



References

- Allaire, S. E., J.A. Lafond, A. R. Cabral, S. E. Lang. 2008. "Measurement of Gas Diffusion through Soils: Comparison of Laboratory Methods." *Journal of Environmental Monitoring* 10:1326 – 1336. doi: 10.1039/B809461F.
- Alleman, B., K. Glover, J. Wolfe. 2018. "Lessons Learned Applying Multiple Remediation Technologies and Air Force Plan 4." *Presentation at FRTR Annual Meeting, Reston Virginia, May 9th 2018*.
- Atlas, R. M. 1981. "Microbial Degradation of Petroleum Hydrocarbons: and Environmental Perspective." *Microbial Review* 45:180 – 209.
- Atlas, R. M. and R. Bartha. 1992. "Hydrocarbon Biodegradation and Oil Spill Bioremediation." *Advanced Microbial Ecology* 12:287 – 338.
- Bamforth, S. M. and I. Singleton. 2005. "Bioremediation of Polycyclic Aromatic Hydrocarbons: Current Knowledge and Future Directions." *Journal of Chemical Technology and Biotechnology* 80:723 – 736.
- Bechtel. 1999. "Groundwater Monitoring Plan for Site 11, Old Camden County Landfill U.S. Naval Submarine Base Kings Bay, Georgia." *Prepared for Department of the Navy, Southern Division, Naval Facilities Engineering Command* June 1999.
- Burnell, S., Spitzinger J, Jin P, Erickson J, Hauber E, and Nelson D. 2013. "Control of Biofouling: Lessons Learned From a Decade of Carbon Injection System Operation and Maintenance. ." *Remediation* Winter 2013, 23 (2):85-101.
- CCVRWQCB. 2015. "Waste Discharge Requirements General Order for In-Situ Groundwater Remediation and discharge of Treated Groundwater to Land." *California Regional Water Quality Control Board* Order No. R5-2015-0012.
- Chamberlain, W. B. . 2003. "Bionutrient Modeling for Design on In situ Bioremediation." *Pollution Engineering* April 2003:28 – 33.
- Chang, H. L. and L. Alvarez-Cohen. 1996. "Biodegradation of individual and multiple chlorinated aliphatic hydrocarbons by methane-oxidizing cultures." *Applied Environmental Microbiology* 62 (9):3371-3377.
- Clayton, W.S. . 2007. "Engineering delivery of soluble amendments." *SERDP Symposium, Washington, D.C., December 4-6, 2007*.
- Clayton, W.S. . 2008. "In situ Chemical Oxidation (Basics, Theory, Design and Application)". California DTSC Remediation Technology Symposium, Sacramento, C.A., May 14-16, 2008.
- Cusack, F., S. Singh, C. McCarthy, and J. Grieco. 1992. "Enhanced Oil Recovery – Three-dimensional Sandpack Simulation of Ultramicrobacteria Resuscitation in Reservoir Formation." *Journal of General Microbiology* 138 (3):647-655.
- DeFlaun, M. F., S. R. Oppenheimer, S. Streger, C. W. Condee, and M. Fletcher. 1999. "Alterations in adhesion, transport, and membrane polymers in an adhesion-deficient Pseudomonad." *Applied and Environmental Microbiology* 65:759-765.
- Dresel, P. Evan, Dawn M. Wellman, Kirk J. Cantrell, and Michael J. Truex. 2011. "Review: Technical and Policy Challenges in Deep Vadose Zone Remediation of Metals and Radionuclides." *Environmental Science & Technology* 45 (10):4207-4216. doi: 10.1021/es101211t.
- ESTCP. 2005a. "Bioaugmentation for Remediation of Chlorinated Solvents." *Department of Defense (DOD) Environmental Security Technology Certification Program* Technology Development, Status, and Research Needs." October 2005.
- ESTCP. 2005b. "A Review of Biofouling Controls for Enhanced In Situ Bioremediation of Groundwater. October." *Department of Defense Environmental Security Technology Certification Program*
- ESTCP. 2010a. "In Situ Remediation of Chlorinated Solvent Plumes." *SERDP/ESTCP*, Springer Science + Business Media, New York, 2010:374.
