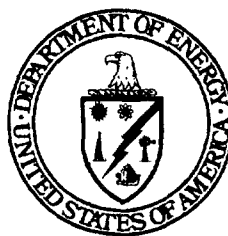


Federal Publications on Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation

Second Edition



Federal Remediation Technologies Roundtable



Prepared by the

**Member Agencies of the
Federal Remediation Technologies Roundtable**

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U.S. Environmental Protection Agency
Department of Defense
 U.S. Air Force
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PREFACE

The Federal Remediation Technologies Roundtable (Roundtable) developed this bibliography to publicize the availability of Federal documents pertaining to innovative and alternative technologies to treat hazardous wastes. The first edition of the bibliography was published in 1991.

This updated edition contains references for documents and reports from the U.S. Environmental Protection Agency (EPA), the U.S. Army, the U.S. Navy, the U.S. Air Force, the U.S. Department of Energy (DOE), and the U.S. Department of Interior (DOI). Publications appearing for the first time in this edition are denoted with an asterisk. The Roundtable obtained this reference information from a variety of sources:

- Federal Agency report, project and publication lists from EPA, the Naval Civil Engineering Laboratory, the U.S. Army Toxic and Hazardous Materials Agency, the U.S. Army Engineer Waterways Experiment Station, the Air Force Engineering and Sciences Center, DOE, and DOI; and
- the National Technical Information Service (NTIS) and other data bases.

This bibliography addresses technologies that provide for the treatment of hazardous wastes; therefore, it does not contain information or references for containment or other non-treatment strategies, such as landfilling and capping. This bibliography emphasizes innovative technologies for which detailed cost and performance data are not available. Information on more conventional treatment technologies, such as incineration and solidification, is not included.

In addition to improving access to information on innovative technologies, the Roundtable hopes this bibliography will assist in the coordination of ongoing research initiatives and increase the development and implementation of these innovative technologies for corrective action and site remediation. This bibliography is intended as a starting point in your pursuit of information on innovative alternative hazardous waste treatment technologies and should not be considered all-inclusive. At the end of this document (page 27), you will find instructions for ordering publications you may be interested in.

This bibliography will be revised periodically. Therefore, if your Agency has produced any publications on innovative remediation technologies that should be included in future versions of this bibliography, or if you have any suggestions for improving this document, please complete the suggestion form on page 29, or contact the EPA Technology Innovation Office:

Daniel Powell
Technology Innovation Office (OS-110W)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

A. INTERNATIONAL SURVEYS AND CONFERENCES

EPA

- *Assessment of International Technologies for Superfund Applications: Technology Review and Trip Report Results.*
EPA/540/2-88/003
- *Assessment of International Technologies for Superfund Applications: Technology Identification and Selection.*
EPA/600/2-89/017
- *Forum on Innovative Hazardous Waste Treatment Technologies, Domestic and International, (Abstract Proceedings).*
EPA/540/2-89/055 (First Forum, Atlanta, GA)
EPA/540/2-90/009 (Second Forum, Philadelphia, PA)
EPA/540/2-91/016 (Third Forum, Dallas, TX)
- *NATO/CCMS Project — International Evaluation of In Situ Bioremediation of Contaminated Soil and Groundwater.*
EPA/540/2-90/012
- * • *NATO/CCMS Project — Demonstration of Remedial Action Technologies for Contaminated Land and Ground Water.*
Proceedings are maintained in the Hazardous Waste Collection, EPA Headquarters Library, Washington, DC
- * • *Remedial Action, Treatment, and Disposal of Hazardous Waste: Proceedings of the 18th Annual RREL Hazardous Waste Research Symposium.*
EPA/600/R-92/028
- * • *Residual Radioactivity and Recycling Criteria: Workshop Proceedings.*
EPA 520/1-90/013; NTIS: PB 91-179 119
- *Second International Conference on New Frontiers for Hazardous Waste Management: Proceedings of a Conference Held in Pittsburgh, PA, Sept. 27-30, 1987.*
EPA/600/9-87/018F
- *Third International Conference on New Frontiers for Hazardous Waste Management: Proceedings of a Conference Held in Pittsburgh, PA, Sept. 10-13, 1989.*
EPA/600/9-89/072

