ANN S. MAEST, PHD

Professional Interests

Environmental aqueous geochemistry; fate, transport, and speciation of metals in natural waters and sediment; effects of hard rock mining on water quality; restoration of mining sites; international independent monitoring

Education

- Princeton University, PhD, Geochemistry and Water Resources, 1984
- Princeton University, MA, Geochemistry and Sedimentology, 1981
- Boston University, BA, Geology, 1979

Employment History

- Vice President, Buka Environmental, Boulder, CO 1998 – present
- Vice President, E-Tech International, Santa Fe, NM 2003 – present
- Senior Advisor, Stratus Consulting, Boulder, CO 1998-present
- Senior Geochemist, Hydrosphere Resource Consulting, Boulder, CO, 1997-1998
- Manager and Senior Associate, Hagler Bailly Consulting, Inc., Boulder, CO, 1992-1997
- Independent Environmental Consultant, Boulder, CO, 1991-1992
- Senior Scientist, Environmental Defense Fund, Washington, DC, 1989-1991
- Research Geochemist, U.S. Geological Survey, Menlo Park, CA, 1983-1989

Professional Experience

Dr. Maest is an aqueous geochemist with expertise in the fate and transport of natural and anthropogenic contaminants in groundwaters, surface waters, and sediments. She has over 20 years of research and professional experience as a geochemist and has worked on natural systems as well as on systems that have been impacted by industrial activities such as mining. At Buka Environmental and Stratus Consulting, Ann is responsible for designing, conducting, and managing groundwater and surface water hydrogeochemistry studies at mining and other sites. The results of Dr. Maest's research have been published as numerous articles in peer-reviewed journals including: *Applied Geochemistry, Canadian Journal of Fisheries and Aquatic Sciences, Chemical Geology, Applied and Environmental Microbiology,* and *Environmental Science and Technology.* Before joining Buka Environmental, Dr. Maest worked at Hydrosphere Resource Consultants and Hagler Bailly Services and specialized in water quality impacts of hard rock mining and transport of toxics in groundwater and surface waters. As a senior scientist at Environmental Defense Fund, Dr. Maest was responsible for designing technical and policy approaches to minimize releases of toxic substances from mining and manufacturing facilities. Dr. Maest was a research geochemist in the U.S. Geological Survey's National Research Program for six years after completing her PhD, where she conducted research on metal-organic interactions, metal and metalloid speciation, and redox geochemistry in surface water and groundwater. Ann has served on a number of national and international committees, including several National Academy of Sciences committees related to mining and minerals research issues.

Selected Research and Professional Experience

International Finance Corporation (Compliance Advisory Ombudsman Office), Yanacocha Mine, Peru. Served as independent monitor of potential water quality impacts related to operation of theYanacocha Mine in northern Peru, the largest gold mine in Latin America. Issues included effects of mineralized areas (natural mineralization) on stream water quality, and fate and transport of metals and other elements from mine to streams. Designed water quality monitoring plan, conducted monitoring with veedores (community "witnesses"), and interpreted results of monitoring.

Border Ecology Project/Packard Foundation, Cananea Mine, Mexico. Examined groundwater and surface water quality in the vicinity of the Cananea Mine, an open-pit copper mine in Mexico. Designed water quality monitoring plan to be carried out by local authorities and university and regulatory agency in Arizona, using public-interest laboratory at Universidad de Sonora. Assisting in expanding and improving this public-interest laboratory.

Battle Mountain Gold Company and the State of Colorado; Battle Mountain San Luis Gold Mine, Colorado. Served as third-party monitor in unique agreement between the State of Colorado and the owner of a gold mine in southern Colorado where permit levels of cyanide in a tailings impoundment had been violated. Sampled stream, groundwater and process points for cyanide and metals, prepared reports, interpreted analytical and QA/QC data.