- ESTCP. 2010b. "Loading Rates and Impacts of Substrate Delivery for Enhanced Anaerobic Bioremediation." ESTCP Final Report for Project ER-0627.
- ESTCP. 2011a. "Decision and Management Tools for DNAPL Sites: Optimization of Chlorinated Solvent Source and Plume Remediation Considering Uncertainty." (ESTCP ER-200704).
- ESTCP. 2011b. "Diagnostic Tools for Performance Evaluation of Innovative In Situ Remediation Technologies at

- Chlorinated Solvent Sites." *ESTCP Project ER-200318*.
- ESTCP. 2016. "Development of an Expanded, High-Reliability and Performance Database for In Situ Remediation Technologies." *ESTCP Project ER-201120:93*.
- Evans, P., J. Hooper, M. Lamar, D. Nguyen, P. Dugan, M. Crimi, N. Ruiz. 2018. "Sustained In situ Chemical oxidation (ISCO) of 1,4 Dioxane and Chlorinated VOCs Using Slow-release Chemical Oxidant Cylinders." *ESTCO Project ER-201324:576*.
- Fathepure, B. Z. . 1987. "Anaerobic bacteria that dechlorinate perchloroethene." *Applied and Environmental Microbiology* 53 (11):2671-2674.
- Fowler, T., B. Thompson, and J. Mueller. 2011. "Acetone and 2-butanone creation associated with biological and chemical remediation of environmental contamination." *Remediation* 22 (Winter). doi: 10.1002/rem.21296.
- Harkness, M., A. Fisher, M. D. Lee, E. E. Mack, J. A. Payne, S. Dworatzek, J. Roberts, C. Acheson, R. Herrmann, and A. Possolo. 2012. "Use of statistical tools to evaluate the reductive dechlorination of high levels of TCE in microcosm studies." *Journal of Contaminant Hydrology* 131 (1-4):100 -118.
- Harkness, M., P. Freyer, L. Reusser. *Unpublished Paper*.
- He, J., V. F. Holmes, P. K. H. Lee, and L. Alvarez-Cohen. 2007. "Influence of Vitamin B12 and cocultures on the growth of Dehalococcoides isolates in defined medium." *Applied Environmental Microbiology* 73 (9):2847 - 2853.
- Heald, S, and Jenkins, R.O. 1994. "Trichloroethylene removal and oxidation toxicity mediated by toluene dioxygenase of *Pseudomonas putida*." *Appl Environ Microbiol* 60:4634-4637.
- ITRC. 2002a. "DNAPL Source reduction: Facing the Challenge." *Interstate Technology and Regulatory Council*.
- ITRC. 2002b. "A systematic Approach to In Situ bioremediation in Groundwater, Including Decision Trees on In Situ Bioremediation for Nitrates, Carbon Tetrachloride and Perchlorate." *Interstate Technology & Regulatory Council*, ISB-8.
- ITRC. 2003. "Technical and Regulatory Guidance for Surfactant / Cosolvent Flushing of DNAPL Source Zones." *Interstate Technology and Regulatory Council, Washington DC, ITRC DNAPLs-3*.
- ITRC. 2004. "Remediation Process Optimization Identifying Opportunities for Enhanced and More Efficient Site Remediation." *Interstate Technology and Regulatory Council*.
- ITRC. 2005. "Technical and Regulatory Guidance for In situ Chemical Oxidation of Contaminated Soil and Groundwater, Second Edition " *Interstate Technology and Regulatory Council*.
- ITRC. 2007. "Improving Environmental Site Remediation through Performance-based Environmental Management." *RPO*.
- ITRC. 2008a. "Enhanced Attenuation: Chlorinated Organics EACO-1." *Interstate Technology and Regulatory Council Washington D.C. (EACO-1)*.
- ITRC. 2008b. "In situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones." *Washington, D.C.: Interstate Technology & Regulatory Council, Bioremediation of DNAPLs Team*.
