Fassett is also currently the Chairman and the Federal Representative to the Red River Compact Commission, involving Texas, Oklahoma, Arkansas and Louisiana. He has previously served on a National Research Council committee for the National Academy of Sciences study of Colorado River Basin Water Management. Mr. Fassett has been involved with a wide range of water supply, water rights and regulation, water sales, leasing, marketing and values, instream flows, and private property and State's rights aspects of the use of water, with significant practical, on-the-ground experience with water supply, water rights litigation and engineering projects across a broad range of clients; including private individuals, energy industries, environmental organizations, and municipal, state and federal government agencies. He is a registered professional engineer in Wyoming and Colorado. Mr. Fassett has received no external research grants from government agencies, private companies, or foundations.

Faustman, Elaine M.

University of Washington

Dr. Elaine M. Faustman is Professor in the Department of Environmental and Occupational Health Sciences and Director of the Institute for Risk Analysis and Risk Communication in the School of Public Health and Community Medicine at the University of Washington, where she has received the Outstanding Teaching Award. Dr. Faustman holds an A.B. in Chemistry and Zoology from Hope College and a Ph.D. in Pharmacology/Toxicology from Michigan State University. Her research includes quantitative risk assessment for non-cancer endpoints, molecular mechanisms of developmental and reproductive toxicity, and in vitro and molecular biological methodologies. Dr. Faustman's research expertise also includes development of decision-analytic tools for communicating and translating new scientific findings into risk assessment and risk management decisions. She is the principal investigator of the Pacific Northwest National Children's Study Center. She also directs the Pacific Northwest Center for Human Health and Ocean Studies. The goals of Dr. Faustman's research are to discover the mechanisms that define susceptibility in at-risk populations and to provide linkages across disciplines. Through her research, she seeks to train the next generation of scientists. Dr. Faustman is an elected fellow of the American Association for the Advancement of Science and the Society of Risk Analysis. She has served as chair for the National Academy of Sciences Committee on Developmental Toxicology and as a member for the National Institute of Environmental Health Sciences (NIEHS)-National Toxicology Program (NTP) Committee on Alternative Toxicology Methods, the NIEHS-NTP Board of Scientific Counselors, National Academy of Sciences Committee in Toxicology and the Institute of Medicine Upper Reference Levels Subcommittee of the Food and Nutrition Board. Dr. Faustman also served on the executive boards of the Society of Toxicology, the Teratology Society, the Society for Risk Analysis, and NIEHS Council. She has served as Associate Editor of Fundamental and Applied Toxicology and on the editorial boards of Birth Defects Research Journal, Reproductive Toxicology and Toxicology Methods. Dr. Faustman's research is currently supported by the United States Environmental Protection Agency, NIEHS, the National Science Foundation, the National Institute for Child Health and Human Development, the U.S. Department of Health and Human Services, and the U.S. Food and Drug Administration.

Finkel, Madelon

Cornell University

Dr. Madelon L. Finkel is Professor of Clinical Public Health and Director of the Office of Global Health at the Weill Medical College of Cornell University. She holds a B.A. in Sociology from University College, New York University, and an M.P.A. in Public Health and a Ph.D. in Epidemiology and Health Services Research from New York University. Dr. Finkel's professional career has been spent at the Weill Medical College of Cornell University. She is Course Director for the courses offered by the Department (Epidemiology, Biostatistics, Evidence-Based Medicine, Introduction to the Health Care System, and Clinical Clerkship in Health Care Policy). In addition to her faculty appointment at Weill Cornell Medical College, Dr. Finkel also holds the rank of Professor of Research in Medicine at SUNY Stony Brook, and was a Visiting Professor at the University of Sydney (Australia) School of Public Health. Dr Finkel has been involved in epidemiological research (focusing on women's health) and health care policy studies, and has published numerous articles, book chapters, and books on a variety of Public Health issues and topics. She served as Editor of a three-volume text on public health, *Perspectives in Public Health: Challenges for the 21st Century* (Praeger Publishing, 2010). Dr Finkel has served as consultant to numerous organizations, including law firms and pharmaceutical companies, in the areas of epidemiology and health care policy. She has been appointed by the Director General of the World Health Organization (WHO) to the WHO Expert Advisory Panel on Drug Evaluation. She is a member of the American College of Epidemiology, an advisor to the American Council on Science and Health, and a charter member of the Academy of Benefit Authors of the International Foundation of Employee Benefit Plans. Dr. Finkel has written on the topic of hydraulic fracturing, particularly on the potential risk for adverse health effects. Dr. Finkel has received no external research grants from government agencies. Her recent research has been supported by funding from private Foundations and through contractual sources of funding.

Fontana, John V.

Vista GeoScience LLC

Mr. John V. Fontana is a Professional Geologist and business executive currently serving as President and 50% owner of Vista GeoScience LLC. He holds a B.S. in Geology, Oceanography, and Physics from Humboldt State University in California. Since earning his degree, Mr. Fontana's entire career has been in the private service and consulting industry. He holds water well drilling contractor's licenses in several states for drilling environmental monitoring wells, soil testing and ground water sampling. Mr. Fontana is a member of 12 professional industry organizations and has held board member and officer positions. At Vista GeoScience, he has provided site investigation and remediation support services to the environmental engineering and consulting industries as well as laboratory and consulting services to the oil/gas/uranium exploration and extraction industries. He oversees the operations of all consulting, field and analytical services and mobile and fixed based laboratory programs, environmental remediation services. Mr. Fontana manages and mentors environmental technicians, environmental drillers, analytical chemists, field geologists, and sampling crews. He provides design, project support, and cost estimation on major geochemical exploration surveys, environmental site investigations, in-situ remediation design and baseline investigations. He has supervised development of new field and laboratory methods and data interpretation techniques. Mr. Fontana's research has been supported by grants from both government agencies and private companies, including the New York State Energy & Development Authority (NYSERDA), the U.S. Department of Energy through the Utah Geologic Survey, and in-kind contributions from industry firms. He has provided consulting on stray gas migration issues including water wells, casing leakage, and natural surface gas seeps for oil and gas operators as well as state agencies. Mr. Fontana was deposed as an expert with regards to stray gas migration issues at an underground gas storage facility (in an abandoned coal mine) in Colorado. He was among the earliest to promote the implementation of baseline investigation methods (testing water wells, investigating drilling history and old wells, and locating natural gas seeps) prior to conducting oil and gas drilling programs. Mr. Fontana has co-authored over 70 publications and presentations at professional conferences on these topics, including an upper level graduate seminar presentation at the Colorado School of Mines. He was most recently invited to present the keynote address titled "Water Well Problems in Areas of Unconventional Resource Developments: Appearances are Deceiving and Solutions are Many" at the Division of Environmental Geosciences (DEG) and Energy Minerals Division (EMD) Luncheon at the American Association of Petroleum Geologists International Conference in Singapore on September 17, 2012.

Gintautas, Peter

Colorado Oil and Gas Conservation Commission

Dr. Peter Gintautas is an Environmental Protection Specialist with the Colorado Oil and Gas Conservation Commission. He holds a B.S. in Geology from the University of Minnesota, an M.S. in Geology from the University of Calgary, and a Ph.D. in Geochemistry from the Colorado School of Mines. Dr. Gintautas has more than 30 years of experience in geology, geochemistry and environmental chemistry. He has performed research on the interaction and transport of metals and organic compounds from natural and anthropogenic sources in ground waters, soils, sediments and surface waters. Dr. Gintautas's work at the Colorado Oil and Gas Conservation Commission covers southeastern Colorado. He has investigated numerous instances of potential groundwater contamination and the relationships between oil and gas exploration and production activities in Colorado. Dr. Gintautas has received no external grants from either government agencies, private companies, or foundations.

Goldstein, Bernard D.

University of Pittsburgh

Dr. Goldstein is Professor of Environmental and Occupational Health and the former Dean of the University of Pittsburgh Graduate School of Public Health. He holds a B.S. in Psychology from the University of Wisconsin - Madison, an M.D. from New York University School of Medicine, and conducted Post-Doctoral studies in Hematology at the National Institutes of Health. Dr. Goldstein is a physician, board certified in Internal Medicine, Hematology and in Toxicology. He is author or co-author of over 150 publications in the peer-reviewed literature. Dr. Goldstein is an elected member of the National Academies of Science Institute of Medicine and of the American Society for Clinical Investigation. His experience includes appointment as Assistant Administrator for Research and Development of the U.S. Environmental Protection Agency (EPA), 1983-1985. Dr. Goldstein has chaired more than a dozen National Research Council (NRC) and Institute Of Medicine committees, most recently the Committee on Effectiveness of National Biosurveillance Systems: Biowatch and the Public Health System; and the Committee on Sustainability at EPA. He has been president of the Society for Risk Analysis and has served as a member or chairperson of numerous U.S. governmental and World Health Organization committees, including chairperson of the National Institutes of Health Toxicology Study Section and EPA's Clean Air Scientific Advisory Committee. Dr. Goldstein's activities related to shale gas development includes research, presentations and serving as a member of the Council of Canadian Academies Expert Panel on Harnessing Science and Technology to Understand the Environmental Impacts of Shale Gas Extraction. Dr Goldstein currently is a professor emeritus and has no current external research funding sources. His recent research activities were funded through grants from the U.S. government (National Institute of Environmental Health Sciences), and also through contracts with a wide variety of industries and foundations.

Goode, Daniel J.

U.S. Geological Survey

Dr. Daniel J. Goode is a Research Hydrologist with the U.S. Geological Survey (USGS), Pennsylvania Water Science Center, and Co-coordinator for the USGS Toxic Substances Hydrology Program research project on Chlorinated Solvents in Fractured Sedimentary Rock. He holds an S.B. and S.M. in Civil Engineering/Water Resources from Massachusetts Institute of Technology, and a Ph.D. in Civil Engineering/Water Resources from Princeton University. Dr. Goode leads a team of multi-disciplinary scientists conducting long-term, field-scale-focused investigations that improve the understanding, monitoring, and remedial modification of processes controlling the fate of recalcitrant contaminants in complex hydrogeologic settings. He previously worked at the U.S. Nuclear Regulatory Commission on fate and transport of radionuclides in groundwater, has taught several short courses, and has taught undergraduate and graduate courses at Penn State Great Valley, Drexel, and Princeton Universities. Dr. Goode has participated in review panels and consultations for the U.S. Agency for International Development (USAID) and the U.S. Department of Energy (DOE) Oak Ridge Operations. In addition to USGS funding from the National Research Program and the Toxic Substances Hydrology Program, his research also has been externally funded by the Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, the U.S. Environmental Protection Agency (EPA), and USAID. Dr. Goode has received grant funding from the U.S. Department of Defense/EPA/DOE Strategic Environmental Research and Development Program.

Grant, Roberta L.

Texas Commission on Environmental Quality

Dr. Roberta L. Grant is a Manager of the Toxicology Section at the Texas Commission on Environmental Quality (TCEQ). She holds a B.S. in Biology and a Ph.D. in Toxicology from the University of Texas at Austin, and completed a postdoctoral fellowship in the Integrated Toxicology Program at Duke University before joining the TCEQ in January 1997. Dr. Grant manages staff conducting the toxicological evaluation of air permit applications, monitoring projects, risk assessments, and toxicity assessments to develop acute and chronic inhalation toxicity factors. She participated with other staff toxicologists in writing TCEQ Guidelines for Developing Toxicity Factors (revised RG-422 2012). Dr. Grant has served on U.S. Environmental Protection Agency's National Advisory Committee for Developing Acute Exposure Guideline Levels (AEGLs), as a member on Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Scientific Advisory Panels, and is a member of the Science and Decisions Dose-Response Advisory Committee (DRAC). She is on the editorial board of Toxicology in Vitro and is an adjunct professor in the College of Pharmacy, UT Austin. Dr. Grant has published numerous scientific articles and book chapters. Her expertise is in general toxicology and human health risk assessment, and the use of in vitro models to investigate mechanisms of toxicity. She has received no external research grants from government agencies, private companies, or foundations.

Hammack, Richard

U.S. Department of Energy

Mr. Richard Hammack is a leading Project Manager for the U.S. Department of Energy (DOE)/National Energy Technology Lab (NETL) within DOE's Office of Research & Development. He holds a B.S. and M.S. in Geology from West Virginia University. As the Research Group Leader (since 2007), Mr. Hammack implements projects to analyze Environmental Impacts of Oil and Gas Exploration and Production Activities (Energy Policy Act of 2005, Subchapter J) and has duties that include technical planning and oversight of research activities performed by NETL, URS (NETL onsite contractor), and the Research University Alliance (University of Pittsburgh, Carnegie Mellon University, West Virginia University, Penn State University, and Virginia Tech University). His knowledge relevant to hydraulic fracturing includes: a) Knowledge of all current and emerging methods for the treatment and/or beneficial use of produced/flowback water; b) Knowledge of current best management practices for limiting air emissions from oil and gas production activities; c) Knowledge of methods used to locate abandoned wells (most likely contaminant pathway from hydrofractured formation to potable groundwater); d) Knowledge of airborne and ground-based geophysical methods for mapping contaminant plumes from leaking fracture ponds, and e) Knowledge of most likely ecological impacts of oil and gas production activities in the central Appalachian hardwood forests. Mr. Hammack has been the Principle Investigator for 14 high-risk projects that have won numerous awards and national recognition focusing on areas like innovative technologies of electromagnetic surveys that can detect sources and pathways of groundwater contamination. His project "SEQURE Well Finding Technologies" received DOE's Research and Development 100 award in 2007. As a research geochemist for the U.S. Department of Interior's former Bureau of Mines, Mr. Hammack conducted research pertaining to environmental impacts of mining including: a) investigation of morphological factors and crystal defects that control pyrite reactivity; b) development of rapid methods (evolved gas analysis, corrosion voltammetry, and Mossbauer spectroscopy) to determine pyrite reactivity; c) development of water treatment technologies that use biogenic sulfide; and d) investigation of methods for selectively recovering metals (as metal sulfide concentrates) during water treatment to offset treatment cost. He has authored more than 85 scientific publications, and also has served on numerous advisory committees including, but not limited to: the U.S. Environmental Protection Agency (EPA) Technical Advisory Committee for the Iron Mountain Superfund Site, CA, 1989-1992; EPA Committee on Prediction of Acid Mine Drainage, Las Vegas, NV, 1993; EPA Committee on Water Treatment Using Bacterial Sulfate Reduction, Cincinnati, OH, 1994; and the Mine Void Forum, Lexington, KY, 2003. Mr. Hammack has also worked for many diverse organizations within various federal and state governments and industry. He has received no external grants from either government agencies, private companies, or foundations.

Hayes, Thomas D.

Gas Technology Institute E&P Center

Dr. Thomas D. Hayes is an Environmental Engineer with the Gas Technology Institute E&P Center. He holds a B.S. in Public Health from Indiana University, an M.S. in Environmental Engineering from Purdue University, and a Ph.D. in Environmental Engineering from Notre Dame University. For more than twenty years, Dr. Hayes has developed numerous processes for the treatment of water streams associated with natural gas supply and operations. He has led numerous research and development projects on the development of biological and physical separations processes for the treatment of conventional produced waters. Recently, under a project funded by the U.S. Department of Energy (DOE), Dr. Hayes explored the use of electrodialysis processing for the beneficial use of coalbed methane produced waters. In past work, he has managed research and development on innovative water treatment technologies, including nanofiltration, reverse osmosis (RO), microfiltration, ion exchange, living-filter aquaculture and high-rate biological processing. Under the support of the Marcellus Shale Coalition (MSC), Dr. Hayes has teamed up with URS Corporation and the companies of the MSC to characterize waters associated with well completions at 19 locations in the states of Pennsylvania and West Virginia. His most current work, supported by the Research Partnership to Secure Energy for America (RPSEA)/National Energy Technology Laboratory (NETL)-DOE, involves the development of water management methods and technologies that reduce demands for freshwater and mitigate environmental impacts associated with shale gas well completions; this work encompasses alternate water sourcing, electrodialysis, RO membranes improved with novel coatings, field documentation of mechanical vapor recompression and water based life cycle modeling. Dr. Hayes also led a team of water management experts from industry and academia for a techno-economic assessment of shale gas water management solutions (including practices and treatment technologies) which was supported by 13 energy developers from the United States and Europe. All of this work was performed under contract; Dr. Hayes has received no external research grants from government agencies, private companies or foundations. In recent years, he has served as the Managing Director of the Barnett Shale Water Conservation and Management Committee (BSWCMC) and the Appalachian Shale Water Conservation and Management Committee, both of these organizations comprised of energy companies working to develop environmentally responsible water management approaches for shale gas development. GTI currently works with the BSWCMC and the Marcellus Shale Coalition to identify new opportunities for technology improvement.

Hellweger, Ferdi

Northeastern University

Dr. Hellweger is an Associate Professor in the Department of Civil and Environmental Engineering, and acting director of the Center for Urban Environmental Studies at Northeastern University. He holds a B.S. in Civil Engineering from Northeastern University, an M.S. in Civil Engineering from the University of Texas at Austin and Dr. Eng. Sci. from Columbia University. Prior to joining Northeastern, he was a Project Manager at the environmental modeling firm HydroQual. Dr. Hellweger's research interests are in the area of water quality and its relation to human and environmental health, with an emphasis on mathematical modeling. Examples of present projects include cyanobacteria in surface waters and phthalates in karstic groundwater systems. Dr. Hellweger's research has been supported by grants from the National Science Foundation (NSF) and National Institutes of Health (NIH) and various state and local governments, entities, and foundations. In 2012, Dr. Hellweger was awarded the Environmental Merit Award by the New England Region of the Environmental Protection Agency (EPA).

Henretig, Fred M.

University of Pennsylvania

Dr. Fred M. Henretig is Professor of Pediatrics at the University of Pennsylvania School of Medicine, and Director, Section of Clinical Toxicology at the Children's Hospital of Philadelphia. He holds a B.A. from the University of Pennsylvania, and an M.D. from Yale University. Dr. Henretig has over 35 years experience in academic pediatric emergency medicine and medical toxicology. He participated in the founding of Philadelphia's regional poison control center in 1985, served as its medical director until 2005, and is now Senior Toxicologist and Associate Medical Director of the Poison Control Center. His scholarly interests include general pediatric emergency medicine and related procedures, as well as a focus on pediatric toxicology and environmental health hazards. Dr. Henretig is a senior editor of four textbooks, and has authored or co-authored 52 original articles and 91 textbook chapters and review articles. He served on the Board of Directors of the American College of Medical Toxicology, and represented the American Board of Pediatrics on the Subboard of Medical Toxicology, which he chaired in 2000. In recent years Dr. Henretig also has become involved in disaster preparedness and education, particularly in the context of chemical threats, and has served in this context on several committees and workgroups of the Centers for Disease Control, the National Institutes of Health (NIH), and related federal agencies. He has also participated clinically on medical disaster relief teams responding to New York City on 9/11/2001, Banda Aceh, Indonesia after the 2004 tsunami, New Orleans in the wake of Hurricane Katrina in 2005, and Haiti after the 2010 devastating earthquake. Dr. Henretig has participated in research on low-level lead poisoning and neurocognitive development in children that was funded by the NIH, but is currently not receiving any external research grant support.

Honeycutt, Michael E.

