

## Brian Giroux, C.E.M., P.G., C.Hg. Hydrogeologist

### Professional Experience

Mr. Giroux is a Senior Hydrogeologist with 18 years of professional experience in water resource and contaminant investigations and remediation, serving the public, academic and private sectors. A broad scientific and practical background combined with a sharp focus on groundwater hydrology and contaminant fate and transport allows Mr. Giroux to establish confident science in each project. Central to Mr. Giroux's effective project management style are clear and consistent client communications, persistent regulatory liaison and efficient data and deliverable QA/QC. Mr. Giroux is a founding partner of McGinley & Associates, Inc.

### Project Experience

#### *Select Environmental Site Assessment and Remediation Projects*

- **BMI Complex, Henderson, NV** – Associate responsible for multiple groundwater flow and contaminant transport modeling projects, management of a third-party review team, and remedial operations oversight for the State's largest and most complex soil and groundwater contaminant site.

The Las Vegas Wash Perchlorate Investigation included development of a water budget, and groundwater flow/solute transport model set to evaluate the plausibility of remediation. The results of stochastic modeling and sensitivity analyses predicted that concentrations of perchlorate would decline to near background levels within approximately 3 years; the recommendation to stem active remediation efforts in the Wash saved the State and several responsible parties years of effort and multiple millions of dollars. Several years' of post-prediction monitoring data have validated the enormous cost saving recommendation.

The provision of third-party hydrogeologic review, and management of a review team of statisticians and risk assessors, ensures the that highest quality operations and deliverables are provided for the State. Reviewed documents include sampling and analysis plans (SAP), remedial alternative studies (RAS) and a wide array of CERCLA- and RCRA-based compliance documents.

Remedial operations oversight is provided to ensure the highest level of performance in the removal of up to 4 million cubic yards of multiple-hazardous waste materials, transport across a State highway, and placement into an on-site corrective actions management unit (CAMU) landfill.

- **Boeing/Rocketdyne Former Nevada Field Laboratory** - Senior Hydrogeologist responsible for hydrogeologic and contaminant characterization in complex bedrock settings at a former rocket testing facility, database management and compliance reporting for three separate trichloroethylene (TCE) and perchlorate plume sites. Projects involve large scale groundwater pump and treat remediation systems, ground injection of treated water and large groundwater monitoring network operations. Technical project aspects include degradation of non-aqueous phase liquid (NAPL) TCE contamination deeply emplaced in fractured bedrock, design and

maintenance of digital data stream for support of rapid decision support and complex reporting requirements, incidental conceptual and analytical modeling, and remediation system optimization. One site area is currently under review for closure by the NDEP (expected 2010), following 12 years of active remediation and optimization; this will be the first site closure in Boeing history, and will include the State's first environmental covenant for contaminated groundwater.

- **Lockwood Regional Landfill, Washoe County, NV** - Project Hydrogeologist responsible for hydrogeologic characterization for landfill expansion permitting. Responsible for deep unsaturated zone lithologic and hydraulic characterization methods review, acquired data review, previous studies review and literature review; hydrogeologic characterization report preparation. A unique project aspect is the pursuit of an alternative landfill design with limited liner coverage, to reduce overall project time schedules and costs.
- **Three Kids Mine, Henderson, NV** – Associate responsible for third-party hydrogeologic review and management of a review team of statisticians and risk assessors for the State of Nevada. This project, currently in start-up phase, includes many of the facets described above for the BMI Complex, including replacement of hazardous waste mine tailings into lined and capped former mine pits.
- **American Pacific Corporation (AMPAC), Henderson, NV** – Associate responsible for third-party hydrogeologic review and management of a review team of statisticians and risk assessors for the State of Nevada. Combined with the BMI Complex described above, these sites represent the largest perchlorate contaminant plumes and remediation systems (both recovery- and destructive-types) on Earth. Technical review and guidance of the groundwater flow and contaminant transport modeling projects for this site is ensuring the highest level of contaminant mass recovery, and reducing the risk profile for the State to the greatest degree practicable.
- **Berry-Hinckley Industries, >50 Sites, CA and NV** - Project Manager responsible for assessment and characterization of hydrocarbon contamination as the result of leaking Underground Storage Tanks (USTs). Responsible for work plan development, regulatory liaison, field activities coordination, drilling investigations and monitoring well network design and construction, soil and groundwater sampling program design, contaminant fate and transport (analytical) model development, field pilot testing and analysis, and report generation. MGA has achieved closure at the majority of these site, and is approaching closure at the remaining sites.
- **Nevada Division of Environmental Protection (NDEP) Landfill Closures, Smith Valley and Jarbidge, NV** - Project Manager responsible for hydrogeologic characterization and groundwater detection monitoring for contamination as the result of landfill leaching. Responsible for regulatory liaison, monitoring well field design and construction, groundwater sampling activities coordination, data review and interpretation, and report preparation.
- **Squaw Valley Ski Corporation, Olympic Valley, CA** - Project Hydrogeologist in charge of hydrocarbon-contaminated site assessment for multiple sites at the ski resort. Challenging project aspects included characterization of fracture-controlled flow and transport pathways

developed in volcanic and granitic rock environments under extreme and variable climatic conditions and large vertical gradients.