DOE

- *Bioremediation of Mercury-Contaminated Sites: Foreign Trip Report, Sept. 9-17, 1989.*
Turner, R.R. Oak Ridge National Laboratory, DOE, TN. Sept. 1989.
ORNL/FTR-3393; NTIS or OSTI: DE90001248

B. TECHNOLOGY SURVEY REPORTS

EPA

- *A Compendium of Technologies Used in the Treatment of Hazardous Waste.*
EPA/625/8-87/014
- *Approaches for Remediation of Uncontrolled Wood Preserving Sites.*
EPA/625/7-90/011
- *Assessing Detoxification and Degradation of Wood Preserving and Petroleum Wastes in Contaminated Soil.* April, W., R. Sims, and J. Sims. Waste Management & Research. 8(1): 45-65. Feb. 90.
EPA/600/J-90/009; NTIS: PB 90-243275
- * • *Assessment of International Technologies for Superfund Applications — Technology Identification and Selection.*
EPA/600/S2-89/017
- * • *Assessment of Technologies for the Remediation of Radioactively Contaminated Superfund Sites.*
EPA/540/2-90/001; NTIS: PB 90-204140
- * • *Compendium of Costs of Remedial Technologies at Hazardous Waste Sites.*
EPA/600/S2-87/087
- * • *EPA Workshop on Radioactively Contaminated Sites.*
EPA/520/1-90-009; NTIS: PB 90-227 950/AS
- * • *General Methods for Remedial Operation Performance Evaluation.*
EPA/600/R-92/002
- *Guidance on Remedial Action for Superfund Sites with PCB Contamination.*
EPA/540/G-90/007
- *Guide to Treatment Technologies for Hazardous Wastes at Superfund Sites.* Office of Environmental Engineering and Technology, U.S. EPA, Washington, DC. Mar. 1989.
EPA/540/2-89/052; NTIS: PB 89-190821/XAB
- *Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils.*
EPA/540/2-90/002
- * • *Handbook: Stabilization Technologies for RCRA Corrective Action.*
EPA/625/6-91/-2C
- *In Situ Restoration Techniques for Aquifers Contaminated with Hazardous Wastes.* Lee, M.D., J.T. Wilson, and C.H. Ward. Journal of Hazardous Materials. Elsevier Science Publishers B.V. Amsterdam, The Netherlands. 14: 71-82. 1987.
EPA/600/J-87/032; NTIS: PB 87-198396

- *Innovative Operational Treatment Technologies for Applications to Superfund Sites.*
EPA/540/2-90/006
EPA/540/2-90/004 (Nine Case Studies)
- *Innovative Processes for Reclamation of Contaminated Subsurface Environments.* Canter, L.W., L.E. Streebin, M.C. Arquiga, F.E. Carranza, and B.H. Wilson.
EPA/600/2-90/017 (Project Summary); NTIS: PB 90-199514
- * • *Innovative Treatment Technologies: Overview and Guide to Information Sources, October 1991.*
EPA/540/9-91/002
- * • *Innovative Treatment Technologies: Semi-Annual Status Report.* Number 3, April 1992.
EPA/540/2-91/001
- * • *Literature Survey of Innovative Technologies for Hazardous Waste Site Remediation: 1987-1991 — Preliminary Draft.* Feb. 1992.
No published documentation number.
- *Mobile Treatment Technologies for Superfund Wastes.*
EPA/540/2-86/003f
- * • *On-Site Treatment of Creosote and Pentachlorophenol Sludges in Contaminated Soil.*
EPA/600/2-91/019
- *PCB (Polychlorinated Biphenyl) Sediment Decontamination, Technical/Economic Assessment of Selected Alternative Treatments: Final Report, Jun. 1985-Feb. 1986.* Carpenter, B.H. Hazardous Waste Engineering Research Laboratory, U.S. EPA, Cincinnati, OH. Dec. 1986.
EPA/600/2-86/112
- * • *Procuring Innovative Technologies at Remedial Sites: Q's and A's and Case Studies.* (Fact Sheet)
EPA/542/F-92/012
- * • *Remediation of Contaminated Sediments.*
EPA/625/6-91/028
- * • *Remediation of Sites Contaminated with TCE.*
EPA/600/J-91/030
- *Report on Decontamination of PCB-Bearing Sediments.* Wilson, D.L. Hazardous Waste Engineering Research Laboratory, U.S. EPA, Cincinnati, OH. Oct. 1987.
EPA/600/2-87/093
- *Review of In-Place Treatment Techniques for Contaminated Surface Soils. Volume I. Technical Evaluation.*
EPA/540/2-84/003a
- *Seminar Publication — Corrective Actions: Technologies and Applications.*
EPA/625/4-89/020