Texas Commission on Environmental Quality

Dr. Michael E. Honeycutt is the Director of the Toxicology Division of the Texas Commission on Environmental Quality (TCEQ). He holds a B.S. and Ph.D. inToxicology from Northeast Louisiana University. Dr. Honeycutt has been employed by the TCEQ since 1996 and has managed the Division of 14 toxicologists since 2003. His responsibilities include overseeing health effects reviews of air permit applications, overseeing the review of the results of ambient air monitoring projects, and overseeing the reviews of human health risk assessments for hazardous waste sites. Dr. Honeycutt spearheaded the updating of TCEQ's Effects Screening Levels (ESLs), or toxicity factors for chemicals. The current TCEQ ESL derivation procedure has been through two independent external scientific peer reviews and multiple rounds of public comment (http://www.tceq.texas.gov/toxicology/esl/guidelines/about.html). Dr. Honeycutt serves as a technical resource for TCEQ management and staff on issues concerning air and water quality, drinking water contamination, and soil contamination. He also serves as an expert witness in public and state legislative hearings, participates in public meetings, and has conducted hundreds of media interviews. Dr. Honeycutt is an adjunct professor at Texas A&M University, has published numerous articles in the peer-reviewed literature, serves or has served on numerous external committees, and has provided invited testimony at Congressional hearings. The TCEQ receives both state and federal operating funds, and Dr. Honeycutt has received no external research grants from either government agencies, private companies, or foundations.

Honeyman, Bruce D.

Colorado School of Mines

Dr. Bruce D. Honeyman is an Emeritus Professor of Environmental Science and Engineering at the Colorado School of Mines. He holds a B.S. in Applied Earth Science, and an M.S. and Ph.D. in Civil/Environmental Engineering from Stanford University. In his 35-year career, Dr. Honeyman's research and teaching have focused on the particle water interface and processes that control the behavior of metals and organic compounds in marine systems and the subsurface. A substantial portion of Dr. Honeyman's research has emphasized the chemistry and transport of uranium-series isotopes. At the Colorado School of Mines, Dr. Honeyman also established a radioisotope laboratory licensed for the use of plutonium isotopes and the last 15 years of his and his students' work have emphasized the role of bacterial exudates on the subsurface behavior of plutonium and its decay products. Dr. Honeyman has received grants for research from the National Science Foundation, the U.S. Geological Survey and a variety of U.S. Department of Energy programs. Over his career, Dr. Honeyman has served on a number of advisory panels reviewing licensing and siting of nuclear waste repositories and radioactive waste remediation actions.

Howarth, Robert

Cornell University

Dr. Robert Howarth is the David R. Atknson Professor of Ecology & Environmental Biology at Cornell University, where he also directs the Agriculture, Energy & Environment Program, and he is an Adjunct Senior Scientist at the Ecosystems Center of the Marine Biological Laboratory in Woods Hole, MA. He holds a B.A. in Biology from Amherst College and a Ph.D. jointly from Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution. Dr. Howarth's research focuses on the sources and effects of nutrient pollution in coastal marine ecosystems, the interactions of biogeochemical cycles from ecosystem to regional to global scales, and the environmental effects of energy systems (including biofuels and fossil fuels, with an emphasis on water quality and on greenhouse gas emissions). He is the Founding Editor of the journal Biogeochemistry and was Editor-in-Chief of the journal from 1983 to 2004. Dr. Howarth has served on 11 committees and panels of the National Academy of Sciences, including serving as chair for two of these: the Committee on Causes and Consequences of Coastal Marine Eutrophication from 1998-2000, and the Working group on Scientific Studies in Pristine Areas in 1995. He also served on the Panel on Fluxes of Trace Gases from Terrestrial Ecosystems of the Committee on Global Change (1989-1990) and the Panel on Ecological Effects, Committee on Fate and Effects of Oil in the Sea (1981-1984) of the Academy of Sciences. Dr. Howarth co-chaired the International SCOPE Nitrogen Project from 1992 to 2002, directed the North American Nitrogen Center of the International Nitrogen Initiative from 2003-2006, and has been chair of the International SCOPE Biofuels Project on environmental effects of biofuels since 2007. From 1989-1990, he was the lead consultant for the Attorney General of Alaska on the Exxon Valdez oil spill. Dr. Howarth also served as an expert witness in two federal court trials on pollution from oil and gas drilling. From 2000 to 2002, he directed the Oceans Program at Environmental Defense. Dr. Howarth was the co-lead author of the chapter on responses to nutrient pollution for the Millennium Ecosystem Assessment in 2005 and served as a consultant to the Pew Oceans Commission on nutrient pollution from 2002-2003. From 2006-2008, Dr. Howarth served as a member of the EPA's Science Advisory Board Panel on Hypoxia in the Northern Gulf of Mexico. From 2007 to 2008 he served as President of the Coastal & Estuarine Research Federation. From 2008-2010, Dr. Howarth served on the Board of Directors of the Council of Scientific Society Presidents (CSSP), an umbrella group representing 1.5 million scientists. He co-chaired the CSSP Committee on Energy & Environment in 2009 and 2010. Dr. Howarth also represents the State of New York on the Science and Technical Advisory Committee of the Chesapeake Bay Program. He has edited 7 books and authored more than 180 papers. Over the past few years, Dr. Howarth's laboratory has been funded by grants from the National Science Foundation, the National Oceanic and Atmospheric Administration Coastal Ocean Program, Woods Hole SeaGrant, U.S. Department of Agriculture, Hudson River Foundation, Park Foundation, Packard Foundation, and the University of Stockholm.

Hufford, Walter R.

Talisman Energy USA

Mr. Walter R. Hufford is Manager of U.S. Regulatory Affairs for Talisman Energy USA. He holds a B.S. in Earth Sciences - Geology from Middle Tennessee State University, an M.S. in Geology from Texas A&M University, and a Masters in Management – Business Administration from Pennsylvania State University. Mr. Hufford has 30 years of experience in the energy industry working with environmental issues associated with legacy and current operations. He provides internal technical and regulatory support in his company's North America exploration and production operations, and serves on committees with trade organizations at the regional and national level. He has been integral to internal company activities relating to drilling and completions. Mr. Hufford participates on industry and state regulatory committees that address new legislation and rulemaking including oil and gas provisions. Mr. Hufford serves as a corporate advisor regarding hydraulic fracturing, gas migration and stray gas matters. His prior experience includes management of multimillion dollar environmental liabilities including; nuclear fabrication and disposal sites, chemical plants, petrochemical facilities, manufacturing locations and refinery projects with complex environmental and liability issues. He has successfully closed hundreds of environmentally impacted sites regulated at the federal and state level throughout the United States. He served in a leadership role during the 2010 Macondo Deep Water Horizon gulf response coordinating and advising as a company liaison with the U.S. Coast Guard, EPA, Departments of Homeland Security & Interior, U.S. Fish and Wildlife Service as well as multiple state regulatory agencies. He also served as a spokesperson for BP's Community outreach effort conducting "town hall meetings" for residents and elected officials along the Gulf Coast. Mr. Hufford was selected to present in the EPA 2011 workshops dealing with Hydraulic Fracturing. Mr. Hufford has received no external research grants from either government agencies, private companies, or foundations during his tenure with Talisman or BP.

Hyden, Ron

Halliburton Energy Services

Mr. Ron Hyden is the Director of Technology for Halliburton's Production Enhancement product service line. He holds a B.S. in Chemical Engineering from Texas A&M University. Currently based in Houston, Mr. Hyden has more than three decades of oilfield experience with Halliburton, including stimulation field work in the East Texas and North Louisiana basins of the U.S. In addition to his most recent role as Production Enhancement's Strategic Business Manager, he has also served Halliburton in various areas that have included field engineering and operations, technical sales, and global marketing for stimulation and underbalanced applications. Mr. Hyden's project engineering experience includes multiple well reservoir development and optimization, including drilling to completion, cementing, log analysis, stimulation design, and reservoir evaluation. Mr. Hyden has received no external grants from either government agencies, private companies, or foundations.

Ingraffea, Anthony

Cornell University

Dr. Ingraffea is the Dwight C. Baum Professor of Engineering and Weiss Presidential Teaching Fellow at Cornell University where he has been since 1977. He holds a B.S. in Aerospace Engineering from the University of Notre Dame, an M.S. in Civil Engineering from Polytechnic Institute of New York, and a Ph.D. in Civil Engineering from the University of Colorado. Dr. Ingraffea's research concentrates on computer simulation and physical testing of complex fracturing processes. He and his students performed pioneering research in the use of interactive computer graphics and realistic representational methods in computational fracture mechanics. He has authored with his students and research associates over 250 papers in these areas, and is Director of the Cornell Fracture Group (www.cfg.cornell.edu). Since 1977, Dr. Ingraffea's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (National Science Foundation; National Aeronautics and Space Administration (NASA) – Langley; NASA – Glenn; U.S. Air Force Office of Scientific Research; U.S. Army Engineer Waterways Experiment Station; U.S. Department of Transportation; Sandia National Laboratories;) and from private industry (IBM; Caterpillar Tractor). Professor Ingraffea was a member of the first group of Presidential Young Investigators named by the National Science Foundation in 1984. For his research achievements in hydraulic fracturing he has won the International Association for Computer Methods and Advances in Geomechanics "1994 Significant Paper Award" for one of five most significant papers in the category of Computational/Analytical Applications in the previous 20 years, and he has twice won the National Research Council/U.S. National Committee for Rock Mechanics Award for Research in Rock Mechanics (1978, 1991). He became a Fellow of the American Society of Civil Engineers in 1991, and named the Dwight C. Baum Professor of Engineering at Cornell in 1992. His group won a NASA Group Achievement Award in 1996, and a NASA Aviation Safety /Turning Goals into Reality Award in 1999 for its work on the aging aircraft problem. He became Co-Editor-in-Chief of Engineering Fracture Mechanics in 2005. In 2006, he won American Society for Testing and Materials' George Irwin Award for outstanding research in fracture mechanics, and in 2009 was named a Fellow of the International Congress on Fracture. TIME Magazine named him one of its "People Who Mattered" in 2011.

Jack, Richard

Thermo Fisher Scientific Corporation

Dr. Richard Jack is currently the Manager of Market Development, Thermo Fisher Scientific Corporation and is involved with environmental applications for over 15 years. He holds a B.S. in Biochemistry from Virginia Tech University, an M.S. in Ecology from the University of Tennessee, and a Ph.D. in Biochemistry and Anaerobic Microbiology from Virginia Tech University. Working with regulatory agencies around the world, he assists these agencies in developing robust analytical methods that are eventually used for compliance monitoring by bringing customer problems to his company to develop new applications, hardware, software or column chemistries. Dr. Jack is a co-author for EPA' Analytical Method #557 and has also drafted several methods through the American Society for Testing and Materials –International (ASTM) and a member of ASTM's D19 Water committee's task force on hydraulic fracturing. Dr. Jack's research has been supported by funding from Thermo Fisher Scientific Corporation, and has received no external grants from either government agencies, private companies, or foundations. Previously, he was a product manager for Dionex and Hitachi High Technologies where he designed analytical instrumentation including ion chromatography, high-performance liquid chromatography systems, pumps, autosamplers and a variety of detectors. Prior to analytical instrumentation, Dr. Jack worked at Clontech laboratories in Palo Alto, CA. He completed post doctoral work at Virginia Tech and was involved in vaccine development then worked as an environmental scientist involved in bioremediation of toxic compounds in soils.

Jester, Stephen

ConocoPhillips

Stephen L. Jester, P.E., is a Senior Principal Environmental Engineer with ConocoPhillips. He holds a B.S. in Civil & Environmental Engineering from Cornell University, and an MBA from Villanova University. He is recognized in the oil & gas industry for his experience in water issues related to hydraulic fracturing. He has 29 years of experience in managing projects related to characterization and remediation of soil and groundwater, and water and wastewater treatment, including 15 years in the oil & gas industry. He is currently responsible for managing water issues related to hydraulic fracturing for ConocoPhillips Lower 48 region, including evaluating recycle and reuse opportunities, fresh water and alternative water sourcing, and regulatory changes. He formed and led the Eagle Ford Water Consortium, a group of experts from 18 oil & gas companies who manage water issues for hydraulic fracturing in the Eagle Ford Shale. This group funded and provided more accurate and timely water use data to the University of Texas Bureau of Economic Geology to enable a more robust analysis of water use in hydraulic fracturing in Texas. He has studied and presented on the water supply and demand for hydraulic fracturing in Eagle Ford, including presentations to the U.S. Environmental Protection Agency Hydraulic Fracturing Work Group, and various conferences and groups in Texas. He is currently working with the American Petroleum Institute to update the "Water Management Associated with Hydraulic Fracturing" guidance document to include recommended practices on baseline water sampling. He has extensive experience in groundwater contamination and remediation throughout the lower 48 states, with past responsibilities that included a large project portfolio and remediation technology development. Mr. Jester has received no external research grants from either government agencies, private companies, or foundations.

Kaback, Dawn

AMEC Environment & Infrastructure, Inc.

Dr. Dawn Kaback is currently a Principal Geochemist with AMEC E&I in Denver CO. She holds a B.S. in Earth and Space Sciences from State University of New York at Stony Brook, and an M.S. and Ph.D. in Geological Sciences from University of Colorado. Dr. Kaback has more than 35 years of experience in technical and management roles with emphasis on applied research and technology development for environmental and energy issues. Her research has involved 1) development and implementation of innovative solutions focused on investigation and remediation of contaminated groundwater and soil; 2) understanding of oil and gas reservoirs and methods for resource extraction, 3) regional aquifer characterization; 4) prediction of mining impacts to surface water, groundwater, soils, flora, and fauna, and 5) collaborative decisionmaking to solve environmental problems such as mining impacted watersheds. Dr. Kaback's sources of grant research funding have included federal government agencies and foundations, primarily the National Science Foundation, the U.S. Department of Energy (DOE), and, the Hewlett Foundation, She has also received internal corporate research funding from Conoco, Inc. and AMEC and contract funding from federal agencies, such as the U.S. Air Force. Her expertise includes 1) aqueous geochemistry, involving fate and transport of organics, trace metals, and radionuclides; 2) geology and hydrogeology; 3) innovative subsurface access methods including horizontal drilling and fracturing; 4) innovative technologies for subsurface characterization and remediation, including geophysical methods; 5) petroleum geology, including sedimentary petrography and diagenesis to enhance resource extraction methods; 6) stakeholder involvement to promote acceptance of innovative technologies, and; 7) decision science. Dr. Kaback has significant experience leading and participating on more than 35 independent technical panels to review: 1) research programs (e.g., National Academy of Science's Committee on the U.S. Geological Survey's Water Resources Research and DOE's Office of Environmental Management Technology Innovation), 2) research proposals (e.g., small business innovative research), and 3) DOE environmental cleanup projects. Dr. Kaback has also conducted numerous reviews of innovative environmental technologies for U.S. Environmental Protection Agency's Technology Innovation Office and DOE's Technology Innovation Office. She has dedicated significant efforts to transfer of innovative technologies from government laboratories to commercial practice, has worked with the Interstate Technology and Regulatory Council to promote innovative technologies through state regulatory agencies, and holds four patents for innovative remediation systems based upon horizontal drilling for in situ groundwater treatment and subsurface desiccation for immobilization of radionuclides in the unsaturated zone. Dr. Kaback works closely with the National Ground Water Association: serving as a Board member, a Committee Chair for the Horizontal Drilling Interest Group, Technical Editor for Ground Water Monitoring and Remediation Journal and a column in Ground Water Journal; has taught numerous workshops at national conferences; and received the Keith Anderson Award for service to the organization.

Kane, Kimberlee

New York City Department of Environmental Protection

Dr. Kimberlee Kane serves as Special Assistant to the Assistant Commissioner for Watershed Protection Programs at New York City Department of Environmental Protection (NYCDEP). She holds a B.S. in Geology from SUNY Binghamton and an M.S., M.Phil. and Ph.D. in Geophysics from Lamont Doherty Earth Observatory, Columbia University. Dr. Kane has been with the NYCDEP, Bureau of Water Supply since 1995. She works on a wide range of scientific projects, provides input on policy and regulatory issues, represents the Bureau with regulators and watershed stakeholders, and is the in-house expert on potential impacts of natural gas development on the NYC water supply for NYCDEP. Dr. Kane has broad expertise in watershed management, water supply operations, treatment, and regulatory requirements, with specific familiarity with the scientific and operational issues of the New York City water supply. She also has a strong technical background in geophysics, scientific data analysis, interpretation, and modeling. Dr. Kane previously served on a Project Advisory Committee for an American Water Works Association (AWWA) Research Foundation project and is currently participating on hydrofracking subcommittees for AWWA and the New York Section of the AWWA. Dr. Kane's work is not supported by any grant funding.

King, George E.

Apache Corporation

Mr. George E. King is a Distinguished Engineering Advisor with Apache Corporation. He holds a B.S. in Chemistry from Oklahoma State University, and a B.S. in Chemical Engineering and an M.S. in Petroleum Engineering from the University of Tulsa. Mr. King is a Registered Professional Engineer with over 41 years oilfield and 11 years of academic teaching (night) experience since starting with Amoco Production Research in 1971. His technical background includes environmental risk analysis in fracturing, basic research on energized fracturing, production and fracturing chemicals, acidizing, perforating, evaluating well integrity over life of the well, completion design evaluation, and complex formations (North Sea chalk, San Juan coal, Alaskan viscous oil, U.S. tight gas and GoM Deep Water). His research and application work involved was covered by grants from industry. Mr. King has studied unconventional resources in the Barnett Shale, Horn River Shale, Eagle Ford Shale, Fayetteville Shale, and Gothic Shale, with involvement in over 500 fracturing treatments. Mr. King has applied or many commercially available types of fracture tracer, microseismic, tilt meter and production logging devices to study fracture progression through and production from planar and complex (network) fracturing. Mr. King has significant experience with new technology application and has used or evaluated gelled fracs, slick-water fracs, gas fracs, dense phase CO_2 fracs, alcohol fracs, liquefied hydrocarbon gas fracs, propellants, high explosive fracs and pulse frac techniques. Mr. King's technical accomplishments include 65 technical papers including the first industry published and reviewed environmental fracturing risk analysis, a book on completions and workovers, 1985/86 Distinguished Lecturer on foam fracturing and a Lecturer on horizontal wells for the Society of Petroleum Engineers (SPE) Short Course series in 1998/9. Industry positions held include Technical Chairman of the 1992 SPE Annual Fall Meeting, past American Petroleum Institute subcommittee chair on perforating, eleven years adjunct professor at the University of Tulsa (teaching well completions and fracturing courses), and numerous SPE involvement in forums and SPE Applied Technology workshops.

Kissel, John C.

University of Washington

Dr. John C. Kissel is currently Professor of Environmental and Occupational Health Sciences at the University of Washington in Seattle. He holds a B.S. in Civil Engineering from the University of Notre Dame, an S.M. in Environmental Engineering from Harvard University, and a Ph.D. in Civil/Environmental Engineering from Stanford University and is a registered professional engineer. Dr. Kissel's research interests generally involve human exposure assessment, with emphasis on exposures related to waste management practice, agricultural use of pesticides, and consumer products. He is particularly interested in probabilistic prediction of exposure and reconciliation of model predictions with observed biomarker data. Dr. Kissel and his students have produced multiple papers describing human exposure to soil that are listed as "key studies" in the U.S. Environmental Protection Agency's (EPA) Exposure Factors Handbook. He is a former President and Councilor of the International Society of Exposure Science and also served one term as chair of the Exposure Assessment Specialty Group within the Society for Risk Analysis. Dr. Kissel was a member of a National Academy of Sciences Committee that evaluated Superfund-related remediation of mining wastes in the Coeur d'Alene Basin in Idaho and has served as an ad hoc member of EPA's Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Science Advisory Panel on multiple occasions. His recent research activities have been funded by EPA, the National Institute for Occupational Safety and Health, and the Washington State Departments of Ecology and Health.

