
Wiley's Remediation Technologies Handbook

Major Contaminant Chemicals and Chemical Groups

JAY H. LEHR

Senior Scientist
AR Environmental Services, Inc.
Cushing, OK

and

The Heartland Institute
Chicago, IL



A JOHN WILEY & SONS, INC., PUBLICATION

Wiley's Remediation Technologies Handbook

Wiley's Remediation Technologies Handbook

Major Contaminant Chemicals and Chemical Groups

JAY H. LEHR

Senior Scientist
AR Environmental Services, Inc.
Cushing, OK

and

The Heartland Institute
Chicago, IL



A JOHN WILEY & SONS, INC., PUBLICATION

Copyright © 2004 by John Wiley & Sons, Inc. All rights reserved.

Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
Published simultaneously in Canada.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning, or otherwise, except as permitted under Section 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, 978-750-8400, fax 978-646-8600, or on the web at www.copyright.com. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008.

Limit of Liability/Disclaimer of Warranty: While the publisher and author have used their best efforts in preparing this book, they make no representations or warranties with respect to the accuracy or completeness of the contents of this book and specifically disclaim any implied warranties of merchantability or fitness for a particular purpose. No warranty may be created or extended by sales representatives or written sales materials. The advice and strategies contained herein may not be suitable for your situation. You should consult with a professional where appropriate. Neither the publisher nor author shall be liable for any loss of profit or any other commercial damages, including but not limited to special, incidental, consequential, or other damages.

For general information on our other products and services please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993 or fax 317-572-4002.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print, however, may not be available in electronic format.

Library of Congress Cataloging-in-Publication Data:

Lehr, Jay H., 1936-

Wiley's remediation technologies handbook : major contaminant chemicals and chemical groups / Jay H. Lehr.
p. cm.

Includes bibliographical references and index.

ISBN 0-471-45599-7 (cloth)

1. Hazardous wastes--Purification--Handbooks, manuals, etc. 2. Hazardous waste site remediation--Handbooks, manuals, etc. 3. Pollutants--Handbooks, manuals, etc. 4. Hazardous substances--Handbooks, manuals, etc. I. Title: Remediation technologies handbook. II. Title.
TD1060 .L44 2004
628.5--dc22

2003023093

Printed in the United States of America.

10 9 8 7 6 5 4 3 2 1

CONTENTS

Preface	ix
Chemicals Sorted by Chemical Groups	1
Technologies Applicable to Specific Chemicals	11
Alcohols	11
Aldehydes	12
Aldehydes and Ketones	13
Aldehydes or Ketones with Other Functional Groups	13
Aliphatic Hydrocarbons	14
Aliphatic Nitriles and Cyanates	20
Aliphatic Nitrosamines	21
Aliphatic Organophosphorous Compounds	21
Alkanes and Cyclic Alkanes	21
Alkenes, Cyclic Alkenes, and Dienes	26
Alkyl Halides	27
Alkynes	28
Aluminum	28
Americium	29
Amides	30
Amines	30
Antimony	31
Aromatic Amines and Diamines	31
Aromatic Nitriles and Cyanates	34
Aromatic Nitro Compounds	34
Aromatic Nitro Compounds with Other Functional Groups	35

Aromatic Organophosphorous Compounds	35
Aromatics with Halogenated Side Chain	35
Arsenic	37
Azo Compounds	40
Azo Compounds, Hydrazine Derivatives	40
Barium	40
Benzene and Monosubstituted Benzene Hydrocarbons	42
Benzene and Substituted Benzene Hydrocarbons	67
Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)	67
Beryllium	73
Bismuth	73
Bromide Ion	73
Cadmium	73
Calcium	77
Carbon Compounds	77
Carboxylic Acids	77
Carboxylic Acids and Derivatives	79
Carboxylic Acids with Other Functional Groups	79
Cesium	80
Chlorine and Chlorine Compounds	81
Chlorine Compounds	81
Chlorine, Ionic Species	81
Chromium	83
Chromium-Containing Ionic Species	87
Cobalt	88
Copper	89
Cyclic Ethers	91
Dihalogenated and Polyhalogenated Ethers	92
Dioxin and Related Compounds	94
Disubstituted and Polysubstituted Benzene Hydrocarbons	97
Elemental Sulfur	109
Esters	109
Ethers	112
Fluoride Ion	113
Glycols	113
Glycols, Epoxides	115
Gold	115
Halogenated Aromatic Compounds	115
Halogenated Ethers and Epoxides	116
Halogenated Phenolic Compounds	116
Halophenols	116
Heterocyclic Nitrogen Compounds	123
Heterocyclic Oxygen Compounds	123
Heterocyclic Oxygen Compounds with Three or More Rings	123

Hydrazine Derivatives	124
Iodine	124
Ionic Species Containing Iron	125
Ions Containing Phosphorus	125
Ions Containing Sulfur	125
Ions with Nitrogen	126
Iron	130
Ketones	131
Lanthanides	138
Lead	138
Lead Compounds	142
Lithium	143
Magnesium	143
Manganese	144
Mercury	145
Molybdenum	147
Monohydric Phenols	148
Nickel	151
Nitrogen Compounds	154
Nitrophenolic Compounds	155
Nitrophenols	155
Nitrosamines	156
Noncyclic Aliphatic or Aromatic Ethers	156
Organophosphonates	159
Organophosphorus Compounds	159
Organosulfur Compounds with Other Functional Groups	159
Other Nitrophenols	160
Pesticides	160
Phenols	165
Platinum	166
Plutonium	166
Polycyclic Aromatic Hydrocarbons with More Than Five Fused Rings	167
Polycyclic Aromatic Hydrocarbons, Four-Ring Compounds	168
Polycyclic Aromatic Hydrocarbons, Two- or Three-Ring Compounds	175
Polycyclic Aromatic Hydrocarbons; PAH; PNA; POM	187
Polycyclic Hydrocarbons, Nonalternant Compounds with Four Fused Rings	192
Polycyclic Hydrocarbons, Nonalternant Compounds with Five Fused Rings	195
Polycyclic Hydrocarbons, Nonalternant Compounds with Fused Rings	198
Polycyclic Hydrocarbons, Nonalternant Compounds with More Than Five Fused Rings	204
Polycyclic Hydrocarbons, Nonalternant Compounds with Two or Three Fused Rings	205
Polycyclic Aromatic Hydrocarbons, Five-Ring Compounds	208

