



PROFESSIONAL PROFILE



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Vice President | Principal Geologist

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EDUCATION

Bachelor of Arts, Earth Science,
1995, University of California,
Berkeley

OSHA 40-Hour Hazardous Waste
Operations and Emergency
Response (HAZWOPER)
Certified

Research Assistant to UC
Berkeley PhD Candidate
Dawnika L. Blatter and
Professor Ian S. E. Carmichael
in Study of Continental
Crustal Deformation from
Subduction of the Cocos
Plate in Western Mexico and
Study of Upper Mantle
Petrology in Central Mexico,
January to April 1996

PROFESSIONAL LICENSES

Professional Geologist, State of
California, No. 07506

EXPERIENCE SUMMARY

Twenty-one years of consulting experience: Principal Geologist with Roux (2011 to Present); Senior Manager, Manager, and Senior Associate with ENVIRON International Corporation (2004 to 2011); Project Geologist with URS Corporation (2001 to 2004); Geologist with Hart Crowser (1998 to 2001).

TECHNICAL SPECIALTIES

Professional Geologist with over twenty years of experience designing, managing, and implementing environmental soil and groundwater investigations and remediation strategies for public and private clients. Experience as in-house consultant assisting with management of a \$25 million yearly remediation portfolio for a Fortune 100 Company. Practice developing and implementing high-level strategies that consider legal and regulatory issues, communications, and government relations, as well as technical challenges and costs. Significant assignments representing clients during Working Group meetings for Superfund sites and participation in technical committee meetings. Expertise in design and field implementation of in-situ chemical oxidation (ISCO) in hard rock and porous media-flow aquifers.

Substantial experience evaluating and remediating industrial, commercial, and residential sites impacted with numerous contaminants in multiple media, including crude oil, fuels, volatile organic compounds, chromium VI, 1,4-dioxane, and PCBs. Extensive experience managing implementation of remediation programs that utilize and consider multiple technologies including soil vapor extraction, dual phase extraction, traditional pump and treat, in-well stripping, air sparging, chemical oxidation and reduction, thermal treatment, and natural attenuation. Experience managing large-scale remedial excavations involving the use of heavy earth moving equipment. Significant field experience using numerous drilling, soil sampling, groundwater sampling, and soil vapor sampling techniques.

REPRESENTATIVE PROJECTS

- **PRP Representation of Fortune 100 Company, Omega Chemical Superfund Site, Whittier, California.** Provide ongoing technical consulting to a Fortune 100 Company and major PRP at the Omega Chemical Superfund Site in Whittier, California. Active participant of the Omega PRP Group (OPOG) Technical Committee. Attend all pertinent technical meetings and provide Client with technical and strategic input that protects their best interests. Maintain constant interaction with the legal and finance teams as necessary to ensure the technical and legal strategies are in agreement and that adequate funding is reserved well in advance of regulatory commitments and OPOG cash calls. Pertinent technical issues include soil gas and vapor intrusion, and a regional groundwater plume. Regulatory oversight is provided by USEPA Region IX.
- **Strategy Expert Consulting, Fortune 100 Company, Los Angeles, California.** Ongoing third-party technical and strategic support to a Fortune 100 company for a major project involving former bulk storage and distribution facilities converted to open public space and residential uses. The Site is undergoing remedial investigations and remedial alternatives evaluations under heavy regulatory and public scrutiny. Charged with providing opinions and recommendations as to the direction the current consultant and the regulatory agencies want to take the project and evaluating the conceptual site model and long term technical strategy. Active participant on technical team calls and ongoing direct communications with internal legal team.