Klecka, Gary

Independent Consultant

Dr. Gary Klecka is currently an Independent Consultant, and was formerly a Senior Fellow with the Toxicology and Environmental Research Laboratory of The Dow Chemical Company. He holds a B.A. and Ph.D. in Microbiology from the University of Texas at Austin. Dr. Klecka was a research scientist and technical consultant with Dow from 1980 until his retirement in 2012, and has published over 75 articles, book chapters, and patents addressing various topics in the environmental sciences. His research, funded by The Dow Chemical Company, focused on the fate, transport, effects, and risks of organic chemicals in the environment. Dr. Klecka has conducted research on the mechanism and kinetics of organic chemical degradation in wastewater treatment systems, the fate and transport of chemicals in surface waters and sediments, and extensive work on the microbial transformations and bioremediation of organic compounds in groundwater. As a leader on EPA's Remediation Technologies Development Forum Bioremediation of Action Committee, he led a research program examining the importance of natural attenuation of chlorinated solvents in groundwater conducted at Dover Air Force Base. For over 15 years, Dr. Klecka applied these concepts to the remediation of groundwater contaminants at industrial facilities around the world. He has considerable experience in the evaluation of environmental persistence and transport potentials of persistent, bioaccumulative and toxic substances (PBTs), and he has served as Chairman or Co-chair of two Society of Environmental Toxicology and Chemistry Pellston Workshops on the Evaluation of PBTs and Persistent Organic Pollutants. Among Dr. Klecka's current interests include the biological fate and effects of endocrine active compounds and other chemicals of emerging concern in wastewater treatment systems and receiving waters. As a current member of the International Joint Commission's Science Advisory Board, he has served as co-chair of the Chemicals of Emerging Concern Workgroup for the past two priority cycles. In addition to the assessment of environmental exposures to chemicals of emerging concern in the Great Lakes basin, Dr. Klecka recently led a project to assess the performance of wastewater treatment facilities in the watershed. Dr. Klecka's travel for participation on the Board is supported by funding from the International Joint Commission.

Leber, A. Philip

Independent Consultant

Dr. A. Philip Leber is an Independent Consultant in chemistry, toxicology, risk assessment, and eco-toxicology & -fate. He holds a B.S. in Chemistry from the University of California-Davis, and an M.S. and Ph.D. in Pharmacology/Toxicology from Purdue University. Dr. Leber is currently teaching two web-based courses for the American Chemical Society entitled "Toxicology for Chemists" (since 2005), and "Ecological Impact of Chemicals." These courses include basic concepts of human health impact and ecological effects of chemicals, laboratory testing methodologies, computer-based modeling, metabolism/toxicokinetics, and biochemical mechanisms that initiate toxic effects. In January, Dr. Leber will commence as instructor at Kent State University's School of Public Health, and will be teaching a graduate course in "Applied Risk Assessment" which will focus upon human health and ecological risks associated with chemical exposures. For 20+ years of his career, he was employed by producers of commodity chemicals, pesticides, lubricants, and polymeric products. Since 1988, he has served as a consultant in Toxicology in a variety of roles, including collaborating with an environmental contract lab in UK to provide ecological testing of chemicals for the purpose of providing data needed for registrations on international scale; assisting in development and expert review of U.S. Environmental Protection Agency and Agency for Toxic Substances and Disease Registry documents describing health effects of water and air contaminants as well as agents found in waste sites, and performing health assessments for chemicals found in environmental settings (air, water, soil), underground tanks, and in the workplace. Dr. Leber has provided toxicological expertise and comments addressing development of Indoor Air Quality (IAQ) guidelines related to second-hand tobacco smoke. He has designed, monitored, and reviewed hundreds of research/testing reports on animal toxicity and ecological endpoints for veterinary drugs, environmental contaminants, polymers, food additives, and industrial agents. Dr. Leber has received no external research grants from government agencies, private companies, or foundations.

Lee, Cindy M.
Clemson University
Dr. Cindy M. Lee is a Professor of Environmental Engineering and Earth Sciences and of Environmental Toxicology at Clemson University. She holds a B.A. in English from Indiana University (1977), a B.A. in Geology and Chemistry from University of Colorado (1984), and a Ph.D. in Geochemistry from the Colorado School of Mines (1990). Dr. Lee joined the faculty at Clemson in 1990. Her major teaching and research interests are the chemistry of environmentally significant organic compounds and environmental sustainability. Dr. Lee's specific research interests involve the use of chiral chemistry as a tool for investigating the fate and transport of pesticides, pharmaceuticals, and persistent organic pollutants (POPs) in the environment; the bioremediation of chlorinated contaminants; and the role of black carbon and natural organic matter in the fate of contaminants. Her research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from federal government (National Science Foundation, U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Army Corps of Engineers), with additional grant support from state and local governments, industry, and foundations. From July 2006 to July 2007, Dr. Lee served at the National Science Foundation as the founding Program Director of the Environmental Sustainability Program in the Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET), Directorate of Engineering. Dr. Lee has a national perspective on engineering and science research and research needs in environmental sustainability. She served as a member of the Energy and Environment Coordinating Group for development of the National Aeronautical Research and Development Plan under the auspices of the Office of Science and Technology Policy (OSTP). Dr. Lee participated on the Feedstocks Task Force of the U. S. Department of Energy's Biofuels Action Plan.

Lewis, Steven

Integral Policy & Science, LLC

Dr. Steven Lewis is President and Principal Scientist of Integral Policy & Science, LLC, Adjunct Professor of Environmental and Occupational Medicine, RW Johnson Medical School and Adjunct Professor of Toxicology, University of Massachusetts (at Amherst). He holds a B.A. in Chemistry and a Ph.D. in Toxicology from Indiana University. Dr. Lewis served as Analyst and Manager of the Indiana State Tumor Registry (the state-wide statistical cancer research unit). During his 28-year career with ExxonMobil, he held various technical, consulting and management positions, including Head of the Petroleum and Synthetic Fuels Group and served as a corporate advisor on scientific and science-policy issues in occupational and environmental health. Dr. Lewis' research and safety assessment activities focused on potential health risks from exposure to petroleum and chemical carcinogens, nervous system toxicants, and hazards to reproductive health. He served as the senior on-site health scientist (in Alaska) following the oil spill event of 1989; his assignments included managing scientific programs to assess potential human health impacts of the oil spill and clean-up. Dr. Lewis' duties also included facilitating seafood safety communications with the Alaskan public, private stakeholders, and officials of federal and state governments. He has continued his engagement in the assessing seafood safety following oil spills as a consultant to BP following the 2010 Deepwater Horizon accident and spill in the Gulf of Mexico. Dr. Lewis is a four-time winner of ExxonMobil's most prestigious award for excellence in the health and environmental sciences. Following retirement from ExxonMobil (December, 2003), he founded an independent consulting service, Integral Policy & Science, LLC (IPS; formerly Integrative Policy & Science, Inc., IPSi). IPS provides public- and private-sector clients with advice in general toxicology, qualitative and quantitative assessment of risk from occupational and/or environmental hazards, science policy, and legislative/regulatory affairs. Dr. Lewis has extensive experience in facilitating public engagement in environmental issues and decision-making, as well as in the area of risk communication. He is a Diplomate of the American Board of Toxicology, has served on the editorial boards of 4 scientific journals, and served as Associate Editor of Dose-Response (formerly, Nonlinearity in Biology, Toxicology and Medicine). Dr. Lewis is very active in a variety of professional societies, including the Society for Risk Analysis (past-member of the governing Council and nominee for the office of President), the International Society for Regulatory Toxicology and Pharmacology (elected to governing Council), and the Society of Toxicology. He has served as a Consultant to the U.S. Environmental Protection Agency Science Advisory Board and as a Member of the Risk Communication Subcommittee of the EPA Board of Scientific Counselors (of the Office of Research and Development). Dr. Lewis frequently provides comments on scientific and regulatory issues before U.S., state and international agencies and has repeatedly served as a selected peer reviewer for more than 30 separate toxicological profiles, summaries and risk assessments. He is a Past-Chair of the American Petroleum Institute's Toxicology Committee, and a former member of the Board of Directors of the Toxicology Forum, past Chair of the American Industrial Health Council's Science Policy Committee, and a former member of the Science Program Committee of the Chemical Industry Institute of Toxicology. Dr. Lewis served as a member and Chairman of the Board of Trustees of Toxicology Excellence in Risk Assessment (TERA, a not-for-profit organization specializing in the assessment of health and environmental risks) and is continuing his association with TERA in the role of collaborative Fellow. He served as a member of the U.S. National Research Council's panel on "Public Participation in Environmental Decision-Making." Dr. Lewis retains the title of Senior Fellow (Cecil and Ida Green Center for the Study of Science & Society, University of Texas at Dallas), where he was a Visiting Scholar in 1995. He has published and presented the results of his work widely, and has delivered numerous invited seminars and other presentations.

Li, Abby A.

Exponent, Inc.

Dr. Abby A. Li is a Senior Managing Scientist in the Health Science Practice of Exponent Inc., an international scientific consulting firm. She holds a B.A. in Chemistry and a Ph.D. in Pharmacology and Physiology from the University of Chicago. Dr. Li's research interests include evaluating the neurotoxic potential of industrial and agricultural chemicals and applying quantitative risk assessment approaches to neurotoxicity endpoints. Her research has been funded by government grants and industry, most recently by the United Kingdom Department of Environment, Food and Rural Affairs (UK DEFRA). Dr. Li has served on international and national panels for workshops on integration of in vivo and in vitro screening methods and development of databases for prioritizing chemicals for further testing and regulatory decision-making. Prior to joining Exponent Inc., Dr. Li was Senior Science Fellow at Monsanto, providing expertise in toxicology/risk assessment. She led the neurotoxicology group at Monsanto's Environmental Health Laboratory where she conducted pharmacokinetic, toxicology and neurotoxicology studies for industrial chemicals, agricultural products, and pharmaceuticals. These studies included guideline, specialized mechanistic studies, as well as human and in vitro studies. Dr. Li served on the National Academy of Science's National Research Council Committee on Toxicity Testing and Assessment of Environmental Agents in the 21st century, the EPA's Science Advisory Board (SAB) Environmental Health Committee, and the EPA's SAB Risk and Technology Review Committee evaluating effects of industrial emissions of hazardous air pollutants on public health and the environment. She served on panels sponsored by the National Academies of Science and the State of California Environmental Protection Agency's Office of Environmental Health Hazard Assessment on application of computational toxicology and development of toxic information clearinghouse for green chemistry initiatives. She has been a member of several International Life Science Institute Committees on adult and developmental neurotoxicity testing (DNT), and toxicity testing strategies for pesticides. Dr. Li served on the U.S. expert teams to the Organization for Economic Cooperation and Development (OECD) for the development of international test guidelines for adult and developmental neurotoxicity testing. She has been a member of the Scientific Planning Committee for the Society of Toxicology, the International Neurotoxicology Association, and several international conferences on alternative (in vitro and non-mammalian) screening approaches for DNT.

Liang, Xu

University of Pittsburgh

Dr. Xu Liang is Professor of Civil and Environmental Engineering at the University of Pittsburgh. She also holds a Chang Jiang Chair Professor position at the Sichuan University in China. Prior to joining the University of Pittsburgh in 2006, she was on the faculty of the Department of Civil and Environmental Engineering at the University of California at Berkeley. Dr. Liang holds a B.S. and M.S.E. in Hydraulic Engineering from the Sichuan University, China, and an M.S.C.E. in Environmental Science and Engineering and a Ph.D. in Hydrology and Water Resources from the University of Washington. After her postdoctoral research work at the Princeton University, Dr. Liang took a research scientist position at the Joint Center for Earth Systems Technology, National Aeronautics and Space Administration (NASA)/University of Maryland. Dr. Liang received the Hellman Faculty Fund Award for Junior Faculty from the University of California at Berkeley in 2000. She also received two award certificates from NASA in 2003. Two Ph.D. students under her supervision received the Student Research Award from the Berkeley Atmospheric Sciences Center in 2002, 2003, and 2004, respectively; and one received the American Geophysical Union Outstanding Student Paper Award in 2009 at the AGU Joint Assembly – The Meeting of the Americas, Toronto, Canada, May 24-27, 2009. Dr. Liang's fundamental research interests are: (1) to discover and reveal fundamental laws that govern water and energy cycles, and (2) to investigate how the water and energy cycles affect the health of our environment and ecological systems, and how they influence the transport and cycling of nutrients and pollutants at different scales, such as at local, regional, continental, and global scales. She is also very interested in research topics leading to improving accuracies on weather forecasts, droughts and floods, and on climate studies; scaling and data assimilation using in situ and remotely sensed measurements; and applications of emerging information technology for sustainable ecological system and water resources management. Her recent work is also in the areas of eco-hydrology, hydro-informatics with machine learning methods, cyber-infrastructure for earth science, data assimilation, land surface modeling, and applications of sensors and wireless sensor network for environmental, ecological, and hydrological systems. Dr. Liang has published over 50 refereed journal papers with over 2330 Institute for Scientific Information Science Citation Index citations by others. She has given over 45 invited talks nationally and internationally. She currently serves as an Associate Editor for Water Resources Research. She has served as a guest editor for the Journal of Hydrology in 2003 – 2004 and for the International Association of Hydrological Sciences (IAHS) in 2005-2006. Dr. Liang's research has been primarily supported by grants from the federal government agencies (e.g., U.S. Department of Energy, NASA, the National Oceanic and Atmospheric Administration, and National Science Foundation). She also received one grant support from the Alcoa in the past.

Lieske, Sean

City of Aurora, Colorado

Mr. Sean Lieske is the Environmental Permitting and Compliance Manager for the City of Aurora Water Department (Aurora Water), Colorado. He holds a B.S. in Environmental Health from Colorado State University. Mr. Lieske manages a team of individuals responsible for ensuring the water utility maintains compliance with all applicable State and Federal rules and regulations, monitoring permits and permit activities and developing a managing a source water protection plan for the Aurora water department. Part of Aurora Water's source water protection has been focused on oil and gas exploration & production, particularly hydraulic fracturing, around several of their sources of supply to ensure their sources are not being negatively impacted. In addition to his duties within Aurora Water, Mr. Lieske currently participates on the City of Aurora's Oil and Gas Committee, which is a committee that was formed to evaluate potential impacts and/or benefits of oil & gas exploration within the city limits. Furthermore, he is the past Chair of Colorado's Water Utility Council and has also served on Project Advisory Committees (PACs) for a number of water research organizations, including the Water Research Foundation, Water Environment Research Foundation and WateReuse Foundation. Mr. Lieske has received no external grants from either government agencies, private companies, or foundations.

Lynch, Keith Wilson

ConocoPhillips Company

Mr. Keith Lynch is the Global Completions Chief for ConocoPhillips Company based in Houston, TX. He holds a B.S. in Petroleum Engineering from the University of Wyoming. Mr. Lynch is responsible for advising business units on complex well completion-related issues and designs and senior management on investment and development opportunities with completion-related drivers and risks. In his near 30 years with the company, he has held a variety of technical and leadership engineering positions in drilling, completions, reservoir and production. He has years of hydraulic fracture design, optimization and field implementation experience. Prior to the formation of ConocoPhillips in 2002, Mr. Lynch held a variety of engineering positions in some of its heritage companies, Phillips Petroleum Company and ARCO. Being a ConocoPhillips employee, Mr. Lynch's research has been supported by funding from ConocoPhillips; Mr. Lynch has received no external research grants from government agencies, foundations, or private companies other than ConocoPhillips. He has authored 10 technical papers for the Society of Petroleum Engineers (SPE) and is a co-inventor on one U.S. patent. Mr. Lynch is an active member of SPE with a seat on their Drilling and Completions Advisory Committee and the Drilling Awards Committee. He also serves on the Advisory Board for the Drilling Engineering Association and on the Editorial Advisory Board for World Oil.

Malouta, Dean

Independent Oil and Gas Consultant

Mr. Dean Malouta is an Independent Consultant in the Oil and Gas Exploration and Development, as well as Alternative and Renewable Energy industries. He holds a B.S. in Geology/Earth and Environmental Sciences from City University of New York and an M.S. in Geology from the University of Southern California. Mr. Malouta worked for Shell Oil for 33 years in various capacities in exploration, development and technology and retired as Head of Technology for E&P for the Western Hemisphere, leading a staff of over 450 scientists and engineers, directing and influencing budget spends of many billions of dollars a year. He has experience with both operations and R&D and has extensive expertise in the exploration and development of natural resource. He has since returned to Shell as a contractor in which capacity he is principle author of Shell Oil’s Onshore Operating Principles which is a public document on Shell Oil’s website. In this work Mr. Malouta developed safe procedures for drilling, completions, water protection, atmospheric protection, footprint minimization and community involvement. Mr. Malouta lectures widely on these and other energy related subjects and is a Certified Petroleum Geologist with the American Association of Petroleum Geologists and a Licensed Geologist in the State of Texas. Mr. Malouta's research has been supported by funding from Shell Oil Company and contractual sources of funding. Mr. Malouta has received no external research grants from either government agencies, private companies, or foundations.

Mamerow, Steve

Pioneer Natural Resources

Mr. Steve Mamerow is currently Vice President of Corporate Drilling and Completions for Pioneer Natural Resources. He holds a B.S. in Petroleum Engineering from the University of Texas at Austin. Mr. Mamerow joined Pioneer Natural Resources in July of 1998 after spending 23 years with Amoco in a number of drilling engineering and management positions in numerous locations. He has corporate governance responsibility to ensure Policies, Best Practices, and Technology are developed and implemented consistently throughout the company. Mr. Mamerow leads a group of drilling and completions technical professionals in support of all asset teams within the company. Professional memberships include AADE, SPE, and IADC. Pioneer Natural Resources expects to drill the third most wells in the USA among oil and gas companies in 2012. Mr. Mamerow leads Pioneer's efforts to consistently and safely plan and execute drilling and completions. His role focuses on maintaining best practices that meet or exceed all regulatory requirements and promote company values. Over 95% of Pioneer's wells are fractured hydraulically and many of the wells are completed using Pioneer's integrated services. Mr. Mamerow is also active in numerous professional industry groups to improve Pioneer's understanding of technologies, processes and best practices. He is the past president of the Dallas Fort Worth chapter of the American Association of Drilling Engineers and is scheduled to speak at the annual meeting of the International Association of Drilling Contractors. Mr. Mamerow's research has been supported by funding from Pioneer Natural Resources; he has received no external grants from either government agencies, private companies, or foundations.

McDonald, Lyman L.

Western EcoSystems Technology, Inc.

