Gregory P. Miller, Ph.D., P.G.
Principal

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Professional Summary

Gregory P. Miller is a professional geochemist with 23 years of practical experience and specialized training in aqueous geochemistry, water-rock interaction, water treatment, contaminant transport hydrology, geostatistics, and quality assurance. Dr. Miller is experienced in complex groundwater flow and contaminant transport investigations including forward and predictive modeling. He is not limited to groundwater investigations; surface water hydrology experience includes design, installation and maintenance of hydrologic and meteorologic data collection apparatus for small watersheds, engineered cap assessment and design, and modeling. He has a strong regulatory background in RCRA, CERCLA, NEPA, SDWA, and CWA, with practical experience in state- and federal-lead regulatory permitting, site assessment, data validation, quality assurance and quality control program assessment and implementation. He is expert in well hydraulics and rehabilitation, tracer tests, and the collection of representative groundwater samples using state of the art techniques. He is experienced in the application of solute transport and aqueous geochemistry models in remedial design, site investigations, mineral exploration, and monitored natural attenuation closures. He has participated as an expert in several litigation projects.

Dr. Miller began working specifically with arsenic as a groundwater contaminant in 1992, working for the power industry evaluating substation herbicide migration, and coal combustion residual leachate impacts on groundwater. Anticipating the EPA rulemaking that would lower the arsenic drinking water standard, Dr. Miller began research in 1997 to examine the behavior and mechanisms of arsenic binding to hydrous metal oxides. While this effort was conducted in natural systems, it has direct applicability to EPA BAT treatment technologies that use adsorptive media. Dr. Miller then extended that effort to a successful multi-year project to develop methods for creating arsenic-binding filter media in the subsurface; *in situ* arsenic treatment technology.

Education

Ph.D., Dissertation in Geochemistry, New Mexico Institute of Mining and Technology, 2001
"Surface Complexation Modeling of Arsenic in Natural Sediment-Water Systems"
M.S., Geology, New Mexico Institute of Mining and Technology, 1988
B.S., Geology, Honors, New Mexico Institute of Mining and Technology, 1986

Relevant Project Experience

Natural Attenuation of Arsenic, Beryllium, Cobalt and Sulfide, Dominion Resources:
Dominion Resources operates several Coal Combustion Product disposal facilities in Virginia. Legacy operations at the facilities have resulted in groundwater contamination, dominantly by arsenic. The first task was a review of work by others and over 10 years of hydrogeologic and contaminant data to evaluate if natural attenuation of arsenic was taking place. The second effort was to design and execute a focused field investigation to close data gaps identified by the review. The site-specific corrective action plan and facility permits were updated resulting in the first closure of a legacy CCP facility using monitored natural attenuation of inorganics as the remedial alternative.

Mineral Exploration Permitting and Water Quality Investigations, BE Resources, New Mexico: A mineral exploration activity was proposed for a location containing culturally significant thermal springs that support critical habitat for threatened and endangered species. Directed the efforts of the project team to create basin to local scale conceptual and quantitative models of water chemistry, surface-groundwater interaction, and hydrostratigraphy used to support permit applications and rebut the non-technical affirmations of stakeholders and opposition groups that exploration drilling would negatively impact the springs water quality and quantity. Provide sworn testimony as to hydrogeologic conditions at public meetings. Developed monitoring plan for exploration drilling to verify no impact to springs. Exploration drilling was permitted and completed with no impact to spring water quality.

Understanding the Mobility of Arsenic in Natural Systems, Electric Power Research Institute (EPRI) Palo Alto, California: Provided support to EPRI in an effort to better present the current state of science regarding arsenic mobility in the environment. A review usable by technical and non-technical managers was created. The review was put to use in arsenic mitigation strategy development, and program design for site assessment and cleanup.

Energy Water Needs and Availability Assessment, Colorado: Directed the technical efforts of the project team to use public domain data to perform an assessment of the water needs, and supply availability, associated with future potential energy resource development in the Upper Colorado River Basin of western Colorado. Evaluated expected water demands for energy development at key locations across the 10,000 mi2 study area, and identified and quantified available groundwater resources, and developed first order estimates of costs for groundwater resource development at those locations.