- *Summary of Treatment Technology Effectiveness for Contaminated Soil: Final Report.*
EPA/540/2-90/002
- * • *Superfund Engineering Issue—Treatment of Lead Contaminated Soils.*
EPA/540/2-91/009
- *Superfund Innovative Technology Evaluation (SITE) Program — Brochure.*
EPA/540/8-89/010
- *Superfund Innovative Technology Evaluation Program — SITE Program Fact Sheet.*
OSWER Directive 9330.1-03FS
- *Superfund Innovative Technology Evaluation Program: Technology Profiles.*
EPA/540/5-91/008
- *Superfund Treatability Clearinghouse Abstracts.*
EPA/540/2-89/001
- * • *Survey of Materials-Handling Technologies Used at Hazardous Waste Sites.*
EPA/540/2-91/010
- *Technical Resource Document: Treatment Technologies for Halogenated Organic Containing Wastes. Volume I.*
EPA/600/2-87/098
- * • *Technological Approaches to the Cleanup of Radiologically Contaminated Superfund Sites.*
EPA/540/2-88/002
- *Technologies of Delivery or Recovery for the Remediation of Hazardous Waste Sites.*
EPA/600/S2-89/066 (Project Summary)
- *Technologies for In Situ Treatment of Hazardous Wastes.* Sanning, D.E. and R.F. Lewis. Hazardous Waste Engineering Research Laboratory, U.S. EPA, Cincinnati, OH. Jan. 1987.
EPA/600/D-87/014; NTIS: PB 87-146007/XAB
- *Technology Screening Guide for Treatment of Soils and Sludges.*
NTIS: PB 89-132674
- *Treatment Potential for 56 EPA Listed Hazardous Chemicals in Soil.* Sims, R.C., W.J. Doucette, J.E. McLean, W.J. Greeney, and R.R. Dupont. Feb. 1988.
EPA/600/6-88/001; NTIS: PB 89-174446
- *Treatment Technology Background Document.* Berlow, J.R. and J. Vorbach. Office of Solid Waste, U.S. EPA, Washington, DC. Jun. 1989.
EPA/530/SW-89/048A; NTIS: PB 89-221410/XAB
- * • *Workshop on Innovative Technologies for Treatment of Contaminated Sediments, June 13-14, 1990, Summary Report.*
EPA/600/S2-90/054

DOE

- *Characterization of Uranium Contaminated Soils from DOE Fernald Environmental Management Project Site: Results of Phase I Characterization.* Lee, S.Y. and J.D. March, Jr. Jan. 1992.
NTIS: ORNL/TM-11980
- *Demonstrations of Technology for Remediation and Closure of Oak Ridge National Laboratory Waste Disposal Sites.* Spalding, B.P., G.K. Jacobs, and E.C. Davis. Oak Ridge National Laboratory, DOE, TN. Sept. 1989.
NTIS: ORNL/TM-11286; or OSTI: DE90001854
- *Treatability of Hazardous Chemicals in Soils: Volatile and Semivolatile Organics.* Walton, B.T., M.S. Hendricks, T.A. Anderson, and S.S. Talmage. Oak Ridge National Laboratory, DOE, TN. Jul. 1989.
NTIS: ORNL-6451; or OSTI: DE89016892 (Also available from EPA, Ada, OK)