Dr. Lyman L. McDonald is currently Senior Biometrician with Western EcoSystems Technology, Inc. (WEST, Inc.) in Laramie, Wyoming, a private consulting company specializing in statistical design and analysis of ecological and environmental studies. He holds a B.S. and M.S. in Mathematics from Oklahoma State University, and a Ph.D. in Statistics from Colorado State University. Prior to founding and serving as President of West, Inc., Dr. McDonald held the position of Professor in the Departments of Statistics and Zoology at the University of Wyoming, Laramie, Wyoming and Associate Professor in the Department of Statistics at Kansas State University, Manhattan, Kansas. He is currently an Adjunct Professor of Statistics at the University of Wyoming. Dr. McDonald is a biometrician/statistician with over forty years of comprehensive experience in the application of statistical methods to design, conduct, and analyze environmental and laboratory studies. His work and research has been supported by grants and contracts with both government agencies and private companies with core funding from the National Oceanic and Atmospheric Administration, Northwest Power and Conservation Council, U.S. Forest Service, and U.S. Fish and Wildlife Service. Dr. McDonald's specialties include sampling and monitoring of biological communities, calibration of biased sampling procedures, and modeling resource selection by animals. He has designed and managed both large and small environmental impact assessment and monitoring programs. He has experience in terrestrial and aquatic ecosystems including marine environments. Dr. McDonald's expertise and experience has lead to appointments to regional and national technical advisory and review committees, including the Technical Dispute Settlement Board for the Pacific Salmon Commission, the Independent Scientific Advisory Board for National Oceanic and Atmospheric Administration Fisheries, Northwest Power and Conservation Council and Columbia River Inter-Tribal Fish Commission, the U.S. Fish and Wildlife Service, New York State Hudson River Natural Resource Trustees Peer Review Team, and the Peer Review of Michigan State University's PCB Exposure and Effects Studies in the Floodplain of the Kalamazoo River. He is the author of more than 100 papers in the scientific literature and is joint author of the Second Edition of the book entitled Resource Selection by Animals: Statistical Design and Analysis for Field Studies.

McKenzie, Lisa M.

Colorado School of Public Health

Dr. Lisa M. McKenzie is a Research Associate at the Colorado School of Public Health (CSPH) on the University of Colorado Denver's Anschutz Medical Campus. She holds a B.A. in Chemistry from the University of Colorado, an MPH in Epidemiology from the CSPH, and a Ph.D. in Environmental Chemistry from the University of Montana. Dr. McKenzie's research focuses on health effects of exposures to organic chemicals and climate change and has contributed to the understanding of how air pollutants affect the health people living in natural gas development areas. Dr. McKenzie was a co-investigator on a Health Impact Assessment (HIA) which assessed potential health effects associated with a proposed natural gas development project, as well as the principal author of the supporting human health risk assessment published in Science of the Total Environment (March 2012). She is one of the few scientists with publications on the health effects potentially associated with natural gas development in the scientifically peer reviewed literature. Dr. McKenzie has testified before the United States Congress and the Denver Metropolitan Regional Air Quality Council on the public health implications of natural gas development. As a senior chemist and human health risk assessor in private industry, she provided analytical chemistry and human health risk assessment expertise for dozens of RCRA facility investigations, Phase I and Phase II site investigations, and remedial investigations/feasibility studies working with interdisciplinary teams of scientists and engineers to plan and conduct these investigations. Finally, Dr. McKenzie receives grant funding from the Department of Energy (DOE) through the Research Partnership to Secure Energy for America (RPSEA) to provide public health expertise for the Environmental Friendly Drilling Systems Program and has received contractual funding from the Garfield County Board of County Commissioners to conduct the HIA and to design a long term prospective environmental and health study on environmental exposures and health effects associated with natural gas well development in Garfield County, Colorado.

Miller, Cass T.

University of North Carolina

Dr. Cass T. Miller is the Okun Distinguished Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering at the University of North Carolina (UNC). He holds a B.S. and M.S. in Civil Engineering from the University of Toledo, and an M.S. and Ph.D. in Environmental Engineering from the University of Michigan. Dr. Miller's work focuses on theoretical, computational, and experimental aspects of fluid flow and species transport in multiphase environmental systems, especially systems involving a porous medium. He is a co-developer of the thermodynamically constrained averaging theory for formulating multiscale mathematical models, and he has worked extensively in continuum scale modeling, pore scale modeling, interphase mass transfer phenomena, and environmental remediation of subsurface systems. Dr. Miller is a fellow of the American Geophysical Union, has been a coauthor of 145 journal publications and more than 400 additional research products including books, book chapters, proceedings, abstracts, and presentations. He has served since 1997 as Editor of Advances in Water Resources, and he previously served as an Associate Editor of Environmental Science & Technology and on the editorial boards of Advances in Water Resources and Ground Water. Dr. Miller is a permanent organizer of the bi-annual international conferences on computational methods in water resources. He has directed the work of 82 post doctoral associates, Ph.D. students, and M.S. students at UNC. Dr. Miller's research is currently supported by the National Science Foundation and the U.S. Department of Energy.

Montgomery, Carl T.

NSI Technologies

Mr. Carl T. Montgomery is an Engineering Consultant with NSI Technologies specializing in technical service, engineering development and research in well stimulation and completions. He holds a B.S. from Colorado State University and an M.S. in BioSciences from Ball State University. Mr. Montgomery is recognized as one of the leaders in all areas of well stimulation, including hydraulic fracturing, acid fracturing, matrix stimulation, cavity completions, waste/cuttings injection, rock mechanics, and scale prevention/removal. He also has considerable experience in well cementing, sand management, conformance control, perforating strategy, and formation damage. Formerly, Mr. Montgomery worked with ConocoPhillips, Arco, and Dowell Schlumberger. He has also served as a Society of Petroleum Engineers (SPE) Distinguished Lecturer and an SPE International Board member, and was awarded SPE's Drilling & Completions Engineer of the year award in 2009. Mr. Montgomery pursues engineering development projects to improve the techniques and methods used for well completions and production enhancement. His focus has been towards the design and enhanced development of fracturing and acidizing models, design of innovative stimulation techniques for North Sea chalk, tight gas and shale gas wells, improvement in the understanding and application of electric logs and core analysis to assess borehole failure and the stimulation process, development of real-time monitoring and history matching techniques for the optimization of matrix and hydraulic fracturing treatments, application of stimulation methodologies for novel uses such as drilling and produced solid waste disposal, and use of electro-magnetic stimulation of heavy and viscous oil, chemo mechanical weakening of rock and sand control. Mr. Montgomery serves as an expert trainer in the area of well completion and stimulation, and conducts safety, quality control and performance inspections of stimulation and pumping service treatments. Mr. Montgomery has received no external research grants from government agencies, private companies, or foundations.

Moos, Daniel

Baker Hughes

Dr. Daniel Moos is a Baker Hughes technology fellow with more than 25 years of expertise in the application of geomechanics solutions in the oilfield and in geothermal and civil engineering. He holds a B.S. in Geology from Cornell University, and an M.S. and a Ph.D. in Geophysics from Stanford University. Dr. Moos has worked diligently in public and private roles to further subsurface understanding. While at Stanford University he also worked for the U.S. Geological Survey and following graduation in 1983 he joined Columbia University's Lamont-Doherty Earth Observatory as an associate research scientist and participated in the organization and provision of wire line services for the International phase of the Ocean Drilling Program. In 1987 Dr. Moos returned to Stanford University as a research scientist. As a co-founder in 1996 of GeoMechanics International (GMI) he helped to establish geomechanics as an integral oilfield technology and GMI as the technology leader. After its acquisition in 2008 by Baker Hughes, Dr. Moos became the GeoMechanics International chief scientist in the Reservoir Development Services (RDS) division. He was elected a Technology Fellow in 2010. Dr. Moos is known for his work in petrophysics and acoustic log analysis. In addition to holding patents in diverse disciplines—including computer science, well completion, and pore-pressure prediction— he has published more than 80 technical papers. Dr. Moos speaks frequently at technical conferences and participates on their organizing committees. He is an active member of the American Geophysical Union, the Society of Exploration Geophysicists, the Society of Petroleum Engineers, the American Association of Petroleum Geologists, the American Rock Mechanics Association, and the Society of Petrophysicists and Well Log Analysts. Dr. Moos was supported while at Stanford University by consortium funding and through various National Science Foundation and U.S. Department of Energy (DOE) research grants, and through a DOE Small Business Innovation Research grant to GMI in the late 1990's. He currently has no research support from entities other than Baker Hughes.

Muehlenbachs, Karlis

University of Alberta

Dr. Karlis Muehlenbachs is a professor in the Department of Earth and Atmospheric Sciences at the University of Alberta, Edmonton, Canada. He holds an A.B. in Chemistry from Washington University, St. Louis and a Ph.D. in Chemistry from the University of Chicago. Following a post-doctoral fellowship at the Geophysical Laboratory off the Carnegie Institution of Washington, Dr. Muehlenbachs joined the faculty of University of Alberta in 1974. In 1982 he held a Humboldt Fellowship at the German Geological Survey. Dr. Muehlenbachs has devoted the past 35 years to research and teaching of stable isotope geochemistry. Among a wide range of research topics, he has addressed the basic science questions re origin of natural gases, most recently shale gases but has also pioneered the practical use of isotope analyses of fugitive gases emanating from oil and gas wells to identify the source depth of gas leaks. Dr. Muehlenbachs has analyzed thousands of fugitive gases to help the industry successfully remediate failures of well integrity. In 2006, he sat on a Government of Alberta panel establishing parameters for base line water well testing prior to coal bed methane development. Dr. Muehlenbachs' research funding comes from grants from the Natural Sciences and Engineering Research Council of Canada and research contracts from Industry. He has been a consultant to the oil and gas industry as well as to Non-Governmental Organizations.

Muessig, Karl W.

New Jersey Geological and Water Survey

Dr. Karl W. Muessig is the New Jersey State Geologist and Director of the New Jersey Geological and Water Survey. He holds a B.S. in Geology from the University of Pennsylvania, and an M.S. and Ph.D. in Geology from Princeton University. Dr. Muessig provides geologic expertise and management support to a broad range of Water Resource Management programs within the N.J. Department of Environmental Protection including water allocation and well permitting, water quality and quantity, geoscience and natural resources such as offshore sand for beach replenishment. He coordinates input to the State Police Office of Emergency Management on earthquakes, landslides, sinkholes, droughts and abandoned mines. As State Geologist, Dr. Muessig serves on the Site Remediation Professional Licensing Board and Well Drillers and Pump Installers Advisory Board. He serves as an alternate N.J. representative to the Delaware River Basin Commission providing input on natural gas development regulations. Dr. Muessig has served on several national councils and advisory committees including the National Water Quality Monitoring Council, the Outer Continental Shelf Policy Committee, and the Advisory Committee for Water Information review of the USGS-State Cooperative Water Program. He worked extensively on mineral resources in the United States and around the world prior to joining the Geological Survey. Dr. Muessig represents New Jersey's interests to other states and nations through a leadership role on several committees of the Association of American State Geologists and coordinates the State's multimillion dollar water monitoring networks under the Cooperative Water Program with the U.S. Geological Survey. He has received grant funding from the U.S. Department of Energy through the Midwest Regional Carbon Sequestration Partnership to evaluate carbon sequestration potential in New Jersey, and from the Federal Emergency Management Agency through the State Office of Emergency Management to evaluate collapse risk for abandoned mines.

Murdoch, Lawrence C.

Clemson University

Dr. Lawrence C. Murdoch is Professor of Environmental Engineering and Earth Sciences in the College of Science and Engineering at Clemson University. He holds a B.S. in Geology from Pennsylvania State University, and an M.S. in Geology, an M.S. in Environmental Science, and a Ph.D. in Geology from University of Cincinnati. Dr. Murdoch's teaching and research interests are in hydrogeology. His recent research activities have included projects in environmental remediation, aquifer characterization, interaction between ground water and surface water, and carbon sequestration. Dr. Murdoch has done research on hydraulic fractures since the mid 1980s, when he first proposed to develop fracturing methods for remediating contaminated ground. Since then, he has conducted theoretical and field-based investigations into both the propatation of hydraulic fractures and mechanisms of flow and transport processes in the vicinity of hydraulic fractures. He has also led investigations into innovative applications for hydraulic fractures used for environmental remediation. More recently he has been developing hydromechanical techniques for characterizing rock aquifers. Many of his projects involve innovative field or laboratory techniques with modeling coupled processes of flow, transport, and deformation. Dr. Murdoch teaches an introductory course in applied hydrogeology, and advanced courses in the hydrogeology of U.S. aquifers and fractured rock hydrology. He also teaches a course in methods for analyzing geological processes, and organizes Clemson's hydrogeology field camp. Dr. Murdoch's recent research has been supported by grants from the U.S. Environmental Protection Agency (for research on Understanding and Managing Risks Posed by Brines Containing Dissolved Carbon Dioxide), the National Science Foundation, and the U.S. Department of Energy, and various state and local governments, entities, and foundations.

Murphy, Eileen

Rutgers University

Dr. Eileen Murphy is the Director of Research and Grants at the Rutgers University Ernest Mario School of Pharmacy. She holds a Ph.D. in Environmental Science from Rutgers University (1989), an M.S. in Environmental/Outdoor Education from Northern Illinois University (1984), and a B.S. in English with a minor in Biology from the University of Notre Dame (1983). Dr. Murphy coordinates multi-disciplinary research projects in pharmacology, toxicology, communication, environmental science, engineering and other disciplines at Rutgers. Her research interests include occurrence, fate and transport of pharmaceuticals and other anthropogenically-derived organic chemicals in the environment with a particular research emphasis on exposures to toxic substances, fate and transport of toxic substances and assessments of the potential risks to human health and the environment posed by these exposures. Prior to holding this position, Dr. Murphy served as the Director of the New Jersey Department of Environmental Protection (NJDEP) Division of Science, Research and Technology. She held the position of Assistant Director for the group for four years before that and served as a research scientist for 15 years within the group, developing an expertise in the drinking water field. Dr. Murphy has focused much of her career on drinking water science, including contaminant occurrence and fate & transport. She has been involved in the issue of unregulated contaminants in drinking water and the treatment to remove them from finished water. Dr. Murphy is co-author on numerous peer-reviewed scientific papers that have appeared in scholarly journals, including Environmental Science and Technology. Her research has been conducted without the support of grants from either federal government agencies or private companies. Dr. Murphy currently has no federal research funding.

Nickolaus, Michael

Ground Water Protection Council

Mr. Michael Nickolaus is the Special Projects Director for the Ground Water Protection Council (GWPC). Mr. Nickolaus holds a B.A. in Geology from Indiana University. Mr. Nickolaus has additional training in groundwater hydrology and contamination, injection well mechanical integrity testing, bioremediation of oil and gas wastes, injection well construction, operation and management, and field sampling and analysis procedures. Mr. Nickolaus responsibilities at GWPC include development and management of projects related to water/ energy issues and underground injection control (UIC). Mr. Nickolaus has conducted several research projects for the GWPC and authored or co-authored a number of reports including "State Oil and Gas Regulations Designed to Protect Water Resources" and "Assessment of State Needs for Geologic Sequestration of CO_2". Mr. Nickolaus research has been supported by funding from the GWPC and contractual sources of funding; Mr. Nickolaus has received no external research grants from government agencies, private companies, or foundations. Prior to joining GWPC, Mr. Nickolaus worked for the Indiana Department of Natural Resources (DNR), Division of Oil and Gas for 20 years in program enforcement, permitting, and underground injection control. During his tenure with the DNR Mr. Nickolaus wrote several state rules, program manuals, and guidance documents. In his final two years with the DNR, Mr. Nickolaus served as the state Director of Oil and Gas. As the former head of a state oil and gas program, Mr. Nickolaus is familiar with regulatory requirements for well construction, mechanical integrity and operation, including well plugging and abandonment. Mr. Nickolaus has a working knowledge of well casing and cementing procedures, plugging materials and procedures, waste fluids handling and disposal and well completion technology including hydraulic fracturing. Mr. Nickolaus is intimately familiar with state regulatory processes, legislative and regulatory language development and state program procedures, especially those related to oil and gas operations and the UIC program. Mr. Nickolaus is a member of the Society of Petroleum Engineers and a Licensed Professional Geologist in the State of Indiana.

Nicot, Jean-Philippe

University of Texas

Dr. Jean-Philippe Nicot is a research scientist with the Bureau of Economic Geology at the University of Texas at Austin. He holds a B.S. in Geological Engineering from France and an M.S. in Geological Sciences and Ph.D. in Civil Engineering from the University of Texas at Austin. His areas of expertise include (1) subsurface hydrology, multiphase flow and contaminant transport in both the unsaturated and saturated zones; (2) geochemical modeling and subsurface reaction transport; and (3) mathematical geology and risk analysis. Dr. Nicot's recent research has focused on topics such as water needs and use for shale gas production; geologic carbon sequestration including predicting or detecting leakage through faults, cementing failures, pressurization, or other mechanisms; groundwater availability assessments; and desalination, including the handling and disposal of waste brines. Dr. Nicot has presented widely on his research related to the water needs and use for shale gas production, including serving as workshop lead for the U.S. Environmental Protection Agency's (EPA) Technical Workshop for the Hydraulic Fracturing Study (Fate and Transport), March 28-29, 2011 in Arlington, VA. His current research funding comes primarily from federal (EPA, U.S. Department of Energy) and state (Texas Water Development Board, Texas Commission on Environmental Quality) grants complemented by non-profit and private sector contributions.

Nygaard, K.J.
ExxonMobil Production Company
Dr. K. J. (Kris) Nygaard is the Senior Stimulation Consultant at ExxonMobil Production Co. (EMPC). He holds a B.S. in Mechanical Engineering, an M.S. in Aerospace Engineering, and a Ph.D. in Mechanical Engineering all from the University of Arizona. In his Senior Technical Professional role at ExxonMobil, Dr. Nygaard is the Company's recognized expert on hydraulic fracturing and is responsible for coordinating ExxonMobil's Upstream Fracturing Center of Excellence. During the last 20 years at ExxonMobil, he has held numerous technical and management positions and has extensive background and expertise in unconventional resources, hydraulic fracturing, subsurface engineering, and related technologies. Dr. Nygaard began his career as at Exxon Production Research in 1992 following a post-doctoral research and teaching assignment at the University of Arizona. In his initial assignment, Dr. Nygaard provided consulting to Exxon affiliates on wellbore hydraulics, completion design, formation damage and removal, and led development of high pressure laboratory to evaluate production chemistry and phase behavior of well fluids and chemicals. He also gained extensive experience in the area of production logging, providing expert production log interpretations, and often taught in ExxonMobil's internal schools. Between 1999 and 2005, Dr. Nygaard coordinated Piceance Basin (Colorado) field trials of ExxonMobil's breakthrough hydraulic fracturing "Multi-Zone Stimulation Technology" (MZST). Dr. Nygaard is a co-inventor of MZST and component technologies. ExxonMobil received the 2005 Platts Global Energy Award for Most Innovative Commercial Technology for development and commercialization of MZST. Between 2005 and 2010 Dr. Nygaard held several technical and managerial positions at ExxonMobil's Upstream Research Company (URC) in the areas of drilling, subsurface engineering, well completions, and unconventional resources. During 2005, Dr. Nygaard was Senior Supervisor of URC's Well Stimulation Section responsible for developing ExxonMobil's next generation stimulation technologies and providing global technical support to business units performing hydraulic fracturing and acid stimulation operations. In 2006, he became Senior Supervisor of the Well Completion Section, responsible for developing ExxonMobil's next generation technologies in the areas of completion hardware, stimulation methods and techniques, and wellbore tubular designs; and providing global technical support to business units in the broad area of completion technologies. In 2007, Dr. Nygaard was Senior Supervisor of URC's Well Construction Section, responsible for developing ExxonMobil's next generation technologies in the areas drilling mechanics, drill-string vibration mitigation, and borehole stability and hole-cleaning; and providing global technical support to business units in the broad area of drilling technologies. In 2009, he became Senior Supervisor of URC's Unconventional Resources – Recovery Section responsible for developing ExxonMobil's next generation completion and reservoir recovery technologies focused on unconventional resources (tight gas, shale gas, tight oil, and coal-bed methane), and providing global technical support to business units in the broad area of unconventional resources. In 2010, Dr. Nygaard moved to EMPC to form and lead ExxonMobil's Upstream Fracturing Center of Excellence. In his current role, he is relied upon widely across ExxonMobil for his expertise in stimulation technology and applications to new and existing business opportunities. Dr. Nygaard also advises the R&D program at ExxonMobil's Upstream Research Company, and works closely with ExxonMobil's business units on technology strategy, deployment, and applications. He is a member of the Society of Petroleum Engineers and the American Society of Mechanical Engineers. As an employee of ExxonMobil, Dr. Nygaard's research and work has been solely supported by funding from ExxonMobil; Dr. Nygaard has received no external research grants from either government agencies or foundations.

