

BARBARA MICKELSON, P.E.



Education and Professional Development

- B.S., Civil Engineering, South Dakota School of Mines and Technology
- Short Courses at University of Texas, Oklahoma State University, University of Tennessee and Colorado School of Mines
- Occupational Safety and Health Administration (OSHA) 40-Hour Hazardous Waste Operations and Emergency Response Training
- OSHA Health and Safety Training for Supervisors of Hazardous Waste Workers
- Numerous Conferences and Seminars on Remedial Technologies, Site Characterization Techniques and Regulatory Compliance

Registrations and Professional Affiliations

- Professional Engineer – California, Texas, and Wyoming
- American Society of Civil Engineers
- National Water Well Association
- Association of Groundwater Scientists and Engineers
- American Water Works Association

Summary of Professional Experience

Barbara Mickelson is a Registered Professional Engineer in California, Texas, and Wyoming, and has over 30 years of experience specializing in the following:

- Assessment of petroleum hydrocarbon impacts to soil and ground water
- Analysis of environmental risks associated with organic and inorganic substances and planning for appropriate remediation and mitigation
- Mining project permitting with respect to water quality and quantity, geomorphology, dam and embankment design and engineering, and design of alternate sediment and runoff control facilities
- Water and wastewater treatment systems for municipal, industrial, and chemical manufacture and petroleum refining processes
- Expert witness testimony

Representative Experience

Evaluation and Remediation of Petroleum Hydrocarbons

- Executive-in-charge of external technical assessment activities at a major southern California refinery including analyses of NAPL physical properties and mobility as well as assessment of recovery techniques and mechanisms for enhancements. AME performed visualization of soil vapor, soil, ground water, and NAPL data to assist development of a refined site conceptual model. AME modeled dissolved phase contaminant transport trends through time including rates of mass transfer. AME utilized these data to assess the transport pathways and impacts of both on and off-site well pumping on dissolved contaminant flow and NAPL recovery.
- Participated in arbitration between Arco and ConocoPhillips as an independent third party. Determinations regarding cost allocation, release timing and remediation liability were made by a three party panel including representatives of each oil company and the independent third party. Decisions of the panel were binding on the parties. Participated in two arbitration sessions evaluating costs and responsibilities for cleanup at 12 retail sites in California.
- Project coordinator for investigation of MTBE contamination at a retail gasoline service station as part of a regional assessment of impacts to a major southern California well field. Ms. Mickelson provided oversight of regional assessment activities, which included a basin-wide ground water flow model.
- Coordinated underground storage tank program including tank upgrade, testing and regulatory compliance for over 4,000 service station sites, administered retail store capital projects, and retail site divestment activities while employed by a major oil company.
- Coordinated investigation and mitigation of environmental incidents related to underground gasoline storage system operation at over 300 sites in the Eastern United States and California while employed by a major oil company.
- Served on U.S. Air Force technical panel on bioremediation of hydrocarbon contaminated sites to evaluate emerging technologies and research needs for effective remediation.
- Managed and permitted the installation and operation of remedial systems for ground water and soil contamination. Supervised installation of remediation systems, including ground water recovery and treatment and soil vapor extraction and treatment.
- Investigations completed included product source identification, ground water quality characterization and assessment, ground water modeling (vadose zone and saturated zone), modeling and evaluation of differential transport of contaminants, and risk assessments.

- Prepared final environmental impact assessment in satisfaction of RCRA 7003 Consent Order issued by EPA Region I. Coordinated a cooperative oil company (Exxon, Gulf/Chevron, Amoco) aquifer evaluation and monitoring program required by EPA Region III, in Jacksonville, Maryland. RCRA 3013 cooperative monitoring program included monitoring well construction, aquifer pump testing, and soil and ground water sampling and analyses.
- Provided expert witness testimony in support of underground storage tank related environmental litigation in Maryland, Delaware, California, Colorado, Texas, Arizona, and the U.S. Virgin Islands. Provided environmental testimony at numerous hearings and negotiations with environmental compliance agencies in Delaware, Maryland, Pennsylvania, Virginia, West Virginia, California, and Nevada.