- **Portfolio Project Control, Fortune 100 Company, Torrance, California.** Three years of experience working as a full-time in-house consultant for a Fortune 100 Company assisting with management of all aspects of a complex multi-site portfolio. General role included communication with alliance partners, vendors, corporate finance, attorneys, public relations/communications, and procurement to track and facilitate progress of 9 major projects (\$400,000 to \$1 MM/year) and 3 mega projects (\$3MM to \$10MM+/year) that were unique in nature and complexity. Portfolio included former chemical sites, landfills, aerospace facilities, and other heavy use industrial facilities that were undergoing State and RCRA closure, as well as sites under CERCLA Superfund actions with PRP commitments. Charged with helping to develop, evaluate, and refine remedial strategies and lifecycle costs for sites that utilized various cleanup technologies such as application of oxidants and reducing agents, thermal oxidation, groundwater pump and treat, dual-phase and 2-PHASE™ extraction, soil vapor extraction, air sparging, and in-well air stripping. My major role included verifying adequate funding and maintaining documentation consistent with Sarbanes Oxley.
- **Shipyards Decommissioning, Subsurface Assessment, Remedial Investigation, Demolition and Closure, Campbell Shipyards - Marco, Port of San Diego, California.** Lead geologist in the preparation of a comprehensive subsurface study of the former Campbell Shipyards property at the Port of San Diego, California. Over 200 borings were necessary to delineate the extent of impacted soils. Relevant environmental issues included a former coal works gasification plant immediately adjacent to the Site, a 2 to 4-foot thick lens of polynuclear aromatic hydrocarbon (PAH) laden sediment present throughout the Site below the water table, a former on-site diesel and kerosene tank farm, and numerous leaking fuel USTs. Responsibilities also included management of shipyard abandonment activities, such as abatement of asbestos and lead-based paint containing materials, demolition of on-site structures, crushing of asphalt and concrete into Class II base, and a comprehensive geophysical survey to locate all on-site utilities and buried structures. The work was performed under the regulatory oversight of the San Diego Regional Water Quality Control Board and the San Diego Unified Port District. Total cost of the work was approximately \$1.3MM, implemented over a 15-month period.
- **Neutral Third-Party Oversight of Remediation Work, ITT Corporation and Home Depot, Glendale, California.** Provided third party oversight for a site undergoing major remediation of VOCs and chromium VI in soils and groundwater. The site was a former electronics manufacturing facility redeveloped as a major box retailer in Glendale, California. Services were provided on behalf of the former facility owners/operators and the current property owners, both of whom had differing interests and views on the remedial work being performed. Viewed all fieldwork and construction of remediation systems and attended quarterly meetings with consultants, attorneys, and clients to gauge progress, discuss ongoing work, and evaluate projected schedules for completion of remediation. Technical challenges to remediation included dewatering of 20-foot thick perched zone impacted with VOC contamination, despite a leaking slurry wall originally designed to prevent onsite migration from upgradient sources.
- **ISCO Demonstration Plan Using Permanganate, Wyle Laboratories, Riverside County, California.** Designed, managed, and implemented an ISCO Demonstration Plan using sodium permanganate injection at a former industrial manufacturing facility in Southern California. Main goals of the application were to demonstrate effective oxidation of trichloroethene (TCE) in alluvium and fractured granitic bedrock, evaluate potential mobilization of naturally occurring reduced metals, and evaluate the potential application of ISCO at other areas of the Site, including off-site beneath residential homes. Twelve thousand gallons of 10% permanganate solution were delivered to the subsurface through 47 multi-depth permanent injection probes over a 22-day field event. TCE concentrations were reduced from a maximum of 30,000 microgram per liter (µg/L) to non-detect at the source area. Significantly, elevated hexavalent chromium [Cr(VI)] concentrations were observed in the area of injection and immediately downgradient. Following field observations, a Bench Scale Assessment (BSA) was conducted to evaluate potential significant sources of Cr(VI), evaluate the capacity of the aquifer to naturally attenuate Cr(VI), and provide data sufficient to estimate distance and time Cr(VI) would revert to its trivalent form. BSA and field data showed that principal source of Cr(VI) was from the raw product, with secondary contribution from chromium in the native rock, and deterioration of stainless steel well screens. Natural attenuation of Cr(VI) to background concentrations was estimated at 2 to 3 years post injection. Monitoring of the Demonstration Plan area for the 2+ years has proved those predictions accurate and a Remedial Action Plan (RAP) recommending full-scale on- and off-site treatment of TCE with permanganate was submitted to the California Department of Toxic Substances Control (DTSC). Total cost of the work was more than \$1.0 million.
- **Remedial Excavation and ISCO Used to Facilitate Property Transfer, Sanmina, Inc., Irvine, California.** Managed and implemented an aggressive remedial strategy for a former electronics manufacturing facility in Southern California. The site had TCE concentrations in groundwater suggestive of dense non-aqueous phase liquid (DNAPL) and required