Olson, Jon E.

University of Texas

Dr. Jon E. Olson is an Associate Professor in Petroleum and Geosystems Engineering at the University of Texas at Austin (UT-Austin). He holds B.S. degrees in Earth Sciences and Civil Engineering from the University of Notre Dame and a Ph.D. in Geomechanics and Engineering Geology from Stanford University. Dr. Olson spent 6 years as a research engineer with Mobil Oil Corporation before joining the faculty at UT-Austin in 1995. He specializes in the applications of rock fracture and continuum mechanics to petroleum engineering and structural geology problems, and teaches courses in reservoir geomechanics, hydraulic fracturing, petroleum geology and general petroleum engineering. Dr. Olson's current research projects, conducted in collaboration with researchers from the Bureau of Economic Geology in the Jackson School of Geosciences at UT-Austin, include the design of hydraulic fracture treatments in tight gas sandstones and shales, the interaction of propagating hydraulic fractures with natural fractures, shear-enhanced permeability in heavy oil reservoirs, and the characterization of naturally fractured oil and gas reservoirs. He has also published on topics including hydraulic fracturing from deviated and horizontal wells, the interpretation of hydraulic fracture geometry from surface deformation using tiltmeters, compaction and subsidence modeling, in situ stress determination, and geologic rock fracture processes. Dr. Olson's research is largely funded by unrestricted grant money from a consortium of oil and gas companies, with additional research funding through contracts from the U.S. Department of Energy and the federal government's Research Partnership to Secure Energy for America. In addition, Dr. Olson has received contracts for research from Shell and ExxonMobil Corporations. He is currently involved in consulting with the U.S. Army Corps of Engineers on a hydraulic fracturing related project, as well as creating a startup company to market hydraulic fracturing software.

Oneacre, John W.

Ground Water Solutions, Ltd.

Mr. John W. Oneacre is President of Ground Water Solutions, Ltd. (GWS). He holds a B.S. and M.S. in Geology from Kent State University. Mr. Oneacre has 38 years of hydrogeological expertise on hundreds of projects in more than a dozen countries. His areas of interest and expertise include: hydrogeological investigations, contaminant fate and transport evaluations, and environmental isotopic analyses of water and gases. Mr. Oneacre has served as a Board Member of the American Ground Water Trust; served as an invited expert hydrogeologist on the Ground Water Subcommittee of Water 2000, a report prepared for the U.S. Congress; served on the American Society for Testing and Materials (ASTM) D-18.21) Ground Water Subcommittee to establish monitoring guidelines and best practices; was a member of the Texas Water Development Board Technical Advisory Group; taught a ground water monitoring course at the request of the National Ground Water Association (NGWA); and currently serves as a Board Member of a Municipal Water District in Houston, Texas. As an invited speaker, Mr. Oneacre has lectured at numerous universities and technical conferences, both domestically and internationally, as an expert in hydrogeology, geochemistry, and environmental isotopes. Mr. Oneacre, at the invitation of EPA Regions 1 and 9, participated in panel discussions and presentations regarding ground water monitoring issues. His technical papers and presentations have been published in numerous publications, both domestic and international, including Enviropro '92 International Conference in Kuala Lumpur, Malaysia (1992), Geological Society of America (GSA) meetings in Missouri (1993) and Massachusetts (2001), American Society of Civil Engineers (ASCE) in Wisconsin (1996), Geotechnical News (1993), Elsevier Publishing (2004), and various American Institute of Professional Geologists (AIPG), Association of Engineering and Environmental Geologists (AEG), and American Ground Water Trust conferences. With 25 years of isotope experience, Mr. Oneacre has utilized that expertise in nearly two dozen litigation cases. He has combined forensic methods to help differentiate sources of liquids and gases in the subsurface and is currently involved with several projects that involve natural gas drilling and hydraulic fracturing. Ground Water Solutions, Ltd. has conducted research on behalf of an energy company to evaluate real time monitoring technologies and data collection of ground water in areas near natural gas drilling. Mr. Oneacre is a registered professional geologist in Texas, California, Kentucky, and Indiana; a certified engineering geologist in California, and certified environmental manager in Nevada. He is a member of several professional organizations including the NGWA, American Institute of Professional Geologists, and AEG. Mr. Oneacre has received no external grants from either government agencies, private companies, or foundations.

Padilla, Ingrid

University of Puerto Rico, Mayagüez

Dr. Ingrid Padilla is currently a full professor in Environmental and Water Resources Engineering in the Department of Civil Engineering and Surveying and the Director of the Environmental Engineering Laboratory (EEL) at the University of Puerto Rico, Mayagüez. She holds a B.S. in Natural Resources Science and Management from the University of Maryland, an M.S. in Water Resources Science from the University of Michigan, and a Ph.D. in Contaminant Hydrology from the University of Arizona. Dr. Padilla has been at the University of Puerto Rico since 2001. She led the groundwater office at Greg Morris and Associates from 1999 through 2001, and directed several hydrologic investigations while working with the U.S. Geological Survey from 1988 through 1992. Dr. Padilla has directed laboratory, field-scale, and modeling environmental engineering and ground-water investigations in the academic, government, and private sectors, and has been awarded with numerous scientific grants (National Science Foundation; National Institutes of Health; U.S. Department of Defense; U.S. Department of Energy; U.S. Environmental Protection Agency). As Director of the EEL, she has leaded the development of numerous research programs of multidisciplinary character. Her work and expertise cover a wide range of environmental and water resources problems, including: characterization and quantification of contaminant fate and transport processes in soils, geologic media, and urban environments; flow and transport in the vadose zone; environmental remedial technologies; chemical detection in subsurface environments; contamination assessment; water quality sampling and monitoring; surface water and groundwater contaminant modeling; aquifer evaluation and characterization; well evaluation and design; characterization and modeling of surface water and groundwater interactions; and sorption, volatilization, and diffusion of organic contaminant in environmental matrices. Dr. Padilla's current work focuses on: development of detection technologies for underground contamination; development of potential relationships between contamination and adverse reproductive outcomes; fate, transport, and potential exposure of contaminants in karst systems; enhanced remedial technologies in low-permeability systems; and the integration of multidisciplinary efforts in science and engineering education and training. She teaches a wide range of environmental courses, including: Introduction to Environmental Engineering, Introduction to Water Resources Engineering, Environmental Chemistry, Field Methods in Hydrology, Surface Water Quality Pollution and Modeling, Environmental Impact Assessment, Subsurface Remediation, Sampling and Environmental Monitoring, and Groundwater Hydrology, which incorporates concepts of hydraulic fracturing. Dr. Padilla has served in several review panels for the National Science Foundation and the National Research Council, and in the Advisory Committee for Civil Infrastructure Research Center of the University of Puerto Rico. She has received numerous awards through her career, including: Distinguished Professor in Civil Engineering; Innovative Woman in Engineering Education; and Ford Foundation Fellowship. Dr. Padilla has presented her work in many local, regional, and national conferences, and published in distinguished journals and proceedings.

Palmer, Carl D.

Idaho National Laboratory

Dr. Carl D. Palmer is a Research Scientist for Energy Resource Recovery and Sustainability Department at U.S. Department of Energy's Idaho National Laboratory (INL). He holds a B.S. in Geology and in Mathematics from Pennsylvania State University, an M.S. in Geology from Pennsylvania State University, and a Ph.D. in Hydrogeology from the University of Waterloo, Canada. Dr. Palmer has twenty eight years experience conducting research on aqueous geochemistry, solute transport, and hydrogeology including impact of oil shale development on groundwater quality, identification of phases affecting solute transport, measurement of thermodynamic properties of chromium-enriched phases at waste sites, rates of redox transformations, installation and monitoring of wells in clay tills, heat transport in porous media, and bioavailability of cesium in the rhizosphere. He has fifteen years experience teaching aqueous geochemistry, subsurface hydrology, and groundwater modeling. Dr. Palmer's current research focuses on environmental aspects of unconventional energy development. His recent projects have included pyrolysis of oil shale and its impact on groundwater quality, thermal transport properties of oil shale, fracture development in oil shale, conservative and reactive tracer testing of geothermal systems, and development of improved methods of geothermometry. Dr. Palmer's recent research has been supported by a grant from DOE's Geothermal Technologies Program, and funding from INL's Laboratory Directed Research and Development program and the oil shale industry. Dr. Palmer has received no external grants from either private companies or foundations.

Parkerton, Thomas F.

ExxonMobil Biomedical Sciences

Dr. Thomas F. Parkerton is a Distinguished Environmental Scientist with ExxonMobil Biomedical Sciences (EMBSI). He holds a B.S. in Environmental Science with an emphasis in Environmental Chemistry from Rutgers University and M.S. degrees in Aquatic Biology/Toxicology and Environmental Engineering from North Texas State University and Manhattan College, respectively. He received a Ph.D. in Exposure Assessment from Rutgers University. Dr. Parkerton's area of expertise is in the development and application of computer models to predict the physio-chemical fate, bioaccumulation, trophic transfer and toxicological effects of chemicals entering the environment. Prior to joining EMBSI, Dr. Parkerton had gained experience in the development of scientifically defensible effluent, water and sediment quality criteria to protect aquatic life, wildlife and human health. He has coordinated numerous laboratory-based research programs to support environmental hazard classification and risk assessment of Exxon Mobil products. Dr. Parkerton's other responsibilities have included performing multi-media exposure and environmental risk assessments in support of existing or new regulations. He relocated to Brussels in 1998 and served as the European ecotoxicology advisor for four years. In this role, Dr. Parkerton provided technical assistance to Exxon Mobil business units, industry associations and European regulatory agencies on environmental science issues relevant to both products and facility operations. In 2004, he became head of the EMBSI environmental sciences section that is headquartered in Annandale, New Jersey. In this position, Dr. Parkerton managed a group of approximately 20 consultants and laboratory staff. Over the next few years, Dr. Parkerton also led industry efforts to develop innovative methods, data and models to comply with the European REACH regulation. In 2011, Dr. Parkerton relocated to Houston Texas to assume a new position as senior environmental technical advisor. In this role, Dr. Parkerton is coordinating EMBSI technical support to its Houston-based clients and is providing expertise in helping EM address a variety of strategic environmental issues. Dr. Parkerton has received no external grants from either government agencies, private companies, or foundations.

Patil, Deepak

EagleOne Green Solutions

Mr. Deepak Patil is Chief Technology Officer for Eagle One Green Solutions. He holds a B.S. and M.S. in Chemical Engineering from New Jersey Institute of Technology. He led research and development and engineering departments of various multinational companies. Mr. Patil's areas of expertise encompass complex chemistry, application of these chemistries and engineering, innovative product and process development, and adapting these technologies in an economically feasible manner. In recent years, he has developed technologies to clean water and treat various waste waters from water intensive industries such as; pulp and paper, oil and gas exploration, sugar production, distilleries, pharmaceuticals, and specialty chemical industries. Mr. Patil consults as an expert for two financial institutions for evaluating various companies and technologies. Mr. Patil's research over the past 35 years has been supported as an employee of Albemarle Corp, Geo Specialty Chemicals, Kemiron, Kemira, and Eagle One. Mr. Patil has received no external research grants from either government agencies, private companies, or foundations.

Paulson, Jerome

George Washington University

Jerome A. Paulson, MD is a Professor of Pediatrics at the George Washington (GW) University School of Medicine & Health Sciences, and Professor of Environmental & Occupational Health at the GW School of Public Health & Health Services. He is the Medical Director for National & Global Affairs of the Children's Health Advocacy Institute at the Children's National Medical Center and the director of the Mid-Atlantic Center for Children's Health and the Environment (MACCHE). He holds a B.S. in Biochemistry from the University of Maryland, and an M.D. from Duke University. Dr. Paulson is the chair of the Executive Committee of the American Academy of Pediatrics' Council on Environmental Health and a member of the Children's Health Protection Advisory Committee for the U.S. Environmental Protection Agency (EPA). He served on the Pediatric Medical Care Committee of the National Commission on Children and Disasters and was part of the National Conversation on Public Health and Chemical Exposures organized by the Agency for Toxic Substances and Disease Registry (ATSDR). Dr. Paulson was a recipient of a Soros Advocacy Fellowship for Physicians from the Open Society Institute and worked with the Children's Environmental Health Network. He also served as a special assistant to the director of the National Center on Environmental Health of the Centers for Disease Control and Prevention working on children's environmental health issues. He has published on a number of topics related to children's health and the environment and has served on numerous boards and committees related to children's environmental health. Dr Paulson receives no research support; MACCHE is funded through a collaborative agreement between the ATSDR and the Association of Occupational and Environmental Clinics with supplemental funding from EPA.

Perkins, Edward J.

U.S. Army Engineer Research and Development Center

Dr. Edward J. Perkins currently serves as Senior Research Scientist in Environmental Networks and Genetic Toxicology in the U.S. Army Engineer Research and Development Center (ERDC) Environmental Laboratory. He holds a B.S. in Genetics from the University of Illinois, and a Ph.D. in Genetics and Cell Biology from the Washington State University. Prior to joining ERDC, Dr. Perkins worked in development of transgenic plants for phytoremediation and molecular measures of soil quality. He joined the ERDC Environmental Laboratory in 1996 where he established a genetics research lab. Dr. Perkins' research focuses on using biological networks and systems biology to understand chemical impacts on animals, bioinspired approaches for novel materials, the use of gene expression to monitor adverse environmental impacts, the use of environmental DNA to monitor invasive species, and the effect of military activities on genetic viability of threatened and endangered species on Department of Defense lands. His current work focuses on development and application of new tools and approaches for chemical hazard assessment in addition to understanding complexity and function in biological systems. This work has used toxicogenomics, molecular networks and mechanistic modeling to assess the reproductive toxicity, hepatotoxicity, and neurotoxicity of chemicals in a wide range of species (rat, quail, earthworms, fish, and invertebrates). Dr. Perkins serves as the U.S. Department of Defense (DOD) representative to the U.S. Environmental Protection Agency (EPA) NexGen Risk Assessment program, the Organization for Economic Cooperation and Development expert working group on molecular screening for chemical hazards, and President of the MidSouth Computational Biology Society. Dr. Perkins' research has been primarily supported by grants from the federal government (DOD and EPA) with additional grant support from state and local governments and industry.

Phillips, Richard D.

ExxonMobil Biomedical Sciences, Inc.

Dr. Richard D. Phillips is a Senior Scientific Advisor at ExxonMobil Biomedical Sciences, Inc. He holds a B.S. and M.S., in Microbiology from the University of Alabama, and a Ph.D. in Toxicology from the University of Mississippi Medical Center, Jackson. Dr. Phillips' expertise is in the toxicology of hydrocarbons and in risk assessment. He has held a number of management positions at ExxonMobil including Laboratory Director (1988 – 1995) and Director of Toxicology (1996 – 2002). Most recently he served as an Expat in the Brussels office (2006-2010) where he actively led the chemical industry's Long-range Research Initiative (LRI) and assisted the refining business in meeting their Registration, Evaluation and Authorization of Chemicals (REACH) obligations. Dr. Phillips' research interests are in high throughput in vitro systems and applying their use to chemical risk assessment. He received the ExxonMobil Ambassador Award in 2005 for collaborative work with Corporate Research in Predictive Toxicology. Dr. Phillips also received the ExxonMobil Chemical Responsible Care Award in 2010 for work on REACH. He has held the office of Vice President Administration for the Toxicology Forum (2001- 2008) and served as Councilor to the American College of Toxicology. Dr. Phillips currently serves on the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC) Board of Directors and is a Diplomat of the American College of Toxicology. Dr. Phillips receives no federal research funding.

Plunkett, Laura

Integrative Biostrategies, LLC

Dr. Laura Plunkett is a pharmacologist, toxicologist, regulatory specialist and principal of a consulting company known as Integrative Biostrategies, LLC. Integrative Biostrategies, based in Houston, Texas, is a consulting firm that works at the interface of biological science, regulatory affairs and business decisions to provide its clients with science-based solutions to issues associated with product development and stewardship. She holds a B.S. in Pharmacology from the University of Georgia, and a Ph.D. in Pharmacology from the University of Georgia. Dr. Plunkett is board-certified as a Diplomate of the American Board of Toxicology, and a member of several professional organizations. She has authored or co-authored numerous scientific publications, has over twenty years of experience in the areas of pharmacology and toxicology, and has worked in both government and academic research. Dr. Plunkett taught pharmacology and toxicology at the undergraduate and postgraduate levels. From June 1984 through August 1986, she was a Pharmacology Research Associate Training (PRAT) fellow at the National Institute of General Medical Sciences, Bethesda, Maryland, and worked in a neurosciences laboratory of the National Institute of Mental Health. From September 1986 to June 1989, Dr. Plunkett was an Assistant Professor of Pharmacology and Toxicology in the medical school at the University of Arkansas for Medical Sciences, where she performed basic research in the areas of neuropharmacology and toxicology as well as cardiovascular pharmacology and toxicology. She taught courses for both medical students and graduate students in pharmacology and toxicology as well as the neurosciences. After moving from Arkansas to Washington, D.C., Dr. Plunkett worked for ENVIRON Corporation from 1989 through 1997, first in the Arlington, Virginia office and then in the Houston, Texas office. During her consulting career, Dr. Plunkett has worked on a variety of projects dealing with the toxicology and human health risk assessment of chemicals and products regulated by agencies such as the U.S. Environmental Protection Agency, the Consumer Products Safety Commission, the Occupational Safety and Health Administration, the U.S. Food and Drug Administration, and the U.S. Department of Agriculture. She has expertise in pharmacokinetics and toxicokinetics. A tool common to all of Dr. Plunkett's work as a consultant has been risk assessment. During her academic research career, she received funding from the American Heart Association and the National Institutes of Health. During her consulting career, Dr. Plunkett's work has been supported by contractual sources of funding, including the American Chemistry Council, industrial clients who manufacture pesticides and chemicals, and a variety of other companies such a food companies, pharmaceutical companies, and medical device companies.

Pyrak-Nolte, Laura J.

Purdue University

Dr. Laura J. Pyrak-Nolte is a Professor in the Physics Department, College of Science, at Purdue University. She also holds courtesy appointments in the School of Civil Engineering and in the Department of Earth, Atmospheric and Planetary Sciences also in the College of Science. Prior to arriving at Purdue in 1997, she was an Assistant Professor at the University of Notre Dame in the Department of Civil Engineering and Geological Sciences. Dr. Pyrak-Nolte holds a B.S. in Engineering Science from the State University of New York at Buffalo, an M.S. in Geophysics from Virginia Polytechnic Institute and State University, and a Ph.D. in Materials Science and Mineral Engineering from the University of California at Berkeley. Her interests include applied geophysics, experimental and theoretical seismic wave propagation, rock mechanics, micro-fluidics, particle swarms, and fluid flow through earth materials. In 1995, Dr. Pyrak-Nolte received the Schlumberger Lecture Award from the International Society of Rock Mechanics. She received Young Investigator Awards from the National Science Foundation and the Office of Naval Research. In 2001, Purdue recognized Dr. Pyrak-Nolte's accomplishments with a University Scholar Award. In 2012, she was appointed to the Department of Energy Earth Sciences Council, the Board of the American Rock Mechanics Association and to the Council for the International Society of Porous Media. Dr. Pyrak-Nolte's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (National Science Foundation, Department of Energy), with additional grant support from industry and foundations.