- ITRC. 2010. "Use and Measurement of Mass Flux and Mass Discharge." *Washington, D.C.: Interstate Technology & Regulatory Council, Integrated DNAPL Site Strategy Team (MASSFLUX-1)*.
- ITRC. 2011. "Permeable Reactive Barrier: Technology Update." *Washington, D.C.: Interstate Technology & Regulatory Council, PRB: PRB-5*.
- ITRC. 2011a. "Biofuels, Release Prevention, Environmental Behavior, and Remediation." *Interstate Technology and Regulatory Council, Washington D.C.*
- ITRC. 2011b. Environmental Molecular Diagnostics Fact Sheets. EMD-1. *Washington, D.C.: interstate Technology and Regulatory Council*.
- ITRC. 2011c. "Integrated DNAPL Site Strategy." *Washington, D.C.: Interstate Technology & Regulatory Council, Integrated DNAPL Site Strategy Team. (IDSS-1.)*.
- ITRC. 2011d. "Project Risk Management for Site Remediation." *Interstate Technology and Regulatory Council RRM-1*.
- ITRC. 2013a. "Environmental Molecular Diagnostics, New Site Characterization and Remediation Enhancement Tools." *Washington, D.C.: Interstate Technology & Regulatory Council, Environmental Molecular Diagnostics Team (EMD-2)*.
- ITRC. 2013b. "Groundwater Statistics and Monitoring Compliance Website." *Interstate Technology and Regulatory Council*.
- ITRC. 2015. "Integrated DNAPL Site Characterization and Tools Selection (ISC-1)." *Washington D.C.: Interstate Technology and Regulatory Council, DNAPL Site Characterization Team*.
- ITRC. 2016. "Geospatial Analysis for Optimization at Environmental Sites." *Interstate Technology and Regulatory Council*.

- ITRC. 2017a. "Characterization and Remediation of Fractured Rock." *Interstate Technology and Regulatory Council, Washington D.C. FracRx-1.*
- ITRC. 2017b. "Remediation Management of Complex Sites." *Interstate Technology and Regulatory Council RMCS-1.*
- ITRC. 2018. "LNAPL Site Management: LCSM Evolution, Decision Process, and Remedial Technologies." *Interstate Technology and Regulatory Council*
- ITRC. 2019. "Implementing Advanced Site Characterization Tools." Washington, D.C.: Interstate Technology & Regulatory Council, ASCT: ASCT-1.
- Johnson, C.D., and M. J. Truex. 2006. "rtFlux: RT3D Flux Plane Utility."
- Krembs, F.J. and W.S. Clayton. 2010. "ISCO design best practices as demonstrated by past case study data." *The Seventh International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California, May 24-27, 2010.*
- LARWQB, Los Angeles Regional Water Quality Control Board. 2008. "Technical Report: Subsurface injection of In situ Remedial Reagents (ISRRS) within the Los Angeles Regional Water Quality Control Board Jurisdiction." 46.
- Lebron, Carmen. 2011. "Development and Validation of a Quantitative Framework and Management Expectation Tool for the Selection of Bioremediation Approaches at Chlorinated Solvent Sites." *SERDP - ESTCP ER-201129.*
- Little, C. D., A. V. Palumbo, S. E. Herbes, M. E. Lidstrom, R. L. Tyndall, and P. J. Gilmer. 1988. "Trichloroethylene biodegradation by a methane-oxidizing bacterium." *Applied Environmental Microbiology* 54 (4):951-956.
- Maillacheruvu, K. Y. and G. F. Parkin. 1996. "Kinetics of Growth, Substrate Utilization, and Sulfide Toxicity for Propionate, Acetate, and Hydrogen Utilizers in Anaerobic Systems." *Water Environmental Research* 1996 (68).
- Munakata-Marr, J., P. L. McCarty, M. S. Shields, M. Reagin, and S. C. Francesconi. . 1996a. "Enhancement of trichloroethylene degradation in aquifer microcosm bioaugmented with wild type and genetically altered *Burkholderia (Pseudomonas) cepacia G4 and PR1.*" *Environmental Science and Technology* 30 (6):2045-2062.