Potassium	212
Primary Alcohols	212
Primary Aliphatic Amines and Diamines	214
Pyridine and Substituted Pyridines	215
Pyrrole and Fused-Ring Derivatives of Pyrrole	215
Radionuclides	216
Radium	220
Ring-Substituted Aromatics	220
Saturated Alkyl Halides	236
Secondary Alcohols	257
Secondary Aliphatic Amines	258
Selenium	260
Silicon Compounds—Other Significant	261
Silver	261
Simple Aromatic Nitro Compounds	263
Single-Ring Heterocyclic Sulfur Compounds	266
Sodium	267
Strontium	267
Sulfides, Disulfides	268
Sulfur	269
Sulfur Compounds	269
Sulfur Compounds—Other Significant	270
Technetium	270
Tertiary Alcohols	270
Thallium	270
Thiols	271
Thiols, Sulfides, and Disulfides	271
Thorium	271
Tin	272
Titanium	272
Total Petroleum Hydrocarbons (TPH)	273
Tungsten	282
Unsaturated Alkyl Halides	282
Uranium	304
Vanadium	306
Volatile Organic Compounds	307
Zinc	316
Zirconium	319

Technologies with Abstracts and Technology Costs	320
---	------------

[Based on the Remediation Information Management System (RIMS)]

References	1148
-------------------	-------------

Specific Chemical Index	1264
--------------------------------	-------------

PREFACE

I have personally been involved in environmental remediation projects for half a century and am still going strong. In some regards it was easier decades ago when there were few proven options for the wide variety of chemical contaminants that plagued our waters, soil, and air. Of course, there were also less clear-cut success stories. Today there exists a myriad of proven options successfully implemented by intelligent environmental scientists, consulting firms, and technology providers.

It has thus become difficult to understand the many options and their efficacy under a variety of conditions relating to concentrations, media, confounding conditions, and environmental sensitivity. One always has to wonder if there might not be a better solution. Now one need wonder no longer. This handbook presents the most comprehensive collection of technologies that have proven successful in field conditions since environmental engineering became one of our nation's most important technological professions.

In this handbook you will discover 901 existing innovative and emerging solutions to contaminant problems. Each technique features a carefully worded yet brief summary of the technology written by specialists in the field in collaboration with talented technical editors. Each is accompanied by technical and cost performance reports, source documents, and the vendors that may specialize in the various applications.

Because no one would want to wade through 901 proven technologies to find the right one for his or her problem, we have provided simple paths to the right solutions.

First, we sorted every conceivable chemical of concern into chemical groups in the book's opening index. The available technologies are then listed for each chemical in the appropriate chemical group in the handbook's second index. Each technology is listed by a numeric code along with its title and a company specializing in its use.

The next section lists the 901 technologies in their numeric order with their descriptions, case studies, costs, and references. Throughout the technology section we refer to this database as RIMS, which stands for Remediation Information Management System. This, the largest section of the handbook, is followed by a compilation of references for each technology. They are again listed in numerical order, but the related references are divided into groupings that relate to total costs, technology costs, general studies, and technology descriptions. The complete bibliographic citations for these references can be found on the CD ROM that accompanies this book.

The handbook concludes with a specific chemical index that cross references every included chemical with the group with which it is linked. In short, there are simply no dead ends in this book. No matter where you start, you will find a smooth path to the information you desire.

The information in this book was obtained from every imaginable source within the environmental science and engineering profession. They include virtually every peer-reviewed journal in the field, every government-issued report, the proceedings of every related conference in the past two decades, as well as publications of commercial companies working in this field. Ultimately the providers of every technology were contacted personally for interviews involving their work. Only top-quality services and products survived the search for information and eventual publication in this handbook.

We hope every reader, company, organization, and government agency that utilizes this hard-won compendium of remediation knowledge finds it to be a useful tool in the continuing effort to improve and protect an environment that has been severely stressed by our many industrial advances.

JAY H. LEHR

AR Environmental Services, Inc.
The Heartland Institute

CHEMICALS SORTED BY CHEMICAL GROUPS

Alcohols

Aldehydes

Aldehydes

Butyraldehyde

Formaldehyde

Aldehydes and Ketones

Aldehydes or Ketones with Other Functional Groups

Aldehydes, Ketones with Other Functional Groups

Kepone; Chlordane

Aliphatic Hydrocarbons

Aliphatic Nitriles and Cyanates

Acetonitrile

Acrylonitrile

Aliphatic Nitriles

Aliphatic Nitrosamines

Aliphatic Nitrosamines

N-Nitrosodimethylamine (NDMA)

Aliphatic Organophosphorous Compounds

Aliphatic Organophosphorous Compounds

Dibutyl Phosphate

Tributyl Phosphate

Alkanes and Cyclic Alkanes

Alkanes and Cyclic Alkanes

Cyclohexane

Decane, *n*

Heptanes

Hexadecane

Hexanes

- Isobutane
- Methane
- Methyl Cyclohexane
- Nonane
- Octane, iso; Isooctane
- Pentanes
- Propane
- Alkenes, Cyclic Alkenes, and Dienes
 - Alkenes, Cyclic Alkenes, and Dienes
 - Ethylene
 - Propylene
- Alkyl Halides
- Alkynes
- Aluminum
- Americium
- Amides
 - Amides
 - Carbofuran
 - Dimethyl Acetamide
- Amines
- Antimony
- Aromatic Amines and Diamines
 - Aniline
 - Aromatic Amines and Diamines
 - Atrazine
 - Benzidine
 - Chloroaniline, 4
 - Chloroaniline(bis) Methylene; Methylene Bis(chloroaniline); MBOCA;
Dichlorodiaminodiphenyl Methane
 - Dichlorobenzidine, 3,3
 - Propazine
- Aromatic Nitriles and Cyanates
 - Aromatic Nitriles
 - Toluene Diisocyanate
- Aromatic Nitro Compounds
- Aromatic Nitro Compounds with Other Functional Groups
 - Aromatic Nitro Compounds with Other Functional Groups
 - Pentachloronitrobenzene
- Aromatic Organophosphorous Compounds
 - Aromatic Organophosphorous Compounds
 - Parathion
- Aromatics with Halogenated Side Chain
 - Aromatics with Halogenated Side Chain
 - Benzyl Chloride; Chlorotoluene, Alpha
 - DDT; Trichloro(chlorophenyl,4-bis) Ethane
- Arsenic
- Azo Compounds
 - Azo Compounds
 - Azobenzene
- Azo Compounds, Hydrazine Derivatives

