Exponent
4141 Arapahoe Avenue
Suite 101
Boulder, CO 80303

telephone 303-245-7070
facsimile 303-245-7075
www.exponent.com

# Yvette Wieder Lowney, M.P.H.

**Senior Managing Scientist, Regional Manager**

## Professional Profile

Ms. Yvette Wieder Lowney is a Senior Managing Scientist in Exponent's Health Sciences Center for Exposure Assessment and Dose Reconstruction. She has over 20 years of professional experience assisting clients and conducting research in the assessment of exposure and risks from chemicals in environmental media and consumer products. She has conducted risk assessments under CERCLA, RCRA, FIFRA, and state-led regulatory contexts involving a wide range of chemicals and exposure scenarios. In each of these contexts, a consistent goal is to identify strategic data gaps, and if needed, to conduct research to provide information for more realistic evaluation of exposures. Ms. Lowney assists clients in negotiating with regulatory agency representatives or other parties to resolve issues related to human exposure to toxic substances.

In the context of conducting risk assessments for metal-containing soils, Ms. Lowney has been closely involved in developing data regarding the bioavailability of metals from soils. This research included assessment of the relative oral bioavailability of metals to human surrogate or ecological receptors, percutaneous absorption of metals from soils, characterization of the mineralogical forms and soil chemistry that controls bioavailability, and generating bench-top extraction models for assessing the relative bioavailability of metals from soil, for application in both human health and ecological risk assessments. Results from this research have been presented at professional-society meetings, as testimony before scientific advisory panels, and in peer-reviewed publications. Ms. Lowney has been an invited speaker at symposia on bioavailability hosted by the California EPA, SERDP, and SBRP; has provided peer consultation on bioavailability research undertaken by ESTCP; and has participated in a peer-review panel of EPA guidance regarding the bioavailability of metals in soil for use in human health risk assessment.

In addition to site-specific evaluations, Ms. Lowney has broad experience in the risk evaluation of consumer products. This includes evaluation of exposures and risks associated with the presence of pesticides or toxic chemicals in building products, testing of various toys and consumer products to assess the potential for exposure to toxic chemicals during consumer use, and evaluation of alternative formulations during product development. These efforts have been undertaken to provide strategic advice to clients regarding the need for product recall, generate specific data to address issues raised by consumer advocates, or during due diligence associated with product development or distribution.

## Academic Credentials and Professional Honors

M.P.H., Environmental Health/Toxicology, University of California, Berkeley, 1986
B.A., Molecular, Cellular, and Developmental Biology, University of Colorado, Boulder, 1982

Past President of the Rocky Mountain Chapter of the Society for Risk Analysis
2000 Outstanding Presentation Award: Risk Assessment Specialty Section of SOT (co-author)

**Publications**

Yost LJ, Shock SS, Holm SE, Lowney YW, Noggle JJ. Lack of complete exposure pathways for metals in natural and FGD gypsum. Hum Ecol Risk Assess 2009, in press.

Menzie CA, Ziccardi LM, Lowney YW, Fairbrother A, Shock SS, Tsuji JS, Hamai D, Proctor D, Henry E, Su SH, Kierski MW, McArdle ME, Yost LJ. Importance of considering the framework principles in risk assessment for metals. Environ Sci Technol 2009; 43(22):8478–8482.

McArdle M, Ziccardi L, Lowney Y, Kane Driscoll S. Considerations for interpreting nanomaterial toxicity studies for use in environmental risk assessment. Proceedings, International Conference on the Environmental Implications and Applications of Nanotechnology, University of Massachusetts Amherst, pp. 57–60, June 9–11, 2009.

Ziccardi L, McArdle M, Lowney Y. The ecological effects of nanomaterials: A focus on aquatic life. Special Issue on Applications of Nanotechnologies in Environmental Protection and Pollution, Part 1. Schulte J, Vaseashta A (eds), NANO: Brief Reports and Reviews 2008; 3(4):251–255.

Lowney YW, Wester RC, Schoof RA, Cushing CA, Edwards M, Ruby, MV. Percutaneous absorption of arsenic from soils as measured in the Rhesus monkey. Toxicol Sci 2007; 100(2):381–392.