- Munakata-Marr, J., P.L.McCarty,M.S. Shields, M. Reagin, S.C. Francesconi. 1996b. "Enhancement of trichloroethylene degradation in aquifer microcosms bioaugmented with wild type and genetically altered *Burkholderia (Pseudomonas) cepacia G4 and PR1.*" *Environmental Science and Technology.*
- NAVFAC. 2013a. "Best Practices for Injection and Distribution of Amendments." Battelle Memorial Institute and NAVFAC Alternative Restoration Technology Team. March 2013 *Technical Report (TR-NAVFAC-EXWC-EV-1303).*
- NAVFAC. 2013b. "Sampling and Analysis Plan for Groundwater Sample and Analysis Monitoring Plan At Site 11, Old Camden County Landfill - Naval submarine Base Kings Bay, Kings bay, Georgia " *N42237 .AR.001228,NSB KINGS BAY 5090.3A.*
- NAVFAC. 2015. "Biogeochemical Transformation Handbook." Engineering and Expeditionary Warfare Center, *Technical Report TR-NAVFAC EXWC-EV-1601.*
- NAVFAC. 2018. "Advances in the State of the Practice for Enhanced In Situ Bioremediation." *Technical Report TR-NAVFAC EXWC-EV-1806.*
- Neilsen, D.M. 1991. "Practical Handbook for Groundwater Monitoring." 728.
- NFESC. 2002. "Surfactant-Enhanced Aquifer Remediation (SEAR) Design Manual." NFESC Technical Report *TR-2206-ENV.*
- NIOSH. 2006. "Handbook for Methane Control in Mining." *Department of Health and Human Services, Center for Disease Control IC 9486 Information (IC 9486 Information Circular/2006.).*
- NJDEP. 2017. "In Situ Remediation: Design Considerations and Performance Monitoring Technical Guidance Document." *NJDEP Site Remediation and Waste Management Program, October 2017.* New Jersey Department of Environmental Protection, Site Remediation and Waste Management Program (Version 1.0).
- Oldenhuis, R., Vink, R.L.M., Janssen, D.B., and Witholt, B. 1989. "Degradation of chlorinated aliphatic hydrocarbons by *Methylosinus trichosporium OB3b* expressing soluble methane monooxygenase." *Appl Environ Microbiol* 55:2819-2826.
- Parker, J., K. Ungtac, P. Kitanidis, M. Cardiff, L. Xiaoyi, and L. Jonghyum 2011. "Practical Cost-Optimization of Characterization and Remediation at DNAPL Sites with Consideration of Prediction Uncertainty." (SERDP Project ER-1611).
- PERF. 2013. "Performance evaluation of in situ chemical oxidation of petroleum impacts in soil and groundwater." *Petroleum Environmental Research Forum (PERF) Project 2009-01.*
- Perolo, L. W. . 2010. "In Situ Bioremediation of Organic Pollutants in Aquatic Sediments - A Review." *Journal of Hazardous Material* 177:81 - 89.

- PNNL. 2015. "Performance Assessment for Pump and Treat Closure or Transition." *Pacific Northwest National Laboratory Provectus Environmental Products, Inc. "Provect-CH4™ Methane Inhibitor / ERD and ISCR Supplement."* Illinois, Freeport, 17 July 2014.
- Rouse, J. D., D. A. Sabatini, R. E. Brown, J. H. Harwell. 1996. "Evaluation of Ethoxylated Alkylsulfate Surfactants for Use in Subsurface Remediation." *Water Environmental Research Foundation*, February 6 2014 68:162 - 168.
- Ryoo, D.; Shim, H. Canada, K. Barbieri, and P Wood 2000. "Aerobic degradation of Tetrachloroethylene by toluene-o-xylene mkonooxygenase of *Pseudomonas stutzeri* OX1." *Nat Biotechnol* 18:775-778.
- Sander, R. 1999. "Modeling Atmospheric Chemistry: Interactions between Gas-Phase Species and Liquid Cloud/Aerosol Particles." *Surveys in Geophysics* (20(1)):1-31.