expedited soil and groundwater remediation, in lieu of ongoing 2-PHASE™ and dual-phase extraction (DPE) efforts, to accommodate its divestiture and redevelopment. Groundwater was generally encountered at 15 feet below ground surface (bgs) and contained TCE concentrations in the source area as high as 77,000 µg/L. The project was successfully completed by installing a 90-well dewatering system, excavating 13,000 cubic yards (cy) of soils, and removing 3,200 cy of TCE impacted soil along the axis of a residual TCE DNAPL mass; total depth of the excavation was 32 feet bgs. ISCO using sodium and potassium permanganate was used to remediate residual TCE-impacted soil and groundwater outside the area of excavation. Following implementation of the aggressive remedial strategy, TCE concentrations in groundwater were reduced by one to three orders of magnitude, suggesting the DNAPL had been removed and/or destroyed. The Orange County Health Care Agency (OCHCA) provided soils closure and the Santa Ana Regional Water Quality Control Board provided groundwater closure for the site 16 months after completion of remediation. The site was sold and redeveloped. Total cost of excavation and ISCO application was approximately \$1.4 million.

- **Assessment, Remediation and Closure of Former Industrial Facility for Residential Re-development, Former Boeing Plant, Los Angeles, California.** Managed the assessment, remediation, and closure of a former asphalt batch plant and defense contractor facility on behalf of a residential developer. The work was performed simultaneously with planning and entitlement of the property, under the oversight of the County of Los Angeles Fire Department, Hazardous Materials Division. Unique challenges included the discovery of 15+ feet of buried asphalt debris and soils with elevated arsenic and chromium concentrations requiring off-site disposal. Developed site-specific cleanup thresholds for VOCs and heavy metals by preparing a limited human health risk assessment and incorporating Risk Based Screening Levels (RBSLs) developed by the San Francisco Regional Water Quality Control Board. The entire project was implemented in 15 months from initial assessment to site closure at a cost of \$250,000.
- **Hydrocarbon Release Characterization and Remedial Investigation, Kinder Morgan Energy Partners, La Habra, California.** Designed, managed, and implemented a subsurface investigation with the primary focus of characterizing lateral and vertical distribution of hydrocarbon impacts to the groundwater and unsaturated zone. The release was related to a pipeline booster station flange rupture dating to the early 1980s. Fractured siltstone bedrock presented unique subsurface conditions and as a result, special consideration was given to drilling techniques and boring/well installations. The project involved 12 months of fieldwork for the installation of soil vapor probes, backhoe trenches, soil borings, and monitoring wells. Discovery of up to 15-feet of light non-aqueous phase liquids (LNAPL) resulted in amendments to the original work scope to provide for LNAPL removal and assessment of pneumatic and hydraulic properties of the soil/rock. A high vacuum DPE test was performed at selected wells to evaluate the feasibility of this technology for the removal of hydrocarbons. All work was conducted under the oversight of the Los Angeles Regional Water Quality Control Board in consideration of future residential development. Work was performed over a 2-year period at an approximate cost of \$1.0 million.
- **Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan for Bunker C Tank Farm Redevelopment, Long Beach, California.** Managed the preparation of a RCRA Facility Investigation Work Plan for a former power plant tank farm facility in Long Beach, California. The site was being planned for redevelopment with a retail box store and restaurant uses. The RFI Work Plan was prepared as part of a Corrective Action Consent Agreement between the Client and the DTSC. The purpose of the RFI was to determine the nature and extent of releases at the site and to gather all the necessary data to support completion and implementation of a Corrective Measures Study (CMS).
- **Remedial Investigation of Former Transformer Washing Facility, General Electric and City of Los Angeles Redevelopment Agency, Los Angeles, California.** Prepared, managed, and implemented a Remedial Investigation Work Plan for a former transformer washing facility under the oversight of the DTSC. The field investigation was intended to evaluate and delineate the nature and extent of residual VOC, PCB, and dioxin impacts at the Site, to support decisions regarding the need for, and extent of, future removal or remedial actions. The field program showed that shallow soils at the site were significantly impacted with PCBs and deep soils and groundwater were significantly impacted with TCE and tetrachloroethene (PCE). ISCO Demonstration Plan Using Permanganate, Riverside County, California.
- **Remedial Investigation and Remedial Action Plan for Former Small Arms Firing Range, City of Huntington Beach Community Development Office, Huntington Beach, California.** Managed the preparation of a Remedial Investigation and RAP for the City of Huntington Beach in their effort to assess the extent of contamination and remedial options for a former public and police firing range. The project was performed under the oversight of the OCHCA. Relevant issues included soil berms and coal-tar treated wood posts impregnated with lead-shot, shallow landfill conditions (<5-feet), lack of a landfill cap, heavy hydrocarbon contamination, and landfill gas issues. The RAP included remedial options, costing, and an outline for implementation. Special

