

**Dr. B.H. Kueper, BAsC, PhD, NGWA Fellow & Hubbert Award,
Emeritus Professor, Queen’s University, Kingston, Ontario, Canada**

Dr. Kueper is a hydrogeologist with expertise in the area of soil and groundwater contamination, groundwater hydraulics, and subsurface remediation. He received his Ph.D. in hydrogeology from the University of Waterloo in 1989 and joined the faculty at Queen’s University in 1990 where he is currently emeritus professor. Dr. Kueper’s research is focused on the behaviour and remediation of soil and groundwater contaminants in unconsolidated deposits such as clays, silts and sands, as well as fractured rock. His research has included performing field experiments, laboratory experiments, and numerical simulation studies related to the behaviour and remediation of contaminants. In addition to his research duties, which include the supervision of Masters and Ph.D. students, Dr. Kueper’s responsibilities at Queen’s University included teaching undergraduate and graduate courses in groundwater flow and contaminant hydrogeology, as well as administrative duties.

Dr. Kueper is a former Associate Editor for the Journal of Ground Water, the Journal of Contaminant Hydrology and the Canadian Geotechnical Journal. He has provided professional short courses and training seminars on the topics of soil and groundwater contamination, groundwater hydraulics, and subsurface remediation to regulatory agencies including USEPA, the State of Maine, the State of Texas, CETESB (Sao Paulo), FEEMA (Rio de Janeiro), TIKTVF (Hungary), the province of Ontario, the province of British Columbia, as well as for various licensing bodies including the Massachusetts LSPA and the Connecticut LEPA. In addition, Dr. Kueper has taught in several professional short courses open to practitioners in Australia, China, England, Denmark, Switzerland, Canada and the United States. Appendix A presents a summary of his short course teaching. Dr. Kueper co-authored the definitive EPA guidance titled “Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites”, and Dr. Kueper is the lead editor of the published textbook “Chlorinated Solvent Source Zone Remediation”. Dr. Kueper is the 2019 recipient of the prestigious NGWA M. King Hubbert award for major contribution to the groundwater industry.

In addition to being employed at Queen’s University, Dr. Kueper has provided his services as a technical consultant to government agencies and private industry around the globe for 32 years. This work has included technical expert testimony in court and at public hearings, meetings with USEPA and state/provincial agencies, oversight of site investigation activities, and the preparation of a variety of technical documents. Specific work assignments have included, but are not limited to, evaluation of oil and gas exploration and production sites, design and analysis of pump-and-treat systems, site assessment, delineation of source zones and plumes, assessment of capture zones, plume stability analysis, design of field sampling plans, assessment of remedial options, numerical simulation of groundwater flow and contaminant migration, analysis of the performance of horizontal drain systems, vadose zone leaching analyses, assessment of vapor migration above the water table, and writing of technical workplans.

EMPLOYMENT:

- 1999-present Professor
Department of Civil Engineering
Queen's University, Kingston, Ontario, Canada
- 1994-1999 Associate Professor
Department of Civil Engineering
Queen's University, Kingston, Ontario, Canada
- 1990-1994 Assistant Professor
Department of Civil Engineering
Queen's University, Kingston, Ontario, Canada

EDUCATION:

- 1989 Ph.D., Hydrogeology
Department of Earth Sciences
University of Waterloo, Waterloo, Ontario, Canada
- 1985 B.A.Sc., Civil Engineering
Department of Civil Engineering
University of Waterloo, Waterloo, Ontario, Canada

OTHER APPOINTMENTS:

- 2000 – 2003
- 2006 – 2009 Member, Queen's University Senate
- 1999 – 2006 Associate Editor, Journal of Contaminant Hydrology
- 1998 - 1999 Chair of Graduate Studies, Department of Civil Engineering,
Queen's University.
- 1997 - 2011 Associate Editor, Journal of Ground Water
- 1996 - 1998 Chair, Canadian Geotechnical Society Hydrogeology Division
- 1994 - 1997 Associate Editor, Canadian Geotechnical Journal

CURRENT AND PAST UNIVERSITY TEACHING RESPONSIBILITIES:

Subsurface contamination by hazardous industrial liquids

This graduate/undergraduate course deals with subsurface contamination by hazardous industrial substances such as per- and polyfluoroalkyl substances (PFAS), coal tars, petroleum compounds, chlorinated solvents, PCB oils, and jet fuel. The fundamentals of multiphase/multicomponent flow and transport are outlined followed by specific treatments of both dense and light non-aqueous phase liquids (NAPLs). The course examines the subsurface distribution of these contaminants, sampling and detection, remediation technologies, and selected case histories.

Theory of groundwater flow and contaminant transport

Graduate level course examining the theoretical foundations of groundwater flow and contaminant transport. Topics include potential concepts, groundwater flow, aquifer-aquitard systems, unsaturated flow, reactive and non-reactive solute transport, stochastic flow and transport, multiphase flow, fractured media, and density-dependent transport.

Leadership and teamwork

This undergraduate course deals with the principles behind effective leadership and teamwork. Students are exposed to lectures, role playing workshops, and a personality assessment. The course recognizes that professionals may be called upon to assume both leadership and teamwork roles at various stages of their career.

Numerical Analysis

This undergraduate course teaches students a variety of numerical methods applicable in science and engineering including root finding, optimization, numerical integration, solution of systems of linear and non-linear equations, solution of ordinary differential equations, and solution of partial differential equations.

Effective Oral Communication

This undergraduate course teaches students the fundamentals of giving an effective oral presentation. All students are provided the opportunity to present a talk on an assigned topic.

Groundwater Hydraulics

This undergraduate course teaches students the fundamentals of groundwater flow in unconsolidated deposits. Specific topics addressed include hydraulic head, flownets, Darcy's Law, the groundwater flow equation, anisotropy, storage concepts, interpretation of slug tests, and interpretation of pumping tests.

Engineering Design

This undergraduate course introduces second year Civil Engineering students to the design process. Elements of the course include report writing, speaking, and a design project.

REFEREED PUBLICATIONS:

Mumford, K., Bryck, S., Kueper, B.H., Mancini, S., Kavanaugh, M., Reynolds, D., 2022. Virtual site investigation to evaluate conceptual site model development at DNAPL-impacted sites. *Groundwater Monitoring and Remediation*, 42(3), pp. 44-58.

Jaoude, I.B., Novakowski, K.S. and Kueper, B.H., 2022. Comparing heat and solute transport in a discrete rock fracture of variable aperture. *Journal of Hydrology*, Vol. 607, published Article Number 127496.

Jaoude, I.B., Novakowski, K.S. and Kueper, B.H., 2022. The Effect of Fracture Aperture Variability on Heat Transport in a Discrete Rock Fracture Under Natural Groundwater Flow Conditions. Submitted for publication in *Journal of Geophysical Research – Solid Earth*.