- Barium
- Benzene and Monosubstituted Benzene Hydrocarbons
 - Benzene
 - Benzene and Monosubstituted Benzene Hydrocarbons
 - Biphenyl
 - Cumene; Isopropyl Benzene; Methyl ethyl Benzene
 - Ethylbenzene
 - Styrene
 - Toluene
- Benzene and Substituted Benzene Hydrocarbons
- Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)
- Beryllium
- Bismuth
- Bromide Ion
- Cadmium
- Calcium
- Carbon Compounds
 - Carbon Compounds
 - Carbon Monoxide
- Carboxylic Acids
 - Acetic Acid
 - Acrylic Acid; Propenoic Acid
 - Benzoic Acid
 - Carboxylic Acids
- Carboxylic Acids and Derivatives
- Carboxylic Acids with Other Functional Groups
 - Carboxylic Acids with Other Functional Groups
 - Dichlorophenoxyacetic Acid; 2,4-D
- Cesium
- Chlorine and Chlorine Compounds
- Chlorine Compounds
 - Chlorine Compounds
 - Chlorine Gas
- Chlorine, Ionic Species
 - Chlorides
 - Chlorine, Ionic Species
 - Perchlorates
- Chromium
- Chromium-Containing Ionic Species
 - Chromate Ion, Hexavalent Chromium
- Cobalt
- Copper
- Cyclic Ethers
 - Cyclic Ethers
 - Dioxane-1,4
 - Ethylene Oxide
- Dihalogenated and Polyhalogenated Ethers
 - Dichloroethyl, 1,1-Ether
 - Dichloromethyl, 1,1-Ether; Methyl-dichloro-1,1-ether
 - Dieldrin

- Dihalogenated and Polyhalogenated Ethers
 - Endrin
 - Trichlorophenoxyacetic, 2,4,5 Acid
- Dioxin and Related Compounds
 - Dioxin and Related Compounds
 - HxCDF; Hexachlorodibenzofurans
 - TCDD; Tetrachlorodibenzodioxins
 - TCDF; Tetrachlorodibenzofurans
- Disubstituted and Polysubstituted Benzene Hydrocarbons
 - Diethyl Benzene
 - Disubstituted and Polysubstituted Benzene Hydrocarbons
 - Ethyltoluene
 - Indene; Dihydroindene
 - Trimethyl Benzene
 - Xylenes
- Elemental Sulfur
- Epoxides
- Esters
 - Butyl Acrylate; Propenoic Acid, Butyl Ester
 - Esters
 - Ethyl Acetate
 - Ethyl Acrylate
 - Ethyl Lactate; Hydroxypropanoic Acid, Ethyl Ester
 - Methyl Methacrylate
 - Phthalate, Butyl Benzyl; Butyl Benzyl Phthalate
 - Phthalate, Dibutyl; Dibutyl Phthalate, *n*
 - Phthalate, Diethylhexyl; Diethylhexyl Phthalate
 - Phthalate, Dimethyl; Dimethyl Phthalate
 - Phthalate, Dioctyl; Di-*n*-octyl Phthalate
 - Vinyl Acetate
- Ethers
- Fluoride Ion
- Glycols
 - Ethylene Glycol
 - Glycols
 - Propylene Glycol
 - Propylene Glycol Monoethyl Ether Acetate (PGMEA)
- Glycols, Epoxides
- Gold
- Halogenated Aromatic Compounds
- Halogenated Cresols
- Halogenated Ethers and Epoxides
- Halogenated Phenolic Compounds
- Halophenols
 - Chlorophenol
 - Dichlorophenol
 - Halophenols
 - Pentachlorophenol; PCP
 - Tetrachlorophenol
 - Trichlorophenol
- Heterocyclic Nitrogen Compounds
- Heterocyclic Oxygen Compounds

Heterocyclic Oxygen Compounds with Three or More Rings

Dibenzofuran

Oxygen Heterocycles with Three or More Rings

Hydrazine Derivatives

Dimethylhydrazine, *N,N*; Unsymmetrical Dimethylhydrazine

Hydrazine Derivatives

Methylhydrazine; Monomethylhydrazine

Iodine

Ionic Species Containing Iron

Ferrocyanide Ion

Ions Containing Phosphorus

Phosphate

Ions Containing Sulfur

Sulfate Ion

Sulfide Ion

Ions with Nitrogen

Ammonium Ion; NH_4^+ Cyanide (CN^-)

Hydrazine

Nitrate (NO_3^-)

