

Richard K. Borden

Environmental scientist and manager with over 30 years of experience in the consulting and mining industries. Expertise in geochemistry, hydrogeology, waste management, remedial investigations, rehabilitation, biodiversity, due diligence and environmental mine planning, permitting and closure.

Professional Experience

- 2019 **Independent Consultant** – Midgard Environmental Services LLC. Providing strategic environmental expertise to industry and NGO clients worldwide.
- 2011-2019 **General Manager Environment** - Rio Tinto Copper & Diamonds, Copper & Coal and Copper Product Groups. Portfolio typically included about ten large mines and projects on four continents. Drove improved environmental performance; reduced environmental impacts, risks and liabilities; strengthened organizational capacity; and responded to strategic environmental, closure and permitting business needs. Directly managed a centralized team of up to five senior professionals and maintained strong dotted-line reporting relationships with each site-specific environment team. Also provided oversight and support to two non-managed copper operations via technical committees and management boards.
- Provided direct support and guidance to all operations for strategic technical, staffing, organizational decisions. Involved in high level discussions and negotiations with external stakeholders such as regulators, lenders and investors. Represented the product group on the internal Environment Forum and Closure Working Group which managed corporate-wide objectives, standards and initiatives. Also provided environmental expertise during due diligence reviews for potential acquisitions, internal strategic HSE reviews and technical evaluations in support of internal investment decisions. Governor-appointed member of the Utah Board of Oil, Gas and Mining since 2015.
- 2006-2011 **Manager Mineral and Non-Mineral Waste** - Rio Tinto. Led development of corporate programs, policies, targets and guidance to improve the management of mineral wastes such as tailings, waste rock and slag for all commodity groups and operations. Also improved corporate management of hazardous materials, non-mineral waste and contaminated sites. Provided direct consulting on permitting, mine planning, reclamation, closure, mineral waste management and water quality protection to operations world-wide. Environmental representative on the Freeport Indonesia Technical Committee and Tailings Management Board overseeing environmental and permitting issues for Rio Tinto's investment in the Grasberg Mine. Assessed strategic environmental issues, risks and liabilities during due diligence reviews of potential acquisitions, technical evaluations of large capital projects, technical water reviews and general HSE reviews of existing operations.
- 2010 **Manager Closure and Remediation** - Kennecott Utah Copper Corporation. Six month temporary assignment managing a team of environmental specialists and external consultants performing contaminant characterization, groundwater and contaminated sites remediation, demolition, closure planning and emergency spill response. Worked with senior management on long term mine planning and closure issues; and negotiated with state regulatory personnel and the US Environmental Protection Agency on Remedial Investigation/Feasibility Studies.
- 2003-2006 **Principal Advisor Environment** - Rio Tinto Technical Services. Managed and provided technical support for projects related to mineral waste management, acid rock drainage, surface and groundwater quality, reclamation, mine planning, new developments and mine closure. Provided direct consulting services to solve environmental problems at copper, gold, coal, diamond, nickel, iron and uranium mines and projects in Australia, Africa, North America and Asia. Designed and implemented a corporate Acid Rock Drainage Risk Review Program. This initiative involved detailed assessments of the scientific, engineering and management programs addressing acid rock drainage hazards at more than twenty high-risk mines and projects. Implementation required the management and coordination of about ten internal and

external technical experts. The program led to significant reductions in the financial and environmental risks posed by acid rock drainage within the company.