Raja, Suresh

Providence Engineering and Environmental Group, LLC

Dr. Suresh Raja is a Senior Air Quality Scientist at Providence Engineering and Environmental Group, LLC. He holds a Bachelors of Technology in Chemical Engineering from the University of Madras, and an M.S. in Nuclear Science and Engineering and an M.S. and Ph.D. in Chemical Engineering from Louisiana State University. Dr. Raja has over ten years of experience in air quality research and management. He has taught classes on air pollution control and engineering, atmospheric chemistry and air pollution measurement, with over five years of post-doctoral experience in several areas of air quality management. His contributions to the air quality management field include: development of methods to monitor and model spatial distribution of ambient particulate matter, exposure assessment of particulate matter, indoor air quality and its effect on asthma symptoms, and development of methods to test emissions of criteria pollutants from stationary combustion systems. Dr. Raja has also served as an expert witness in air quality litigation cases using models he developed to simulate source contribution analysis. He has published over 18 peer-reviewed journal papers and presented over 30 peer-reviewed conference papers. Dr. Raja currently serves as reviewer for journals such as Atmospheric Environment, Environmental Science and Technology, and the Canadian Journal of Environmental Engineering. He is a member of ACCESS VIII, a colloquium organized by the Brookhaven National Laboratory. ACCESS (Atmospheric Chemistry Colloquium for Emerging Senior Scientists) is a highly selective program that brings together young atmospheric scientists from around the world for scientific discussions. Dr. Raja has led several projects funded by the Syracuse Center of Excellence in Environmental and Energy Systems and the New York State Energy Research and Development Authority through the U.S. Environmental Protection Agency while he was a Research Assistant Professor at Clarkson University. These projects are related to particulate matter exposure and health effects, indoor air quality, asthma and human exposure of airborne pollutants and statistical data analysis. Dr. Raja research has been supported has been supported by grants from both government agencies and private companies. Funding sources include the California Air Resources Board, New York State Energy Research and Development Authority, Syracuse Center of Excellence, San Joaquin Valley Air Pollution Control District, and the San Joaquin Valleywide Air Pollution Study Agency.

Randtke, Steve

University of Kansas

Dr. Steve Randtke is a Professor in the Department of Civil, Environmental, and Architectural Engineering at the University of Kansas in Lawrence, KS. He holds a B.S. degree in Civil Engineering from Loyola University of Los Angeles and M.S. and Ph.D. degrees in Civil & Environmental Engineering from Stanford University. Dr. Randtke is a licensed professional engineer in Kansas and Illinois, and a diplomate in the American Academy of Environmental Engineers. Professor Randtke's teaching and research activities focus primarily on water quality and drinking water treatment. His current sources of research funding are the U.S. Environmental Protection Agency (EPA) and the Water Research Foundation. He is a member of the American Association for the Advancement of Science, the American Water Works Association (AWWA), the Association of Environmental Engineering and Science Professors, the North American Lake Management Society, the Water Environment Federation, and the International Water Association. Dr. Randtke has served as a member of the Research Advisory Council of the AWWA Research Foundation (1986-1988), as President of the Association of Environmental Engineering and Science Professors (1994-95), as chair of the Research Division of the American Water Works Association (1995-1998), and as a technical editor for the 5th edition of Water Treatment Plant Design (2012), a design handbook prepared under the auspices of AWWA and the American Society of Civil Engineers. He is currently chair of the Kansas Section of AWWA and a member of the Drinking Water Committee of EPA's Science Advisory Board.

Reible, Danny

University of Texas

Dr. Danny Reible is the Bettie Margaret Smith Chair of Environmental Health Engineering at the University of Texas and Director of the Center for Research in Water Resources. Dr. Reible holds B.S. (Lamar), M.S. (Caltech) and Ph.D. (Caltech) degrees in Chemical Engineering. His research career has been focused on understanding the fate and transport of contaminants in the environment, particularly in surface waters and sediments. His work develops tools to assess and manage the risks posed by contaminants. He has authored two books and edited four, and authored more than 110 refereed technical papers and more than 30 chapters in books. He served on the National Research Council Board of Environmental Studies and Toxicology and on five National Research Council committees and is a member of the EPA SAB Environmental Engineering Committee (EEC). He is a Board Certified Environmental Engineer, a Professional Engineer and in 2005 was elected to the National Academy of Engineering for the “development of widely used approaches for the management of contaminated sediments”. He has received the LK Cecil Award of the American Institute of Chemical Engineers and the New Frontiers in Research Award of the Association of Environmental Engineering and Science Professors. Dr. Reible is a Fellow of the American Institute of Chemical Engineers and the American Association for the Advancement of Science and Associate Editor of four technical journals. His research has been supported by grants from both government agencies and private companies including Chevron, Department of Defense, District of Columbia, DuPont, Electric Power Research Institute, Environmental Protection Agency (US), Louisiana Biotechnology Initiative, National Institute of Environmental Health Sciences, National Science Foundation, Oregon Department of Environmental Quality, Parsons Engineering, and URS Corporation.

Ryan, Joseph N.

University of Colorado

Dr. Joseph Ryan is a Professor of Environmental Engineering in the Department of Civil, Environmental, and Architectural Engineering at the University of Colorado. He has been teaching and conducting research at the University of Colorado Boulder since 1993. At the University, Dr. Ryan is also affiliated with the undergraduate Environmental Engineering program in the College of Engineering and Applied Sciences (currently serving as the interim director), the Environmental Studies Program in the College of Arts and Sciences, and the Center of the American West. Dr. Ryan holds a B.S. in Geological Engineering from Princeton University and an M.S. and Ph.D. in Civil and Environmental Engineering from the Massachusetts Institute of Technology. The emphasis of Dr. Ryan's research and teaching is on the fate and transport of contaminants in natural waters. Dr. Ryan's research interests include the role of colloids and organic matter in the speciation and transport of contaminants in subsurface and surface waters, the role of organic matter in the speciation of trace metals in natural waters, and the transport of microbes in subsurface waters. He and his co-authors have published more than sixty articles in leading environmental engineering and science journals on these topics. His research is currently supported by grants from the National Science Foundation (to understand the fate and transport of mercury and steroidal hormones), the Department of Energy (to study the release of mercury from contaminated soils), the Tennessee Valley Authority (to examine the release of mercury from coal ash), and the University of Colorado Boulder (to engage in water quality studies with Colorado communities). Dr. Ryan is co-director of the University's Colorado Water and Energy Research Center, which is addressing the effects of oil and gas development on water resources. He has engaged in consulting in the areas of abandoned mine remediation and trace metal bioavailability and release from hazardous waste. Dr. Ryan is a member of the American Geophysical Union, the American Chemical Society, and the Association of Environmental Engineering and Science Professors.

Saiers, James

Yale University

Dr. James Saiers is a Professor of Hydrology and Associate Dean of Academic Affairs at Yale University's School of Forestry and Environmental Studies. He holds a B.S. in Geology from Indiana University of Pennsylvania, and an M.S. and Ph.D. in Environmental Sciences from the University of Virginia. Dr. Saiers' research focuses on the movement of water and waterborne constituents on and below the earth's surface. This research relies on laboratory-scale and field-scale experimentation and focuses on complex systems governed by coupled hydrological and geochemical processes. He uses data collected from these experiments to test and refine mathematical models that quantify fluid flow, mass transport, and chemical reactions. Dr. Saiers' overarching goal is to generate new experimental observations and to develop predictive approaches that can be used to inform water-resource management decisions and to guide restoration plans for sites impacted by polluted groundwater or surface water. Dr. Saiers has published extensively on factors affecting groundwater and surface-water flow and on the role of coupled hydrological and geochemical processes in governing the migration of contaminants in soils, aquifers, streams, and wetlands. This research has been supported by numerous grants from federal agencies, including the National Science Foundation, the U.S. Department of Energy, the Army Research Office, and the United States Geological Survey. Dr. Saiers has served on the editorial boards of Water Resources Research and Geophysical Research Letters and is a member of the National Research Council Committee on Scientific Review of Everglades Restoration Progress.

Scarnecchia, Dennis

University of Idaho

Dr. Dennis Scarnecchia is Professor of Fisheries in the Department of Fish and Wildlife Sciences at the University of Idaho. He holds a B.S. in Physics from the University of Arizona, an M.S. in Fisheries from Oregon State University, and a Ph.D. in Fisheries from Colorado State University. Dr. Scarnecchia has previously been a faculty member at Iowa State University and has worked for state fisheries agencies and in Iceland as a Fulbright Scholar and Research Scientist. His areas of research include fisheries and aquatic ecology, fish population dynamics, large river, reservoir, and small stream fishes and fisheries. Dr. Scarnecchia has conducted field research in Idaho, Oregon, Montana, North Dakota , Iowa, Oklahoma, and numerous other localities as part of agency research contracts and grants. His current work includes studies on paddlefish, salmon, trout, and other large river fishes, including research contract work (state and federal) in areas of western North Dakota and eastern Montana where widespread energy development is occurring. Dr. Scarnecchia has prepared management plans and served in various fisheries and aquatic sciences workgroups. He currently serves on the Independent Scientific Advisory Board and the Independent Scientific Review Panels of the Northwest Power and Conservation Council, which advise on aspect of Columbia River fisheries, aquatic issues, and habitat. He has authored more than 80 refereed publications and advised more than 30 graduate students. Dr. Scarnecchia has not sought nor received grant funding from state or federal agencies.

Schlenk, Daniel

University of California, Riverside

Dr. Daniel Schlenk is Professor of Aquatic Ecotoxicology and Environmental Toxicology at the University of California Riverside. He holds a B.S. in Toxicology from Northeast Louisiana University, and a Ph.D. Biochemical Toxicology from Oregon State University. Dr. Schlenk was supported by a National Institute of Environmental Health Science postdoctoral fellowship at Duke University from 1989-1991. Since 2007, he has been a permanent member of the U.S. Environmental Protection Agency's (EPA) Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Science Advisory Panel and has been chair from 2012-2013. From 2003-2006, he was a member of the Board of Directors for the North American Society of Environmental Toxicology and Chemistry. He is the co-editor-in chief of Aquatic Toxicology and serves on the editorial boards of Toxicological Sciences, The Asian Journal of Ecotoxicology and Marine Environmental Research. Dr. Schlenk has co-edited a 2 volume series entitled "Target Organ Toxicity in Marine and Freshwater Teleosts" and has published 170 peer reviewed journal articles. He has been a recipient of the Ray Lankester Investigatorship of the Marine Biological Association of the United Kingdom; a visiting Scholar of the Instituto Del Mare, Venice Italy; a visiting Scholar in the Department of Biochemistry, Chinese University of Hong Kong; a Visiting Scientist at the CSIRO Lucas Heights Laboratory, in Sydney Australia, and a Distinguished Fellow of the State Key Laboratory for Marine Environmental Science of Xiamen University, China. Dr. Schlenk has been an ad hoc member for the EPA Science Advisory Board for Aquatic Life Criteria Guidelines from the Ecological Processes and Effects Committee, and has participated in proposal review panels for the National Science Foundation, EPA, National Oceanic and Atmospheric Administration, and the National Institute of Environmental Health Sciences (NIEHS). His research interests focus around mechanisms of action of pesticides and emerging compounds in aquatic organisms. Dr. Schlenk has been supported by grants from government agencies, with core grant research support primarily being from NIEHS, the U.S. Department of Agriculture, the CALFED Bay Delta Program, and the State of California.

Shapiro, Allen

U.S. Geological Survey

Dr. Allen Shapiro is a Senior Research Hydrologist with the U.S. Geological Survey (USGS). He holds a B.S. in Civil Engineering from Lafayette College, Easton, PA, and a Ph.D. in Civil and Geological Engineering from Princeton University. Dr. Shapiro is a member of the USGS National Research Program (NRP), where he serves as Project Chief of the research project "Transport Phenomena in Fractured Rock." His research has shown a unique combination of field investigations and modeling of groundwater flow and chemical transport in a wide range of fractured rock environments, including crystalline rock, sedimentary formations, and carbonate aquifers that have undergone karstification. Dr. Shapiro's research has focused on the development of field techniques and equipment, and methods of integrating and interpreting geologic, geophysical, hydraulic, and geochemical information in the characterization of fluid movement and chemical transport in fractured rock aquifers. In these investigations, he has described fundamental processes that are unique to geologic environments characterized by highly heterogeneous conditions. Dr. Shapiro was one of the first researchers to recognize that large variability in the groundwater velocity gives rise to chemical transport phenomena resembling chemical diffusion, even though the chemical transport is an artifact of fluid advection. He demonstrated this phenomenon in carefully designed field experiments over 10's of meters in different fractured rock environments, and used environmental tracers and dye-tracing methods to demonstrate the same phenomena in fractured rock over distances of kilometers. Dr. Shapiro has also investigated the effect of scale on the hydraulic properties of fractured rock through carefully designed hydraulic testing and modeling investigations conducted over physical dimensions of meters to kilometers. He has also been active in the characterization and remediation of various contaminants in fractured rock, including groundwater contamination by Dense Non-Aqueous Phase Liquids (DNAPLs). Dr. Shapiro is a Principal Investigator (PI) of a multidisciplinary project investigating the fate and transport of DNAPLs in fractured rock and their remediation through biological augmentation. He is also investigating the role of the primary porosity of the rock in the retention and subsequent release of groundwater contamination, and he is a Co-PI of a research investigation that is focusing on the application of geophysical techniques as a means of evaluating and monitoring remediation of contaminated groundwater in fractured rock aquifers. Prior to joining the USGS, Dr. Shapiro conducted hydrologic research at the Royal Institute of Technology in Stockholm, Sweden and Technion-Israel Institute of Technology in Haifa, Israel. He has been an Adjunct Professor in the Department of Earth and Environmental Sciences at Columbia University and frequently teaches courses on the characterization and modeling of groundwater flow and chemical transport in fractured rock. Dr. Shapiro has patented equipment for conducting hydraulic tests and collecting groundwater samples for geochemical analyses in fractured rock aquifers, and he has published numerous articles in peer-reviewed journals. He has served as an Associate Editor of Journal of Hydrology, and he is currently an Associate Editor of the journal Ground Water. Dr. Shapiro is a Fellow of the Geological Society of America, and in 2004, the National Ground Water Association selected Dr. Shapiro as the 2004 Distinguished Darcy Lecturer, for which he lectured on his research, both nationally and internationally, at over 50 universities and research institutes. He is currently serving on a National Research Council Panel on the "Future Options for Management in the Nation's Subsurface Remediation Effort." Dr. Shapiro's research is funded by federal appropriations through programs within the USGS, and through funding from other federal agencies, including the Department of Defense's (DoD) Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP). He also receives funding for research related activities through an Interagency Agreement with the U.S. Environmental Protection Agency (EPA) Technology Innovation Program under the Office of Solid Waste and Emergency Response (OSWER).

Siegel, Donald I.

Syracuse University

Dr. Donald I. Siegel is Laura J. and L. Douglas Meredith Professor of Earth Sciences at Syracuse University. He holds a B.S. in Geology from the University of Rhode Island, an M.S. in Geology and Geophysics from The Pennsylvania State University, and a Ph.D. in Hydrogeology from the University of Minnesota. After 8 years working as a hydrologist/aqueous geochemist with the U.S. Geological Survey (USGS), Dr. Siegel joined the Syracuse University faculty in 1982. Throughout his career, he has studied aqueous geochemistry and groundwater fluid and solute transport at all scales, from basin wide to near local streams and lakes and has published widely in the peer review literature on these topics. Dr. Siegel currently serves as Chair of the National Research Council of the National Academy of Science's Water Science and Technology Board. He also currently Chairs the National Research Council's National Academy of Sciences committee reviewing the USGS National Assessment of Water Quality Program, and recently served on the NRC's panel convened to address environmental issues associated with Coal Bed Methane extraction. Dr. Siegel is an associate editor for the American Geophysical Union's journal Water Resources Research. He is a Fellow of the Geological Society of America, whose Hydrogeology Division awarded him its Distinguished Birdsall-Dreiss Lectureship, Distinguished Service Award, and O.E. Meinzer Award for Research. He was also awarded by Syracuse University the William Wassertrom Award for Excellence in Graduate Teaching and the Laura J. and Douglas Meredith Professorship. Dr. Siegel's research has been supported by grants from government agencies and private foundations, with core grant research support primarily being from the federal government (U.S. National Science Foundation).

Small, Mitchell

Carnegie Mellon University

Dr. Mitchell Small is the H. John Heinz III Professor of Environmental Engineering at Carnegie Mellon University (CMU). He holds a B.S. in Civil Engineering/Engineering and Public Affairs from Carnegie Mellon University, and an M.S. and Ph.D. in Environmental and Water Resources Engineering from the University of Michigan. Dr. Small joined the Departments of Civil and Environmental Engineering and Engineering & Public Policy (EPP) at CMU in 1982, following completion of his Ph.D. at the University of Michigan. His research involves mathematical modeling of environmental systems, risk assessment and decision support. Dr. Small's current projects involve the modeling of geologic sequestration of CO_2 to determine the best combination of monitoring devices needed to verify that sequestered CO_2 is remaining underground, and the development of decision support tools for ecosystem management with multiples stakeholders and objectives, including studies of coral reefs, invasive species and future energy and environmental scenarios for the Navajo Nation. This research has been supported by grants from a number of government agencies, including the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy, U.S. Army Corps of Engineers (DOD), and the National Science Foundation, as well as support for his Chair from the Heinz Foundations. Dr. Small has served as a member of the EPA Science Advisory Board (SAB) and has been a member of a number of U.S. National Research Council committees addressing issues of environmental risk assessment and management. He is a Fellow of the Society for Risk Analysis and a feature columnist for the Journal of Industrial Ecology.

Smith, Bert

Chesapeake Energy Corporation

Mr. Bert Smith is a Senior Specialist—Hydrogeology, in the Regulatory Affairs Group of Chesapeake Energy Corporation. He holds a B.S. in Geology and an M.S. in Engineering from Washington State University, and his areas of expertise are groundwater hydrogeology, geochemistry, and evaluation of oil/gas impacts to the environment. Mr. Smith previously worked for Science Applications International Corporation (SAIC) (or prior affiliated companies) for approximately 25 years, all in the environmental profession and mostly on issues related to oil and gas development and production. His last position with SAIC was as Technical Director of the Shale Gas Group. Prior to SAIC and upon obtaining his graduate degree, Mr. Smith worked approximately 8 years for Kerr-McGee Corporation in a number of environmental areas (nuclear, chemical, coal, oil/gas), with his last title being Division Geotechnical Coordinator. At Chesapeake and SAIC, he has been actively involved in the geochemical review of over 20,000 pre-drill baseline groundwater samples (culminating in presentations at conferences, with technical papers under preparation). Mr. Smith managed the technical aspects of pre-drill baseline sampling conducted by SAIC for oil/gas industry members in several states, and was a technical lead on a comprehensive investigation of a surface release of fracking fluid in NE Pennsylvania. His current research activities include a year-long study of 12 private water wells to determine the variability of methane occurrence in groundwater, and factors that control that variability such as groundwater chemistry, climate, or pumping of wells by landowners. In addition, Mr. Smith is a Chesapeake Energy Corporation technical lead on the U.S. Environmental Protection Agency's (EPA) prospective hydraulic fracturing study being proposed at a site in northwest Oklahoma. He is also very involved and a technical lead in reviewing the EPA retrospective sampling program and associate results. Mr. Smith is also active in a number of other technical areas involving evaluation of hydraulic fracturing activities. He recently served on a Oklahoma Water Resources Board committee to promulgate rules regarding water issues related to mining activities. Mr. Smith's research, while employed at Chesapeake, has been supported by funding from Chesapeake Energy Corporation; Mr. Smith has received no external research grants from either government agencies or foundations while employed by Chesapeake.