Battye, N.J., Patch, D.J., Roberts, D.M.D., O'Connor, N.M., Turner, L.P., Kueper, B.H., Hulley, M.E. and Weber, K.P., 2022. Use of a horizontal ball mill to remediate per- and polyfluoroalkyl substances in soil. *Science of the Total Environment* 835, Article 155506.

Wu, X., Kueper, B.H. and Novakowski, K.S., 2022. Global and local sensitivity analysis of heat transport in fractured rock using a modified LH-OAT method. Submitted for publication.

Wu, X., Novakowski, K.S. and Kueper, B.H., 2022. A semi-analytical solution for heat transport in rock with parallel fractures and a heat source in both fracture and matrix. Submitted for publication.

Mumford, K.G., Martin, E.J. and Kueper, B.H., 2021. Removal of trichloroethene from thin clay lenses by electrical resistance heating: laboratory experiments and the effects of gas saturation. *Journal of Contaminant Hydrology*, 243(8):103892, September 2021.

Xie, Q., Mumford, K.G. and Kueper, B.H., 2021. Incorporating hysteresis into a macroscopic invasion percolation model for gas flow in the subsurface. Submitted for publication.

Turner, L., Kueper, B.H., Jaansalu, K.M., Patch, D.J., Battye, N., El-Sharnouby, O., Mumford, K.G. and Weber, K.P., 2020. Mechanochemical remediation of PFOS and PFOA amended sand and AFFF impacted soil by planetary ball milling. *Science of the Total Environment*, 765, Article 142722.

- Liu, B., Guanghe, L., Mumford, K.G., Kueper, B.H. and Zhang, F., 2020. Low permeability zone remediation of trichloroethene via coupling electrokinetic migration with in situ electrochemical hydrodechlorination. *Chemosphere*, Vol. 250, Article 126209.
- Xie, Q., Mumford, K.G. and Kueper, B.H., 2020. Modelling gas-phase recovery of volatile organic compounds during in-situ thermal treatment. *Journal of Contaminant Hydrology*, Vol. 234, Article 103698.
- Xie, Q., Mumford, K.G., Kueper, B.H. and Zhao, C., 2019. A numerical model for estimating the removal of volatile organic compounds in laboratory-scale treatability tests for thermal treatment of NAPL-impacted soils. *Journal of Contaminant Hydrology* Vol. 226, Article 103526.
- Hicknel, B.N., Mumford, K.G. and Kueper, B.H., 2018. Laboratory study of creosote removal from sand at elevated temperatures. *Journal of Contaminant Hydrology*. doi.org/10.1016/j.jconhyd.2018.10.006
- Jaoude, I.B., Novakowski, K.S. and Kueper, B.H., 2018. Identifying and Assessing Key Parameters Controlling Heat Transport in Discrete Rock Fractures. *Geothermics*, Vol. 75, pp 93-104.
- Martin, E.M., Mumford, K.G., Kueper, B.H. and Siemens, G.A., 2017. Gas Formation in Sand and Clay during Electrical Resistance Heating. *International Journal of Heat and Mass Transfer*. Vol. 110, pp. 855-862.
- Munholland, J., Mumford, K.G. and Kueper, B.H., 2016. Factors affecting gas migration and contaminant redistribution in heterogeneous porous media subject to electrical resistance heating. *Journal of Contaminant Hydrology*, 184, 14-24.
- Martin, E.M., Mumford, K.G. and Kueper, B.H., 2016. Electrical resistance heating of clay layers in water-saturated sand. *Groundwater Monitoring and Remediation*, 36(1) 54-61.
- Hansen, S.K. and Kueper, B.H., 2014. A new model for coupled multi-component NAPL dissolution and aqueous-phase transport with application to creosote dissolution in discrete fractures. *Water Resources Research*, 50, 58-70, doi: 10.1002/2013WR013773.
- Zhao, C., Mumford, K.G. and Kueper, B.H., 2014. Laboratory study of non-aqueous phase liquid and water co-boiling during thermal treatment. *Journal of Contaminant Hydrology*, 164, 49-58, doi:10.1016/j.jconhyd.2014.05.008.
- West, M.R. and Kueper, B.H., 2012. Numerical Simulation of DNAPL Source Zone Remediation with In Situ Chemical Oxidation (ISCO). *Advances in Water Resources* (44),
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pp. 126-139.

Alexandra, R., Gerhard, J.I. and Kueper, B.H., 2012. Hydraulic Displacement of Dense, Non-Aqueous Phase Liquids. *Journal of Ground Water*, Vol. 50, No. 5, pp. 765-774.

Rodriguez, D.J. and Kueper, B.H., 2012. Specification of matrix clean-up goals in fractured porous media. *Journal of Ground Water*, Vol. 51, No. 1, pp. 58-65.

Martin, E.J. and Kueper, B.H., 2011. Observation of Trapped Gas During Electrical Resistance Heating of Trichloroethylene Under Passive Venting Conditions. *J. Contaminant Hydrology*, Vol. 126, Issues 3-4, pp. 291 – 300.

Hansen, S.K. and Kueper, B.H., 2011. Forensic misidentification of Aroclor sources in fractured bedrock due to “chromatographic” PCB congener separation. *Environmental Forensics*, 12(1), pp. 25-34.

Baston, D.P., Falta, R.W. and Kueper, B.H., 2010. Numerical modeling of thermal conductive heating in bedrock. *Journal of Ground Water*, 48(6), pp. 836-843.

West, M. and Kueper, B.H., 2010. Plume detachment and recession times in fractured rock. *Journal of Ground Water*, 48(3), pp. 416-426.

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Burghardt, J.M. and Kueper, B.H., 2008. Laboratory Study Evaluating Heating of Tetrachloroethylene Impacted Soil. *Journal of Groundwater Monitoring and Remediation*, 28(4), pp. 96 - 106.

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West, M., Kueper, B.H. and Unga, M.J., 2008. Reply to Comments (V. Batu) on “On the use and error of approximation in the Domenico (1987) solution”. *Journal of Ground Water*, 46(5), pp. 666-668.

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Gauthier, M. and Kueper, B.H., 2006. Removal of PCB-DNAPL from a rough-walled fracture using alcohol/polymer flooding. *Journal of Contaminant Hydrology*, 84(1-2), pp. 1-20.

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Lunn, S.D. and Kueper, B.H., 1999. Risk reduction during chemical flooding: Preconditioning DNAPL density in-situ prior to recovery by miscible displacement. Environmental Science & Technology, Vol. 33, No. 10, pp. 1703-1708.

Lunn, S.D. and Kueper, B.H., 1999. Manipulation of density and viscosity for the optimization of DNAPL recovery by alcohol flooding. Journal of Contaminant Hydrology, Vol. 38, No. 4, pp. 427-445.

Longino, B.L. and Kueper, B.H., 1999. Non-wetting phase retention and mobilization in rock fractures. Water Resources Research, Vol. 35, No. 7, pp. 2085-2093.