- **Aerojet Propulsion Division, CA** - Project Hydrogeologist responsible for conceptual and numerical model development of vertical-circulation well component of a proposed in-situ remediation system. Challenging project aspects included the sensitivity analysis and optimization of well screen lengths, screen separations, and pumping/treatment rates for vertical-circulation groundwater flow cell curtain development and plume capture.

#### *Select Groundwater Resource Projects*

- **Wabuska Geothermal Discharge to Walker River, Lyon County, NV** – Hydrogeologist responsible for technical evaluation of surface water and geothermal process discharge data, and preparation of a mixing model to support the permit application for discharge to the Walker River. Wabuska is the first, smallest and coolest geothermal power plant in Nevada. Successful completion of this project will ultimately benefit Walker Lake, a terminal lake in which salinity has increased to levels dangerous for aquatic life, due to consumptive water use along upstream reaches.
- **Silverhawk Water Supply Project, near Las Vegas, NV** - Project Hydrogeologist involved with groundwater resource assessment, water rights application and transfer, and groundwater production well drilling, testing, and construction. This project resulted in the completion of a nominal 700 foot deep industrial water supply well in karst carbonate sedimentary rock – believed to be the highest producing well in the State of Nevada at that time.
- **National Water Quality Assessment (NAWQA) Program, Carson and Truckee River Basins, NV** - Hydrologist responsible for the placement and development of more than 20 groundwater monitoring wells for the study of surface water nutrient loading distributions throughout Northern Nevada's two dominant river drainage basins. The NAWQA Program was the first large-scale national water resources project, and standardized rigorous parts-per-billion sampling protocols for a large suite of analytes.
- **Regional Aquifer Systems Analysis (RASA) Project, Mojave River Basin and Santa Clara River Basin, CA** - Hydrologist responsible for the placement, development and sampling of more than 30 deep-basin nested groundwater monitoring wells. The purpose of this project was to define the regional geohydrology and establish a framework of background information on geology, hydrology, and geochemistry of the Nation's typical alluvial and coastal basins. Also responsible for a database QA/QC program for approximately 300 wells located within the Mojave River Basin, and instrumentation and analysis of aquifer testing in the Rialto-Colton Basin.
- **Nevada Test Site, Nye County, NV** - Research Assistant in charge of numerical groundwater flow model development for the purposes of examining the regional hydraulic effects of groundwater production in various sub-basins of the Nevada Test Site.
- **White Pine County Schools, NV** - Hydrogeologist responsible for the assimilation of hydrogeologic and water rights data, water rights application and transfers, generation of a site-specific conceptual hydrogeologic model, assessment of groundwater production potential, and design of public water supply wells.

## Publications and Presentations

Optimization Pump and Treat to Closure, Battelle Conference on Recalcitrant Chlorinated Compounds, May 2010. (Presenter)

Groundwater/Surface Water Interactions and Perchlorate Transport along the Las Vegas Wash, Henderson, Nevada, November 2007, U.S. Environmental Protection Agency, Technical Support Project Biannual Meeting. (Invited Presenter)

Expanding Las Vegas Wash Perchlorate Modeling, National Groundwater Association (NGWA) Conference on Perchlorate and MTBE, Costa Mesa California, June 2004. (Keynote Presenter)

Las Vegas Wash Perchlorate Investigation, Battelle Conference on Recalcitrant Chlorinated Compounds, May 2004. (Poster Presenter)

Evaluation of a Two-Dimensional Telescopic Grid Refinement Technique, M.S. Thesis, University of Reno, Nevada, 1998.

Numerical Simulation of Groundwater Withdrawal within the Nevada Test Site. DOE Report No. DOE/NV/11508-36. Desert Research Institute, Water Resources Center, Publication No. 45163, 1998.

Groundwater Production Assessment at the Nevada Test Site: Results of Telescopic Mesh Refinement. Eos, Transactions, American Geophysical Union, 1997 Fall Meeting, Vol. 78, No. 46/Supplement, 1997. (Poster Presenter)

Total slip across the San Miguel Fault, Northern Baja California: Implications for the Initial Age of Faulting, Geological Society of America, Cordilleran Section Meeting Abstracts with Programs, Vol. 26, No. 2, 1994. (Poster Presenter)

## Education

M.S., Hydrogeology, University of Nevada, Reno, 1998.

B.S., Geological Sciences, San Diego State University, 1993.

## Certifications and Registrations

California Certified Hydrogeologist, #784.

California Professional Geologist, #7246.

Nevada Certified Environmental Manager, #1742.

OSHA, 29 CFR 1910 40-Hour and 8-Hour Annual Refresher, Hazardous Waste Operations and Emergency Response (HAZWOPER).

MSHA, 40-Hour, Surface Miner Training.

## Affiliations and Training

National Ground Water Association (Member).

Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle Chlorcon (Bi-annual Attendee).



## Qualifications Resume

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Natural Attenuation of Chlorinated Solvents: Recent Developments and Practical Tools, Battelle Chlorcon, 2008.

Risk-Based Corrective Action Applied at Petroleum Release Sites, American Society for Testing and Materials (ASTM), 2007.

Principles of Water Quality, USGS Water Resources Division, 1993.