Cushing, CA, Golden R, Lowney YW, Holm SE. Human health risk evaluation of ACQ-treated wood. Hum Ecol Risk Assess 2007; 13(5):1014–1041.

Shock SS, Bessinger BA, Lowney YW, Clark JL. Assessment of the solubility and bioaccessibility of barium and aluminum in soils affected by mine dust deposition. Environ Sci Technol 2007; 41(13):4813–4820.

Roberts SM, Munson JW, Lowney YW, Ruby MV. Relative oral bioavailability of arsenic from contaminated soils measured in the Cynomolgus monkey. Toxicol Sci 2007; 95(1):281–299.

Nico PS, Ruby MV, Lowney YW, Holm SE. Chemical speciation and bioaccessibility of arsenic and chromium in CCA-treated wood and soils. Environ Sci Technol 2006; 40(1):402–408.

Lowney YW, Ruby MV, Wester RC, Schoof RA, Holm SE, Hui X, Barbadillo S, Maibach HI. Percutaneous absorption of arsenic from environmental media. Toxicol Indust Health 2005; 21(1):1–14.

Wester RC, Hui X, Barbadillo S, Maibach HI, Lowney YW, Schoof RA, Holm SE, Ruby MV. *In vivo* percutaneous absorption of arsenic from water and CCA-treated wood residue. Toxicol Sci 2004; 79:287–295.

Yost LJ, Tao S-H, Egan SK, Barraj LM, Smith KM, Tsuji JS, Lowney YW, Schoof RA, Rachman NJ. Estimation of dietary intake of inorganic arsenic in U.S. children. Hum Ecol Risk Assess 2004; 10:473–483.

Salatas JH, Lowney YW, Pastorok RA, Nelson RR, Ruby MV. Metals that drive health-based remedial decisions for soils at U.S. Department of Defense sites. Hum Ecol Risk Assess 2004; 10:983–997.

Nico PS, Fendorf SE, Lowney YW, Holm SE, Ruby MV. Chemical structure of arsenic and chromium in CCA-treated wood: Implications of environmental weathering. Environ Sci Technol 2004; 38:5253–5260.

Deubner DC, Lowney Y, Paustenbach D, Warmerdam J. Contribution of incidental exposure pathways to total beryllium exposures. Appl Occup Environ Hyg 2001; 16(5):1–12.

Hays S, Butcher M, Hook G, Lowney Y, Kirman C, Paustenbach DJ. Probabilistic distributions for PBPK model parameters. Toxicol Sci 2000; 54(1):90.

Paustenbach D, Deubner D, Kelsh M, Lowney Y, Kolanz M. Consideration of alternate exposure pathways in the possible relation to prevalence of chronic beryllium disease. Abstract for presentation to Society of Toxicologists. Toxicol Sci 2000; 54(1):249.

Lowney Y, Deubner D, Hays S, Chapman P, Kerger B, Shields W, Paustenbach D. Biomonitoring for beryllium: Experience with a U.S. work force. Abstract for presentation to Society of Toxicologists. Toxicol Sci 2000; 54(1):310.

Lowney Y, Ruby MV, Hook GC, Nelson RR. Biological interactions: Human health considerations. In: Metals-Contaminated Soils: *In Situ* Inactivation and Phytorestoration. Vangronsveld J, Cunningham SD (eds), Landes Bioscience, Austin, TX, 1998.

Fan A, Wieder Y, DiBartolomeis M. Human health implications of dietary selenium intake. Toxicologist 1990; 10(1):156.

Uhaa I, Pollock G, Wieder Y, Fan A, Cook R. Potential health risk from consumption of contaminated fish: Dioxin contamination of the upper Sacramento River, California. J Am Public Health Assoc 1990.

Pollock G, Wieder Y, Uhaa I. Factors involved in human health based study design of chemical contamination of fish: California Department of Health Services study of southern California. Proceedings, National Marine Fisheries Service, 1989.

Pollock G, Wieder Y, Uhaa I, Fan A. Risk assessment of dioxins in fish. Department of Health Services, Sacramento, CA, June 1989.

**Presentations**

Lowney YW. Applying bioavailability data to achieve site closure: metals in soil – Leadville, Colorado. Invited presentation, Superfund Basic Research Program Conference on Bioavailability as a Determinant of Pollutant Exposure, Tampa, FL, 2008.