Longino, B.L. and Kueper, B.H., 1999. Effects of capillary pressure and viscosity ratio on DNAPL retention and mobilization in a rough-walled fracture. Environmental Science & Technology, Vol. 33, No. 14, pp. 2447 – 2455.

Gerhard, J.I., Kueper, B.H. and Hecox, G., 1998. Waterflooding for the removal of pooled DNAPL. Journal of Ground Water, 36(2), pp. 283-292.

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Lunn, S.D. and Kueper, B.H., 1997. Removal of pooled DNAPL from saturated porous media using upward gradient alcohol floods, *Water Resources Research*, Vol. 33, No. 10, pp. 2207-2219.

Chown, J.C., Kueper, B.H., and McWhorter, D.B., 1997. The use of upward hydraulic gradients to arrest downward DNAPL migration in rock fractures. *Journal of Ground Water*, Vol. 35, No. 3, pp. 483-491.

Bizzigotti, G., Reynolds, D. and Kueper, B.H., 1997. Enhanced solubilization and destruction of tetrachloroethylene by hydroxypropyl- β -cyclodextrin and iron, *Environmental Science & Technology*, 31(2), pp. 472-478..

Longino, B.L. and Kueper, B.H., 1997. The use of waterflooding to remove DNAPL from fractured rock. *Proceedings, Air & Waste Management Conference*, Toronto, Ontario, 16 pp.

Lunn, S.D. and Kueper, B.H., 1996. Removal of DNAPL pools using upward gradient ethanol floods. *Proceedings, NAPLs in The Subsurface Environment: Assessment and Remediation*, American Society of Civil Engineers, Washington, DC., pp. 345-356.

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Mason, A.R. and Kueper, B.H., 1996. Numerical simulation of surfactant enhanced solubilization of pooled DNAPL. *Environmental Science and Technology*, Vol. 30, No. 11, pp. 3205-3215.

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Longino, B.L. and Kueper, B.H., 1995. The use of upward gradients to arrest downward DNAPL migration in the presence of solubilizing surfactants. *Canadian Geotechnical Journal*, Vol. 32(2), pp. 296-308.

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Reitsma, S. and Kueper, B.H., 1994. Laboratory measurement of capillary pressure saturation curves in a natural rock fracture. *Water Resources Research*, 30(4), pp. 865-878.

Kueper, B.H., Redman, J.D., Starr, R.C., Reitsma, S. and Mah, M., 1993. A field experiment to study the behavior of tetrachloroethylene below the watertable: Spatial distribution of residual and pooled DNAPL. *Journal of Ground Water*, Vol. 31, No. 5, pp. 756-766.

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BOOKS, CHAPTERS IN BOOKS, and RELATED WORK:

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Thompson, B.R., Hunt, J., Gefell, M., LaChance, J., Kueper, B.H., Heron, G., Galligan, J. and Swift, R., 2014. In situ thermal remediation at a major multi-PRP CERCLA site: Establishing cleanup levels, design and implementation. Published abstract and poster presentation, Ninth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California. Battelle Memorial Institute, Columbus, OH. May, 2014.

Kueper, B.H., Sleep, B.E. and Mumford, K.G. 'Gas-enhanced In-situ Thermal Treatment for Rapid Site Remediation'. Final Report, NSERC Strategic Project Grant STPGP 396730. June 30, 2015.

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Zhao, C., Mumford, K. and Kueper, B.H., 2013. Investigation of co-boiling behavior during in situ thermal treatment: experiments and modelling. Conference presentation and published extended abstract, GeoMontreal 2013, Canadian Geotechnical Society and International Association of Hydrogeologists, Montreal, QC, Sept/29 – Oct/3, 2013.

Bryck, S. and Kueper, B.H., 2013. Thermal enhancement of in situ chemical oxidation (ISCO) for remediation of groundwater impacted by chlorinated solvents. Conference presentation and published extended abstract, GeoMontreal 2013, Canadian Geotechnical Society and International Association of Hydrogeologists, Montreal, QC, Sept/29 – Oct/3, 2013.

Bryck, S. and Kueper, B.H., 2013. Thermal treatment of in-situ chemical oxidation (ISCO) for remediation of groundwater impacted by chlorinated solvents. Conference presentation and abstract, Symposium for New Research in Groundwater Science, Western University, London, ON. September 20 – 21, 2013.

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Zhao, C., Mumford, K. and Kueper, B.H., 2013. Remediation of dense, non-aqueous phase liquids using heating. Conference presentation and abstract, 3rd Annual Water Research Centre Student Symposium, Queen's University, Kingston, ON. January 23, 2013.

Hansen, S.K. and Kueper, B.H., 2012. Separation of phenolic and PAH plumes from weathering creosote NAPL: coupled effects of Raoult's Law and differential sorption. Published abstract, Proceedings of the 39th International Association of Hydrogeologists Congress, September 16 – 21, 2012. Niagara Falls, ON.

Hansen, S.K. and Kueper, B.H., 2012. Employing Laguerre Function Bases to Extend Analytic Transport Solutions to Arbitrary Boundary Conditions: Mathematical Underpinnings of a New Modelling Technique for Multi-component Dissolution with Reactive Transport. Published abstract, Proceedings of the XIX International Conference on Computational Methods in Water Resources, Urbana-Champaign IL, June 2012.

Gefell, M.J. and Kueper, B.H., 2012. Passive NAPL barriers – Design process and full-scale results at MGP sites. Manufactured Gas Plant Symposium, Chicago, Il., March.

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Hansen, S.K. and Kueper, B.H., 2011. Challenges in forensic identification of multi-component NAPL sources – A new model and some results. Published abstract, Proceedings of the International Conference on Environmental Pollution and Remediation, Ottawa, Ontario, Canada, 17-19 August.

Martin, E. and Kueper, B.H., 2011. Observation of trapped gas during electrical resistance heating of trichloroethylene under passive venting conditions. Published abstract, Proceedings Geological Society of America Annual Meeting & Exposition, 9-12 October 2011, Abstract #194487.

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Lebron, C., Kueper, B.H., Heron, G., LaChance, J.C., Phelan, D. and Lacombe, P., 2010. DNAPL removal from fractured rock using thermal conductive heating (TCH) – treatability study and pilot progress. Poster presentation number 214 and published abstract G-183. Partners in Environmental Technology Technical Symposium and Workshop. US Department of Defense, November 30-December 2, 2010. Washington, DC.

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Shi, J.S., Gefell, M.J., White, K.A., Kueper, B.H. and Blazicek, T., 2006. Hydraulic control of DNAPL migration without pumping groundwater. Abstract, DNAPL-1, Pittsburgh, PA, September 23 – 28.

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Easton, A. and Kueper, B.H., 2004. A sensitivity analysis of well capture zones in discretely fractured rock. Abstract No. H23D-04, EOS Transactions, American Geophysical Union, 85(17), Joint Assembly, Montreal, Canada, May 17-21.

