

**Invitation for Public Comment on the List of Candidates for the EPA Science Advisory Board Radiation Advisory Committee Augmented for the Review of EPA's Draft Technical Document Pertaining to Uranium and Thorium In-Situ Leach Recovery and Post-Closure Stability Monitoring**

April 20, 2011

The U.S. Environmental Protection Agency (EPA) Science Advisory Board (SAB) Staff Office announced in a Federal Register Notice (Volume 75, Number 226, Pages 71702-71703) published on November 24, 2010 that EPA's Office of Radiation and Indoor Air (ORIA) has requested the SAB to review and provide independent expert advice on EPA's draft scientific and technical document related to Uranium and Thorium Mill In-Situ Leach Recovery Post-Closure Stability Monitoring. The SAB Staff Office sought public nominations of nationally and internationally recognized scientists and engineers with demonstrated expertise and experience in one or more of the following areas: environmental statistics, geochemistry, geology, geostatistics, hydrogeology, environmental monitoring, and radiation health science.

Based on the qualifications and interest of the nominees, the SAB Staff Office identified candidates to augment the Radiation Advisory Committee (RAC) of the SAB for this advisory activity. The biosketches of these candidates are provided below. Biosketches of the members of the RAC are available at:

<http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommitteesSubcommittees/Radiation%20Advisory%20Committee>

The SAB Staff Office Director will make the final decision about who will serve on the Panel based on all relevant information. This includes a review of confidential disclosure form (EPA Form 3110-48), relevant information 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 advisory committees and panels; and, for the panel as a whole, f) diversity of scientific expertise and viewpoints.

**We hereby invite comments from members of the public to provide relevant information or other documentation that the SAB Staff Office should consider in determining who should serve on the augmented Radiation Advisory Committee. Please be advised that comments received are subject to release under the Freedom of Information Act. Comments should be submitted to Dr. K. Jack Kooyoomjian, Designated Federal Officer, no later than May 11, 2011. E-mailing comments ([kooyoomjian.jack@epa.gov](mailto:kooyoomjian.jack@epa.gov)) is the preferred mode of receipt.**

## **Radiation Advisory Committee (RAC) Augmented for Advice on Uranium and Thorium Mill Tailings Standards**

### **Borch, Thomas**

#### **Colorado State University**

Dr. Thomas Borch is an Associate Professor of the Department of Soil and Crop Sciences and has a joint position in the Department of Chemistry at Colorado State University. Dr. Borch is a faculty member of the graduate degree program in ecology (GDPE), the school of global environmental sustainability and center for environmental medicine. He earned a B.S. and M.Sc. in Environmental Chemistry from the University of Copenhagen, and a Ph.D. in Environmental Soil Chemistry at Montana State University in affiliation with the Center for Biofilm Engineering. Following his graduate studies, he did a Postdoctoral Fellowship (2004-2006) in the Soil and Environmental Biogeochemistry group at Stanford University, and joined Colorado State University in 2006 to initiate a program in Environmental Soil Chemistry. Dr. Borch is the recipient of the prestigious Faculty Early Career Development (CAREER) Award, from the National Science Foundation (NSF). His research interests are directed at determining reactions influencing the fate of trace elements, radionuclides and organic contaminants in soils. He applies a multitude of traditional soil chemistry methods in combination with various chromatographic [e.g. Gas Chromatograph (GC), High Performance Liquid Chromatography (HPLC) and Ion Chromatography (IC)], spectroscopic [e.g. Fourier Transform Infrared Spectroscopy (FTIR), X-ray Photoelectron Spectroscopy (XPS)], and microscopic [e.g. Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and Atomic-Force Microscopy (AFM)] methods, including state-of-the-art techniques such as synchrotron radiation-based X-ray techniques, to elucidate (bio) degradation products, chemical states of trace elements and structural states of minerals within soils and pure mineral systems. The ability to identify organic metabolites, the chemical state of trace elements and potential "host" mineral-phases is essential for ascertaining contaminant fate and mobility within soils and waters. Dr. Borch has extensive experience in issues related to uranium mining and remediation and has active collaborations, related to this subject, with research groups at several national laboratories. Dr. Borch is a member of the American Chemical Society and the Soil Science Society of America.