Lowney YW., Roberts SM., Saikat S. Arsenic bioaccessibility testing using various extraction methods: Results and relation to relative oral bioavailability as measured in the cynomolgus monkey. International Society for Exposure Assessment (ISEA), 2007.

Lowney YW, Wester RC, Schoof RA, Cushing CA, Edwards M, Ruby, MV. Percutaneous absorption of arsenic from soils as measured in the Rhesus Monkey. Occupational and Environmental Exposures of Skin to Chemicals (OEESC), 2007.

Lowney YW. Should government agencies establish conservative default assumptions for bioavailability by the subject exposure route? Invited speaker/participant: Health Canada Workshop on Bioaccessibility/Bioavailability in Contaminated Site Assessment – An Industry Perspective, 2006.

Lowney YW. Progress toward development of *in vitro* methods for assessing the relative oral bioavailability of arsenic from soils. Society of Toxicology, 2006.

Lowney YW. Oral and dermal absorption of arsenic from soil. Invited presentation to the California Department of Toxic Substances Control, 2005.

Lowney YW, Ruby MV, Brauning S. Bioavailability of metals from soils to human and wildlife receptors. Society of Toxicology, 2005.

Lowney Y, Wester R, Nico P, Holm S, Ruby M. Chemistry and dermal absorption of arsenic in residues from wood preserved with CCA. Society for Environmental Toxicology and Chemistry, 2004.

Lowney YW. Comments on: Potential for dermal absorption of arsenic from CCA-treated wood. Presentation to U.S. Environmental Protection Agency, FIFRA Science Advisory Panel, 2003.

Lowney Y, Ruby M, Wester R, Schoof R, Holm S, Maibach H. Percutaneous absorption of arsenic from environmental media. Society of Toxicology, 2003.

Lowney Y, Tsuji J, Pyatt D, Yost L, Paustenbach D. Children's exposure to metals from CCA-treated wood: Factors in assessing inadvertent ingestion exposures. Presented at the International Arsenic Meeting of the Society for Geochemistry and Health, San Diego, CA, 2002.

Lowney Y. Comments on: Exposures related to contact with residue on CCA-treated wood. Presentation to EPA's FIFRA Science Advisory Panel, October 23, 2001.

Lowney Y. Kinds of risk assessment. Risk assessment training session provided to the Citizen's Advisory Panel for Roche America, 2005, 2004, 2002, and 1999.

Lowney Y, Ruby M. Progress toward developing an *in vitro* model for assessing arsenic bioavailability. Presented at the Society for Risk Analysis, Washington, DC, 2000.

Lowney Y, Ruby M. Recent advances in evaluating the oral bioavailability of inorganics in soil. Presented at the Society for Risk Analysis, Atlanta, GA, 1999.

Lowney Y, Schoof R, Cushing C. Estimating adult blood lead concentrations in residents exposed via inhalation. Presented at The Society for Risk Analysis, Washington, DC, 1997.

Lowney Y, Beck B. Factors affecting selection of an appropriate target population and soil cleanup level for lead. Presented at the Conference on Similarities and Differences between Children and Adults: Implications for Risk Assessment. International Life Sciences Institute and U.S. Environmental Protection Agency, Hunt Valley, MD, 1990.

Karam H, Beck B, Lowney Y. Evaluation of two methods to determine cleanup levels for lead in soil. Presented at the Fourth Annual Exhibition and Conference of the Colorado Hazardous Waste Management Society, Denver, CO, October 18–19, 1990.

Wieder Y, Pollock G, Uhaa I. Dioxin in fish from the Sacramento River: A health assessment. Poster. Fourteenth Annual Conference of the National Association of Environmental Professionals, Lake Tahoe, NV, June 1989.

**Selected Project Experience**

***Metals***

Managed a broad-based research effort to understand the bioavailability of metals in soils to human and ecological receptors. Project work included identifying and coordinating a cadre of academic researchers and direct involvement in designing and conducting *in vivo* research to assess the relative oral bioavailability of metals in soil to human and ecological receptors. This multi-year research was funded by the U.S. Department of Defense's Strategic Environmental Research and Development Program (SERDP) and included original research to assess:

- Which metals in soils drive remedial decisions at DoD sites
- The relative oral bioavailability of arsenic to human receptors, as assessed in a monkey model
- The relative oral bioavailability of cadmium to humans, as assessed in a swine model
- The relative oral bioavailability of arsenic, cadmium, lead, and chromium to ecological receptors, as assessed in a shrew model

- The percutaneous absorption of arsenic, as assessed in a monkey model
- The potential use of *in vitro* methods for assessing bioavailability as measured in the above-mentioned animal models.