Regional Groundwater Chemistry Modeling and Mapping for the Island of Newfoundland: Newfoundland has a large geochemical data set for rocks and sediments and a much smaller data set for groundwater quality. If the rock and groundwater data sets are well correlated the sediment and rock data could be used to project water quality into unknown areas. Work by others had indicated that objectionable parameters such as arsenic were related to rock type. Directed and reviewed the efforts of project staff using the USEPA software Pro UCL, Excel, and ArcInfo GIS to evaluate the statistical relationships between geologic data and water quality information. Through AMEC efforts, geochemical constituents from the lake sediments as correlated to groundwater chemistry were used as predictors for water quality throughout a given geologic unit. Ultimately, the groundwater quality maps identify potentially problematic zones for drilling groundwater supply wells.

Independent Peer Review of Los Alamos National Lab Risks to Rio Grande Water Quality: Retained as geochemistry expert by Buckman Direct Diversion Board (associated with Santa Fe Water Utility / Sangre de Cristo Water) to perform an independent peer review of LANL data and information related to historical and expected future releases of contaminants. Participated in public scoping meeting, and carried out detailed review of available LANL documents on historical contaminant characterization and monitoring of surface water, sediment, and groundwater. Performed independent analysis of data to project possible off-site releases to the Rio Grande and groundwater in the underlying regional aquifer, and potential impacts to water quality at the location of the Buckman Direct Diversion. Presented interim and final team findings public meetings.

Well and Aquifer Safe Yield Analysis, Buckley Air Force Base, Aurora, Colorado: Buckley Air Force Base has several deep wells (>1100 ft.) that were installed some decades ago. Declining regional water levels have forced the Air Force to evaluate the sustainability of continued use of the old wells. Forward modeling using the results of pumping tests and the AQTESOLV code was conducted to determine the drawdown and yield of Buckley wells under several management scenarios. The results of the drawdown analysis was superimposed on the regional water level decline, as predicted by the Denver Basin MODFLOW model, to evaluate pumping level decline in individual wells over a 50 year time frame. Recommendations were made regarding well rehabilitation and redevelopment, depth to set pumps and pump extenders, and pumping rates to achieve a sustainable water resource management solution in a declining water table situation.

Vista Ridge Groundwater Geochemistry, Erie, Colorado: When AMEC was retained by Zurich Insurance to supply groundwater hydrology expert services, Dr. Miller supported the groundwater hydrology team for a very large construction defects insurance recovery case. Activities undertaken by Dr. Miller included review and synthesis of local and regional groundwater geochemistry with an eye to supporting flow-path and water source evaluations, specification of monitoring well and soil moisture monitoring arrays, and project QA/QC. Contributed technical exhibits to support ongoing mediation, trial is scheduled for Spring 2012.

Hydrometeorologic Data Collection Realignment, Navajo Nation, Arizona and New Mexico: Project manager for effort to increase the quality and utility of climatic, stream flow and snowpack assessment for the 27,000 square mile Navajo Nation Reservation. The project goals were to reduce field time for data collection and equipment maintenance by 30% with no increase in annual budget or decrease in the quality, utility, or spatial density of the data collected. An innovative error projection algorithm was used in combination with transportation efficiency analysis within ArcGIS to locate stations on routs varying from paved roads to jeep and snowmobile trails. The project was completely successful at meeting the client-set goals for efficiency and quality.