### **Brown, Steven H.**

#### **SENES Consultants Limited**

Mr. Steven H. Brown, M.S. CHP is a board certified health physicist and diplomat of the American Academy of Health Physics with over 35 years of nuclear industry experience. He has worked as a licensee of the U.S. Atomic Energy Commission (AEC) / U.S. Nuclear Regulatory Commission (NRC) and Agreement States in the commercial nuclear fuel cycle and as a contractor to the U.S. Dept. of Energy (DOE) in the U.S. nuclear weapons program. He is recognized as an expert in environmental, safety and health aspects of uranium processing facilities and is a member of national and international advisory committees. He was the ES&H and licensing manager and radiation safety officer for five large NRC/Agreement State uranium mills and several radiochemical laboratories. He has authored numerous technical papers and presentations on radiological and environmental aspects of actinides (uranium, plutonium) including uranium mining, milling and uranium in-situ recovery. He received an A.B.S. in Radiological Health and a B.S. in Physics from Temple University, as well as an M.S. in Physical Science from West Chester University. He is past President 2008 - 2009 of the Central Rocky Mountain Chapter of the Health Physics Society and Chairman of the Colorado Mining Association's Uranium Committee. His biographical synopsis appears in each edition of Marquis' Who's Who in the World since 1987.

### **Chambers, Douglas B.**

#### **SENES Consultants Limited**

Dr. Douglas B. Chambers is Vice President and Director of Risk and Radioactivity at SENES Consultants Limited (SENES). He has more than 35 years of experience in environmental consulting. During this time, he has carried out or directed numerous radiological and risk assessments for a wide variety of industrial and governmental clients in Canada, the United States and internationally. Examples of Dr. Chambers work include directing a large multi-year project on behalf of the Federal Ministry of Environment in Germany for the remediation of former Russian/(east) German uranium activities, numerous environmental assessments associated with the development of new uranium mines, decommissioning of uranium mines, dose reconstruction and development and application of methods for uncertainty analysis. Dr. Chambers has a long interest in the levels of radon in the workplace and home and in the health effects of radon. Dr. Chambers is a member of numerous professional societies and was a founding member of the Canadian Radiation Protection Association. He became a member of the Canadian Standards Association (CSA) Committee on Environmental Radiation Protection in 1978, and subsequently was chairman to 1989. He is currently a working member of the CSA N288.4 on environmental monitoring. Dr. Chambers was a member of the U.S. National Council on Radiological Protection and Measurements Scientific Committee 85 on the Risk of Lung Cancer from Radon, and has participated on a committee of the Science Advisory Board of the U.S. Environmental Protection Agency concerning radon research initiatives. He was a member of the Canadian Atomic Energy Control Board's (former) Advisory Committee on Radiological Protection (ACRP) in 1993 and was vice-chairman in 2001. Dr. Chambers has participated on the United Nations Scientific Committee on the Effect of Atomic Radiation (UNSCEAR) since 1998 as a member of the Canadian delegation. He has been a consultant to UNSCEAR with responsibility for preparing UNSCEAR's assessment of radon at home and at work. He has also recently completed an UNSCEAR annex concerning the effects of ionizing radiation on non-human biota. Dr. Chambers was the recipient of the 1997 W.B. Lewis award of the Canadian Nuclear Society for his achievements in environmental radioactivity. In February 2002, Dr. Chambers was the Morgan lecturer for the Health Physics mid-year symposium in Orlando.