Managed project work to evaluate the potential exposures to arsenic incurred by children playing on structures made of CCA-treated wood. Developed approaches for evaluating this novel exposure scenario, and wrote a White Paper regarding issues for risk assessment, which was provided to the U.S. EPA for consideration in developing their assessment of these exposures. Also evaluated the relative contribution to exposures from the various sources and routes of exposure, to allow for more focused data collection. Efforts culminated in providing expert testimony before two Science Advisory Panels convened by EPA, and publishing four peer-reviewed reports of the original research conducted during this effort.

Managing project work to assess the factors that affect the dissolution of barium from barite-containing soils into simulated physiological extraction fluid. Project includes assessment of the influence of soil relative to purified barite, the effect of soil particle size and soil-to-fluid ratios on dissolution, and the reproducibility of testing results.

Managed risk assessment of a metals-contaminated drainage in Utah. Unique aspects of this assessment included the focus on adult exposures under intermittent recreational use, or short-term occupational use scenarios. Additionally, evaluation of this site required consultation to area developers regarding the significance of area soil metal concentrations, and implications for residential use. Developed appropriate means of using data collected from a biased sampling effort (i.e., biased toward characterizing worst-case concentrations), and negotiated with state and federal regulatory agencies regarding exposure scenarios. Results of the risk assessment supported a very limited scope of remediation at the site.

Managed human health risk assessment efforts for a metals-affected floodplain, for an industrial client in the western United States. Participated in a round-table effort with industry and state and federal agencies to determine appropriate risk assessment methods for the site. Technical issues addressed included delineating potentially exposed populations, identifying appropriate data and additional data requirements, assessing bioavailability, and aggregating data for human health and ecological assessments.

Evaluated the potential for non-standard exposure pathways to contribute significant beryllium exposures in the workplace. Effort included evaluating the potential magnitude of exposure from ingestion, dermal contact, or resuspension of beryllium dusts from surfaces or clothing, and comparing these to exposures incurred from the direct inhalation of workplace air. Evaluated the immunology of chronic beryllium disease (CBD), to assess whether non-inhalation routes of exposure could contribute significantly to the risk of disease. Results of this evaluation were used to support the design of workplace monitoring programs, and were published in the peer-reviewed literature.

Managed a workplace biomonitoring project designed to evaluate whether biomonitoring could be used to distinguish among sources of workplace exposure to beryllium. Worked with research labs to develop an adequately sensitive analytical approach, designed and implemented

a workplace biomonitoring program, and interpreted the results. Data suggested that exposure to different forms of beryllium, in different steps of the production process, results in elevated concentrations of beryllium in the urine. Results were presented to the Society of Toxicology.

Assessed the potential for human health impacts from inhalation exposures to lead associated with a planned expansion in mine production. Used site-specific data regarding employees' blood lead concentrations, air lead concentrations, and time-activity relationships in an adult blood lead model. Model results indicated that the planned increase in production at the facility would not be expected to result in adverse human health impacts. Findings were used to support the expansion permit, as well as changes in mining operations that increased efficiency.

Managed project and prepared detailed technical comments on the public health risk assessment portion of a feasibility study for an NPL site in Montana. Major areas of comment focused on exposure scenarios, toxicity evaluation of various metals, and the soil cleanup levels selected for remediation. Developed alternative exposure assumptions and toxicity parameters, as well as health-based soil cleanup levels, for lead and arsenic at the site.

Managed a human health evaluation for a site in Colorado that was subject to evaluation under an engineering evaluation/cost analysis agreement with EPA. Identified appropriate exposure scenarios for this undeveloped area, wrote health evaluations, and negotiated appropriate target cleanup goals with state and EPA toxicologists.