- Sayler, G. S. and S. Ripp. 2000. "Field applications of genetically engineered microorganisms for bioremediation processes." *Current Opinion in Biotechnology* 11:286 - 289.
- Schechter., Bourrel M. and R. S. 1988. "Microemulsions and Related Systems: Formulation, Solvency, and Physical Properties " *Surfactant Science Series, Marcel Dekker, Inc., New York and Basel, 1988.* 30.
- Schink, B. . 1997. "Energetics of Syntrophic Cooperation in Methanogenic Degradation." *Microbiology and Molecular Biology Reviews* 61(2):262-280.
- Semprini, L., G.D. Hopkins. P.L. McCarty, and P.V. Roberts. 1992. "In situ Transformation of Carbon Tetrachloride and other Halogenated Compounds Resulting from Biostimulation Under Anoxic Conditions." *Environmental Science and Technology*.
- SERDP. 2006a. "In Situ Chemical Oxidation for Groundwater Remediation - Technology Practices Manual." *SERDP - ESTCP ER-200623.*
- SERDP. 2006b. "In Situ Chemical Oxidation for Groundwater Remediation - Technology Practices Manual." *SERDP - ESTCP.*
- SERDP. 2006c. "Loading Rates and Impacts of Substrate Delivery for Enhanced Anaerobic Bioremediation." *SERDP - ESTCP.*
- Shook, G.M.; S.L. Ansley and A. Wylie. 2004. "Tracers and Tracer Testing: Design, Implementation and Interpretation Methods." *INEEL/EXT-03-01466.*
- Siegrist, R.L., M.A. Urynowicz, O.R. West, M.L. Crimi, and K.S. Lowe. 2001. "Principles and Practices of In Situ Chemical Oxidation Using Permanganate." *Battelle Memorial Press, Columbus, Ohio,* :348.
- Suthersan, S.S., C. Divine, E. Cohen, K. Heinze. 2014. "Tracer testing: recommended best practice for design and optimization of in situ remediation systems." *Groundwater Monitoring and Remediation* 34 (3):33-40.
- Suthersan, S. J. McDonough, M. Schnobrich, C. Devine. 2017. "In situ chemical treatment: a love-hate relationship." *Groundwater Monitoring & Remediation* 37 (1):17-26.
- TerraSystems. Unpublished Report. "Case Study of pH Adjustment at a New Jersey Remediation Site."
- Turgeon, Magalie, and Karine Drouin. "Fact Sheet: Bioaugmentation - in Situ." *Government of Canada*, March 7, 2019. <https://gost.tpsgc-pwgsc.gc.ca/tfs.aspx?id=3&lang=eng>.
- USACE. 2000. "SEAM3D: A Numerical Model for Three Dimensional Solute Transport and Sequestration Electron Acceptor-Based Bioremediation in Groundwater." *US Army Corp of Engineers, Engineering Research and Development Center* November 2000.
- USACE. 2003. "Rehabilitation of Injection and Extraction Wells." *U.S. Army Corps of Engineers*
- USEPA. 1997. "BIOSCREEN, Natural Attenuation Decision Support System." *Water Research.*
- USEPA. 1998. "Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water " (EPA/600/R-98?128).
- USEPA. 2000. "Engineered Approaches to In Situ Bioremediation of Chlorinated Solvents: Fundamentals and Field Applications." *EPA 542-R-00-008.*
- USEPA. 2001. "Use of Bioremediation at Superfund Sites." (EPA 542-R-01-019ITRC).
- USEPA. 2004. "Performance Monitoring of Remedies for VOCs in Groundwater." (EPA/600/R-04/027).
- USEPA. 2006a. "Guidance on Systematic Planning Using Data Quality Objectives Process " (EPA/240/B-001).
- USEPA. 2006b. "In Situ and Ex Situ Biodegradation Technologies for Remediation of Contaminated Sites." *EPA 625-R-06-015.* Engineering Issue.