West, M.R., Kueper, B.H., and Novakowski, K.S., 2004. Semi-analytical solutions for solute transport in fractured porous media using a finite width strip source. Abstract No. H23D-03, EOS Transactions, American Geophysical Union, 85(17), Joint Assembly, Montreal, Canada, May 17-21.

Gefell, M.J., Sperry, K.L., Rawson, J.R. and Kueper, B.H., 2004. Field-scale DNAPL zone treatment using potassium permanganate in fractured meta-sedimentary bedrock. Abstract and poster presentation, Remediation of Chlorinated and Recalcitrant Compounds, 4th International Conference, May 24-27. Battelle.

Kueper, B.H., Gerhard, J.I. and Reynolds, D.A., 2003. Timescales of DNAPL migration. Abstract No. EAE03-A-07989. EGS-AGU-EUG Joint Assembly, Nice, France. April 7-11.

Kueper, B.H., 2003. Proposed groundwater exclusion zone, Smithville, Ontario. Draft technical memorandum. Department of Civil Engineering, Queen's University, Kingston, Ontario.

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Gerhard, J.I. and Kueper, B.H., 2002. Critical Phenomena of Nonwetting Fluid Infiltration, Redistribution, and Immobilization in Saturated Porous Media. Poster presentation (and published abstract), American Geophysical Union Fall Meeting, San Francisco, CA.

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design for DNAPL contamination in fractured bedrock. Published abstract, Geological Society of America annual meeting, Vol. 33, No. 6.

Kueper, B.H. and Thomson, N.R., 2000. DNAPL behavior and clean-up in fractured rock: An overview. Published abstract and platform presentation, Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, May 22 – 25.

Longino, B.L. and Kueper, B.H., 2000. Effect of waterflooding on DNAPL retention in rough-walled fractures. Published abstract and poster presentation, Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, May 22 – 25.

Gefell, M.J., Thompson, B.R., and Kueper, B.H., 2000. TI zone delineation at a former solvent recycling facility. Published abstract and platform presentation, Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, May 22 – 25.

Reynolds, D.A. and Kueper, B.H., 2000. DNAPL flow through fractured porous media. Published abstract and poster presentation, Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, May 22 – 25.

Kueper, B.H. and Reynolds, D.A., 2000a. Technical Memorandum, Step 7, Task 7.3.4, Numerical Simulation of Integrated Permeation Grouting and Extraction Wells – High Permeability Enclosure. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 82p.

Kueper, B.H. and Reynolds, D.A., 2000b. Technical Memorandum, Step 7, Task 7.3.5, Numerical Simulation of Permeation Grouting – Low Permeability Enclosure. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 82p.

Kueper, B.H. and Reynolds, D.A., 2000c. Technical Memorandum, Evaluation of Numerical Dispersion. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 23p.

Kueper, B.H. and Reynolds, D.A., 2000d. Technical Memorandum, Step 7, Task 7.3.6, Numerical Simulation of Extraction Wells. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 78p.

Kueper, B.H. and Reynolds, D.A., 1999a. Technical Memorandum, Step 7, Task 7.2, Numerical Model Calibration. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 84p.

Kueper, B.H. and Reynolds, D.A., 1999b. Technical Memorandum, Step 7, Task 7.3.1, Numerical Simulation of Monitored Natural Attenuation. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 340p.

Kueper, B.H. and Reynolds, D.A., 1999c. Technical Memorandum, Step 7, Task 7.3.2, Numerical Simulation of Excavation Option. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 70p.

Kueper, B.H. and Reynolds, D.A., 1999d. Technical Memorandum, Step 7, Task 7.3.3, Numerical Simulation of Thermal Wells Option. Department of Civil Engineering, Queen's University, Kingston, ON. Submitted to Township of West Lincoln. 71p.

Kueper, B.H. and Thomson, N.R., 1999. NSERC Strategic Grant Final Report, 'Two-phase flow and aqueous phase transport in fractured rock'.

Kueper, B.H., and Gerhard, J.I., 1999. The use of waterflooding for the recovery of pooled DNAPL. NGWA Theis Conference published abstract and poster presentation, Nov. 12-15, Amelia Island Plantation, FL.

Konzuk, J.S. and Kueper, B.H., 1999. Estimation of capillary pressure and relative permeability curves in a single, rough-walled fracture using parameter estimation techniques. Proceedings, Dynamics of Fluids in Fractured Rocks, Concepts and Recent Advances, LBNL-42718, Berkeley Lab., pp. 280-283.

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Simpkin, T.J., Sale, T., Kueper, B.H., Lowe, D., and Pitts, M., 1998. Technology practices manual for surfactants and cosolvents: summary of findings. Poster Abstracts, First International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, Monterey, CA.

Gefell, M., Thomson, B.R.T., and Kueper, B.H., 1998. NAPL and 'TI' zone delineation at a former solvent recycling facility. Poster Abstracts, First International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, Monterey, CA.

Kueper, B.H., 1997. Hydrogeologists facing tough decisions at DNAPL sites. *Geotechnical News*, Vol. 15, No. 5, p. 20.

Longino, B.L. and Kueper, B.H., 1997. Retention and waterflooding of DNAPL in fractured rock. Abstract No. 50707, *GSA Abstracts with Programs*, Vol. 29, No. 6.

Konzuk, J. and Kueper, B.H., 1997. Estimation of capillary pressure and relative permeability functions using history-matching in a single fracture. Abstract No. 50832, *GSA Abstracts with Programs*, Vol. 29, No. 6.

Falta, R.W., Jarosch, T.R., Kueper, B.H., Looney, B.B., Sabatini, D.A., Siegrist, R.L., and Udell, K.S., 1996. Technical Evaluation of DNAPL Enhanced Removal Technologies. Prepared for U.S. Department of Energy.

The use of Alcohol Flooding to Remediate Sites Contaminated by Dense, Non-aqueous Phase Liquids, Progress Report #3, Subcontract 19Y-GUG26V. Submitted to Lockheed-Martin Inc., Oak Ridge, TN, January 8, 1996.

The use of Alcohol Flooding to Remediate Sites Contaminated by Dense, Non-aqueous Phase Liquids, Progress Report #2, Subcontract 19Y-GUG26V. Submitted to Lockheed-Martin, Oak Ridge, TN, Feb. 7, 1995, 118p.

Mason, A.R. and Kueper, B.H., 1995. Numerical simulation of surfactant enhanced solubilization of pooled DNAPL. *EOS, Transactions, American Geophysical Union*, Vol. 76, No. 17, p.123.

Gerhard, J.I. and Kueper, B.H., 1994. Sensitivity of DNAPL migration to source strength and release location in heterogeneous media. *EOS, Transactions, American Geophysical Union*, Vol. 75, No. 44, p. 254.