U.S. Army

- * • *Clean Up of Heavy Metals in Soils Technology Assessment: Draft.* Bricka, R.M. and C.W. Williford. U.S. Engineer Waterways Experiment Station, Vicksburg, MS. 1992.
No published document number.
- *Guidelines for Selecting Control and Treatment Options for Contaminated Dredged Material Requiring Restrictions: Final Report.* Cullinane, M.J., et al. U.S. Army Corps of Engineers Waterways Experiment Station. Sept. 1986.
No published document number.
- *Installation Restoration and Hazardous Waste Control Technologies.* 1990 Edition. U.S. Army Toxic and Hazardous Materials Agency. Aug. 1990.
USATHAMA: CETHA-TS-CR-90067
- * • *Proceedings from the 15th Annual Army Environmental R&D Symposium.* U.S. Army Corps of Engineers Toxic and Hazardous Materials Agency. Jun. 1991.
USATHAMA: CETHA-TS-CR-91076
- * • *Review of Removal, Containment and Treatment Technologies for Remediation of Contaminated Sediment in the Great Lakes.* Averett, D.E., B.D. Perry, and E.J. Torrey. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 1990.
WES: MP-90-25

C. TREATABILITY STUDIES (General)

EPA

- * • *Conducting Treatability Studies Under RCRA.*
OSWER Directive 9380.3-09 (Fact Sheet)
- *Groundwater and Leachate Treatability Studies at Four Superfund Sites.*
EPA/600/2-86/029

- * • *Guide for Conducting Treatability Studies Under CERCLA, Interim Final.*
EPA/540/2-89/058
- * • *Guide for Conducting Treatability Studies Under CERCLA, Soil Washing.*
EPA/540/2-89/058
- * • *Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation Remedy Screening.*
EPA/540/2-91/013B
- * • *Inventory of Treatability Study Vendors, Draft Interim Final.*
EPA/540/2-90/003a
- *Results of Treatment Evaluations of Contaminated Soils.* Esposito, P., J. Hessling, B.B. Locke, M. Taylor, and M. Szabo. Hazardous Waste Engineering Research Laboratory, U.S. EPA, Cincinnati, OH. Aug. 1988.
EPA/600/D-88/181
- * • *Treatability of Hazardous Chemicals in Soils: Volatile and Semi-Volatile Organics.*
NTIS: DE89-016892
- *Treatability Potential For EPA Listed Hazardous Wastes in Soil.* Loehr, R.C.
EPA/600/2-89/011; NTIS: PB 89-166581 (Available from EPA, Ada, OK)
- *Treatability Potential for 56 EPA Listed Hazardous Chemicals in Soil.*
NTIS: PB 89-174446 (Available from EPA, Ada, OK)

U.S. Army

- * • *Treatability of Ninth Avenue Superfund Site Groundwater.* Zappi, M.E., C.L. Teeter, and N.R. Francingues. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 1991.
WES: EL-91-8

D. GROUNDWATER

EPA

- * • *Chemical Enhancements to Pump-and-Treat Remediation.*
EPA/540/S-92/001
- * • *Containment Transport in Fractured Media: Models for Decision Makers (Issue Paper).*
EPA/540/4-89/004
- * • *Dense Nonaqueous Phase Liquids — A Workshop Summary.*
EPA/600/R-92/030
- *Emerging Technology Report — Removal and Recovery of Metal Ions from Ground Water.*
EPA/540/5-90/005a (Evaluation Report)
EPA/540/5-90/005b (Data and Supporting Information)