Iron

Ketones

Acetone

Butanone; MEK; Methyl Ethyl Ketone

Cyclohexanone

Isophorone

Isopropylacetone; Methyl Isobutyl Ketone; Hexone; 4-Methyl-2-pentanone

Ketones

Lanthanides

Lead

Lead Compounds

Lead Compounds

Tetraethyl Lead

Lithium

Magnesium

Manganese

Mercury

Molybdenum

Monohydric Phenols

Monohydric Phenols

Phenol

Phenol, Dimethyl; Xylenols

Phenol, Methyl; Cresols; Methyl Phenol

Nickel

Nitrogen Compounds

Ammonia

Nitrogen Trifluoride

Nitrophenolic Compounds

Nitrophenols

Nitrophenol, 4; Nitrophenol, *p*

Nitrophenols

Picric Acid; Trinitrophenol

Nitrosamines

Noncyclic Aliphatic or Aromatic Ethers

Diethyl Ether

Methyl *tert*-Butyl Ether; MTBE; Methyl Tertiary Butyl Ether

Noncyclic Aliphatic or Aromatic Ethers

Tetrahydrofuran

Organophosphonates

Diisopropyl Methyl Phosphonate; DIMP

Organophosphonates

Organophosphorus Compounds

Organosulfur Compounds with Other Functional Groups

Endosulfan

Organosulfur Compounds with Other Functional Groups

Other Nitrophenols

Dinoseb; *sec*-Butyl Dinitrophenol; Dinitrophenol, 4,6-*sec*-Butyl

Other Nitrophenols

Pesticides

Pesticides/Herbicides

Phenols

Platinum

Plutonium

Polycyclic Aromatic Hydrocarbons with More Than Five Fused Rings

Benzo(*g,h,i*)perylene

Polycyclic Aromatic Hydrocarbons with More Than Five Fused Rings

Polycyclic Aromatic Hydrocarbons, Four-Ring Compounds

Benzo(*a*)anthracene

Chrysene

Polycyclic Aromatic Hydrocarbons with Four Fused Rings

Pyrene

Polycyclic Aromatic Hydrocarbons, Two- or Three-Ring Compounds

Acenaphthene

Acenaphthylene

Anthracene

Methylnaphthalene

Naphthalene

Phenanthrene

Polycyclic Aromatic Hydrocarbons with Two or Three Fused Rings

Polycyclic Aromatic Hydrocarbons; PAH; PNA; POM

Polycyclic Hydrocarbons, Nonalternant Compounds with Four Fused Rings

Fluoranthene

Four-Ring Fused Nonalternant Hydrocarbons

Polycyclic Hydrocarbons, Nonalternant Compounds with Five Fused Rings

Benzo(*b*)fluorantheneBenzo(*k*)fluoranthene

Polycyclic Hydrocarbons, Nonalternant Compounds with Five Fused Rings

Polycyclic Hydrocarbons, Nonalternant Compounds with Fused Rings

Polycyclic Hydrocarbons, Nonalternant Compounds with More Than Five Fused Rings

Indeno(1,2,3-*cd*)pyrene

Polycyclic Hydrocarbons, Nonalternant Compounds with More Than Five Fused Rings

Polycyclic Hydrocarbons, Nonalternant Compounds with Two or Three Fused Rings

Fluorene

Indene

Polycyclic Hydrocarbons, Nonalternant Compounds with Two or Three Fused Rings

Polycyclic Aromatic Hydrocarbons, Five-Ring Compounds

Benzo(*a*)pyreneDibenzo(*a,h*)anthracene

Polycyclic Aromatic Hydrocarbons, Four-Ring Compounds

Potassium

Primary Alcohols

Benzyl Alcohol

Butanol, *n*

Ethanol

Methanol

Primary Alcohols

Primary Aliphatic Amines and Diamines

Hexylamine

Monomethylamine

Primary Aliphatic Amines

Pyridine and Substituted Pyridines

Paraquat

Pentachloropyridine

Pyridine

Pyridine and Substituted Pyridines

Pyrrole and Fused-Ring Derivatives of Pyrrole

Captan

Pyrrole and Fused-Ring Derivatives of Pyrrole

Radionuclides

Radium

Ring-Substituted Aromatics

Chlorobenzene; Monochlorobenzene

Chlorotoluene, 2

DDD; Dichloro(chlorophenyl)-bis Ethane

DDE; Dichlorodiphenyldichloroethylene

Dichlorobenzene, 1,2

Dichlorobenzene, 1,3

Dichlorobenzene, 1,4

Hexachlorobenzene

Polychlorinated Benzenes

Polychlorinated Biphenyls; PCBs; Aroclor

Ring-Substituted Aromatics

Tetrachlorobenzene

Trichlorobenzene, 1,2,4

Saturated Alkyl Halides

Bromodichloromethane

Bromoform; Tribromomethane

Butyl Chloride; Chlorobutane

Carbon Tetrachloride

Carbon Tetrafluoride

Chloroform; Trichloromethane

Chloromethane; Methyl Chloride

Dibromochloromethane

Dibromoethane, 1,2; Ethylene Dibromide

Dibromomethane

Dichlorodifluoromethane; Freon 12

Dichloroethane, 1,1

- Dichloroethane, 1,2; DCA
- Dichloropropane, 1,2
- Dichlorotrifluoroethane; HCFC-1,2,3
- Ethyl Chloride; Chloroethane
- Freon 111
- Freon 113
- Hexachlorocyclohexane; Lindane
- Hexachloroethane
- Hexafluoroethane
- Methyl Bromide; Bromomethane
- Methylene Chloride; Dichloromethane
- Saturated Alkyl Halides
- Tetrachloroethane, 1,1,2,2
- Trichloroethane, 1,1,2
- Trichloroethane, 1,1,1; TCA
- Trichlorofluoromethane; Freon 11; Fluorocarbon 11
- Trichloropropane, 1,2,3
- Secondary Alcohols
 - Isobutyl Alcohol
 - Propanol, 2; Isopropyl Alcohol; Isopropanol
- Secondary Alcohols
- Secondary Aliphatic Amines
 - HMX, Octagen, Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazine
 - RDX, Cyclonite, Hexahydro-1,3,5-trinitro-1,3,5-triazine
- Secondary Aliphatic Amines
- Selenium
- Silicon Compounds—Other Significant
 - Hexamethyldisilicon
- Silver
- Simple Aromatic Nitro Compounds
 - Dinitrotoluene
 - Nitrobenzene
- Simple Aromatic Nitro Compounds
 - Trinitrotoluene; TNT
- Single-Ring Heterocyclic Sulfur Compounds
 - Single-Ring Heterocyclic Sulfur Compounds
 - Tetrachlorothiophene
- Sodium
- Strontium
- Sulfides, Disulfides
 - Dimethyl Disulfide
 - Dimethyl Sulfide
- Sulfides, Disulfides
- Sulfonic Acids
- Sulfonic Acids, Sulfoxides
- Sulfoxides
- Sulfur, Compounds and Ions
- Sulfur Compounds
 - Carbon Disulfide
 - Hydrogen Sulfide
 - Sulfur Oxides