- 2000-2003 **Senior Environmental Specialist** - Kennecott Utah Copper Corporation. Managed seven ground water discharge permits covering all facilities. Ensured compliance, completed renewals and negotiated new permit conditions. Designed remedial actions for groundwater contamination, managed acid rock drainage issues, provided environmental oversight during mine planning, designed and implemented reclamation activities and managed all interactions with the State Division of Oil, Gas and Mining, and the Division of Water Quality.
- 1996-2000 **Senior Environmental Engineer** - Kennecott Utah Copper Corporation Bingham Canyon Mine, Copperton Concentrator and the Barneys Canyon Gold Mine. Managed all day-to-day environmental activities including waste characterization and disposal, spill response, ensuring compliance and reporting for all air, surface water, ground water and reclamation permits, completing compliance audits, training, managing reclamation activities, and providing support and oversight during new project planning. Completed the first environmental geochemistry study ever performed at Bingham Canyon.
- 1989-1995 **Senior Geologist** - Foster Wheeler Environmental Corporation. Project Manager, Field Operations Leader and Technical Leader for various remedial, geologic and hydrogeologic investigations at hazardous and radioactive waste sites. Designed and managed field programs, wrote sampling and analysis plans, oversaw drilling operations and well installation, performed geologic and landform mapping, environmental sampling, pump and slug tests, analyzed chemical, stratigraphic and hydrologic data, and wrote final reports. Selected project experience includes: 1) Field Operations Leader/Technical Leader during a RCRA Facility Investigation at the Saylor Creek Electronic Warfare Range, Idaho; 2) Technical Leader during geochemical and stable isotope studies at the Bunker Hill Superfund Site, Idaho; and 3) Field Operations Leader/Technical Leader during groundwater contamination studies at the Fort Lewis Logistics Center, Washington.
- 1987-1988 **Field Geologist** - AMAX Exploration and Technical Services. Managed gold exploration programs in Idaho and Nevada. Performed reconnaissance and detailed geologic mapping, exploration drill hole site selection and logging, geochemical sampling, data analysis and geologic evaluation of gold prospects.
- 1986-1987 **Officer** - National Oceanic and Atmospheric Administration Research Ship Davidson. Navigated and piloted the vessel during assigned watches while performing bathymetric mapping. Acted as the ship's diving and oceanographic officer.
- 1985 **Geologic Field Assistant** - Ernest K. Lehmann and Associates. Worked on gold and fluorite exploration programs in Montana and Oregon. Performed geologic mapping, geophysical surveys and sampling programs.

EDUCATION

M.S. in Geology. South Dakota School of Mines and Technology. Emphasis on structural and economic geology. Thesis entitled: Structural Geology and Stratigraphy on the Southwestern Margin of the Meade Thrust, Southeastern Idaho. Teaching assistantship for courses in physical, historical, economic and structural geology. GPA of 3.6.

B.S. in Geological Sciences. Pennsylvania State University. GPA of 3.1.

University of Washington. Classes in water chemistry, hydrogeology, groundwater flow modeling and hillslope geomorphology. GPA of 3.6.

SELECTED PUBLICATIONS

Borden, R., 1994, Waste-Water Treatment Options: *in* The Nepalese-Tibetan Carpet, Published by Nepal Traveler, p. 72-78.

Borden, R., 1998, Geologic Map and Report for Naval Submarine Base Bangor: *in* Hydrogeology of Naval Submarine Base Bangor and Vicinity, Kitsap County, Washington, U. S. Geological Survey Water Resources Investigation Report 97-4060, 23 p.

Borden, R., and Goetz Troost, K., 2001, Late Pleistocene Stratigraphy in the South-Central Puget Lowland, West-Central Pierce County: Washington Division of Geology and Earth Resources Report of Investigation 33, 33 p.

Borden, R., 2001, Geochemical Evolution of Sulphide-Bearing Waste Rock Soils at the Bingham Canyon Mine, Utah: *Geochemistry, Exploration, Environment and Analysis*, v. 1, n. 1, p. 15-21.

Borden, R., 2003, Environmental Geochemistry of the Bingham Canyon Porphyry Copper Deposit, Utah: *Environmental Geology*, v. 43, p. 752-758.

Borden, R., and Black, R., 2005, Volunteer Revegetation of Waste Rock Surfaces at the Bingham Canyon Mine, Utah: *Journal of Environmental Quality*, v. 34, p. 2234-2242.

Borden, R., Peacey, V., and Vinton, B., 2006, Groundwater Response to the End of Forty Years of Copper Heap Leach Operation, Bingham Canyon, Utah: 7th International Conference on Acid Rock Drainage, March 26-30, St. Louis, Missouri, R.I. Barnhisel, editor, p. 214-232.

Borden, R., 2011, Chapter 16.6 Waste Disposal and Contamination Management, in P. Darling editor., *SME Mining Engineering Handbook*, 3rd Edition, Society for Mining, Metallurgy and Exploration, Inc., p. 1733-1751.

Borden, R., and Black, R., 2011, Biosolids Application and Long Term Noxious Weed Dominance in the Western United States: *Restoration Ecology*, v. 19, p. 639-647.