## Demuth, Hal P.

### Petrotek Engineering

Mr. Hal Demuth has more than twenty-five years of varied petroleum engineering and applied hydrogeologic experience. He earned a B.S. in Petroleum Engineering from the University of Tulsa, and an M.S. in Hydrogeology from the University of Idaho. In addition to expertise regarding ground-water characterization, remediation and permitting, he provides design and supervision consulting services regarding hydrocarbon production and disposal well drilling, workover, stimulation and testing. Early in his career with Tenneco, he became experienced as a drilling engineer by working in a wide variety of geologic settings and supervised activities offshore in the Gulf of Mexico. Prior to joining Petrotek he was responsible for design, coordination and supervision of ground-water investigations and remediation programs at sites throughout the western U.S. He also has experience with oil industry production operations and injection well start-ups throughout the country. Successful projects with Petrotek have included injection well permitting, site supervision of well installations, recompletions and remedial stimulations in Wyoming, Kansas, Nebraska and the Michigan Basin. Hal has conducted reservoir characterization in a variety of geologic settings; has managed ground-water characterization, modeling and remediation projects including LNAPLs, DNAPLs and metals; completed storm-water permitting and performed technical services regarding other regulatory compliance matters; and performed a variety of multi-phase flow studies in hydrocarbon reservoirs. He is an active member of the Society of Petroleum Engineers and the National Groundwater Association.

## Fabryka-Martin, June

### Los Alamos National Laboratory

Dr. June Fabryka-Martin is a Staff Scientist in the Environmental and Earth Sciences Division at Los Alamos National Laboratory (LANL) in Los Alamos, NM. Dr. Fabryka-Martin's work experiences span a broad range of topics related to radiological issues, focusing on the interpretation of geochemical and isotopic compositions as indicators of groundwater flow paths and transport processes, evaluation of the effects of drilling and well construction products on the reliability of contaminant data from monitoring wells, and radioactive waste disposal issues. Her Yucca Mountain studies of spatial distributions of chloride and chlorine-36 in the subsurface played significant roles in the development and testing of hydrologic process models for assessing the viability of this site as a geologic repository for radioactive waste, in particular by highlighting the potential role of fast transport paths in this geologic setting. Dr. Fabryka-Martin contributed to two books dealing with transport in the unsaturated zone, including development of the conceptual model of unsaturated zone hydrology at Yucca Mountain, and iodine-129 in a text on environmental tracers in subsurface hydrology. She has published over 35 refereed journal articles and conference papers in published proceedings. Dr. Fabryka-Martin holds a PhD and MS in Hydrology and Water Resources from the University of Arizona and received a BA degree in Geography from the University of Delaware. She served as a member of the US EPA Science Advisory Board's Radiation Advisory Committee from 1992 to 1998, and as a consultant from 2000 to 2006, contributing to over 11 SAB reports and advisories, including reviews of the Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual and the Agency's use of various regulatory environmental models such as MMSOILS, PATHRAE, PRESTO, and RESRAD. She recently served on the Waste Form Technology and Performance committee for the National Academies' Nuclear and Radiation Board, which examined waste forms and waste processing technologies with the potential to improve efficiencies of the processing and disposal of radioactive waste. As a LANL employee, Dr. Fabryka-Martin works for the Los Alamos National Security LLC on projects funded by the US Department of Energy and the National Nuclear Security Agency.

## Hoy, Roberta

### H2oy, LLC

Ms. Roberta N. Hoy, since the mid-1990's, has been working on development, operation, and closure of uranium mines and mills, including in-situ recovery (ISR) and conventional mines and mills, primarily in Wyoming. She has been responsible for evaluating both technical and regulatory aspects of these projects because of her scientific and legal education (J.D., University of Colorado; M.S. Hydrology and B.S., Geology, New Mexico Institute of Mining and Technology). While working for the Land Quality Division of the Wyoming Department of Environmental Quality (WDEQ), her work included: regulation of existing ISRs (from development through restoration); rewriting ISR rules to conform with EPA requirements and incorporate knowledge gained from commercial projects; and evaluation of contaminant transport in ground water at uranium mill tailings sites. She participated in public and professional meetings on these topics, ranging from formal rule-making hearings to informal discussions with interested parties. In addition to addressing legacy uranium issues, she worked on similar issues at underground coal gasification and oil shale retort sites. Roberta also chaired the Site Characterization Work Group, one of three groups of state, industry, and public representatives implementing WDEQ's Voluntary Remediation Program. Since moving to Colorado in 2005 to be with family, Roberta has been working as an environmental consultant, providing guidance to people from industry, government, and the public, on the technical and regulatory aspects of uranium mines. Prior to working in Wyoming, Roberta worked as consultant on projects requiring analysis of ground water movement and contaminant transport in a variety of complex hydrogeologic settings. These projects included tracking migration of organic compounds 'around' clay layers due to influence of multiple stresses (e.g., municipal wells); 'sorting out' a variety of contaminants (e.g., organics and metals) from adjacent sources; and evaluating the influence of surface/ground water interaction on contaminant transport.