Sulfur Compounds—Other Significant
Sulfur Hexafluoride
Technetium
Tertiary Alcohols
Tertiary Amines (Alkyl, Aryl)
Tertiary Amines (Alkyl, Aryl)
Thallium
Thiols
Methanethiol; Methyl Mercaptan
Thiols, Mercaptans
Thiols, Sulfides, and Disulfides
Thorium
Tin
Titanium
Total Petroleum Hydrocarbons (TPH)
Tungsten
Unsaturated Alkyl Halides
Aldrin
Chlordane; Octachlorohexahydromethanoindene
Dichloroethene, 1,1
Dichloroethene, 1,2; DCE
Heptachlor
Hexachlorobutadiene
Hexachlorocyclopentadiene
Tetrachloroethene; Perchloroethylene; PCE
Toxaphene; Chlorinated Camphor
Trichloroethene; Trichloroethylene; TCE
Unsaturated Alkyl Halides
Vinyl Chloride
Uranium
Vanadium
Volatile Organic Compounds (VOCs)
Zinc
Zirconium

TECHNOLOGIES APPLICABLE TO SPECIFIC CHEMICALS

ALCOHOLS

- T0024 Air Stripping—General
- T0101 Bio-Genesis Technologies, Aerobic Biotreatment System (ABS)
- T0110 Biorem Technologies, Inc., Soil Pile Bioremediation
- T0120 BioSystems Technology, Inc., Biosolids-Enhanced Remediation (BER)
- T0127 Blast Fracturing—General
- T0130 Bohn Biofilter Corporation, Bohn Off-Gas Treatment
- T0138 Calgon Carbon Corporation, Perox-Pure
- T0144 Carus Chemical Company, CAIROX Potassium Permanganate
- T0148 CBA Environmental Services, Inc., Mobile Injection Treatment Unit (MITU)
- T0161 Chemical Oxidation—General
- T0196 Dames & Moore, Bioinfiltration
- T0224 ECO Purification Systems USA, Inc., ECOCHOICE
- T0236 Electrokinetic Remediation—General
- T0309 Fixed-Bed Soil Biofilters—General
- T0337 Geokinetics International, Inc., Pool Process Electrokinetic Remediation
- T0346 Geotech Environmental Equipment, Inc., Scavenger Recovery Systems
- T0367 Harding ESE, Inc., In Situ Vadose Zone Soil Treatment
- T0370 High Mesa Technologies, L.L.C., Silent Discharge Plasma
- T0408 In-Situ Fixation, Inc., Dual Auger System
- T0422 InterBio, Petrobac
- T0423 InterBio, Phenobac
- T0467 KSE, Inc., AIR-II Process
- T0490 M4 Environmental, L.P., Catalytic Extraction Process
- T0494 ManTech Environmental Corporation, CleanOX Process
- T0498 Matrix Photocatalytic, Inc., TiO₂ Photocatalytic Treatment System
- T0509 Metal-Based Permeable Reactive Barriers—General

T0541	MYCELX Technologies Corporation, MYCELX
T0552	NEPCCO, Photocatalytic Oxidation Technology
T0585	Oxidation Systems, Inc., HYDROX Oxidation Process
T0599	PerkinElmer, Inc., NoVOCs
T0606	PHYTOKinetics, Inc., Phytoremediation
T0617	PPC Biofilter
T0637	R.C. Costello and Associates, Inc., Actopentin Biomass Filter
T0641	Radian International, L.L.C., Aquadetox/Soil Vapor Extraction (SVE)
T0683	Sandia National Laboratory and Illinois Institute of Technology, Thermally Enhanced Vapor Extraction System (TEVES)
T0698	Scientific Ecology Group (SEG), Steam Reforming—Synthetica Technologies Detoxifier (STD)
T0727	Soliditech, Inc., Soliditech Solidification and Stabilization Process
T0796	Thermatrix, Inc., PADRE Air Treatment Systems
T0802	ThermoRetec, Microbial Fence
T0817	T-Thermal Company, Submerged Quench Incineration
T0826	U.S. Filter/Zimpro Products, Powdered Activated Carbon Treatment (PACT)
T0855	Vapor-Phase Biofiltration—General

ALDEHYDES

Aldehydes

T0108	Biomim, Inc., Organoclay
T0120	BioSystems Technology, Inc., Biosolids Enhanced Remediation (BER)
T0130	Bohn Biofilter Corporation, Bohn Off-Gas Treatment
T0135	Calgon Carbon Corporation, Activated Carbon
T0136	Calgon Carbon Oxidation Technologies, Rayox
T0138	Calgon Carbon Corporation, Perox-Pure
T0144	Carus Chemical Company, CAIROX Potassium Permanganate
T0161	Chemical Oxidation—General
T0309	Fixed-Bed Soil Biofilters—General
T0370	High Mesa Technologies, L.L.C., Silent Discharge Plasma
T0371	High Voltage Environmental Applications, Inc., High-Energy Electron Beam Irradiation
T0498	Matrix Photocatalytic, Inc., TiO ₂ Photocatalytic Treatment System
T0541	MYCELX Technologies Corporation, MYCELX
T0607	Phytoremediation—General
T0617	PPC Biofilter
T0636	Quad Environmental Technologies Corporation, Chemtact Gaseous Waste Treatment
T0637	R.C. Costello and Associates, Inc., Actopentin Biomass Filter
T0683	Sandia National Laboratory and Illinois Institute of Technology, Thermally Enhanced Vapor Extraction System (TEVES)
T0795	Thermatrix, Inc., Flameless Thermal Oxidizer (FTO)
T0833	Ultraviolet Oxidation (UV/Oxidation)—General
T0834	Ultrox International/U.S. Filter, Ultrox Advanced Oxidation Process
T0853	UV Technologies, Inc., UV-CATOX Technology
T0855	Vapor-Phase Biofiltration—General

Butyraldehyde

T0130	Bohn Biofilter Corporation, Bohn Off-Gas Treatment
T0855	Vapor-Phase Biofiltration—General