Subsurface Treatment for Arsenic Removal, San Antonio, New Mexico: Lead scientist for research and development of in situ treatment of iron and arsenic in groundwater. Technology can result in large cost savings when compared with conventional above-ground treatment methods. Received Phase I Small Business Innovation Research (SBIR) award for proof-of-concept development and testing in 2002. Follow-on funding provided by AwwaRF for Phase I and II of project to deliver water to consumers. Funding for transition to a full-scale permanent system was provided by New Mexico Governor Richardson's Water Innovation Fund II in 2006. The technology was developed by oxidizing the subsurface using oxygenated water generated in situ with fine-pore diffusers and membrane technology. The potential for aquifer plugging was evaluated through a series of short and long duration pumping tests and step tests conduced on the 24 wells used in the studies. Well to well induced gradient tracer tests were conducted in a drinking water aquifer using KBr, KCl, and NaCl at several times during the project. Tracer testing determined that aquifer plugging is not a concern for the technology.

Water Quality Impacts of CO_2-Based Well Rehabilitation: Well rehabilitation techniques use physical, chemical, heat, and shock wave sources of energy to dislodge and dissolve well screen encrustations. A technology that uses CO_2 for well cleaning was evaluated over 3 years in various well construction and geologic environments. Groundwater samples were collected and analyzed for a broad suite of parameters of regulatory interest. Sampling was conducted at various times before, during and after CO_2 based well rehabilitation. Comparisons to state and

federal water quality standard for well rehabilitation discharges indicated that the method was suitable for use in the company's operating area. Results were reported to shareholders.

Evaluation of Arsenic Mobility in the Environment, EPRI, Palo Alto, California: Principal investigator for multi-year assessment of processes controlling arsenic mobility on electric utility properties. Novel sampling and preservation methods developed and employed in Canada, Mexico, and the United States. Watershed-scale sediment and aqueous geochemical data collected for reactive transport simulation of arsenic mobility. Transport simulations guided by surface water tracer tests using fluorescent dyes and inorganic salts tested over 20 km of stream channel. Reactive transport scheme utilizing PHREEQC and a component additivity surface complexation method successfully predicted arsenic sediment-water partitioning.

Asbestos Landfill Permitting, Torrance County, New Mexico: Performed groundwater fate and transport modeling for an asbestos landfill in New Mexico. Fate and transport modeling of asbestos is required because of the SDWA standards for asbestos in drinking water. The EPA code MULTIMED was used to evaluate all groundwater exposure scenarios required by state permitting. Innovative approaches were required to account for the particulate nature of asbestos. The modeling results indicated that there would be no groundwater impact from the landfill, as defined by the state requirements.

Zuni Basin (New Mexico) and Little Colorado Basin (Arizona) Adjudications, Navajo Nation: Supported the efforts of the testifying expert in evaluation of land use claims and evapotranspiration estimates used to calculate water duty. Developed numerical tools to "reverse engineer" the evapotranspiration claims of the opposition. A sensitivity analysis was performed that included evaluation of water duty using several published methods for evapotranspiration estimation based in climatic observations and extrapolation.

Jemez y Sangre Regional Water Plan, City of Santa Fe, New Mexico: A regional water plan was needed that incorporated information on water supply, projected future water demands, facilitated public participation process; and analyzed alternatives. Evaluated and presented arsenic treatment alternatives to meet multiple and often competing needs of the regional plan. Evaluation presented to planning committee and stakeholders, integrating expert commentary into presentation. Evaluation results also presented to public to inform and to receive feedback on path that may best meet arsenic treatment needs of planning region.

Fate and Transport Modeling of Pentachlorophenol, Confidential Client, Washington, D.C.: EPA proposed a new rule to regulate how hazardous wastes will be defined for inclusion in the Hazardous Waste (Subtitle C) management system. Project required evaluation of EPA contaminant transport model mandated for use in proposed rule, specifically with respect to pentachlorophenol, and generally in respect to its overall applicability. Provided analysis for inclusion into formal comments to EPA on proposed rulemaking.

Performance Assessment of Large Surface Water Monitoring Network, Oak Ridge National Laboratory, and Tennessee: Used data collected from the extensive Oak Ridge National Laboratory watershed-monitoring network for environmental compliance and basic research. Overall quality of data was unknown. Monitoring points, consisting of over 100 weirs, flumes, and precipitation and meteorological measurement stations, were installed by often-unrelated programs. Analyzed data quality and station rating methods. Made recommendations for short- and long-term strategies to improve data quality and utility, while minimizing costs.