## Johnson, Janet A.

### Tetra Tech MM

Dr. Janet A. Johnson is a part-time Technical Services employee of Tetra Tech MM in Fort Collins, CO and is President of Sopris Environmental, a one-person consulting company. She has expertise in health physics, radiation risk assessment, and environmental health. The radiation protection group at Tetra Tech and Sopris Environmental provide radiation protection services to industry and government including the uranium mining sector. She holds a BS in Chemistry from the University of Massachusetts, an MS in Radiological Physics from the University of Rochester, School of Medicine and Dentistry, and a PhD degree in Microbiology (Environmental Health) from Colorado State University. Dr. Johnson is a Certified Industrial Hygienist (CIH) and is also certified in the comprehensive practice of Health Physics (CHP) by the American Board of Health Physics. She is an active member of a number of radiation and health-oriented professional organizations and is a Fellow of the Health Physics Society (HPS), as well as a former member of the HPS Board of Directors. She served several terms as President of the HPS Environmental/Radon Section. She is currently a member of the Colorado Radiation Advisory Committee and served on the Colorado Hazardous Waste Commission in the 1990s. Dr. Johnson's consulting work includes the mining industry with emphasis on uranium recovery facilities. She is the Radiation Safety Officer of record for a uranium recovery facility and a rare earth mine. She was also involved in developing technical basis documents for the National Institutes of Occupational Safety and Health (NIOSH) dose reconstruction project under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA). Dr. Johnson is a former chair of the Science Advisory Board, Radiation Advisory Committee. In addition, she chaired the ERAMS II advisory (EPA-SAB-RAC-ADV-98-001, August 28, 1998).

## Johnson, Thomas

### Colorado State University

Dr. Thomas Johnson is an Assistant Professor in the Department of Environmental and Radiological Health Sciences at Colorado State University. He holds a BS from Southern Illinois University, an MBA from the University of Illinois, MS in Environmental Engineering from Northwestern University and PhD in Health Physics from Purdue University. His research efforts are on decontamination, health effects of uranium mining, the effect of lasers on the skin and cornea and laser safety standards. Current research projects include determination of best methods to decontaminate livestock, and fate of in-situ recovery uranium mines. He is a member of the Governor's Radiation Advisory Committee for the State of Colorado, serves on the Colorado State University Radiation Safety Committee, and a member of the American National Standards Institute Z136 editorial working group.

## Lawrence, Errol P.

### Petrotek Engineering

Mr. Errol P. Lawrence has more than twenty-five years of experience with the successful application of geology and environmental science to field projects. His education includes a B.S. in Geology from Northern Arizona University, and an M.S. in Engineering Geology from the Colorado School of Mines. His experience has included the characterization and simulation of groundwater systems and contaminant fate in a wide variety of geologic systems. Mr. Lawrence is a registered professional geologist (PG) and Certified Ground Water Professional (CGWP) in multiple states and has successfully conducted prospect generation, development and wellsite geology studies for hydrocarbon, uranium, and injection well installation in basins throughout the country. He has provided geologic feasibility studies in complex basins, and conducted computer simulation studies for the demonstration of injectate containment at injection facilities. In addition to his experience providing clients with specialized consulting services at Petrotek and Hydrosolutions, Mr. Lawrence gained experience with Geraghty & Miller, the USGS and Pogo Producing. He currently conducts geologic characterization studies, hydrologic investigations and performs flow and contaminant transport modeling. Recent projects include the development of groundwater compliance programs for several mining facilities, preparation of landban exemption petition demonstrations, simulation studies to optimize in-situ recovery techniques, development of numerical models in support of Alternate Concentration Limit applications, and the review and assessment of groundwater remediation programs. Mr. Lawrence publishes regularly and is an active member of the American Institute of Professional Geologists, the Colorado Ground Water Association and the National Water Well Association.