Formaldehyde

- T0130 Bohn Biofilter Corporation, Bohn Off-Gas Treatment
- T0136 Calgon Carbon Oxidation Technologies, Rayox
- T0138 Calgon Carbon Corporation, Perox-Pure
- T0161 Chemical Oxidation—General
- T0371 High Voltage Environmental Applications, Inc., High-Energy Electron Beam Irradiation
- T0607 Phytoremediation—General
- T0617 PPC Biofilter, Biofiltration Systems
- T0636 Quad Environmental Technologies Corporation, Chemtact Gaseous Waste Treatment
- T0795 Thermatrix, Inc., Flameless Thermal Oxidizer (FTO)
- T0833 Ultraviolet Oxidation (UV/Oxidation)—General
- T0853 UV Technologies, Inc., UV-CATOX Technology
- T0855 Vapor-Phase Biofiltration—General

ALDEHYDES AND KETONES

- T0024 Air Stripping—General
- T0130 Bohn Biofilter Corporation, Bohn Off-Gas Treatment
- T0144 Carus Chemical Company, CAIROX Potassium Permanganate
- T0161 Chemical Oxidation—General
- T0318 FRX, Inc., Hydraulic Fracturing
- T0354 Grace Bioremediation Technologies, Daramend Bioremediation Technology
- T0406 In Situ Soil Vapor Extraction (SVE)—General
- T0422 InterBio, Petrobac
- T0498 Matrix Photocatalytic, Inc., TiO₂ Photocatalytic Treatment System
- T0541 MYCELX Technologies Corporation, MYCELX
- T0617 PPC Biofilter, Biofiltration Systems
- T0691 SBP Technologies, Inc., Solid-Phase Bioremediation
- T0779 Terra Vac, Inc., Vacuum Extraction
- T0834 Ultrox International/U.S. Filter, Ultrox Advanced Oxidation Process
- T0855 Vapor-Phase Biofiltration—General

ALDEHYDES OR KETONES WITH OTHER FUNCTIONAL GROUPS**Aldehydes, Ketones with Other Functional Groups**

- T0056 Arctech, Inc., Light-Activated Reduction of Chemicals (LARC)
- T0079 BasysTechnologies, Basys Biofilter
- T0168 CleanSoil, Inc., The CleanSoil Process
- T0726 Solidification/Stabilization—General
- T0755 Supercritical Carbon Dioxide Extraction—General
- T0827 U.S. Filter/Zimpro Products, Wet Air Oxidation

Kepone; Chlordecone

- T0056 Arctech, Inc., Light-Activated Reduction of Chemicals (LARC)
- T0726 Solidification/Stabilization—General
- T0755 Supercritical Carbon Dioxide Extraction—General
- T0827 U.S. Filter/Zimpro Products, Wet Air Oxidation

ALIPHATIC HYDROCARBONS

T0003	Abanaki Corporation, Active Belt Oil Skimmers
T0009	Advanced Environmental Services, Inc., System 64MT Low-Temperature Thermal Desorption
T0019	AER Labs, Landtreat Process
T0024	Air Stripping—General
T0025	Akzo Nobel MPP Systems, Macro Porous Polymer (MPP)
T0029	Alternative Technologies for Waste, Inc., Detoxifier In Situ Steam/Hot-Air Stripping Unit
T0032	Alzeta Corporation, EDGE Thermal Processing Units
T0036	American Soil Technologies, Inc., Bio-Spin
T0047	Aqualogy BioRemedics, Environmental Quality NutriBac
T0050	Aquathermolysis—General
T0051	ARC Sonics, Inc., Sonic Reactor (or Sonic Grinder)
T0052	ARCADIS Geraghty and Miller, In Situ Reactive Zones Using Molasses
T0057	Arctech, Inc., Ozo-Detox
T0065	Argonne National Laboratory, Remediation Using Foam Technology
T0070	ARS Technologies, Inc., Pneumatic Fracturing Extraction
T0071	ASTEC, Inc./SPI Division Low-Temperature Thermal Desorption with Heat Recovery
T0075	B & S Research, Inc., B&S Achieve—B&S Industrial
T0078	Barr Engineering Company, Co-Burning Technology
T0091	BenCHEM, Inc., Soil Washing Technology
T0092	Billings and Associates, Inc., Subsurface Volatilization and Ventilation System
T0093	Bio Solutions, Inc., Soil Slurry—Sequencing Batch Reactor
T0095	Bio-Electrics, Inc., Electrofrac Detoxification System
T0096	BioEnviroTech, Inc., BioPetro
T0098	BioGee International, Inc., BioGee HC
T0099	BioGenesis Enterprises, Inc., Soil and Sediment Washing Process
T0100	BioGenesis Enterprises, Inc., Soil Remediation and Cleaning Products
T0102	Bio-Genesis Technologies, Bioremediation—GT-1000
T0104	Biogenie, Inc., Biogenie Biofiltration Process
T0108	Biomin, Inc., Organoclay
T0113	Bioremediation Service, Inc., AquaPlant Biofilter System
T0114	Bioremediation Technology Services, Inc., BTS Method
T0115	Bioscience, Inc., BIOX(TM) Biotreater
T0116	Bioscience, Inc., Microcat
T0117	Bioslurping—General
T0119	Biosurfactants—General
T0120	BioSystems Technology, Inc., Biosolids-Enhanced Remediation (BER)
T0124	BioTrol, Inc., Soil Washing Technology
T0126	Bioventing—General
T0127	Blast Fracturing—General
T0135	Calgon Carbon Corporation, Activated Carbon
T0137	Calgon Carbon Oxidation Technologies, Solaqua
T0138	Calgon Carbon Corporation, Perox-Pure
T0139	Cancrete Environmental Solutions, Inc., Depocrete
T0142	Carlo Environmental Technologies, Inc., Medium Temperature Thermal Desorption (MTTD)
T0144	Carus Chemical Company, CAIROX Potassium Permanganate
T0145	Caswan Environmental Services, Ltd., Thermal Distillation and Recovery
T0147	Catalytic Oxidation—General