Remedial Investigation/Feasibility Studies

- Project Coordinator for investigation and remediation of a former truck maintenance facility in Sutter Creek, California. AME conducted investigation, AST demolition and NAPL recovery at the site. The site is located on Tertiary Mehrten Formation, which overlies Tertiary gold-bearing gravel, which in turn overlies highly sheared and re-crystallized volcanic bedrock. Investigation at the site has included well installation using hollow stem, sonic and mud rotary drilling techniques, ground penetrating radar and passive soil vapor surveys. Recovery of NAPL is accomplished by solar powered electric pumps. A mineshaft located at the site was historically used for waste disposal resulting in contaminant introduction at depth.
- Project Coordinator for investigation, remediation and closure of a chloroform plume in ground water at a former packaging facility in Tracy, California. The site features a stormwater percolation basin used for disposal of waste cooling water and stormwater runoff from the plant. Chloroform was formed in the basin when sodium hypochlorite bleach was added to the ponded water to mitigate complaints of sulfite-type. AME conducted investigation, ground water monitoring, system demolition, soil vapor surveys and in-situ air ozone sparging to mitigate residual chloroform.
- Project coordinator for the investigation of areas of concern identified to be impacted by contaminants associated with former ordnance manufacturing operations. Contaminants of concern included volatile and semivolatile organics, metals and explosives. Perchlorate was detected in ground water and surface water at the site. Nitrosodimethylamine (NDMA) a potential breakdown product of the explosives HMX and RDX was also detected in ground water at the site. The investigation of the occurrence and extent of the perchlorate and NDMA in ground water included depth specific sampling using innovative sampling equipment and traditional multi-depth monitoring well clusters. Coordinated a testing program of both onsite and offsite monitoring and production wells to identify wells impacted by perchlorate following the California Department of Health Services development of testing methods for low level perchlorate analyses in water samples.

- Project Coordinator for preparation of a remedial investigation/feasibility study (RI/FS) work plan for a 1,000-acre former ordnance facility in Santa Clarita. The RI/FS work plan includes a prior Site Investigation Report, a Remedial Investigation Work Plan, a Project Management Plan, a Communication and Coordination Plan, and a Public Participation Plan. Field activities to assess/remediate the site include geophysical surveys, soil gas surveys, soil borings, exploratory trenches, and shallow soil sampling.
- Project Manager for design of a water treatment system for the San Gabriel Valley Areas 1, 2, and 4 Superfund sites (Bartolo Wellfield) in Los Angeles County, California, under contract to the U.S. Army Corps of Engineers. The treatment plant design incorporated treatment of water containing VOCs by packed column air stripping and off-gas treatment with activated carbon to remove airborne VOCs.
- Project Manager responsible for remedial investigation and feasibility study of six sites at Air Force Plant 42, Palmdale, California, as part of the Air Force Installation Restoration Program (IRP) to define the magnitude, extent, direction, and rate of migration of identified constituents of concern within the soil column as well as to evaluate the magnitude of any volatile emissions from the impacted areas. Remedial investigation data were evaluated to identify and screen potential technologies and to assemble alternatives for remediation of impacted areas. Each of the alternatives was evaluated against identified ARARs and TBCs and criteria of (1) effectiveness, (2) implementability, and (3) cost.
- Managed soil vapor assessments performed in support of IRP Phase I Remedial Investigations at Edwards Air Force Base, Lancaster, California, and Plant 42, Palmdale, California. Over 300 vapor points were installed and evaluated for petroleum (jet fuel) related hydrocarbons and chlorinated organic compounds.
- Project Engineer responsible for closure of an explosive burn area. The former explosive waste burn area was excavated and residual soil metals concentrations statistically compared to background for three different soil types. The area received acknowledgment of clean closure from the California Environmental Protection Agency.
- Engineer responsible for oversight of design, installation, and operation of 500 and 600 gallon per minute air strippers and residential carbon activated carbon systems for treatment of TCE impacted ground water used for irrigation and drinking water. Responsible engineer for design and oversight of installation of activated carbon treatment systems at an active ordnance manufacturing facility.
- Project Director responsible for over 35 tasks associated with obtaining closure of five former RCRA units at a 1,000-acre former ordnance facility in Santa Clarita, California, including routine NPDES permitting, quarterly ground water monitoring, and vacuum extraction system monitoring. Activities in support of closure include excavation and statistical evaluation of metals contaminated propellant burn areas, hydrogeologic assessment of a phosphorus-stabilizing lagoon, and ongoing remediation system operations support. One of the remediation technologies being utilized at this site is a state-of-the-art TCE dual-stage, fixed-bed catalytic oxidizer, with batch scrubbing.

Wastewater Treatment

- Environmental engineer responsible for technical support and operating supervision of 13 million gallon per day (mgd) chemical plant waste treatment facility and bio-solids incinerator. Selected and designed treatment schemes for final clarification, sludge thickening, and belt filtration dewatering. Designed and implemented upgraded polymer blending facility.
- Responsible for preparation of selected unit operations manuals, operator training, and on-shift supervision during start-up of a 7 mgd refinery waste treatment plant. Designed and implemented operability modifications and enhancements to the effluent treatment system. Following successful start-up of the effluent treatment system, monitored kinetics of the biological system, set clarifier recycle, and waste rates and nutrient and polymer feed rates to optimize treater performance.