- USEPA. 2007. "Remediation Evaluation Model for Chlorinated Solvents (REMChlor)." *USEPA Water REsearch.*

- USEPA. 2008. "A Guide for Assessing Biodegradation and Source Identification of Organic Ground Water Contaminants Using Compound Specific Isotope Analysis." EPA 600-R—08/148.
- USEPA. 2011a. "An Approach for Evaluating the Progress of Natural Attenuation in Groundwater." EPA 600/R-11/204.
- USEPA. 2011b. "Environmental Cleanup Best Management Practices: Effective Use of the Project Life cycle Conceptual Site Model ".
- USEPA. 2012a. "A Citizen's Guide to In Situ Chemical Reduction." Office of Solid Waste and Emergency Response EPA 542-F-12-012.
- USEPA. 2012b. "Groundwater Sample Preservation at In-situ Chemical Oxidation Sites – Recommended Guidelines." EPA/600/R-12/049.
- USEPA. 2013. "Lessons from Greening America's Capitals Projects: Five Helpful Hints for Communities Wanting to be Greener." EPA-231-F-12-001.
- USEPA. 2016. "Pilot-scale Demonstration of In Situ Chemical Oxidation Involving Chlorinated Volatile Organic Compounds: Design Deployment Guidelines." EPA 600-R-16-383.
- USEPA. 2017a. "Best Practice for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models." EPA /600/R-17/293.
- USEPA. 2017b. "Superfund Optimization Progress Report 2011 – 2015." EPA-542-R-17-002.
- USEPA. 2018a. "Examples of Groundwater Remediation at NPL Sites." EPA-542-R-18-002.
- USEPA. 2018b. "In Situ Treatment Performance Monitoring: Issues and Best Practices." *Groundwater Forum Issue Paper* EPA-542-F-18-002:15.
- USEPA. 2018c. "Remedial Technology Fact Sheet – Activated Carbon-Based Technology for In Situ Remediation."
- USGS. 2009. "Monitoring the Efficiency of Natural Attenuation at the Old Camden County Landfill, Kings Bay Naval Submarine Base." *US Geological Survey* October 2009.
- Waybrant, K., Carol Ptacek, and D. W. Blowes. 2002. *Treatment of Mine Drainage Using Permeable Reactive Barriers: Column Experiments*. Vol. 36.
- West, C. C. and J.H. Harwell. 1992. "Surfactants and Subsurface Remediation." *Environmental Science and Technology* 26:2324-2330.
- Wiedemeier, T. W., H. S. Rifai, C. J. Newell, and J. W. Wilson. 1999. "Natural Attenuation of Fuels and Chlorinated Solvents." *New York: Wiley*.
- Wiedemeier, Todd, J. Wilson, D. Freedman, & B., Lee. 2017. "Providing Additional Support for MNA by Including Quantitative Lines of Evidence for Abiotic Degradation and Co-metabolic Oxidation of Chlorinated Ethylenes." *Technical Report* ER-201584.
- Wilson, J. T. and B. H. Wilson. 1985. "Biotransformation of trichloroethylene in soil." *Applied and Environmental Microbiology* 49:242-243.
- Yongtian, H., C. Su, J. T. Wilson, R. T. Wilkin, C. J. Adair, T. R. Lee, P. Bradley, And M. Ferrey. 2010. "Identification and Characterization Methods for Reactive Minerals Responsible for Natural Attenuation of Chlorinated Organic Compounds in Ground Water." (EPA/600/R-09/115, 2010.).
- Zheng, C. 2010. "MT3DMS 5.3 Supplemental Users Guide." *Technical Report to the U.S. Army Engineer Research and Development Center: Department of Geological Sciences, University of Alabama*, 5.3:220 p.
- Zheng, C., and Wang, P., . 1999. "A modular three-dimensional multispecies transport model for simulation of advection, dispersion, and chemical reactions of contaminants in groundwater systems; Documentation and user's guide: ." *Contract Report SERDP-99-1: Vicksburg, Miss., U. S. Army Engineer Research and Development Center*.:169.

[Click here](#) to download the entire document.