- * • *Estimating Potential for Occurrence of DNAPL at Superfund Sites.*
EPA Publication 9355.4-07FS
- * • *Evaluation of Ground Water Extraction Remedies.*
NTIS: PB90-18358 (Vol. 1, Summary Report)
PB90-274440 (Vol. 2, Case Studies [Interim Final])
PB90-274457 (Vol. 3, General Site Data, Data Base Reports [Interim Final])
- * • *Facilitated Transport (Issue Paper).*
EPA/540/4-89/003
- *Ground Water Issue: Dense Nonaqueous Phase Liquids.*
EPA/540/4-91/020A
- * • *Ground Water Issue — Reductive Dehalogenation of Organic Contaminants in Soils and Ground Water.*
EPA/540/4-90/054
- * • *A Guide to Pump and Treat Ground Water Technology.* November 1990.
EPA/540/2-90/018
- * • *Performance Evaluations of Pump-and-Treat Remediations.* (Issue Paper)
EPA/540/4-89/005

E. THERMAL PROCESSES

EPA

- *Applications Analysis Report (SITE Program) — American Combustion Pyretron Destruction System.*
EPA/540/A5-89/008
- *Applications Analysis Report (SITE Program) — ECOVA, Inc.: Infrared Incineration System.*
EPA/540/A5-89/007 (Also available in videocassette from EPA, Edison, NJ)
- *Engineering Bulletin — Mobile/Transportable Incineration Treatment.*
EPA/540/2-90/014
- * • *Engineering Bulletin — Thermal Desorption Treatment.*
EPA/540/2-91/008
- * • *Experience in Incineration Applicable to Superfund Site Remediation.*
EPA/625/9-88/008
- * • *High Temperature Thermal Treatment for CERCLA Waste Evaluation and Selection of Onsite and Offsite Systems.*
EPA/540/X-88/006

DOE

- * • *Evaluation of the Molten Salt Oxidation Process Technology.*
DOE/ID/12584-97, GJPO-105

U.S. Army

- *Bench-Scale Investigation of Low Temperature Thermal Stripping of Volatile Organic Compounds (VOCs) from Various Soil Types: Technical Report.* Johnson, N.P., J.W. Noland, and P.J. Marks. U.S. Army Toxic and Hazardous Materials Agency. Nov. 1987.
USATHAMA: AMXTH-TE-CR-87124
- *Demonstration of Thermal Stripping of JP-4 and other VOCs from Soils at Tinker Air Force Base, Oklahoma City, OK: Final Report.* U.S. Army Toxic and Hazardous Materials Agency. Mar. 1990.
USATHAMA: CETHA-TS-CR-90026
- *Economic Evaluation of Low Temperature Thermal Stripping of Volatile Organic Compounds from Soil: Technical Report.* Marks, P.J. and J.W. Noland. U.S. Army Toxic and Hazardous Materials Agency. Aug. 1986.
USATHAMA: AMXTH-TE-CR-86085
- * • *Final Report: Design Support for a Hot Gas Decontamination System for Explosives-Contaminated Buildings.* Maumee Research and Engineering. Apr. 1986.
USATHAMA: CETHA-TS-CR-91064
- * • *Final Technical Report: Pilot Test of Hot Gas Decontamination of Explosives-Contaminated Equipment at Hawthorne Army Ammunition Plant (HWAAP), Hawthorne, NV.* Jul. 1990.
- *Pilot Investigation of Low Temperature Thermal Stripping of Volatile Organic Compounds from Soil (2 vols.).* U.S. Army Toxic and Hazardous Materials Agency. Task 11. Jun. 1986.
USATHAMA: AMXTH-TE-TR-86074