Managed a risk assessment to evaluate risks from exposure to arsenic in residential areas of an NPL site in the western United States. Represented a PRP group at roundtable technical advisory committee meetings with federal and state environmental agencies. Selected samples for mineralogical analysis in support of a site-specific bioavailability adjustment in risk calculations, and provided site-specific information regarding determination of exposure-point concentrations and delineation of exposure units.

Managed tiered risk assessment efforts for a site in Trail, British Columbia, Canada. Tasks included identifying metals of potential public health concern for the community, identifying strategic risk assessment issues for further elucidation, and conducting a risk assessment of non-lead metals at the site. Investigated uptake of metals into garden produce, derivation of site-specific toxicity criteria that incorporated background exposure, and assessing site-specific bioavailability for metals of concern at the site.

Conducted a human health risk assessment in support of a voluntary cleanup under the Colorado voluntary cleanup process. Researched state regulations and negotiated with agency staff regarding how to conduct the assessment. Worked with town residents to gain access for site-specific sampling and geological analyses. Developed strategy for submitting cleanup applications in a format designed to maximize the likelihood of acceptance by the state.

Managed an assessment to evaluate potential human health risks from exposure to metal-bearing materials in a riverine system. Evaluated potential risks from direct exposures to site media, as well as exposure via the food chain from fish, vegetables, or beef raised in the area.

Prepared scoping documents outlining appropriate risk assessment procedures for two operable units at the Anaconda Smelter NPL site in Montana. Investigated current toxicological and regulatory status of contaminants of concern.

Reviewed available data characterizing the neurological effects associated with pre- and postnatal lead exposures. Attention focused on age-specific differences in sensitivity and exposures to environmental lead. Evaluated literature in light of considerations for developing cleanup levels for sites with lead-contaminated soils. Prepared a report summarizing and evaluating the findings of the review.

Managed project and prepared the baseline public health and environmental risk assessment for an NPL site in EPA Region VI. Contaminants of concern at the site included cyanide and heavy metals. Evaluated pathways of exposure, including ingestion of contaminated water or soil and inhalation of fugitive dusts.

Proposed health-based soil cleanup levels for an NPL site in Utah. Contaminants of concern at the site were arsenic, cadmium, and lead. The proposed cleanup levels were established on the basis of possible soil ingestion or dust inhalation exposures.

Provided detailed critique of risk assessment documents for a mining and milling site in the western United States. Evaluated alternative assumptions regarding soil ingestion rates and properties of arsenic and lead at mining and milling sites, and conducted a thorough review and interpretation of the literature regarding the impact of these contaminants on exposed populations.

Managed a project to review and critique an endangerment assessment for an NPL site near Anaconda, Montana. Specifically evaluated exposure and toxicity parameters, and recalculated risk estimates, incorporating updated parameters. Primary contaminants of concern included arsenic, cadmium, lead, and copper.

Provided critical review of a draft proposal for a method to be used to determine the impact of environmental lead on human blood lead levels and human health.

Managed a program to analyze emerging regulations and their impact on metals-contaminated sites.

***Children's Risk***

Participated on a technical team investigating the possible association between environmental exposures to chemicals and neurological diseases in children. Efforts included identifying appropriate diseases for evaluation, and reviewing the available literature to determine potential causal relations between exposure and disease. The product of this effort was a "primer" that was provided to the client for education of individuals within the chemical industry.

Evaluated children's potential exposure to arsenic from playground equipment made of CCA-treated wood. This project is described in more detail above, under Metals.

Provided technical support to a law firm regarding children's exposure to a consumer product containing lead. Efforts included determining the origin of the imported product, evaluation of levels of lead in the product, comparison of lead levels to regulatory requirements, and estimating the potential exposure dose from unintended uses of the product by young children. Product was removed from distribution within the U.S., but our assessment indicated that product-associated exposures would not exceed regulatory guidelines, so no formal recall was required.

Evaluated potential exposures to lead from a toy that had been recalled due to the presence of lead in some components of the product. Our exposure assessment indicated that the lead present was bound up in the matrix of the product such that foreseeable uses of the product, including handling, mouthing, or accidental ingestion, would not result in exposures to lead that exceed regulatory guidelines. The results of this effort were used in negotiations with regulatory agencies and in communication with the public.

Designed and implemented a program to protect young children from exposure to toxicants in schools. Developed original criteria for evaluation of products; consulted with legislators, manufacturers, and educators; evaluated epidemiological and toxicological literature for evidence of harmful effects from chemicals; developed health education curricula; and conducted workshops for school personnel and artists around the state of California.