T0148	CBA Environmental Services, Inc., Mobile Injection Treatment Unit (MITU)
T0153	Certified Remediation Systems, Inc., CRS Process
T0157	CH2M Hill, Waterflood Oil Recovery
T0159	Charbon Consultants, HCZyme
T0160	Chemfix Technologies, Inc., Chemfix Solidification/Stabilization Technology
T0161	Chemical Oxidation—General
T0164	ChemPete, Inc., Bioremediation
T0165	Cherokee Environmental Group, The Bio-Solution
T0168	CleanSoil, Inc., The CleanSoil Process
T0171	CMI Corporation, Enviro-Tech Thermal Desorption
T0173	Commodore Applied Technologies, Inc., Solvated Electron Technology (SET)
T0177	Conor Pacific, WINDsparge
T0178	Constructed Wetlands—General
T0182	ConTeck Environmental Services, Inc., Soil Roaster
T0186	Cosolvent Flushing—General
T0187	Covenant Environmental Technologies, Inc., Mobile Retort Unit
T0191	Cunningham-Davis Environmental (CDE Resources, Inc.), ID-20 Chemical Neutralization Process
T0195	DAHL & Associates, Inc., ThermNet
T0199	Dehydro-Tech Corporation, Carver-Greenfield Process
T0201	Delta Cooling Towers, Inc., Aqua-Trim and Vanguard Air Strippers
T0202	Detox Industries, Inc., DETOX Process
T0204	Distillation—General
T0206	Divesco, Inc., Soil Washing
T0211	DRL Environmental Services, Enco-Tec RS-30 Thermal Desorption
T0212	Dual-Phase Extraction—General
T0213	Duke Engineering & Services, Inc., Chemically Enhanced Solubilization for Aquifer Remediation (CESAR)
T0217	Dutch Pride Products, EcoPlus
T0219	E Products, Inc., Venturi Thermal Oxidizer
T0224	ECO Purification Systems USA, Inc., ECOCHOICE
T0225	Ecology Technologies International, Inc., FyreZyme
T0226	Ecolotree, Inc., Ecolotree Buffer
T0227	Ecolotree, Inc., Ecolotree Cap
T0228	ECO-TEC, Inc., EnviroMech Gold Biocatalytic Contaminant Degradation
T0233	Ejector Systems, Inc., VESTRIP
T0234	Ejector Systems, Inc., Stripperator
T0236	Electrokinetic Remediation—General
T0241	Elf Atochem North America, Inc., INIPOL EAP-22 Microemulsion
T0242	ELI Eco Logic International, Inc., Gas-Phase Chemical Reduction (GPCR)
T0252	Energy Products of Idaho, Fluidized-Bed Combustion
T0253	Energy Reclamation, Inc., Pyrolytic Waste Reclamation (PWR)
T0256	Ensite, Inc., SafeSoil
T0259	ENSR International Group, Biovault
T0260	ENSR International Group, Soil Cleaning Process
T0261	Enviro Products, Inc., PetroTrap
T0267	Envirogen, Inc., Spartech
T0269	Enviro-Klean Technologies, Inc., KLEAN-MACHINE
T0270	EnviroLogical Engineering, Inc., Earthwise Formula 1
T0275	Environmental Fuel Systems, Inc., Reclaim
T0276	Environmental Recycling, L.L.C., Asphalt Stabilized Base/Engineered Backfill
T0277	Environmental Remediation Consultants, Inc., Biointegration

- T0278 Environmental Remediation International (EnRem), Ltd., Soil Remediation System (SRS)
- T0282 Environmental Soil Management, Inc., Low-Temperature Thermal Desorption
- T0290 Enviro-Soil Remediation, Inc., Thermal Stripping
- T0293 Enzyme Technologies, Inc., Dissolved Oxygen In Situ Treatment (DO IT)
- T0294 Enzyme Technologies, Inc., Multienzyme Complex (MZC)
- T0297 EPOC Water, Inc., Microfiltration Technology (EXXFLOW and EXXPRESS)
- T0300 ETUS, Inc., Enhanced Bioremediation
- T0303 Extraksol (vendor unknown)
- T0308 First Environment, Inc., FE ACTIVE
- T0309 Fixed Bed Soil Biofilters—General
- T0310 Fluidized-Bed Thermal Oxidation—General
- T0318 FRX, Inc., Hydraulic Fracturing
- T0320 Funderburk & Associates, Solidification Process
- T0321 Fungi Perfecti, Mycova Mycoremediation and Mycofiltration
- T0323 G.E.M., Inc., Chemical Treatment
- T0329 General Atomics, Supercritical Water Oxidation
- T0331 Genesis Eco Systems, Inc., Soil Treatment and Recycling
- T0333 Geo-Cleanse International, Inc., Geo-Cleanse Process
- T0336 Geo-Con, Inc., Shallow Soil Mixing
- T0337 Geokinetics International, Inc., Pool Process Electrokinetic Remediation
- T0342 Geo-Microbial Technologies, Inc., Metals Release and Removal from Wastes
- T0343 Georgia Institute of Technology Construction Research Center, In Situ Plasma Vitrification
- T0344 Geosafe Corporation, In Situ Vitrification
- T0346 Geotech Environmental Equipment, Inc., Scavenger Recovery Systems
- T0348 GHEA Associates, Soil Washing Technology
- T0349 Global Remediation Technologies, Inc., Pressurized Fluidized Bioreactor (PFBR)
- T0353 Golder Associates Corporation, Vertically Oriented Hydraulic Fracture Placed Iron Reactor Walls
- T0354 Grace Bioremediation Technologies, Daramend Bioremediation Technology
- T0355 Granular Activated Carbon (GAC)—General
- T0360 H&H Eco Systems, Inc., Microenfractionator
- T0361 H&H Eco Systems, Inc., Solid-State Chemical Oxidation
- T0363 Harding ESE, Inc., PetroClean Bioremediation System
- T0364 Harding ESE, Inc., Bioremediation—Landfarming Treatment
- T0365 Harding ESE, Inc., Composting
- T0366 Harding ESE, Inc., Forced Aeration Contaminant Treatment (FACT)
- T0367 Harding ESE, Inc., In Situ Vadose Zone Soil Treatment
- T0369 Heaven from Earth, Inc., Organic Cleaners
- T0370 High Mesa Technologies, L.L.C., Silent Discharge Plasma
- T0371 High Voltage Environmental Applications, Inc., High-Energy Electron Beam Irradiation
- T0372 Hi-Point Industries, Ltd., Oclansorb
- T0374 Horizontal Technologies, Inc., Linear Containment Remediation System
- T0376 Horner & Company, Max Bac
- T0379 Hrubetz Environmental Services, Inc., HRUBOUT Process In situ
- T0380 Hrubetz Environmental Services, Inc., HRUBOUT Process, Ex Situ
- T0383 Huntington Environmental Systems, Econ-Abator Catalytic Oxidation System
- T0385 Hydriplex, Inc., HP-80 Solution and Hydrocleaner 20-10 System
- T0386 Hydrocarbon Environmental Recovery Systems, Bioremediation Response Advancement Technologies (BRAT)
- T0387 Hydrocarbon Technologies, Inc., Recovered Oil Pyrolysis and Extraction (ROPE)