Mobilization of Arsenic in Biodegrading Aquifers, Enviro-Sciences, Inc.: Extensive remedial investigation/feasibility study of crude oil and refined products terminal revealed certain areas of aquifer had developed elevated levels of arsenic and iron. Suspecting biodegradation as cause, reviewed site data, created conceptual geochemical model of arsenic-iron biologically mediated dissolution process, and conducted geochemical modeling to test conceptual model. Determined arsenic was being mobilized by biodegradation and being adsorbed before reaching site boundary. Provided information to regulators who subsequently allowed greater freedom in site assessment techniques.

Determination of Uranium Source in a Landfill, Hopi Nation, New Mexico: Provided geochemical interpretation of uranium detections in a well down gradient of a landfill on the Hopi reservation. Geochemical analysis, including modeling using PHREEQC, was used to demonstrate that the contaminated groundwater was more likely from contact with improperly disposed of uranium mill tailings than from naturally occurring uranium in the bedrock.

Evaluation of Reductive Dissolution Mechanisms in Metals Transport, Texas Railroad Commission, Texas: For decades, investigators have been looking at links between metal contaminant plumes with a high iron, manganese, and trace metals signature and the release of organic contamination such as petrochemicals. Implemented procedures to help the commission determine if metals plumes were related to the biodegradation of petrochemicals at several sites.

62-Acre Cap Design and Assessment Oak Ridge National Laboratory, Tennessee: Conducted groundwater and surface water investigations through a four-year Remedial Investigation and Design for a radioactive and hazardous waste shallow land burial site. Complex site hydrogeology required iterative data collection and modeling efforts to determine design. Following construction, performance assessment conducted. Part of planning team for surface water, groundwater, and stream sediment statistically-based sampling and analysis programs. Used automated data collection where possible. Primary author of Performance Assessment Plan elements pertaining to groundwater sampling and analysis, and all aspects of plan pertaining to surface water and groundwater hydrogeochemistry. Conducted oversight of plan implementation.

Sapphire Energy Geohydrological Investigations, Las Cruces, New Mexico: Sapphire Energy is a groundbreaking company producing an alternative fuel source using pond-grown algae. Because of the need for site water for algae ponds AMEC performed groundwater sampling and detailed analyses to determine if groundwater conditions were suitable for algae growth. AMEC logged subsurface materials to determine soil characteristics and groundwater level for a monitoring well that was subsequently plugged and abandoned. Preliminary designs for an innovative vadose zone leak detection system for hundreds of acres of ponds was prepared.

Ash Pond Closure Design, Mississippi Power, Pascagoula, Mississippi: Conducted environmental assessment of active ash pond located at large, coal-fired electric generating facility. Provided geochemical modeling to link FEMWATER (flow model) and PHREEQE (geochemical model) output to predict success of various closure options.

Ash Pond Modeling and EPA Comments, Salt River Project, Arizona: In 2010 the USEPA proposed a new rule for regulation of the disposal of coal combustion byproducts. Using the Coronado Plant disposal scenario as the conceptual model saturated/unsaturated groundwater flow modeling was used to demonstrate that migration of CCB leachate to the underlying drinking water aquifer was improbable at any time scale. The highly conservative model was submitted to the USEPA as part of Coronado's official comments on the proposed rulemaking.

Design of Deep Saline-Water Well Field, Confidential Client, Artesia, New Mexico: Client determined that new and novel food production process could be more economically applied if they could access and use deep saline water. Used time domain electromagnetic methods to probe subsurface using a kilometre-per-side square antenna array to determine the depth to deep saline water. Existing well logs and other data were used to construct a conceptual model and probable chemistry profile for specific site.