Conducted a literature review to identify and evaluate available data on the neurological effects of pre- and postnatal effects of lead exposure. This project is described in more detail above, under Metals.

***Consumer Products***

Conducted an assessment of potential exposures to lead from a toy containing "off-spec" paint on the toy surface. Effort included assessment of potential exposures to lead associated with handling, mouthing, or potential ingestion of lead, as well as an evaluation of the nature of the paint, with regard to product stability and the potential for the matrix of the paint to encapsulate the lead pigment. Exponent determined the origin of the imported product and the levels of lead in the product, compared the lead levels to regulatory requirements, and estimated the potential exposure dose from unintended uses of the product by young children. Product was removed from distribution within the U.S., but our assessment indicated that product-associated exposures would not exceed regulatory guidelines, so no formal recall was required.

Conducted an assessment of potential exposures to toxic chemicals from household hardware. This project involved characterizing the composition of the hardware and associated coatings. Exponent conducted specific testing to assess the potential for toxic metals to be removed from the surface of the products under foreseeable uses. The results indicated that, despite the high metal content of the product line, removal of metals from the product was low under normal use. Additionally, Exponent scientists identified the nature of the coatings present on the surface of each product, to allow an assessment of potential toxicity to be associated with the

coating materials. The work was performed by Exponent as part of due diligence in product development.

Evaluated lead content and potential for removal of lead from the surface of window blind fabrics. Results indicated that total lead content of the blinds exceeded regulatory guidelines regarding lead in PVC window blinds, but that the material was stable and little lead could be removed from the surface of the fabric, even under vigorous testing. This information was used in selecting materials for a new line of window coverings.

Evaluated the potential for adult exposures to lead from a consumer product with high lead content. Project entailed an exposure simulation to determine how much lead might be transferred from the product to the hands of adult users. These data were then used to determine the potential for elevated blood lead levels among the exposed population. Efforts included pharmacokinetic modeling of blood lead levels associated with different levels of exposure to lead from the product. Information was used to assess the potential risks to workers and the public who may have had contact with these products.

Evaluated the potential for human exposures to mercury from wallboard constructed of synthetic gypsum. Following implementation of clean air regulations, the mercury content of synthetic gypsum (fly ash) increased. Therefore, we evaluated the potential for human exposure to the mercury from products made from synthetic gypsum. Project efforts included development of a model to assess potential exposure pathways, collecting data from natural and synthetic gypsum, and comparing metals concentrations in gypsum against health-based standards. Additionally, focused research was conducted to assess the potential for the mercury to vaporize from the wallboard. Results indicated that the concentrations of metals in natural or synthetic gypsum do not exceed most health-based screening criteria, and that emissions of mercury from synthetic gypsum do not result in air concentrations above ambient levels. This information was used to assess potential liabilities associated with distribution of synthetic gypsum products, and in assessing appropriate feedstock for manufacturing processes. Results have been presented at technical meetings, in negotiations with regulators, and in peer-reviewed publications.

Advised clients regarding the potential for allergic contact dermatitis to be associated with use of specific consumer products. Identified the presence of known allergens in the product formulation and in extracts from finished products. Information was used to assess potential liabilities associated with existing products, and in formulating safe new products.

Evaluated potential human health risks associated with new formulation of wood preservatives. Due to the ban on the use of CCA on wood for residential applications, building materials companies switched to new preservatives. Exponent was retained, proactively, to evaluate the potential risks of alternative wood treatment formulations. Results of the health-based evaluation were published in the peer-reviewed literature, and this information was used in selecting the appropriate formulation for new product development.

Evaluated the potential for dermal sensitization from residues present on the surface of building supply materials. Managed two separate projects, the first to provide educational materials

regarding the process of dermal sensitization and the association between dermal sensitization reactions and chemical formulations from new products. The second project entailed assessing the potential for claimed dermal reactions to develop from contact with specific products.

***Industrial Evaluations***

Conducted assessment to evaluate the environmental migration and potential health effects associated with use of pentachlorphenol-treated poles in transmission lines. Effort included evaluating the environmental stability of pentachlorophenol that may leach from the poles in service, and estimating the potential exposures (and associated risks) to terrestrial and aquatic ecosystems, and humans in the vicinity of the transmission line. Information was provided to planning boards and concerned citizens.