Smith, Eric P.

Virginia Polytechnic Institute and State University

Dr. Eric P. Smith is Chair of the Department of Statistics at Virginia Polytechnic Institute and State University. He holds a B.S. in Mathematics from the University of Georgia (1975), and an M.S. from University of Washington (1982) and Ph.D. from University of Washington (1982) in Biomathematics. Dr. Smith has been a member of the Virginia Tech faculty since 1982. His research focuses on the development and application of statistical methods to help understand and solve environmental and ecological problems. Dr. Smith was the Director of the Statistical Consulting Center 1995-2004. In that position he was responsible for providing statistical support to students, faculty and staff and provided training to statistics students on the art of consulting. Dr. Smith has worked on a variety of statistical and scientific problems from areas such as engineering, education and natural resources. He teaches courses on multivariate analysis and linear models (regression, analysis of variance). Dr. Smith is a former Associate Editor of Environmetrics, the Journal of Agricultural, Biological and Environmental Statistics, and the Journal of the American Statistical Association. He is a section editor for the Natural Resources section for the Encyclopedia of Environmetrics and associate editor for Environmental Management. He has supervised 14 Ph.D. students. Dr. Smith's research is currently funded by grants from the U.S. Forest Service (Macroinvertebrates and Air Pollution), the U.S. Forest Service and James Madison University (Resiliency of Brook Trout habitat to Climate Change, Evaluating Stream Community Responses to Global Climate change) and the U.S. Department of Agriculture (Improvement and Marketing of the Food and Agricultural Education Information System), the National Marine Fisheries (Model complexity and stock assessment quality: an investigation of the performance of models of different complexity and implications for model selection in fisheries), and BAE Systems (Biometrics Training, Performance and Research Initiative (BTPRI)).

Smith, Joseph Patrick

ExxonMobil Upstream Research Company

Dr. Joseph Patrick Smith is a Senior Research Associate at ExxonMobil Upstream Research Company where he serves as Senior Technical Professional Advisor for Environmental Research. He holds a B.S. in Chemistry from the University of Rochester, and a Ph.D. in Physical Chemistry from the University of California at Berkeley. After postdoctoral appointments at the University of Wisconsin and Argonne National Laboratory, Dr. Smith joined Exxon Production Research Company in 1981 and has been active in research on the environmental aspects of oil and gas operations since 1990. His current research interests include the environmental aspects of water use, treatment, and disposal in unconventional gas production, the environmental fate of methane in the ocean, the environmental fate and effects of marine discharges of drilling and production wastes, and the effects of seawater usage for thermal management by offshore facilities. Dr. Smith's research has been supported by funding from ExxonMobil Corporation. He has received no external research grants from other private companies, government agencies, or foundations. Dr. Smith is co-chair of the Offshore Operators Committee Environmental Sciences Subcommittee. He is a member of the Society of Petroleum Engineers, where he serves as Associate Technical Editor for SPE Production & Operations, and the American Chemical Society. Dr. Smith served on the U.S. Bureau of Ocean Energy Management's Outer Continental Shelf Scientific Committee between 2003 and 2011.

Smith, Richard K.

Nabors Completion and Production Services

Mr. Richard K. Smith is the Northern Appalachian Region Sales Manager for Nabors Completion and Production Services, Pittsburgh, Pennsylvania. He holds a B.S. and M.S. in Petroleum Engineering from West Virginia University and has 31 years of industry stimulation experience. Mr. Smith is responsible for all Business Development and financial performance for Nabors Completion and Production Services in the Northern Region (Pennsylvania, New York, Ohio, and Michigan). He provides management in Houston, Texas with economic and technical evaluations of individual bids and tenders, service packages, and activity forecasting for petroleum projects. Mr. Smith manages design of horizontal stimulation treatments in the Marcellus Shale in Pennsylvania and Northern West Virginia. He has previously served as Northeast Area Manager for Weatherford Fracturing Technologies, Charleston, West Virginia. Mr. Smith also designed and supervised multiple horizontal fracturing treatments for customers currently working in the Marcellus and Utica Shale in the Northeast, reviewed customer's designs, and made recommendations to improve their success ratio. Prior to working at Weatherford Fracturing Technologies, he worked for 26 years at Halliburton Worldwide Ltd. and Halliburton Energy Services as a Senior Account Representative, Country Manager, Technical Advisor, and District Engineer. Mr. Smith has received no external research grants from government agencies, private companies, or foundations.

Spray, Karen

Colorado Oil & Gas Conservation Commission

Ms. Karen Spray is the Colorado Oil & Gas Conservation Commission (COGCC) Environmental Protection Specialist for southwest Colorado. She holds a B.S. in Geology from the New Mexico Institute of Mining and Technology and an M.S. in Geology/Hydrogeology from the University of Kansas. Ms. Spray has been a practicing environmental consultant and hydrogeologist for over 25 years with special emphasis on groundwater and regulatory compliance issues associated with the energy and minerals industries including public water supplies, toxic release inventories (TRI) and multi-media compliance auditing. She is a co-author of the award-winning Colorado Ground Water Atlas (2003, Colorado Geological Survey) and has been a participant in the recent Colorado chemical inventory and fracture fluid disclosure rulemakings. Ms. Spray is a registered professional geologist in both Wyoming and Utah and is a qualified ISO14000 auditor and Colorado Department of Transportation erosion control supervisor. She has been the Acting Environmental Manager for the COGCC since February 2012. She has received no external grants from either government agencies, private companies, or foundations.

Street, J. Paul

Nalco

Dr. J. Paul Street is Senior Research & Development Manager at Nalco, an Ecolab Company. He holds a Ph.D. in Biomimetic Physical Organic Chemistry from the University of California, Davis. Dr. Street has 20 years' experience at Nalco in the Energy Services Division, a global energy services company. He is experienced with the development and large scale commercialization of novel chemical solutions that provide process efficiencies for both downstream and upstream applications. Dr. Street's current interests include exploring new areas of technology to address challenges in completion stimulation of oil and gas wells and the development of eco-friendly chemistries for these applications in particular. Dr. Street has received no external research grants from either government agencies, private companies, or foundations.

Swackhamer, Deborah L.

University of Minnesota

Dr. Deborah L. Swackhamer is a Professor of Science, Technology, and Public Policy in the Hubert H, Humphrey School of Public Affairs, and Co-Director of the University's Water Resources Center. She also is a Professor of Environmental Health Sciences in the School of Public Health. Dr. Swackhamer holds a B.A. in Chemistry from Grinnell College, IA, and an M.S. and Ph.D. from the University of Wisconsin-Madison in Water Chemistry and Limnology & Oceanography, respectively. After two years post-doctoral research in Chemistry and Public & Environmental Affairs at Indiana University, she joined the Minnesota faculty in 1987. Dr. Swackhamer studies the processes affecting the behavior of, and exposures to, toxic chemicals in the environment and works on policies to address these potential risks. In 2012 Dr. Swackhamer completed a 4 year term as Chair of the Science Advisory Board of the U.S. Environmental Protection Agency, and currently is a member of the Science Advisory Board of the International Joint Commission of the U.S. and Canada. She currently serves on the National Research Council, National Academy of Sciences committee addressing Sustainability Linkages in the Federal Government. Dr. Swackhamer is also a Governor appointee on the Minnesota Clean Water Council. She was President of the National Institutes of Water Resources in 2011. She is a member of the Editorial Advisory Board for the journal Environmental Science & Technology. Dr. Swackhamer is a Fellow in the Royal Society of Chemistry in the UK. She received the 2007 Harvey G. Rogers Award from the Minnesota Public Health Association. In 2009 Dr. Swackhamer received the prestigious Founders Award from the Society of Environmental Toxicology and Chemistry for lifetime achievement in environmental sciences. She was the 2010 recipient of the University of Minnesota's Ada Comstock Award.
Dr. Swackhamer's research has been funded in recent years by the U.S. Geological Survey, from the Environmental Trust Fund of the state of Minnesota, the National Science Foundation, and from the McKnight Foundation.

Syed, Talib

Independent Consultant

Mr. Talib Syed heads his consulting practice based out of Colorado. He holds a B.S. in Chemical Engineering from the University of Madras, India, and an M.S. in Petroleum Engineering from the University of Oklahoma, and is a Registered Professional Petroleum Engineer in CO and WY. Mr. Syed has over 35 years of domestic and international experience in oil and gas production operations (both onshore and offshore) and in ground water and protection of drinking water resources from oil and gas production and injection activities, and has worked in most of the major geological oil and gas provinces in the U.S. His current areas of work have focused on hydraulic fracturing of tight oil and gas reservoirs (drilling and completion), CO_2 geologic sequestration and slurry fracture injection. Mr. Syed 's diverse background includes a unique blend of expertise in both oil and gas production operations (covers drilling/workovers/reservoir analysis/well testing/log interpretation/stimulation/hydraulic fracturing etc.) and regulatory compliance and protection of drinking water resources/Underground Sources of Drinking Waters. Mr. Syed has received no external research grants from either government agencies, private companies, or foundations.

Tanguay, Robert L.

Oregon State University

Dr. Robert L. Tanguay is a Distinguished Professor of Environmental and Molecular Toxicology in the Department of Environmental and Molecular Toxicology at Oregon State University (OSU), and Director of OSU's Sinnhuber Aquatic Research Laboratory. He is also the director of two National Institutes of Health training grants, and is dedicated mentor. He holds a B.S. in Biology from California State University and a Ph.D. in Biochemistry from the University of California – Riverside. He received postdoctoral training at the University of Wisconsin-Madison, and was a faculty member at the University of Colorado School of Pharmacy for 4 years. Dr. Tanguay was recruited to OSU in 2003 and has created a world-class zebrafish-focused research facility that is specifically designed for environmental health related research. Over his career, he has led the charge for advancing the use of zebrafish as a model organism to study environmental effects on human health. Dr. Tanguay recently received a grant from the National Institutes of Health to build innovative advanced robotics to automate zebrafish experimentation. Through this automation, he now uses systems toxicology approaches to drive structure and response relationship studies in hopes to achieve the goals of predictive toxicology. Dr. Tanguay investigates the environmental and biological interactions and mechanisms by which environmental exposures produce biological responses. He studies the mechanisms underlying developmental responses to chemicals such as 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), polycyclic aromatic hydrocarbons, pesticides, nanomaterials, and complex environmental mixtures. Dr. Tanguay continues to develop new methods and approaches to discover the molecular pathways that prevent or promote vertebrate tissue regeneration. This is primarily done using genetics, "omics" techniques and informatics that are intimately anchored to phenotypes. Over the past several years he has also transitioned to the field of green chemistry and green nanotechnology. Dr. Tanguay's laboratory is dedicated to define the nanomaterial characteristics that drive biological responses; with the goal to safely advance the field of nanotechnology. Over his career he has published over 100 manuscripts and review articles that span the areas of toxicology, biochemistry, genetics, behavior, and regenerative medicine. Dr. Tanguay recently received recognition as a University Distinguished Professor in 2011, and received a Career Achievement Award from the Pacific Northwest Association of Toxicologists (2012). His students have received dozens of research awards for advancing the molecular toxicology field. Dr. Tanguay has a broad and federally funded research base. Dr. Tanguay' s research has been supported by grants primarily from government agencies, with core grant research support primarily from the federal government (U.S. Environmental Protection Agency and the National Institutes of Health).

Thyne, Geoffrey

Science Based Solutions

Dr. Geoffrey Thyne is a registered professional Geologist specializing in applications of geochemistry to earth systems and currently works at Science Based Solutions in Laramie, Wyoming. He holds a B.A. in Chemistry and Zoology from University of South Florida, an M.S. in Oceanography from Texas A&M University, and a Ph.D. in Geology from the University of Wyoming). Dr. Thyne has served on a National Research Council committee on beneficial uses of Coal Bed Methane produced water (2008) and the U.S. Environmental Protection Agency's Scientific Advisory Board Hydraulic Fracturing Study Plan Panel (2011). Dr. Thyne was a Research Geochemist at the Arco Oil and Gas research facility in Plano, Texas (1979-1986). He became an assistant professor at California State University-Bakersfield in the department of Physics and Geology (1991-1996). Dr. Thyne then joined the Department of Geology and Geological Engineering at the Colorado School of Mines in Golden, Colorado (1996-2006) where much of his research was focused on impacts of extractive industries on water resources. He also served as project manager for the Colorado Energy Research Institute (2005-2006). He joined the Enhanced Oil Recovery Institute at the University of Wyoming (2006-2012). Dr. Thyne's research specialties include the geochemistry of petroleum and hydrologic systems, contaminant remediation, carbon sequestration and statistical analysis of hydrochemical data. He is the author or co-author of over 50 peer-reviewed scientific papers and has made numerous professional presentations. Dr. Thyne's work was recognized by the AAPG with the A.I. Levorson Award in 2006 for research on gas development in an environmentally-sensitive area in Colorado. He returned to private consultancy in 2012. Dr. Thyne 's research has been supported by funding from the State of Wyoming, and he has received no external grants from either government agencies, private companies, or foundations.

Tintera, John James

Sebree & Tintera

Mr. John James Tintera is a Partner in Sebree & Tintera, an energy consulting firm in Austin, TX. He recently retired as the Executive Director of the Railroad Commission of Texas (RRC). He holds a B.S. in Geology from Michigan State University, and an M.S. in Geology from Bowling Green State University. Mr. Tintera is a Licensed Professional Geoscientist with over 30 years of combined technical and managerial experience as an industry petroleum geologist and environmental regulator. He has conducted thousands of oil field related assessments and cleanup activities while in state government, and is an expert in emergency response as well. As Executive Director, Mr. Tintera was responsible for policy implementation, legislative and budget coordination, all hiring and other personnel actions, as well as supervising 10 divisions ranging from pipeline safety, surface mining, and oil and gas. Mr. Tintera worked at RRC for twenty years in various environmental permitting positions. Prior to his work at RRC, he served as a geologist and consultant with various petroleum companies. Mr. Tintera recently visited Spain at the request of the Basque Government to discuss Hydrofracture regulation with government officials and is scheduled to do the same in Bucharest during Fall, 2012. He has received no external research grants from either government agencies, private companies, or foundations.

Tong, Weida

U.S. Food and Drug Administration

Dr. Weida Tong is Director of the Division of Bioinformatics and Biostatistics at the U.S. Food and Drug Administration's (FDA) National Center for Toxicological Research (NCTR). He holds a B.S. in Chemistry and a Ph.D. in Polymer Chemistry from Fudan University, Shanghai, P.R. China. Dr. Tong completed a postdoctoral fellowship in Computational Chemistry at the University of Missouri-St. Louis in 1996. He joined the FDA's NCTR to develop a knowledge base to evaluate the safety of endocrine disrupting compounds. In 2002, Dr. Tong became Director of a newly formed center of excellences for Bioinformatics (formally Toxicoinformatics), and more recently become Director of Division of Bioinformatics and Biostatistics. He also holds several adjunct positions at universities, including Assistant Professor for Dept. of Pharmaceutical Sciences of UAMS, Associate Professor at the University of Medicine and Dentistry at N.J., and Full Professor at University of Arkansas at Little Rock. Dr. Tong's research interests are focused on developing bioinformatic methodologies and standards to support FDA research and regulation and to advance regulatory science and personalized medicine. Dr. Tong has published >180 papers and book chapters, and has routinely been invited to present in national and international conferences. Dr. Tong's research is funded by FDA; he has received no external research grants from either government agencies, private companies, or foundations.

Turner, Clarke

U.S. Department of Energy

Mr. Clarke Turner is the Director of the U.S. Department of Energy's (DOE) Rocky Mountain Oilfield Testing Center (RMOTC) in Casper, WY. He holds a B.S. in Mining Engineering from the Colorado School of Mines. Mr. Turner manages fossil and renewable energy applied research projects in an operating oil field in partnership with industry, other government agencies and academia. His applied research projects encompass a wide ranch of the energy industry to include oil and gas exploration, drilling, production, produced water processing, and environmental remediation ; geothermal; wind and solar technologies. In addition, Mr. Turner manages oil and gas production operations to include a wide range of environmental remediation projects. In 2002, he was selected to be the Secretary of Energy's representative on an interagency Iraq oil planning and policy task force. Mr. Turner later led a team from DOE into Iraq to assist the Department of Defense's protection of the oil infrastructure and later the Iraq Oil Ministry's post-war rebuilding of the Iraqi Oil Company. He has over 30 years experience in a broad spectrum of the energy industry including: Rocky Mountain gas development and production operations; primary, secondary, and enhanced oil production operations; oil refining; wholesale and retail refined product storage and distribution; coal mining; and renewable energy research and development. Currently, Mr. Turner is not receiving any grant funding from either government agencies, private companies, or foundations.

Tutuncu, Azra N.

Colorado School of Mines

Dr. Azra N. Tutuncu is the Harry D. Campbell Chair in Petroleum Engineering Department at Colorado School of Mines and the director of Unconventional Natural Gas and Oil Institute (UNGI). She holds a B.S.in Geophysical Engineering from Istanbul Technical University, an M.S. degree in Geophysics from Stanford University, an M.S. degree in Petroleum Engineering from University of Texas at Austin, and a Ph.D. degree in Petroleum Engineering from University of Texas at Austin. Dr. Tutuncu held various research and leadership assignments in Well Engineering, Rock Physics, Geomechanics and Subsurface R&D groups at Shell International E&P and Shell Oil Company. Her research interest areas include rock-fluid interactions, integrated borehole stability, geomechanics, reservoir characterization, formation damage and contamination detection, mitigation and removal for environmental protection. Dr. Tutuncu leads several multidisciplinary consortia in solving various technical, environmental and economic challenges in reservoir characterization, coupled geomechanics and fluid flow measurements, modeling and real time monitoring of drilling, hydraulic fracturing and acoustic stimulation in unconventional oil and gas resources. In addition, she coordinates the federal and state regulator training curriculum for Western United States helping standardization of the unconventional regulatory effort. She is an Executive Board Member and immediate past President of American Rock Mechanics Association (ARMA), the Society of Exploration Geophysicists (SEG) representative for American Geosciences Institute Environmental Geoscience Advisory Committee, and a member of SEG's Research Council in addition to serving on several Society of Petroleum Engineers, SEG, American Rock Mechanics Association, and International Society for Rock Mechanics committees. Dr. Tutuncu is a licensed Professional Petroleum Engineer and Licensed Geoscientist in the State of Texas. Dr. Tutuncu's research has been supported by grants from ExxonMobil Corporation, General Electric Corporation, Hess Oil Company, Chevron, Shell, ENI, the U.S. Department of Energy's (DOE) Los Alamos National Laboratory, DOE's National Energy Technology Laboratory, Statoil, Talisman, Halliburton, Schlumberger, Pemex, PlusPetrol and Venoco.