U.S. AID. Various Mines in Peru. Conducted surface water, soil, and mining waste sampling of areas in central and southern Peru impacted by mining activities. Designed and conducted environmental sampling, met with local and regional political figures to discuss the impact of mining on the environment, and analyzed results of sampling efforts.

US Fish and Wildlife Service and Coeur d'Alene Tribe. Coeur d'Alene Mining District, Idaho. Evaluated pre-mining water quality and soil conditions, and soil/sediment and surface water quality, especially for cadmium, lead and zinc concentrations. Involved understanding mineralogy and geology of the ore deposits and surrounding rocks and the effect of weathering on metal concentrations in rocks, soils, sediment and water. Evaluated pathways for transport of metals from sources to surface water and groundwater resources and issues related to lake water and sediment geochemistry. Served as expert on fate and transport, water and sediment/soil quality and baseline and lake issues for Federal trustees and Tribe in Superfund/Natural Resource Damage Assessment case. Provided expert reports and testified at trial in federal court.

USDA Forest Service, the State of Idaho, and the National Oceanographic and Atmospheric Administration. Blackbird Mine Ground Water and Surface Water Chemistry Studies, Idaho. Managed surface water and groundwater resources efforts and served as principle expert for surface water quality and groundwater quality issues for a Natural Resource Damage investigation of the site. Prepared sampling and analysis plan for extensive collection of surface waters and mining wastes; sampled surface water and waste materials to determine sources of contamination, and investigated baseline water quality. Prepared surface water sampling reports. Examined groundwater and surface water impacts from acid drainage related to waste rock open pit and underground workings.

Selected Recent Publications

Questa baseline and pre-mining ground-water quality investigation 4. Historical surface-water quality for the Red River Valley, New Mexico. 2004. A. S. Maest , D. K. Nordstrom, and S. H. LoVetere, 2004. Scientific Investigation Report 2004-5063. U.S. Geological Survey (in press).

Dissolved copper loading to the Berkeley Pit, Montana, USA, and estimates of pit wall leaching. 2004. A.S. Maest, J.J. Metesh and T.E. Duaime. *Water-Rock Interaction 11*, Wanty & Seals II (eds). Balkema, Taylor & Francis Group, London, ISBN 90 5809 641 6, Vol. 2, p. 1569-1573.

Arsenic(III/V) preservation procedures for water samples: New data and an evaluation of the literature. 2004. R. B. McCleskey, D. K. Nordstrom, and A. S. Maest, 2004. *Applied Geochemistry*, Special Issue dedicated to Gunter Faure.

Questa Baseline and Pre-Mining Ground-Water Quality Investigation. 3. Historical Ground-Water Quality for the Red River Valley, New Mexico. 2004. S. H. LoVetere, D. K. Nordstrom, A. S. Maest, and C. A. Naus. 2004. Water-Resources Investigation Report 03-4186. U.S. Geological Survey, 116p.

Selection of an organic-acid analogue of dissolved organic matter for use in toxicity testing. 1999. R. Mac Rae, A.S. Maest, and J. Meyer. *Canadian Journal of Fisheries and Aquatic Sciences*, 56: 1484-1493.

Hardrock Mining on Federal Lands. 1999. with Committee on Hardrock Mining on Federal Lands. National Academy Press, D.C., 247.

Committee Assignments/Awards

- National Academy of Sciences Committee on Bureau of Mines Research, 1995
- National Academy of Sciences Committee to Review the Mineral Resource Surveys Program Plan of the U.S. Geological Survey, 1995-96
- National Academy of Sciences Committee on Hardrock Mining on Federal Lands, 1999
- National Academy of Sciences Committee on Technologies for the Mining Industries, 2000 (elected but declined serving)
- Metal Mining and Sustainable Development, Global Reporting Initiative Advisory Panel, Public Reporting in the Mining and Minerals Sector, 2001
- Selected as Adrian Smith Lecturer in Applied Geochemistry, University of Waterloo, 1999
- Water-Rock Interaction 11, Organizing and Scientific Committees, 2004