Longino, B.L. and Kueper, B.H., 1994. The use of solubilizing surfactants to remove pooled DNAPL under upward gradient flow conditions. Abstracts, Air & Waste Management Association 87th Annual Meeting & Exhibition, p. 142.

Turcke, M. and Kueper, B.H., 1993. A geostatistical analysis of the Borden aquifer. *EOS, Transactions, American Geophysical Union*, Vol. 74, No. 16, p.143.

Kueper, B.H. and Redman, J.D., 1993. A field experiment to study the behavior of tetrachloroethylene in a natural sand aquifer. EOS, Transactions, American Geophysical Union, Vol. 74, No. 16, p. 128.

Reitsma, S. and Kueper, B.H., 1992. Laboratory measurement of capillary pressure - saturation relationships in natural rock fractures. EOS, Transactions, American Geophysical Union, Vol. 73, No. 43, p. 213.

Kueper, B.H. and Poulsen, M., 1991. A field experiment to study the behavior of non-aqueous phase liquids in the unsaturated zone. EOS, Transactions, American Geophysical Union, Vol. 72, No. 44, p. 160.

SELECTED SEMINARS, INVITED CONFERENCE PRESENTATIONS, AND RELATED:

Scientific Committee Member, 4th International Conference on Environmental Sustainability, Development, and Protection (ICESDP'19), April 7-9, 2019, Rome, Italy.

Invited presentation. Remediation of Soil and Groundwater – State of the Practice. BCEER Thermal Remediation Symposium, Beijing, China, May 23, 2018.

Invited presentation. Soil and Groundwater Contamination by Chlorinated Solvents. Contaminant Workshop, Tsinghua University, Beijing, China, May 24, 2018.

Invited presentation. Contaminated Site Assessment in Fractured Bedrock. Ontario Ministry of Environment and Climate Change provincial meeting of hydrogeologists, Toronto, ON, March 20, 2018.

Invited expert panelist. Enough is enough: When do you have enough data? 11th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, USA, April 2018.

Session Co-Chair. Manufactured Gas Plants. 11th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, USA, April 2018.

Invited keynote presentation, 'Remediation of Organic Contaminants in Groundwater', International Conference on Environmental Pollution and Remediation (ICEPR'17), Rome, Italy. June 6-8, 2017.

Invited presentation, 'Remediation of DNAPL Sites and the Influence of Matrix Diffusion', The Langan Remediation Summit, Hamburg, NJ. September 28 – 30, 2016.

Co-chair of conference session, 'Characterization and Risk Management in Fractured Bedrock'. Tenth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, California. Battelle Memorial Institute, Columbus, OH. May, 2016.

Invited keynote presentation, 'Remediation of Soil and Groundwater Impacted by Chlorinated Solvents – State of the Practice'. International Conference on Environmental Sustainability, Development and Protection (ICESDP'16), Prague, Czech Republic, March 30-31, 2016.

Member of Scientific Committee, International Conference on Environmental Sustainability, Development and Protection (ICESDP'16), Prague, Czech Republic, March 30-31, 2016.

Co-chair of conference session, 'Environmental Sustainability, Development and Protection II', International Conference on Environmental Sustainability, Development and Protection (ICESDP'16), Prague, Czech Republic, March 30-31, 2016.

Mumford, K.G. and Kueper, B.H., 2015. Invited presentation 'Thermal remediation – A look at fundamental mechanisms and implications for field implementation'. In-Situ Thermal Seminar, Euremtech, Bruges, Belgium, June 3-4, 2015.

Closing Keynote Presentation, 'Source Zone Remediation – Key Points for Moving Forward'. REMTEC Remediation Technology Summit, The Future of Remediation Technology, Westminster, CO, March 2-4, 2015.

Invited lecture 'Groundwater contamination by dense non-aqueous phase liquids', CEE 275K-01, Stanford University, February 27, 2015

Co-chair of conference session, 'Remediation of chlorinated solvent source zones'. Ninth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California. Battelle Memorial Institute, Columbus, OH. May, 2014.

Kueper, B.H., Stroo, H.F., Vogel, C.M. and Ward, C.H. Invited talk. Chlorinated solvent source zone remediation – Key issues and State of the Practice. Ninth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California. Battelle Memorial Institute, Columbus, OH. May, 2014.

Kueper, B.H., Invited presentation. Use of thermal conductive heating to remove chlorinated solvents from fractured bedrock. Workshop on Characterization, Modeling, Monitoring, and Remediation of Fractured Rock. National Research Council of the National Academies, Washington, DC, USA. May 29 – 30, 2013.

Co-chair of conference session, ‘NAPL source zone characterization and management’. Remediation Technology Summit – The Future of Remediation Technology. March 4 – 6, 2013. Westminster, Colorado, USA.

Stroo, H.F., Kueper, B.H., Vogel, C.M., Ward, C.H. and Leeson, A. DNAPL source zone remediation: status and research needs. Invited talk and published abstract, H33K-01, American Geophysical Union Fall Meeting, December 9 – 13, 2013. San Francisco, USA.

Kueper, B.H., Soil and groundwater impacted by chlorinated solvents – Discussion items. Invited talk, Water Environment Association of Ontario, Kingston, ON. February 12, 2013.

Kueper, B.H., Invited Presentation. Use of thermal conductive heating to remove chlorinated solvents from fractured bedrock – Importance of site characterization. International Association of Hydrogeologists 2012 Congress, Niagara Falls, ON. September 17-21, 2012.

Kueper, B.H., Invited Presentation. Remediation of soil and groundwater impacted by chlorinated solvents – State of the practice. International Association of Hydrogeologists 2012 Congress, Niagara Falls, ON. September 17-21, 2012.

Invited Expert Panel Member, The State of Environmental Remediation in 2012: Present and Future Research Needs. Eighth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle. Monterey, CA, May 21-24, 2012.

Kueper, B.H., Invited Keynote Presentation. Remediation of Dense, Non-Aqueous Phase Liquids. International Conference on Environmental Pollution and Remediation, Ottawa, ON, Aug 17-19, 2011. Member, Scientific Organizing Committee. Published abstract.

Kueper, B.H., Invited Keynote Presentation. Delineation and Remediation of DNAPLs in Heterogeneous Geology. REMTEC Remediation Technology Summit, Chicago, IL, May 16 – 19, 2011.

Co-chair of Conference Session, “Remediation of MGP Sites”, Seventh International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, Monterey, CA. May/24-27/2010.

Kueper, B.H. Invited Seminar. Workshop on NAPL in bedrock. EPRI Manufactured Gas Plant Fall 2009 meeting. Old Town Alexandria, VA, USA. September 1, 2009.

Kueper, B.H. and West, M.R. Invited Talk. High resolution numerical simulation of DNAPL remediation in heterogeneous porous media. American Geophysical Union Spring Meeting and Joint Assembly, Session H33C, Toronto, Ontario, May 27th, 2009.