Zeolite Treatment of Radioactive Spring, Oak Ridge National Laboratory, Tennessee: Provided design support for a passive zeolite treatment system for a radionuclide contaminated seep at ORNL. Conducted field assessments and supported modeling for design of French drain to intercept and direct contaminated water to subsurface treatment vault. Numerical analysis conducted to optimize design of permeable treatment system to maximize retention time and throughput for range of modelled flows and heads. Conducted geochemical modeling using MINTEQA2 to investigate suppression of precipitation of iron oxides and hydroxides. Operated scaled physical model of system to evaluate practical application of technology. Determined design parameters for process chemistry for treatment system.

TCE Plume Treatment System, Portsmouth Gaseous Diffusion Plant, Piketon, Ohio: Detailed field investigation required to support 3-D finite element groundwater flow model for remedial design. Site hydrogeologist for well installation and cone penetrometer work. Determined design parameters for process chemistry for innovative passive catalytic oxidation of TCE. Managed efforts of field teams for surface water weir installation and calibration, monitoring well installation, waste management, health and safety, aquifer pump tests, groundwater sampling, and quality assurance. Primary author of all required plans. All planning, investigation, fieldwork, modeling and reporting completed in less than 90 days in winter and early spring.

White Oak Lake Sediment Transport, Oak Ridge National Laboratory, Oak Ridge, Tennessee: An earthen dam impounding sediment contaminated with radionuclides, organic chemicals, and heavy metals was determined to be unsafe. Linked discharge data with sediment contaminant stratigraphy to assess potential contaminant concentrations in river discharge.

Gaseous Diffusion Plant 'Urban' Runoff Study, Oak Ridge National Laboratory, Oak Ridge, Tennessee: Supported surface water modeling at a mothballed uranium enrichment facility that covers approximately 1,500 acres of mixed urbanized areas and waste management facilities. The site is distinguished by having one of the largest footprint buildings ever built, the K-25 facility, at over 1.6 million sq. ft. Evaluated whether the WWII-era storm drain network was sufficient to convey runoff from storm events. Site plans were used for initial model construction. Field tests were conducted to evaluate the validity of default model parameters.

Litigation Support, Confidential Clients, USA*:* Provided support as consulting expert to litigation involving the primary contaminants: perchroloethylene, perfluorooctanoic acid (PFOA or C8), nitrate, MTBE, arsenic, selenium, diesel fuel, and gasoline. Each individual contaminant represents a separate litigation task, for different clients. Technical approaches employed include: groundwater flow modeling using HST3D and MODFLOW-SURFACT, geochemical reaction path modeling using PHREEQC and PHAST, and Karst tracer test execution and analysis using fluorescent dyes and passive detection techniques.

Toxic Tort: Arsenic Contamination of Private Wells, Vermillion Parish, Louisiana: Testifying expert for case preparation for the defendant. Defendant alleged to have liability for improper use of a subsidiary company's arsenic containing product. Tasked with determining the state-of-science, and knowledge from layman to manufacturer, regarding arsenic mobility in soil for the period 1910 through 1960. Expert opinion filed; case in progress.

Litigation Support

2001 MTBE Contamination in Basin Fill Sole-Source Aquifer, Santa Monica, California
Supported the efforts of testifying experts on groundwater contamination from multiple parties. Specific duties included evaluation of pipeline leak testing results and performing moment analysis of plume centroids for history reconstruction.

2002 Perchloroethylene Damage Allocation, Stockton, California
Supported the efforts of testifying expert as Project Manager on perchloroethylene contamination resulting from sewer leaks at multiple dry cleaners. Directed the efforts of two modeling teams in history reconstruction. Performed separation of costs based on the modeling results.

2002 Nitrate Damage Allocation, San Jose, California
Consulting expert on determination of sources of nitrate contamination for the purpose of damage allocation. A combination of stable isotope analysis and indicator element chemistry was used to separate nitrate sources. Supported testifying experts' effort.

2003 Alleged Sheep Kill, San Juan, New Mexico
Consulting expert for case preparation on a sheep kill alleged to have resulted from runoff and groundwater seepage from a coal-fired power plant. Evaluated water chemistry and hydrologic setting to determine exposure point concentrations of metals potentially toxic to sheep. Case dropped by plaintiff.