consideration was given to the fact that the City intended to use the property for future Central Park recreational uses. The project was awarded on technical merit following a public bidding process that required the submittal of a formal proposal and interviews with City officials. The total cost of the project was \$150,000, implemented over a 2-year period.

PROFESSIONAL TRAININGS

Compounds of Emerging Concern in Groundwater, California Groundwater Resources Association, Concord, California, February 2012

The Remediation Course, Princeton Groundwater, Las Vegas, Nevada, April 2010

Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology and Regulatory Council (ITRC) in conjunction with the California Department of Toxic Substances (DTSC) and California Water Boards, Long Beach, California, June 2009

The Groundwater Pollution and Hydrology Course, Princeton Groundwater, Orlando, Florida, February 2007

Hydrogeologic Analysis of Fractured Bedrock Systems, Midwest GeoSciences Group, University of Nevada Las Vegas and Nevada Test Site at Yucca Mountain, March 2006

PRESENTATIONS

Prevalence and Persistence of Hexavalent Chromium During In Situ Chemical Oxidation of Trichloroethylene with Permanganate, Antony D. G. Jones and Carol L. Serlin, ENVIRON, Irvine, CA; Mauricio H. Escobar, ENVIRON, Los Angeles, CA; George D. Havalias and Maria C. Echarte, American Analytics, Inc.,

Chatsworth, CA. The 19th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, & Water, San Diego, California, March 2009

Assessment of Microbial Community Composition Throughout In Situ Chemical Oxidation of Trichloroethylene with Permanganate, Bram Sercu and Patricia Holden, UCSB, Santa Barbara, CA; Antony D. G. Jones and Carol L. Serlin, ENVIRON, Irvine, CA; Mauricio H. Escobar, ENVIRON, Los Angeles, CA. The 19th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, & Water, San Diego, California, March 2009

Evaluation of the Effects of ISCO on TCE Impacted Ground Water in Weathered Granitic Mass, Mauricio H. Escobar, ENVIRON, Los Angeles, CA; Antony D. G. Jones and Carol L. Serlin, ENVIRON, Irvine, CA. The 6th International Conference on Oxidation and Reduction Technologies for In-Situ Treatment of Soil and Groundwater, San Diego, California, September 2008

Assessing Sources of Hexavalent Chromium during In-Situ Chemical Oxidation of Trichloroethylene with Permanganate, Antony D. G. Jones and Carol L. Serlin, ENVIRON, Irvine, CA; Mauricio H. Escobar, ENVIRON, Los Angeles, CA. The 6th International Conference on Oxidation and Reduction Technologies for In-Situ Treatment of Soil and Groundwater, San Diego, California, September 2008

Aggressive DNAPL Remedial Program Replaces Conventional Methods and Facilitates Property Transaction, Mauricio H. Escobar, Bita Tabatabai, and Douglas Jones, ENVIRON, Irvine, CA. The 4th International Conference on Oxidation and Reduction Technologies for In-Situ Treatment of Soil and Groundwater, Chicago, Illinois, October 2005.