Ralph D. Ludwig, Environmental Scientist in EPA's National Risk Management Research Laboratory

Groundwater, Watershed, and Ecosystem Restoration Division
Mailing Address

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Areas of Expertise:

- Subsurface transport and fate of inorganic and organic contaminants.
- Subsurface characterization and site conceptual model development.
- Remediation of inorganic contaminants including Cr(VI), Pb, Cd, Ni, and As; and organic contaminants, including chlorinated solvents and petroleum hydrocarbons.
- Subsurface redox manipulation for treatment of metals in groundwater.
- Site-specific technical support to EPA Regional and Program Office staff involving critical analyses of site-specific technical issues related to subsurface remediation.

Select Publications:

Ludwig, R.D., D.G Beak, R.T Wilkin, C.J. Ruybal, D.J. Rectenwald (2015). Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Retrospective Case Study in Northeastern Pennsylvania. U.S. EPA, Washington, D.C., EPA 600/R-14/088a.

Ludwig, R. D., D. J. A. Smyth, D. W. Blowes, L. E. Spink, R. T. Wilkin, D. G. Jewett, C. J. Weisener (2009). Treatment of Arsenic, Heavy Metals, and Acidity Using a Mixed ZVI-Compost PRB. *Environmental Science & Technology* 43(6):1979-1976

Ludwig R. D., C. Su, T. R. Lee, R. T. Wilkin, B. M. Sass (2008). In Situ Source Treatment of Cr(VI) Using a Fe(II)-Based Reductant Blend: Long-Term Monitoring and Evaluation. *Journal of Environmental Engineering* 134(8):651-658

Ludwig R., C. Su, T. R. Lee, R.T. Wilkin, S.D. Acree, R.R. Ross, A. Keeley (2007). In Situ Chemical Reduction of Cr(VI) in Groundwater Using a Combination of Ferrous Sulfate and Sodium Dithionite. *Environmental Science & Technology* 41:5299-5305

Ludwig, R.D., R.G. McGregor, D.W. Blowes, S.G. Benner, and K. Mountjoy (2002). A Permeable Reactive Barrier for Treatment of Heavy Metals. *Ground Water* 40(1):59-66.

Ludwig, R. D., M. Barcelona, K. Piontek (2002). Redox Processes in Petroleum Hydrocarbon Site Characterization and Remediation, in *Workshop on Monitoring Oxidation-Reduction Processes for Ground-Water Restoration.* U.S. EPA, Washington, D.C., EPA/600/R-02/002.

View more research publications by Ralph Ludwig

Education:

- Ph.D., McGill University, Montreal, Canada; Environmental Engineering, 1988
- M.S., McGill University, Montreal, Canada; Environmental Engineering, 1983

- B.S., McGill University, Montreal, Canada; Biology, 1978

Professional Experience:

Workgroup and Project Leads

- Co-organizer and Instructor, *Permeable Reactive Barrier Workshop*, Taiwan Environmental Protection Administration, Taipei, Taiwan June 25-27, 2013.

Memberships and Committees

- Journal manuscript peer reviewer for *Environmental Science and Technology, Journal of Hazardous Materials, Industrial & Engineering Chemistry Research, Ground Water Monitoring and Remediation*
- Associate Editor, *Ground Water Monitoring and Remediation* journal (2002-2004)
- Session chair Fifth and Sixth International Conferences on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA (May 2006, May 2008). Session titles: *Alternative Permeable Reactive Barrier Materials* and *Innovative Approaches for Treating Heavy Metals*.
- Co-Organizer, *Workshop on Monitoring Oxidation-Reduction Processes for Ground-Water Restoration,* Dallas, TX, April 25-27, 2000
- Instructor, EPA/ITRC/RTDF Short Course on *Permeable Reactive Barriers for Treating Contaminated Groundwater: Application and Deployment* 1999-2000.

Awards and Honors

- EPA Scientific and Technological Achievement Award (STAA) Level I, *Using retrospective case studies to better understand the relationship between non-traditional oil and gas development and drinking water resources,* 2018
- U.S. EPA Bronze Medal, Hydraulic Fracturing Retrospective Case Studies, 2016
- U.S. EPA Bronze Medal, Permeable Reactive Barrier Team, 2002
- U.S. EPA STAA, Level III, *Advancing the Acceptance and Deployment of Organic-Based Permeable Reactive Barriers for the Treatment of Metals in Contaminated Groundwater,* 2005
- U.S. EPA Honors Award - Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices, Macalloy Corporation Superfund Site Technical Support Team, 2007
- Outstanding Service as Associate Editor *Ground Water Monitoring and Remediation* journal, 2003

Patents

Ludwig, R. D. and C. Su (2007), *Method of Treating a Subsurface Formation With Ferrous Iron to Reduce Contaminants to Harmless Species.* U.S. Patent No. 7,166,228 B2