## Powell, Brian A.

### Clemson University

Dr. Brian A. Powell has extensive expertise with the mobility of radionuclides in soil and groundwater systems through his research in the Department of Environmental Engineering and Earth Sciences at Clemson University as well as previous work at the Lawrence Livermore National Laboratory and the Lawrence Berkeley National Laboratory. He has a B.S. in Chemistry from the University of Montevallo, and M.S. and Ph.D. in Environmental Engineering and Science from Clemson University. He holds memberships in the Association of Environmental Engineering and Science Professors, the American Geophysical Union, Sigma Xi, and the American Chemical Society. At Clemson University, Dr. Powell teaches courses in Actinide Environmental Chemistry, Environmental Radiation Protection (Lecture and Laboratory courses), Geochemistry, and Geochemical Reaction Modeling. His research focuses on biogeochemical processes controlling radionuclide behavior in the environment such as sorption by minerals, interactions with nano-colloids, complexation by organic ligands, and interactions with microorganisms. He has published at least 20 refereed journal publications, thirteen research reports, and made nearly 50 technical presentations on these topical areas. He has conducted sponsored research in a dozen projects dealing with topics of nuclear forensics, evaluation of nanoparticle behavior, sorption and environmental transport of plutonium, development of radiation detection and radiation laboratory courses, iodine, radium, strontium geochemistry in wetland and subsurface sediments, radionuclide geochemistry of saltstone and solid waste performance assessments at the Savannah River Site, measurement of thermodynamic parameters supporting advanced fuel cycle chemistry, and related topics.

## Sandquist, Gary

University of Utah

Dr. Sandquist is an Emeritus Professor in Mechanical and Nuclear Engineering and the former Director of the Graduate Nuclear Engineering Program at the University of Utah. He was a Distinguished Visiting Professor in Physics and Civil and Mechanical Engineering Departments at the US Military Academy at West Point and is an Affiliate Faculty Member at Idaho State University. He is a Registered Professional Engineer in Utah (Mechanical and Structural) and in California (Nuclear), a Board Certified Health Physicist, a Diplomate in Environmental Engineering, a Certified Quality Auditor, and a retired US Naval Reserve Commander-Intelligence Designator. The Reactor Supervisor and NRC Licensed Senior Reactor Operator for a TRIGA Research Reactor, he served as a short mission expert in nuclear science and safeguards for the IAEA and as Technical Training Director for the joint DOE, EPA, and DRI Community Radiation Monitoring Program at the Nevada Test Site. His scientific interests include radiological science, risk assessment; radiation detection, measurement and environmental transport; assessment and decontamination of chemical and radioactive hazards; and design and execution of characterization and final status surveys using MARSSIM. His scientific and technical memberships include American Health Physics Society and American Society of Engineering Education. He is a Fellow of the American Nuclear Society and the American Society of Mechanical Engineering. He has authored or co-authored over 720 publications including 6 books and book chapters, 202 refereed papers, 356 technical reports, developed 17 major technical computer codes and participated in 201 technical meetings, conferences, workshops and government hearings. He holds a BS in Mechanical Engineering, MS in Engineering Science, PhD in Mechanical and Nuclear Engineering, MBA, was a Post Doctoral Fellow at MIT, and served a Sabbatical at Ben Gurion University in Beer Sheva, Israel. He is also Owner and Manager of the veteran owned small business, Applied Science Professionals.

## Wiggins, Charles L.

University of New Mexico

Dr. Charles L. Wiggins, PhD, MPH, Associate Professor of the Department of Internal Medicine at the University of New Mexico, became the Principal Investigator of the New Mexico Tumor Registry (NMTR) in August 2003. Dr. Wiggins earned his PhD in Epidemiology from the University of Washington in Seattle, WA, and most recently, he served as the Medical Director of the Utah Cancer Registry in Salt Lake City, UT. Dr. Wiggins has previous experience with the NMTR; he was a research assistant and epidemiologist before becoming the Medical Director of the Utah Registry. Dr. Wiggins has experience in cancer surveillance and epidemiology and has a strong interest in cancer among American Indian and Hispanic populations. Additionally, he is a member of the National Network for Cancer Control Research for American Indian and Alaska Native Populations.