Kueper, B.H. and West, M.R. ‘Remediation of organic contaminants in groundwater’. Invited talk. 1st International Congress on Subsurface Environment. September 15th – 18th, 2009. Sao Paulo, Brazil.

Kueper, B.H. Invited Panel member, ‘Investigation and rehabilitation of contaminated sites’. 1st International Congress on Subsurface Environment. September 15th – 18th, 2009. Sao Paulo, Brazil.

Kueper, B.H. Invited Keynote Talk. Characterizing and Remediating DNAPL Sites – What we Have Learned From the Past 10 Years. VI International Seminar on Remediation and Redevelopment of Contaminated Sites. EKOS Institute Brazil, Sao Paulo, October 27 – 28, 2008.

Kueper, B.H., Invited Talk. Remediation of Dense, Non-Aqueous Phase Liquids. Central New York Association of Professional Geologists Subsurface Remediation Symposium, April 29, 2008.

Co-Chair of Conference Session, “PAH Contaminated Sites – Session A6”, Sixth International Conference, Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 19 – 22, 2008.

Invited plenary conference presentation, “Behaviour and Remediation of Dense, Non-Aqueous Phase Liquids“, London Geological Society 200th Anniversary Conference: Earth Sciences in the Service of Society, Westminster, London, September 10-12, 2007. (and published abstract)

Invited plenary conference presentation, “Capture zone analysis in fractured rock: designing pump-and-treat remedies”, USEPA/NGWA Fractured Rock Conference, Portland, ME, September 24-26, 2007. (and published abstract)

Invited conference presentation, “Selection of monitoring times to assess remediation performance”. Canadian Geotechnical Society Annual Conference, Ottawa, ON, October 21-24, 2007.

University of Waterloo Distinguished Alumnus Lecture, “Behaviour and Remediation of Dense, Non-Aqueous Phase Liquids”, University of Waterloo Department of Earth and Environmental Sciences, October 19, 2007.

Invited Expert Panel Member, “Performance Assessment – Measuring the Success of Remediation”, USEPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation. Portland, ME. September 24-26, 2007.

Member Conference Advisory Council, USEPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation. Portland, ME. September 24-26, 2007.

Panel Discussion Moderator, “Case Studies Revisited: A Long-Term Look at Cost and Performance”. USEPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation. Portland, ME. September 24-26, 2007.

Co-Chair of Conference Session, “Numerical Modeling”, USEPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation. Portland, ME. September 24-26, 2007.

Invited expert panel member; DNAPL Source Treatment: Lessons Learned and Implications for Future Applications. The Fifth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, May 22 – 25, 2006. Monterey, CA.

Co-chair of conference session: Passive NAPL Collection and Interception Systems. The Fifth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, May 22 – 25, 2006. Monterey, CA.

Member, USEPA/NGWA Advisory Council for the Conference on Remediation of Contaminated Ground Water in Fractured Rock to be held September, 2007.

Canadian Geotechnical Society Annual Conference. Invited talk, Design of a hydraulic capture system in tidally influenced fractured rock. Vancouver, B.C., October 2 – 4, 2006.

Invited member; SERDP/ESTCP DNAPL Source Zone Workshop, Baltimore, MD, March 7 – 8, 2006.

Member, International organizing committee; DNAPL-1 The First International Conference on DNAPL Characterization and Remediation. Pittsburgh, PA, September 25 – 28, 2006.

Groundwater Resources Association of California, 15th Symposium, DNAPL Source Zone Characterization and Remediation. San Francisco, CA. December 7-8, 2005. Invited platform presentation: Remediation Concepts in Fractured Rock.

Australian Contaminated Land Consultants Association, Melbourne, Australia. June 29, 2005. Invited seminar: DNAPL migration and remediation.

The American Geophysical Union, Fall Meeting, San Francisco, December 13-17, 2004. Invited presentation: Timescales of DNAPL migration in heterogeneous porous media.

SERDP/ESTCP Partners in Environmental Technology Conference, Washington, DC. Invited talk: Developing a protocol and a screening tool for selection of DNAPL source are remediation. Nov/30/04 – Dec/02/04.

USEPA/NGWA Fractured Rock Conference: State of the Science and Measuring Success in Remediation, Portland, Maine, September 13 – 15, 2004. Invited talk: ‘DNAPL behaviour in fractured rock – transport facilitated by Pickering emulsions’. Member, conference organizing committee. Session chair, Lessons Learned in Monitored Natural Attenuation. Expert Panel member, Technical Impracticability.

Canadian Geotechnical Society Annual Conference, Quebec City, Quebec. Invited talk: Successive delineation of DNAPL source zones at a Superfund site. Canadian Geotechnical Society, October 25 – 27, 2004.

American Geophysical Union Joint Assembly, Session Co-Chair: Groundwater Remediation in Fractured Rock. Session H23D, American Geophysical Union, Montreal, Canada, May 17-21, 2004.

General Electric Remedial Council, June 9-11, 2004. Invited speaker. “Comparison of source zone concentration decay to plume decay on meeting remedial action objectives in fractured rock”, Chicago, Ill.

U.S.E.P.A. Groundwater Forum, 2003. Invited panel member. October 22-24, Niagara Falls, NY.

U.S.E.P.A. Groundwater Forum, 2003. Invited keynote speaker (and panel member). ‘Characterization of DNAPL Source Zones’. Seattle, WA, April 22-24, 2003.

American Geophysical Union/European Geophysical Union Spring Meeting, Invited talk. ‘Timescales of DNAPL migration’. Nice, France, April 7-11, 2003.

British Geological Survey, NAPL Contamination: Investigation and Remediation Conference, Invited keynote address: “Timescales of DNAPL migration in porous and fractured media”, BGS Keyworth, April 9, 2002.

General Electric Remedial Council, June 13 – 14, 2002, Baltimore, MD. Invited speaker: “Timescales of DNAPL migration”.

U.S.E.P.A. Groundwater Forum, 2002. Invited keynote speaker. ‘Timescales of DNAPL migration’. Pensacolla, Florida.

IAHS International Conference, Groundwater Quality 2001. Invited keynote speaker and member of Scientific Advisory Committee. ‘DNAPL migration through fractured clay/sand sequences’. Sheffield, England, June 18 – 21, 2001.

U.S.E.P.A. Sponsored Fractured Bedrock Workshop. Invited speaker, ‘Overview of Field Applications’. Providence, RI, November 8 – 9, 2000.

Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 22 – 25, 2000, Monterey, CA. Platform presentation (and session chair): ‘DNAPL behavior and clean-up in fractured rock: An overview’.

General Electric Remedial Council, April 27-28, 2000, Washington, DC. Invited speaker: 'Overview of DNAPL Remediation'.

General Electric Remedial Council, June 14-16, 1999, Lake Placid, NY. Invited keynote speaker: 'Behaviour, Migration, and Clean-up of Dense, Non-aqueous Phase Liquids'.