F. BIOLOGICAL

EPA

- *Action of a Fluoranthene-Utilizing Bacterial Community of Polycyclic Aromatic Hydrocarbon Components of Creosote.*
EPA/600/J-89/425
- *Adaptation to and Biodegradation of Xenobiotic Compounds by Microbial Communities from a Pristine Aquifer.* Aelion, C.M., C.M. Swindoll, and F.K. Pfaender. Appl. Environ. Microbiol. 53(9): 2212-2217. Sept. 1987.
EPA/600/J-87/208; NTIS: PB 88-170584
- *Aerobic Biodegradation of Natural and Xenobiotic Organic Compounds by Subsurface Microbial Communities.* Swindoll, C.M., C.M. Aelion, D.C. Dobbins, et al. Environmental Toxicology and Chemistry. 7(4): 291-299. Apr. 1988.
EPA/600/J-88/067; NTIS: PB 89-103204

- *Alaskan Oil Spill Bioremediation Project.*
EPA/600/8-89/073
- *Anaerobic Biotransformations of Pollutant Chemicals in Aquifers.* Suflita, J.M., S.A. Gibson, and R.E. Beeman. Journal of Industrial Microbiology. 3(3): 179-194. May 1988.
EPA/600/J-88/142; NTIS: PB 89-119341
- *Anaerobic Degradation of Nitrogen Substituted and Sulfonated Benzene Aquifer Contaminants.* Suflita, J.M. Hazardous Wastes and Hazardous Materials. 6(2): 121-133. Spring 1989.
EPA/600/J-89/190; NTIS: PB 90-140708
- *The Anaerobic Degradation of o-, m- and p-Cresol by Sulfate-Reducing Bacterial Enrichment Cultures Obtained from a Shallow Anoxic Aquifer.* Suflita, J.M., L. Liang, and A. Saxena. Journal of Industrial Microbiology. 4(4): 255-266. Jul. 1989.
EPA/600/J-89/187; NTIS: PB 90-140674
- * • *Applications Analysis Report — Biotrol: Biotreatment of Groundwater.*
EPA/540/A5-91/001
- *Approach to Bioremediation of Contaminated Soil.*
EPA/600/J-90/203
- *Assessing Detoxification and Degradation of Wood Preserving and Petroleum Wastes in Contaminated Soil.*
EPA/600/J-90/099
- *Athias — An Information System for Abiotic Transformations of Halogenated Hydrocarbons in Aqueous Solution.* Ellenrider, W. and M. Reihhard. Chemosphere. 17(2): 331-344. Feb. 1988.
EPA/600/J-88/026; NTIS: PB 88-224357
- * • *Biological Remediation of Contaminated Sediments, with Special Emphasis on the Great Lakes.*
EPA/600/S9-91/001
- *Biological Treatment of Leachate from a Superfund Site.*
EPA/600/J-89/001
- *The Biodegradation of Cresol Isomers in Anoxic Aquifers.* Smolenski, W.J. and J.M. Suflita. Appl. Environ. Microbiol. 53(4): 710-716. Apr. 1987.
EPA/600/J-87/131; NTIS: PB 88-149125
- *Bioremediation of Contaminated Surface Soils.* Sims, J.L., R.C. Sims, and J.E. Matthews. Robert S. Kerr Environmental Research Laboratory, U.S. EPA, Ada, OK. Aug. 1989.
EPA-600/9-89/073; NTIS: PB 90-164047/XAB
- *Bioremediation of Hazardous Waste.*
EPA/600/9-90/041
- * • *Bioremediated Soil Venting of Light Hydrocarbons.*
EPA/600/J-90/397; NTIS: PB91-171538/XAB