VanBriesen, Jeanne

Carnegie Mellon University

Dr. Jeanne VanBriesen is a Professor of Civil and Environmental Engineering at Carnegie Mellon University, and Director of the Carnegie Mellon Center for Water Quality in Urban Environmental Systems (WaterQUEST). She holds a B.S. in Education (Chemistry) from Northwestern University, and an M.S. and Ph.D. in Civil Engineering (Environmental) from Northwestern University. She is a registered professional engineer in Delaware. Her expertise is in water quality engineering, and in particular environmental biotechnology. Her research foci include biotransformation of recalcitrant organic compounds, detection of biological agents in drinking water and natural water systems, and speciation-driven biogeochemistry of chelating agents and disinfection by-products. Dr. VanBriesen's research has been funded through grants from the National Science Foundation, the Colcom Foundation, the Heinz Endowments, the Packard Foundation, and the Pennsylvania Infrastructure Technology Alliance. She has served on the boards of the Association for Environmental Engineering and Science Professors, the Ohio River Basin Consortia for Research and Education, and the Nine Mile Run Watershed Association. She is an associate editor for the ASCE Journal of Infrastructure Systems and is serving as a guest editor on a special issue of the ASCE Journal of Environmental Engineering. Dr. VanBriesen has received numerous awards, including the Pennsylvania Water Environment Association Professional Research Award in 2007 and the Best Research Paper in the Journal of Water Resources Planning and Management in 2008. Dr. VanBriesen served on the National Research Council's Committee on Water Quality in Southwestern Pennsylvania in 2002-2004. She was a selected presenter at the National Academy of Engineering Indo-US Frontiers of Engineering Symposium on Infrastructure in 2008, and an invited speaker at the National Academy of Engineering Education Symposium in 2010. She was selected as a National Academy of Engineering Gilbreth Lecturer in 2011.

Vengosh, Avner

Duke University

Dr. Avner Vengosh is a Professor of Geochemistry and Water Quality at the Nicholas School of Environment, Duke University. He has also a secondary appointment at the Department of Civil and Environmental Engineering at Duke University. Dr. Vengosh holds a B.S. from Hebrew University of Jerusalem, Israel, an M.S. in Isotope Geology from Hebrew University of Jerusalem, and a Ph.D. in Environmental Geochemistry from the Australian National University, Canberra, Australia. He is an Associate Editor for the international journal Applied Geochemistry, member of the Environmental Surveillance Committee of the North Carolina Radiation Protection Commission, and member of the Geochemical Society, American Geophysical Union (AGU), Geological Society of America (GSA). In 2009, Dr. Vengosh gave testimony to the Subcommittee on Water Resources and Environment, U.S. House of Representatives, regarding: "The Tennessee Valley Authority's Kingston Ash Slide: Potential Water Quality Impacts of Coal Combustion Waste Storage". In 2011, Dr. Vengosh received the International Association of Geochemistry (IAGC) Fellow award. Dr. Vengosh research aims to integrate environmental geochemistry, advanced isotopic tracers, and environmental health in order to delineate the sources and pathways of contaminants in the environment and their possible impacts on human health. Currently his research is focused on three major themes: (1) The energy-water quality-health nexus that includes (i) the impact of shale gas drilling and hydraulic fracturing on the quality of shallow groundwater and surface waters in the Marcellus Shale (Pennsylvania, New York, West Virginia) and Fayetteville Shale (Arkansas); (ii) tracing the impact of coal combustion products on the environment (e.g., the Tennessee Valley Authority coal ash spill in Tennessee); (iii) the origin of contaminants associated with mountaintop mining in valley-fill head waters in West Virginia; (2) Water quality deterioration of water resources and impacts on development and health. Current studies focused on shallow groundwater in the sub-Saharan basins of Morocco and coastal aquifer of the southeastern United States. Studies also include the geochemistry of "new water" generated by reverse osmosis desalination of seawater and saline groundwater; and (3) The occurrence and impacts of naturally occurring contaminants on human health in different aquifer systems, worldwide. Current studies including high arsenic in private wells from North Carolina; high radium in Minnesota, high fluoride and arsenic in groundwater from the Rift Valley in Ethiopia; high salinity, fluoride, and radium in groundwater in Morocco; high radioactivity in fossil groundwater in Jordan, and high arsenic and fluoride in groundwater in Vietnam. Studies include developing new diagnostic tools to evaluate arsenic bioaccumulation in the local populations by measuring As in nails and conducting health surveys in exposed populations. Dr. Vengosh research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from the federal government (National Science Foundation), with additional grant support from state and local governments, industry, and foundations.

Vitale, Rock

Environmental Standards, Inc.

Mr. Rock Vitale is Technical Director of Chemistry/Principal and CEO of Environmental Standards, Inc. He holds a B.S. in Environmental Science/Biology from Marist College, New York. As the founder and a Principal of Environmental Standards, Mr. Vitale oversees a staff of approximately 35 quality assurance chemists and is responsible for the direction of the technical and managerial aspects of the company's operations. Mr. Vitale provides quality assurance oversight of environmental sampling and data management for natural gas exploration and production companies in the Marcellus and other natural gas shale play regions. Mr. Vitale is a recognized expert in the following fields: organic and inorganic data validation (including specialty analyses); laboratory auditing; preparation or third-party review of quality assurance project plans; design of specialty analyses to accommodate project-specific data quality objectives; quality assurance oversight of complex projects (sediment projects, biomonitoring projects); and agency negotiations. Mr. Vitale is a Certified Environmental Analytical Chemist through the National Registry of Certified Chemists. He previously served as an appointed member of the Federal Advisory Committee Board - Environmental Laboratory Advisory and has served on the Board of Directors of the American Institute of Chemists and the National Registry of Certified Chemists. Mr. Vitale has received no external grants from either government agencies, private companies, or foundations.

Vitthal, Sanjay

Shell Center of Excellence for Unconventional Resources

Dr. Sanjay Vitthal is Production Advisor at Shell Center of Excellence for Unconventional Resources. He holds a B. Tech. in Chemical Engineering from Indian Institute of Technology in New Delhi, India, an M.S. in Petroleum Engineering from the University of Texas at Austin, an MBA from Duke University, and a Ph.D. in Petroleum Engineering from the University of Texas at Austin. Dr. Vitthal is the Principal Technical Expert for Hydraulic Fracturing at Shell Worldwide Education. His areas of expertise include Hydraulic Fracturing Design and Completions, Formation Damage, Fracturing fluids. Dr. Vitthal is a member of the Society of Petroleum Engineers. Dr. Vitthal has received no external research grants from either government agencies, private companies, or foundations.

Walker, R. Perry

Photon-Field Engineering

Mr. R. Perry Walker is the owner and sole proprietor of an environmental research small business, Photon-Field Engineering, and a retired U.S. Air Force Physicist and Nuclear Engineer. He holds a B.S. in Physics from the University of Wyoming, and an M.S. in Nuclear Reactor Engineering from the University of Lowell, in Lowell, Massachusetts. During his military service, Mr. Walker authored or coauthored 21 technical papers in the field of underground nuclear testing, and infrared spectroscopic signature measurements of manmade and natural background sources. After retirement, he saw a need to engage in independent field research on the environmental impacts to the atmosphere by accelerated natural gas development in his retirement home of Sublette County Wyoming. That work included first-of-a-kind optical spectroscopy analysis of well completion flaring that follows well fracking. This research revealed that the flaring process lofted fracking chemicals into the atmosphere and resulted in his acquiring samples of local fracking fluids and proppant sand that are still in his possession. Mr. Walker has familiarity with natural gas development and transportation processes because of his early years working in the sector and more recently by spending time touring the Anticline Gas Field in Sublette County observing production pad processes as well as fracking in progress both on the ground and in the instrumentation support trailer. He has written 10 public comment papers to federal and non-governmental organization stakeholders about natural gas development impacts on the local atmosphere. Mr. Walker's field work has been primarily self funded but he has received modest grant funding from the greater Yellowstone Coalition, the Wyoming Outdoor Council, the Wagon Wheel Society, and from a private donor. His research has generated one published paper resulting from his presentation at a University of Wyoming-sponsored conference on coal bed natural gas development, and several invited presentations to citizen groups and a U.S. Forest Service Western Regional Air Partnership Conference. Mr. Walker has a journal article presently in development on air quality issues associated with hydraulic fracturing in the region.

Westerhoff, Paul

Arizona State University

Dr. Paul Westerhoff is an Associate Dean for Research in the Ira A. Fulton Schools of Engineering and Professor in School of Sustainable Engineering and The Built Environment, and member of the Civil, Environmental and Sustainable Engineering faculty, at Arizona State University (ASU). He holds a B.S. in Civil Engineering from Lehigh University, an M.S. in Civil and Environmental Engineering from University of Massachusetts, and a Ph.D. in Civil, Architectural and Environmental Engineering from the University of Colorado at Boulder. Dr. Westerhoff joined ASU in August 1995 and was promoted to full professor as a University Exemplar in 2007. He served as Department Chair in Civil and Environmental Engineering, and was the founding Director for the School of Sustainable Engineering and the Built Environment. Dr. Westerhoff has a strong publication and research record, has garnered wide recognition for his work related to treatment and occurrence of emerging contaminants in water, and has been active in multidisciplinary research. Dr. Westerhoff has over 125 peer reviewed journal article publications and has been involved in over 250 conference presentations. He belongs to the American Society of Civil Engineers (ASCE), the American Water Works Association (AWWA), the Association of Environmental Engineering and Science Professors (AEESP), the American Chemical Society (ACS), and the Arizona Water & Pollution Control Association (AWPCA), International Ozone Association (IOA), International Water Association (IWA), Arizona Water & Pollution Control Association (AWPCA), and International Humid Substances Society (IHSS), and serves on numerous voluntary committees for these organizations. He currently is a member of the U.S. Environmental Protection Agency (EPA) Science Advisory Board – Environmental Engineering Committee, Vice Chair of the WateReuse Foundation Research Advisory Board, and external advisory board member of the EPA-NSF Center for Environmental Impacts of Nanotechnology. Dr. Westerhoff has received several research awards including the 2005 ASCE Walter L. Huber Research Award and the 2006 Water Environment Federation (WEF) Paul L. Busch Award. Dr. Westerhoff's current research is supported by the National Science Foundation to study photocatalytic reduction of nitrate in water; the Water Research Foundation to study Constructed Wetlands for Treatment of Organic and Nanomaterial Pollutants; the Water Environment Research Foundation to study the Fate of Engineered Nanomaterials in Wastewater Biosolids - Land Application; the National Institutes of Health to detect engineered nanomaterials in drinking water, food , commercial products and biological samples; the EPA to develop novel sorbents for multiple contaminant removal from groundwater serving small drinking water systems; Cities of Phoenix, Tempe, Peoria, Chandler (Arizona) and Central Arizona Project to monitor regional water quality (organics, taste and odor, and effects of forest fires) in central Arizona surface water; Semi-conductor Research Corporation (SRC) to develop methods for measurement and monitoring of engineered nanomaterials in electronics manufacturing; and Water Research Foundation to assess means of controlling the formation of nitrosamines in drinking waters.

Williams, Mark

University of Colorado

Dr. Mark Williams is a Fellow at the Institute of Arctic and Alpine Research and Professor of Geography, at the University of Colorado. He holds a B.A. and Ph.D. in Biological Sciences with an emphasis in ecology from the University of California at Santa Barbara. Dr. Williams' research interest is the hydrology and biogeochemistry of mountain areas, looking at surface-groundwater interactions, climate change and water resources, acid mine drainage, and the environmental footprint of unconventional natural gas extraction. He has served as a member of a National Research Council (NRC) committee to review international problems in environmental research, has served on a National Science Board task force, and has served on numerous panels for the National Science Foundation and other advisory committees at the national and international level. Dr. Williams is a Fulbright Scholar and was elected a Fellow of the American Geophysical Union in 2012; other past awards include the Denali Recent Accomplishment Award from the Association of American Mountain Geography Specialty Group; National Park Service, First Intermountain West Annual Award for Research to Support Park Service Resource Management by a non-Federal Scientist; First visiting professor, lâ Institut de la Montagne, University of Savoie, Chambery, France; and U.S. Environmental Protection Agency (EPA) Region VIII Outstanding Environmental Achievement Award. Dr. Williams' recent research has been supported by grants from the National Science Foundation, the Niwot Ridge Long-Term Ecological Research program, and from the U.S. Agency for International Development.

Wyatt, Douglas E.

URS Corporation

Dr. Douglas E. Wyatt is the Director of Science Research for the URS Corporation, Research and Engineering Services contract, at the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL). He holds a B.A. in Zoology and a B.A. in Physical Geography from the University of Tennessee, an M.S. in Geology and Geophysics from Vanderbilt University, and a Ph.D. in Geological Science from the University of South Carolina. Dr. Wyatt co-manages a joint commercial-academic research program (along with a Director of Engineering Research) and is responsible for creating, organizing and coordinating a multidisciplinary team of more than 80 national and international staff scientists, and is working in over 20 programmatic research areas involving more than 40 research projects with a supporting university portfolio of over 200 directed research activities. His current programmatic research areas include: unconventional oil and gas development including shale gas, enhanced oil recovery, geothermal and natural gas hydrates; engineered natural systems evaluation and risk including environmental, ultra-deepwater, and carbon storage; geothermal systems; fractured media fluid flow and advanced modeling-imaging; near-surface and environmental impacts of oil and gas production; natural gas utilization and fuel processing including carbon capture; and advanced combustion and turbine computational fluid dynamics with advanced imaging and modeling. Dr. Wyatt has participated in panels and review groups including as a reviewer for the DOE Quadrennial Technology Review (QTR), as Invited Speaker and Panelist for the Environmental Policy Institute, "Conquering Climate Change, New Opportunities, New Economies", as a Forum Panelist, Alternative Energy Research & Development at the James E. Clyburn Transportation Center at South Carolina State University, as an Invited Speaker – Panelist at the American Association of Petroleum Geologists/Society of Exploration Geophysicists/Society of Petroleum Engineers' Hedberg Conference, "Geological Carbon Sequestration: Prediction and Verification", in Vancouver, BC, and as an Invited Speaker – Panelist: U.S. Environmental Protection Agency & Howard University, Opening Panel Discussion, "Environmental Justice, Climate Change and Clean Coal" at the State of Environmental Justice in America 2009 Conference, Howard University School of Law. Dr. Wyatt is Registered Professional Geologist and Certified Petroleum Geophysicist, and an Adjunct Professor in the Department of Biology and Geology at the University of South Carolina-Aiken where he teaches upper division courses in Depositional and Diagenetic Systems and in Global Energy and Environment. He is also an Adjunct Associate Professor at Clemson University. Dr. Wyatt has approximately 140 papers, presentations and articles. He has no current research grant funding but supports ongoing research through the URS Research and Engineering Services research support contract to the National Energy Technology Laboratory.

Young, Thomas M.

University of California, Davis

Dr. Thomas M. Young is a Professor of Civil and Environmental Engineering at the University of California, Davis. He holds a B.S. in Chemical Engineering from Michigan State University (1985), an M.P.P. in Public Policy from the University of California (1987), Berkeley, and a Ph.D. in Environmental Engineering from the University of Michigan (1996). Before joining the faculty at UC Davis in 1995, Dr. Young worked for three years in U.S. Environmental Protection Agency (EPA)'s Office of Underground Storage Tanks, where he worked closely with several EPA laboratories. Dr. Young's current research centers on the experimental and modeling work required to proactively manage toxic chemicals to reduce their life cycle environmental impacts. The majority of his research has been in the measurement and modeling of contaminant fate and transport in the environment, particularly with respect to environmental sorption processes, and on sorption related water treatment processes. Dr. Young has published extensively on these topics, and has a strong interest in the application of engineering to environmental policy-making. He has received various awards, including the Distinguished Service Award from the Association of Environmental Engineering and Science Professors and a National Science Foundation (NSF) Career Award. Dr. Young is a member of the International Water Association, American Chemical Society, Association of Environmental Engineering and Science Professors, and the Society of Environmental Toxicology and Chemistry. Dr. Young's research has been supported by grants from both government agencies and private companies, with core grant research support primarily being from federal and state and local government (National Institutes of Health, California Department of Pesticide Regulation, Sacramento Regional County Sanitation District, California Department of Transportation, California State Water Resources Control Board), with additional grant support from industry and foundations.

Zeise, Lauren

California Environmental Protection Agency

Dr. Lauren Zeise is Deputy Director for Scientific Affairs of the Office of Environmental Health Hazard Assessment – a department within the California Environmental Protection Agency (Cal EPA). She holds a B.S. from Loyola University, and an S.M and Ph.D. from Harvard University. In her role at Cal EPA, Dr. Zeise oversees the department's scientific activities including risk assessments, development of health advisories and other advice and regulations that implement departmental mandates. To further California's environmental justice mandate, the department is developing a cumulative impact assessment tools for characterizing the impact on communities of multiple sources of pollution and non-chemical stressors in the presence of community vulnerability. Dr. Zeise has conducted hundreds of health risk assessments for the State of California. She has served on numerous national and international science advisory committees and boards focusing on environmental public health and improving the way chemicals are tested or evaluated for health risk. Dr. Zeise has served on over 20 National Academy of Science (NAS) committees and coauthored a number of NAS reports, including "Science and Decisions: Advancing Risk Assessment" (2009), "Toxicity Testing in the 21st Century: A Vision and Strategy" (2007), "Sustainability and the US EPA" (2011), and "Understanding Risk: Informing Decisions in a Democratic Society" (1996). She is member, fellow, former editor and former councilor of the Society of Risk Analysis and was the 2008 recipient of the Society's Outstanding Risk Practitioner Award. She is an honorary lifetime NAS National Associate. Dr. Zeise's research is funded by the State of California; she has received no external research grants from either government agencies, private companies, or foundations.

Ziegler, Victor M.

Occidental Petroleum Corporation

Dr. Victor M. Ziegler is Director of Corporate Development for Occidental Petroleum Corporation in Los Angeles. He holds a B.S. from University of Southern California (USC), an M.S. from Stanford University, and a Ph.D. from USC, all in Petroleum Engineering. Dr. Ziegler is responsible for conducting asset and company evaluations leading to successful mergers, acquisitions or divestitures. He also assists Occidental Petroleum Corporation's operating assets in the design and implementation of projects to enhance oil recovery and development of unconventional resources, such as the Monterey Shale. Dr. Ziegler's research interests include the characterization of shale reservoirs and the optimization of hydraulic fracturing to produce these reservoirs. He is the Sponsor of a grant to USC, the objectives of which are to support these research interests. This grant to USC is funded by Occidental Petroleum Corporation. Dr. Ziegler has received no external research grants from either governmental agencies, private companies or foundations. Prior to his current assignment, Dr. Ziegler was Asset Manager for Occidental Petroleum Corporation's Vintage Production subsidiary and Reservoir Engineering Manager for Occidental Petroleum Corporation. He has more than 33 years of experience in the oil industry with Mobil, Chevron and Occidental Petroleum Corporation. Dr. Ziegler has been a Lecturer in the Petroleum Engineering Program at USC since 1984. He is the author of nine peer-reviewed publications and holder of two patents. He has been a member of the Society of Petroleum Engineers (SPE) since 1974 and was General Co-Chairman of the SPE's 1997 International Thermal Operations and Heavy Oil Symposium. Dr. Ziegler was recognized by the Society of Petroleum Engineers as an Outstanding Technical Editor for 2010 and 2012.