GQ'98 - International Conference and Special Seminars on Groundwater Quality: Remediation and Protection, Tubingen, Germany, September 21-25, 1998. Invited presentation: 'DNAPL pool mobilization in fractured rock.'

Gordon Conference - Modeling Flow in Permeable Media, Andover, New Hampshire, August 2 - 7, 1998. Invited presentation: 'Multiphase flow in fractures'.

International Conference on Groundwater Quality Protection, Remedial Technology and Management Policy for NAPL Contamination, Taipei, Taiwan, December 1 - 3, 1997. Invited presentation: 'The use of surfactant/alcohol flooding to remediate DNAPL sites'.

Canadian Geotechnical Society 1997 Colloquium. Presented at 50th Annual Meeting, Ottawa, Ontario, October 20-22, 1997. 'Behaviour, Migration, and Clean-up of DNAPLs in the Subsurface'.

Information Network for Superfund Settlements Conference, Denver, CO, March 12-13, 1997. Invited presentation: 'The use of surfactant/cosolvent flooding for DNAPL remediation, State-of-the-art.'

University of Arizona, Department of Hydrology and Water Resources. Invited seminar: 'The behavior of dense non-aqueous phase liquids in fractured rock', November 20, 1996.

Center for Mathematics and Computer Science, Amsterdam, Holland. NAPL Movement in the Subsurface Conference. Invited presentation: 'The behavior of DNAPL in fractured rock', October 25, 1996.

Oregon Graduate Institute, Department of Environmental Science and Engineering. Invited seminar: 'Behavior and clean-up of DNAPL in fractured rock', May 17, 1996.

Zurich Technical University Vadose Zone Workshop, Ascona, Switzerland, September 18 -22, 1995. Invited lecture: 'Migration of DNAPL in Heterogeneous Porous Media'.

VEGAS Symposium on Remediation of Contaminated Groundwater, University of Stuttgart, Stuttgart, Germany, September 25-27, 1995. Invited lecture: 'Numerical simulation of surfactant flooding to remove pooled DNAPL from porous media: parameter identification'.

Royal Military College of Canada, Kingston, Ontario, June 12-16, 1995. Invited lecture in 'Site Assessment and Remediation' shortcourse.

American Geophysical Union CHAPMAN conference on Aqueous and Multiphase Flow in Fractured Rock, Burlington, VT, September 12-15, 1994. Invited keynote presentation: 'Two-phase flow in single fractures'.

Geological Society of America PENROSE conference on Groundwater Flow and Contaminant Transport in Fractured Unlithified Deposits, Racine, WI, June, 1994. Invited keynote presentation: 'Multiphase flow in fractured media'.

American Nuclear Society SPECTRUM'94 Specialty Conference, Atlanta, GA, August 15, 1994. Invited presentation: 'Advantages and Disadvantages of Chemical Flooding to Remediate Sites Contaminated by DNAPL'.

CSCE/ASCE Conference on Environmental Engineering, Montreal, PQ, July 12-14, 1993. Invited presentation: 'DNAPL migration in sandy deposits: Field and numerical experimentation'.

Geological Society of America Annual Conference, Boston, MA, October 26, 1993. Invited lecture in 'Contaminant Hydrogeology' workshop: 'Fuels, Solvents, and Other Immiscible Phase Contaminants in Groundwater'.

U.S. Department of Energy Subsurface Science Program, Intermediate Scale Experiment Workshop, Norfolk, VA, October 8-9, 1993. Invited lecture: 'Benefits and Challenges of Experiments on Isolated Volumes of Sediments'.

Kueper, B.H., Feenstra, S., Rivett, M. and Cherry, J.A., 1992. A series of controlled field experiments to study DNAPL behavior: Implications for site remediation. Invited presentation: HAZMAT International, Hazardous Materials & Environmental Management Conference, Atlantic City, June 10-12.

Kueper, B.H. and Frind, E.O., 1990. Numerical modeling of multiphase/multicomponent flow and transport in porous media: An overview. Invited presentation: IAH Conference on Subsurface Contamination by Immiscible Liquids, Calgary, Alberta, April 18-20.

Technical University of Denmark, Department of Environmental Engineering, Lyngby, Denmark. April 12, 1989. 'The Behavior of Dense Non-Aqueous Phase Liquids in Heterogeneous Porous Media'.

Stanford University, Department of Civil Engineering, Stanford, California. December 5, 1988. 'Multiphase Flow in Heterogeneous Porous Media'.

PROFESSIONAL SHORT COURSES TAUGHT:

- 2019 Co-Instructor: Transport Mechanisms and Remediation Technologies for NAPL Contaminants in Soil and Groundwater. Professional Short Course, October 21-22, Beijing, China.
- 2016 Co-Instructor: Sustainable Resources Industry Training Pty, Soil and Groundwater Pollution, Characterization, Remediation and Risk Management. Professional Short Course, September 13-16, Melbourne, Australia.
- 2016 Co-Instructor: 'Hydrogeology of Fractured Rock: Characterization, Monitoring, Assessment and Remediation'. Two day shortcourse presented to the Ontario Ministry of the Environment and Climate Change. Kingston, ON, February 3 – 4, 2016.
- 2014 Co-instructor, Sustainable Resources Industry Training Pty, Soil and Groundwater Pollution, Characterization, Remediation and Risk Management. Professional Short Course, December 1-4, Sydney, Australia.
- 2014 Co-Instructor: 'Hydrogeology of Fractured Rock: Characterization, Monitoring, Assessment and Remediation'. Two day shortcourse presented to the British Columbia Ministry of the Environment. Vancouver, March 4 – 5, 2014.
- 2012 Co-Instructor: 'Investigation, Remediation and Management of Contaminated Soil and Groundwater'. Four day professional shortcourse, Australian Contaminated Land Consultants Association, Melbourne, Australia. September 24 – 27, 2012.
- 2011 Co-instructor: 'DNAPL Delineation and Remediation Workshop' presented to USEPA Region 4. December 7, 2011. Louisville, KY.
- 2011 SERDP/ESTCP, Partners in Environmental Technology Technical Symposium and Workshop. Co-instructor: 'Thermal Treatment Technologies: Lessons Learned'. December 1, 2011. Washington, DC.
- 2011 PIA, Brazil. Co-instructor: 'Groundwater Hydrology, Site Characterization, Contaminant Transport and Site Remediation'. Three-day professional shortcourse, Centro Universitário SENAC, Campus Santo Amaro, São Paulo, Brazil. June 20 – 22, 2011.
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- 2002-2009 Centre For Groundwater Studies, Australia.
- Co-instructor: ‘NAPLs and Groundwater’. Four-day professional shortcourse (1st Australian NAPLs course), Sydney, Australia, July 1-4, 2002.
- Co-instructor: ‘NAPLs and Groundwater’. Four-day professional shortcourse, Melbourne, Australia, June 30 – July 3, 2003.
- Co-instructor: ‘NAPLs and Groundwater’. Four-day professional shortcourse, Brisbane, Australia, June 29 – July 2, 2004.
- Co-instructor. ‘NAPLs and Groundwater’. Four-day professional shortcourse, Melbourne, Australia, June 27 – 30, 2005.
- Co-instructor: ‘NAPLs and Groundwater’. Four-day professional shortcourse, Sydney, Australia, July 18 – 21, 2006.
- Co-instructor: ‘Soil and Groundwater Pollution’. Four-day professional shortcourse, Perth, Australia, June 12 – 15, 2007.
- Co-instructor: ‘Soil and Groundwater Pollution’. Five-day professional shortcourse, Melbourne, Australia, June 18 – 22, 2007.
- Co-instructor: “Soil and Groundwater Pollution”, Five-day professional shortcourse, August 25 – 29, 2008, Perth, Australia.
- Co-instructor: “Soil and Groundwater Pollution”, Five-day professional shortcourse, September 1 – 5, 2008, Sydney, Australia.
- Co-instructor: “Soil and Groundwater Pollution”, Four-day professional shortcourse, June 9 – 12, 2009, Surfers Paradise, Australia.
- 1997-2022 Princeton Groundwater, Co-Instructor: ‘The Princeton Remediation Course’ Semi-annual professional shortcourse, various locations and dates.
- 2003-2022 Princeton Groundwater, Co-instructor: “The Groundwater Pollution and Hydrology Course”. Semi-annual professional shortcourse, various locations and dates.
- 2003 U.S.E.P.A. Co-instructor: Hydrogeology of Fractured Rock. 1-day workshop presented to U.S.E.P.A. Groundwater Forum. Niagara Falls, NY. Oct. 21.
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- 2003 CETESB – Sao Paulo Hidrogeologia em Meio Fraturado: Monitoramento, Investigacao e Remediacao (Hydrogeology in Fractured Media). 2-day workshop presented to Brazilian regulatory agency – notes translated to Portuguese. November 6 – 7, Sao Paulo, Brazil.
- 2003 FEEMA – Rio de Janeiro Hidrogeologia em Meio Fraturado: Monitoramento, Investigacao e Remediacao (Hydrogeology in Fractured Media). 2-day workshop presented to Brazilian regulatory agency – notes translated to Portuguese. November 10 – 11, Rio de Janeiro, Brazil.
- 2003 Connecticut Licensed Environmental Professional (LEP) Association, Co-Instructor: ‘Behavior and remediation of DNAPLs in the subsurface’. 1-day short-course, Hartford, CT, February 25.
- 2002 Massachusettes Licensed Site Professional (LSP) Association, Co-Instructor: ‘Characterization and remediation of DNAPLs’, Marlboro, MA, June 17.
- 2002-2008 Fractured Rock Educational Services. ‘Groundwater flow, contaminant transport, and remediation in fractured rock’. Four-day professional shortcourse:

Newport, RI., April 22-25, 2002.

Niagara Falls, NY., December 2-5, 2002.

Princeton, NJ., May 19-22, 2003.

Burlington, VT., February 21-24, 2005.

Boston, MA., April 30 – May 3, 2007.

Boston, MA., December 8 – 11, 2008.
- 2002 Hudson-Mohawk Professional Geologist’s Association Workshop, Co-Instructor: “Practical Site Characterization & Remediation Techniques for DNAPLs and their Associated Dissolved Phase Plumes”. May 8, 2002, Albany, NY.
- 2001 U.S. Environmental Protection Agency, Region VII., Co-Instructor: ‘Groundwater Contamination and Remediation’. 4-day Professional Shortcourse, Kansas City, MO
- 1998-2002 University of Sheffield, Co-Instructor: ‘Organic Contaminants in Land and Groundwater’ Professional shortcourse, Sheffield, England.
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- 2001 Massachusetts Licensed Site Professional (LSP) Association, Co-Instructor: 'Behavior and remediation of DNAPLs in the subsurface' 1-day short-course, Boston, MA, March 15, 2001.
- 2001 Connecticut Licensed Environmental Professional (LEP) Association, Co-Instructor: 'Behavior and remediation of DNAPLs in the subsurface' 1-day short-course, Hartford, CT, May 8, 2001.
- 2001 State of Maine, Co-Instructor: 'Groundwater flow, solute transport, multiphase flow, and remediation in fractured rock' Four-day in-house shortcourse, Augusta, ME, May 22-25, 2001.
- 2001 State of Texas, Instructor: "Groundwater flow, solute transport, multiphase flow, and remediation in fractured rock'. Two-day in-house shortcourse, Austin, TX.
- 2000 Central New York Association of Professional Geologists, Co-instructor: 'Practical Site Characterization and Remediation Techniques for DNAPLs and Their Associated Dissolved Phase Plumes. 1 day workshop, Syracuse, NY.
- 1997 University Consortium Solvents-In-Groundwater Research Program, Co-Instructor: 'DNAPLs in Fractured Geologic Media: Behavior, Monitoring and Remediation', Professional shortcourse, November 10 - 12, San Francisco, CA.
- 1989-1997 Waterloo Center for Groundwater Research, Co-instructor: 'Behavior and Clean-up of Dense, Immiscible Phase Liquids in Porous and Fractured Media'. Annual 4-day professional short course, various locations and dates.
- 1996 Waterloo Center for Groundwater Research in collaboration with the Denmark Committee on Groundwater Pollution, Co-instructor: 'Diagnosis & Remediation of DNAPL Sites'. May 6-8, Vingsted, Denmark.
- 1996-1997 University of Bradford, Co-instructor: 'In-situ restoration of contaminated land and groundwater', Professional Short-course, Bradford, England, April 15-18.
- 1994 Central New York Association of Profession Geologists, Co-instructor, 'DNAPL Shortcourse'. Two-day shortcourse, November 1-2, Syracuse, NY.
- 1994 E.P.A. Northeast Hazardous Substance Research Center, Co-instructor: 'Remediation of NAPL Contaminated Sites'. Two-day professional short course, March 14-15 (Hoboken, NJ) and April 5-6 (Boston, MA).
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- 1993 University of Birmingham, Co-instructor: 'Groundwater Contamination by Organic Chemicals'. Four-day professional short course, April 19-22, Birmingham, England.
- 1992 ETH Zurich Technical University, Co-instructor: 'Groundwater Pollution by Mineral Oils and Organic Solvents'. Five-day professional short course, March 2-6, Zurich, Switzerland.
- 1991 U.S. Department of Energy, Co-instructor: DNAPL Workshop. Two-day workshop, July 30-31, Atlanta, GA.
- 1988 41st Canadian Geotechnical Conference, Co-instructor: 'Selected Topics in Contaminant Hydrogeology for Geotechnical Engineers'. One-day professional short course, Kitchener, Ontario.