2003 Perfluorooctanoic Acid (PFOA or C8) in Drinking Water, Lubeck, West Virginia
Consulting expert for case preparation on contamination of a municipal utilities' water supply with an exotic contaminant with a known, but poorly quantified, health effect in humans. Established unbroken transport pathways between the plaintiff's wells and the defendants disposal practices. Case settled prior to deposition.

2005 Toxic Tort: Gasoline and Diesel Fuel Contamination, Knoxville, Tennessee
Consulting expert for case preparation for the defendant. Defendant improperly disposed of thousands of yards of contaminated soil and debris in a sinkhole. Following removal and permitted disposal of the material it was alleged that the initial placement of the soil caused groundwater contamination effecting hundreds of homes. Presented findings that there was not a causal relationship between the sinkhole waste and the regional contamination. Case settled prior to deposition for an amount less than 1/400 of the original claim.

2008 Water Rights Adjudication: Navajo Nation - Zuni Basin and Little Colorado River
Project Manager for two tribal water rights cases in Federal Court. Manage and review technical activities of staff engaged in assessment of water rights claims of others and development of water rights claims for the Navajo Nation, in support of the testifying expert. Adjudication proceedings are in progress with a multi-year trial schedule.

2009 Toxic Tort: Arsenic Contamination of Private Wells, Vermillion Parish, Louisiana
Testifying expert for case preparation for the defendant. Defendant alleged to have liability for improper use of a subsidiary company's arsenic containing product. Tasked with determining the state-of-science, and knowledge from layman to manufacturer, regarding arsenic mobility in soil for the period 1910 through 1960. Expert opinion filed - currently not deposed; case in progress.

2010 Toxic Tort: Arsenic Contamination of Private Well, Knoxville, Tennessee
Consulting expert for case preparation for the defendant. Defendant alleged to have caused personal injury through contamination of groundwater by arsenic leached from coal combustion byproducts used on the defendants property. Case in progress.

Grants, Awards, and Patents

Patents

Method, Device, and Kit for Chemical Species Separation. Patent applied for with New Mexico Tech Research Foundation, 1999.

Apparatus, Method and System of Treatment of Arsenic and Other Impurities in Ground Water, Provisional Application Serial No. 60/456,876. March 21, 2003.

Award Winner

Subsurface Treatment for Arsenic Removal – STAR– Governor Richardson's Water Innovation Grant II. 2006. Commercialization of STAR Systems $920,000.

Arsenic Treatment for Small Systems – American Water Works Association Research Foundation. 2005. Development of Subsurface Treatment for Arsenic Removal – Phase II $200,000

Arsenic Treatment for Small Systems – American Water Works Association Research Foundation. 2003. Development of Subsurface Treatment for Arsenic Removal – Phase I $100,000

Small Business Innovation Research Grant - US EPA. 2002. Development of Subsurface Treatment for Arsenic Removal $100,000

Electric Power Research Institute (EPRI), 1998-2000, $76,650. Agreement No. 4CH6890. Testing approaches to arsenic surface complexation modeling of field data. Mary E. McLearn, Project Manager.

Soil Science Society of America, November 1999, $1,000. For presentation of "Modeling arsenic absorption in a small watershed using PHREEQC" at the Oxyanion Surface Chemistry and Remediation in Soil and Geologic Media Symposium, SSSA, Annual Meeting, November, 1999, Salt lake City, Utah.

American Academy of Environmental Engineers, April 2001. Grand Prize Winner in the University Research Category for Excellence in Environmental Engineering; Arsenic Speciation Kit.

Co-Investigator

Arsenic and Arsenic Species in the Rio Grande, and the Effect of Irrigated Lands, NMIMT.

Waste-Management Environment Research Consortium (WERC), January 1999 to December 2000. $230,688. A Commercial Arsenic Testing and Speciation Field Kit, NMIMT.
Fulbright-Hays Scholarship, May-June, 1999. $174,010. Co-investigator of arsenic distribution in rural Ghana, West Africa using Fulbright graduate students in a combined environmental-multicultural field program.