Mining Water Quality Management

- Responsible for evaluation of surface water and ground water data from mining properties in Wyoming, Arkansas, and Texas. Supervised mine-site hydrologic and geomorphic data collection and evaluation for compliance with state and federal permits. Designed and secured permits for sedimentation ponds, diversion ditches, and alternate sediment control structures in Wyoming and Arkansas. Developed pre-mining geomorphic baseline data for three Wyoming mining properties for use in development of predicted geomorphically stable post mining topographies.

Litigation Support

Ms. Mickelson provides technical support to litigation including participation in mediation and expert testimony. Examples of her recent litigation experience include the following:

City of Santa Monica vs. Shell Oil Company, et. al.

Case No. 01CC04331

Superior Court of the State of California, County of Orange

- Provided technical support to and participated in mediation between the city and major oil company client. Evaluated drinking water treatment alternatives for the removal of MTBE and tert-butyl alcohol (TBA). Prepared process flow diagrams, equipment layout drawings, and capital and operational cost estimates for a proposed MTBE/TBA treatment train, utilizing GAC and advanced oxidation processes, to be incorporated into a 7,000 gallon per minute municipal drinking water facility. Participated in settlement related technical committee and participated in issue specific arbitration.

City of Oakland/Port of Oakland vs. ExxonMobil Oil Corporation

Case No. C022968 JSW

United States District Court for the Northern District of California

- Provided technical support to mediation to resolve environmental issues related to prior operation of a bulk fuel terminal at a site redeveloped into an intermodal cargo facility. Provided preliminary design and cost estimates for remedial options including soil vapor extraction and air sparging to mitigate acute risk posed by methane vapors and chronic risks to human health and the environment posed by the presence of petroleum hydrocarbons in soil and ground water. Implemented the selected remedy as required by the settlement agreement resulting from the mediation. Participate on technical committee established by settlement agreement to evaluate remediation progress and other environmental, human health and ecological risks associated with the site.

South Tahoe Public Utility District vs. Atlantic Richfield Co., et. al.

Case No. 999128

Superior Court of California, County of San Francisco

- Evaluated the hydrogeology of the drinking water wells utilized by the utility district and the history of releases and constituent transport associated with numerous underground storage tank sites within the areas of influence of the operating drinking water wells. Provided deposition and trial testimony.

Communities for a Better Environment vs. Unocal Corporation, et. al.

Case No. 99128

Superior Court of California, County of San Francisco

- Evaluated the environmental conditions at over 80 underground storage tank sites throughout California. Evaluated constituent concentration trends and ground water transport rates at each location. Provided affidavit describing plume migration and composition as well as affidavit related to chemical analytical procedures resulting in false positive identification of gasoline oxygenates.

Communities for a Better Environment vs. Tosco Corporation, et. al.

Case No. 300595

Superior Court of California, County of San Francisco

- Provided technical support to mediation regarding remediation progress and future needs for a major oil company refinery. Participated in mediation and presented data and remediation needs and plans for mitigation of impacts resulting from hydrocarbon releases.

Carlton A. Sullins, Rita Sullins, and Don-Sul, Inc., a California Corporation vs. Exxon Mobil Corporation, a New Jersey corporation

Case No. RG08411579

Superior Court of California, County of Alameda

- Provided technical allocation hydrocarbon impacts based on source and extent and fingerprinting of petroleum hydrocarbons. Provided Deposition and Trial Testimony. Following a six-day trial the jury found in favor of Exxon Mobil.

AR Automotive, LLC; Bald Eagle Ventures I, LLC vs. Henry Khachaturian, et al., and related cross-claims
Case No. RG09450197
Superior Court of California, County of Alameda

- Provided technical support in action related to remediation requirements and professional conduct associated with investigation and remediation of in-ground hoists and associated hydraulic fluid. Participated in mediation and provided Deposition testimony.

Publications

Johnson, J. A. and Mickelson, B. J. 2007. "Enhanced MTBE Degradation and TBA Production Resulting From Ethanol Releases at an Operating Retail Service Station." Presented at NGWA Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Remediation Conference.

Jones, M. K., Mickelson, B. J., Chamseddin, H. K., and L. R. Freeberg. 1990. "A Practical Application for Unsaturated Zone Fate and Transport Modeling Using SESOIL for Risk Assessments at Fuel-Contaminated Sites." Presented at NWWA Fourth National Outdoor Action Conference.

Henry, D. K., Mickelson, B. J., and D. Ohnstad. 1990. "Well Logging and Depth Specific Sampling in a Producing Water Supply Well as an Aid in Identifying Contaminant Stratification." Presented at NWWA Fourth National Outdoor Action Conference.