- *Biorestitution of Aquifers Contaminated with Organic Compounds.* Lee, M.D., J.M. Thomas, R.C. Borden, P.B. Bedient, C.H. Ward, and J.T. Wilson. CRC Critical Reviews in Environmental Control. 18(1): 29-89. 1988.
EPA/600/J-88/078; NTIS: PB 89-103527
- *Biotransformation of Priority Pollutants Using Biofilms and Vascular Plants.* Wolvedon, B.C. and R.C.J. McCales. Mississippi Academy of Sciences. Vol. XXXI. pp. 79-89. 1986.
EPA/600/J-86/310; NTIS: PB 87-176764
- *Biotransformation of Selected Alkylbenzenes and Halogenated Aliphatic Hydrocarbons in Methanogenic Aquifer Material: A Microcosm Study.* Smith, B.H., G.B. Smith, and J.S. Rees. Environ. Sci. Technol. 20(10): 997-1002. 1986.
EPA/600/J-86/227; NTIS: PB 87-170791
- * • *Demonstration Bulletin: Aqueous Biological Treatment System (Fixed Film Biodegradation).*
EPA/540/M5-91/001
- *Determination and Enhancement of Anaerobic Dehalogenation: Degradation of Chlorinated Organics in Aqueous Systems.*
EPA/600/2-88/054
- *Determination of Optimal Toxicant Loading for Biological Closure of a Hazardous Waste Site.*
EPA/600/D-89/163
- *Engineering Bulletin — Slurry Biodegradation.*
EPA/540/2-90/016
- *Enhanced Bioremediation Utilizing Hydrogen Peroxide as a Supplemental Source of Oxygen.* Huling, S. and B. Bledsoe.
EPA/600/2-90/006; NTIS: PB 90-183435
- *Extrapolation of Biodegradation Results to Groundwater Aquifers: Reductive Dehalogenation of Aromatic Compounds.* Gibson, S.A. and J.M. Suflita. Appl. Environ. Microbiol. 52(4): 681-688. Oct. 1986.
EPA/600/J-86/379; NTIS: PB 87-212429/AS
- *A Field Evaluation of Bioremediation of a Fuel Spill Using Hydrogen Peroxide.*
NTIS: PB 88-130257 (Available from EPA, Ada, OK)
- *A Field Evaluation of In Situ Biodegradation for Aquifer Restoration.* Semprini, L., P. Roberts, G. Hopkins, D. Mackay. Stanford University, Stanford, CA. Nov. 1987.
EPA/600/2-87/096; NTIS: PB 88-130257
- *Innovative Technology: Slurry-Phase Biodegradation.*
OSWER Directive 9200.5-252-FS (Fact Sheet)
- *In Situ Aquifer Restoration of Chlorinated Aliphatics by Methanotrophic Bacteria.* Roberts, P., L. Semprini, G. Hopkins, et al. Jul. 1989.
EPA/600/2-89/033; NTIS: PB 89-21992/AS

- *In Situ Bioremediation of Spills from Underground Storage Tanks: New Approaches for Site Characterization, Project Design, and Evaluation of Performance.* Wilson, J.T. and L.E. Leach. EPA/600/2-89/042; NTIS: PB 89-219976 (Available from EPA, Ada, OK)
- *In Situ Bio Restoration as a Ground Water Remediation Technique.* Wilson, J.T., L.E. Leach, M.J. Henson, and J.N. Jones. Ground Water Monitoring Review. pp. 56-64. Fall 1986. EPA/600/J-86/305; NTIS: PB 87-177101
- * • *In-Situ Biotransformation of Carbon Tetrachloride under Anoxic Conditions.* EPA/600/S2-90/060
- * • *Interactive Simulation of the Fate of Hazardous Chemicals During Land Treatment of Oily Wastes: Ritz User's Guide.* NTIS: PB-88-195540
- *Laboratory Studies Evaluating the Enhanced Biodegradation of Weathered Crude Oil Components Through the Application of Nutrients.* EPA/600/D-90/139
- *Leaking Underground Storage Tanks: Remediation with Emphasis on In Situ Bio Restoration.* Thomas, J.M., M.D. Lee, P.B. Bedient, et al. Jan. 1987. EPA/600/2-87/008; NTIS: PB 87-168084
- *Lubbock Land Treatment System Research and Demonstration Project. Volume 2. Percolate Investigation in the Root Zone.* EPA/600/2-86/027b
- *Lubbock Land Treatment System Research and Demonstration Project. Volume 5. Executive Summary.* EPA/600/2-86/027e
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H. COMMUNITY RELATIONS

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EPA/530 Document Numbers:
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Aberdeen Proving Ground, Maryland 21010-5401
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