Managed a multi-pathway human health risk assessment of a chlorinated solvent site in Utah. Assessment evaluated exposures associated with groundwater and soils for outdoor construction workers and hypothetical future indoor workers, as well as current and hypothetical future offsite residents. Directed the statistical analysis of soil and groundwater data to surmount difficulties with high detection limits and develop an appropriate exposure concentration. Oversaw vapor intrusion modeling and indoor air quality studies that were conducted using the latest version of the EPA vapor intrusion model and newly updated indoor air quality guidance. Modeling included geological characterization of subsurface soil and groundwater, building characterization, development of site-specific input parameters, and negotiation with EPA to gain acceptance for various scenarios and different building structures.

Directed multi-pathway evaluation of potential human health risks associated with diverse uses of a former manufactured gas plant site. Effort included identifying appropriate ways to use in risk assessment the biased data sets that were generated during characterization of the nature and extent of site contamination (i.e., data biased toward “hot spots”), incorporating consideration of background concentrations, aggregating data for different land uses at the site, prioritizing pathways of exposure for understanding risk drivers, and assessing vapor intrusion for estimating human exposures to site contaminants. Results were used to target remedial actions, and to establish requirements for “no further action” determination from state and federal agencies.

Providing litigation support for claims at a former manufactured gas plant site. Effort is focused on assessing potential health concerns, and currently includes providing technical review and critique of expert reports, evaluating site data to assess validity of claims, and identifying data gaps for appropriate additional site characterization.

Conducted health-based screening of indoor air quality in homes near or above a contaminated groundwater plume. Determined concentrations of volatile chemicals in air that would not be expected to cause adverse health effects, and compared site-specific air data with those target concentrations. Findings of this assessment were used to evaluate the relation between indoor and ambient air concentrations of site-related chemicals, and to determine the need for additional in-home sampling and public notification and education.

Served as project manager to assess potential human health risks associated with emissions of chemicals reported by a local utility company under the Toxic Release Inventory (TRI). Modeled exposures to TRI emissions and compared potential exposures to risk-based screening levels. Met with the state health department and the Governor's office. The initial project culminated in a press briefing regarding the health effects associated with utility emissions. Additional efforts included updating the assessment with new TRI emissions reporting data from subsequent reporting periods.

Managed a project to conduct human health and ecological risk assessments under a voluntary cleanup program for an industrial site in West Virginia. Constituents of potential concern include VOCs, SVOCs, herbicides, and metals. Coordinated data collection efforts, identified laboratory analytical requirements (e.g., detection limits), conducted all facets of the human health risk assessment, and coordinated and reviewed ecological assessments for the site.

Managed an ongoing human health and ecological risk assessment for a site in Colorado with groundwater and soils affected by organic chemicals. Negotiated and cooperated with regulatory agencies, and provided input on all phases, from sampling design through quantitative risk assessment and review of remedial options. The remote, industrial site location necessitated evaluation of non-standard (i.e., not residential) exposure scenarios.

Managed a detailed risk assessment for human populations exposed to PCBs from the Hudson River. The evaluation included elucidation of the exposed population and exposure pathways, performance of a quantitative health evaluation, and a thorough discussion of limitations and uncertainties associated with all phases of the assessment. Coordinated industry activities with EPA requirements, and gave presentations at public meetings and press conferences.

Prepared a risk assessment for a site with potential industrial contamination, including determination of contaminants of concern, elucidation of appropriate exposure pathways, and performance of a quantitative health evaluation of existing conditions. Specific issues of concern included dietary exposure from ingestion of contaminated fish, wildlife, or drinking water, and childhood exposures from contaminated breast milk or soil.

Provided toxicological information and evaluation for contaminants of concern at a wood-preserving plant in the southern United States. Screened site data to determine contaminants of potential concern, and evaluated risks under site-specific land-use scenarios.

Evaluated the potential health risks associated with exposure of the public to toxicants in water. Wrote document for the California legislature that discussed public health risks from exposure to drinking-water contaminants. Conducted field research, including collection of environmental samples and biological specimens, to determine body burdens of pesticides and industrial chemicals.