Professional Qualifications

Tennessee Licensed Professional Geologist No. 254
Kentucky Registered Professional Geologist No. 635
Florida Licensed Professional Geologist No. 1671
Virginia Certified Professional Geologist No. 1847
Illinois Licensed Professional Geologist No. 1323

Publications/Articles

Monitored Natural Attenuation: A Remediation Strategy for Groundwater Impacted by Coal Combustion Product Leachate. World of Coal Ash 2011 Conference Proceedings, May 2011.
Treatment Approach to Reduce Well Maintenance Costs. Ultrapure Water, Mansuy, N. and G.P. Miller. September 2007.
Prediction of the Environmental Mobility of Arsenic: Selection and Use of Partitioning Coefficients. Miller, G.P., EPRI, Palo Alto, CA 2002. 1005308.
A Comment on Arsenic Species Separation Using Ion Exchange. Water Research 34(4): 1397-1400. Miller, G.P., D.I. Norman, and P.L. Frisch. 2000.
Prediction of the Environmental Mobility of Arsenic: Evaluation of a Mechanistic Approach to Modeling Water-Rock Partitioning. EPRI, Miller, G. P., Palo Alto, CA 2000. 1000547.
Modeling Arsenic Mobility in Natural Systems. Chemical Speciation and Reactivity in Water Chemistry and Water Technology: A Symposium in Honor of James J. Morgan, 220th ACS National Meeting, Washington, D.C., Miller, G.P. and D.I. Norman., August 2000.
Modeling Arsenic Mobility in Natural Systems. Soc. of Env. Geoc. and Health, Fourth International Conference on Arsenic in the Environment, Miller, G.P. and D.I. Norman. June, 2000.
Arsenic Speciation in a Geothermally Impacted Watershed, Guadalajara, Mexico. Soc. of Env. Geoc. and Health, Third International Conference on Arsenic in the Environment, Miller, G.P., D.M. Welch, D.I. Norman, L.A. Brandvold, and R.M. Prol-Ledesma, San Diego, CA, July 1998.
Representative Groundwater Samples Call for Proper Protocols. HAZMAT World, Miller, G. P., November 1993.

Memberships

International Association of Geochemistry and Cosmochemistry
American Chemical Society

Languages

English

Summary of Core Skills

Geochemist, geologist, water treatment, drinking water, water resources, regulatory analysis and compliance, permitting, air quality, engineered geochemical barriers, surface water hydrology, geostatistics, reactive transport modeling of groundwater and surface water, groundwater well design and rehabilitation, representative sampling techniques for air, water and geomedia, arsenic, NEPA, CERCLA, RCRA, SDWA, CAA, TSCA, EA, ESA, EIS, RI/FS, DoD, DoE, policy, litigation, expert witness.

Employment History

2012	Principal, GEOCHEMICAL, LLC
2008-2011	Senior Geochemist, AMEC's Earth & Environmental Division.
2004-2008	Vice President Research & Development, Subsurface Technologies, Inc., Rock Tavern, NY
2001-2003	Senior Scientist, Daniel B. Stephens & Associates, Albuquerque, New Mexico
1996-2011	Independent Hydrogeologic and Water Treatment Consultant, Knoxville, TN and Socorro, NM
1997-2001	Research Assistant, New Mexico Institute of Mining and Technology, Socorro, NM
1995-1996	Quality Assurance Manager, Environmental Consulting Engineers, Inc., Knoxville, TN
1988-1995	Hydrogeochemist, Environmental Consulting Engineers, Inc., Knoxville, TN
1987	Hydrogeologist, Martin Marietta Energy Systems - Oak Ridge, TN
1985-1988	Student, New Mexico Institute of Mining and Technology, Socorro, NM
1979-1980	Air Quality Sampling Technician, Ultrachem Laboratories, Walnut Creek, CA
1978-1985	Professional Cook, Chef, Sous Chef, San Francisco Bay Area, CA

Personal

Married 22 years to Theresa Apodaca; no children. Competitive vintage automobile (1965 Austin Healey) road racer.