- T0388 Hydrogen Peroxide In Situ Bioremediation—General
- T0398 IEG Technologies Corporation, Vacuum Vaporizer Well (UVB)
- T0400 IIT Research Institute, Radio Frequency Heating
- T0401 Imbibitive Technologies Corporation (IM-TECH), Imbiber Beads
- T0402 Imperial Petroleum Recovery Corporation, MST 4000
- T0406 In Situ Soil Vapor Extraction (SVE)—General
- T0407 In Situ Steam-Enhanced Extraction—General
- T0411 Institute of Gas Technology Fluid Extraction—Biological Degradation
- T0421 InterBio, Hydrobac
- T0422 InterBio, Petrobac
- T0423 InterBio, Phenobac
- T0427 International Landmark Environmental, Inc., Aminoplast Capillary Technology
- T0433 IT Corporation, Biofast
- T0436 IT Corporation, Direct Application of Surfactants
- T0441 IT Corporation, Hybrid Thermal Treatment System (HTTS)
- T0445 IT Corporation, Ozonation
- T0447 IT Corporation, Slurry Phase Bioremediation—Full Scale
- T0448 IT Corporation, Slurry Phase Bioremediation—Pilot Scale
- T0450 IT Corporation, Thermal Destruction Unit
- T0454 KAL CON Environmental Services, Thermal Desorption
- T0455 Kansas State University, Vibrorecovery
- T0456 Keller Environmental, Inc., Bioinjection
- T0457 KEMRON Environmental Services, Inc., Bioremediation—Soil and Groundwater
- T0460 King, Buck Technologies, Inc., MultiMode Combustion
- T0467 KSE, Inc., AIR-II Process
- T0470 Lambda Bioremediation Systems, Inc., Bioremediation
- T0476 Lehigh University, Ground Rubber as a Reactive Permeable Barrier Sorption Media
- T0479 Limnofix, Inc., Limnofix In Situ Sediment Treatment (LIST)
- T0480 Linatex, Inc., Soil/Sediment Washing Technology
- T0487 Louisiana State University, Colloidal Gas Aphron
- T0490 M4 Environmental, L.P., Catalytic Extraction Process
- T0493 ManTech Environmental Corporation, ElectroChemical GeoOxidation (ECGO)
- T0494 ManTech Environmental Corporation, CleanOX Process
- T0504 Medina Agricultural Products Company, Inc., Medina Bioremediation Products
- T0507 Membrane Technology and Research, Inc., VaporSep Membrane Recovery System
- T0509 Metal-Based Permeable Reactive Barriers—General
- T0516 Metcalf & Eddy, Inc., ORG-X
- T0522 Micro-Bac International, Inc., M-1000 Series Bioremediation Products
- T0523 Microbe Technology Corporation, Bac-Terra Remedial Technology
- T0524 Microbes Research & Development, Inc., Uremel
- T0526 Microbial Environmental Services, Inc. (MES), Bioremediation
- T0528 Midwest Soil Remediation, Inc., GEM-1000 Low-Temperature Thermal Desorption
- T0529 Millgard Corporation, MecTool Remediation System
- T0530 MIOX Corporation, Miox System
- T0532 Modified Natural Clays—General
- T0533 Molasses Treatment for Bioremediation—General
- T0541 MYCELX Technologies Corporation, MYCELX
- T0545 National Research Council of Canada, Solvent Extraction Soil Remediation
- T0555 Niaski Environmental, Inc., Biopurge
- T0556 Niaski Environmental, Inc., BioSparge System
- T0558 NoChar, Inc., Petro-Bond
- T0561 North American Drilling Technologies (NADT), Inc., EnviroZyme
- T0564 North East Environmental Products, Inc., ShallowTray Air Stripper

T0566	NUCON International, Inc., Brayton Cycle
T0576	Oil Waste Treatment Company, Terrazyme Phase Segregation
T0577	On-Site Technologies, Modular Interchangeable Treatment System (MITS)
T0578	OnSite Technology, L.L.C., Portable Indirect Thermal Desorption (ITD)
T0579	On-Site Thermal Services Division of Soil Restoration and Recycling, L.L.C., Low-Temperature Thermal Desorption Plant
T0580	Onsite*Offsite, Inc., Petroleum Sludge Treatment
T0584	Osprey Biotechnics, Munox
T0591	Paragon Environmental Systems, Inc., Paragon SVE/Oxidizers
T0597	Pedco, Inc., Rotary Cascading Bed Incineration
T0599	PerkinElmer, Inc., NoVOCs
T0602	Pet-Con Soil Remediation, Inc., Thermal Desorption
T0603	Petro-Green, Inc., Petro-Green ADP-7
T0604	Philip Environmental Services Corporation, Thermal Recycling System
T0606	PHYTOKinetics, Inc., Phytoremediation
T0607	Phytoremediation—General
T0610	Pile Biodegradation (Biopile)—Multiple Vendors
T0617	PPC Biofilter, Biofiltration Systems
T0620	Praxis Environmental Technologies, Inc., In Situ Thermal Extraction
T0621	Pressure Dewatering—General
T0622	Pressure Systems, Inc., Phoenix Ash Technology
T0625	Process Technologies, Inc., Photolytic Destruction Technology
T0626	Product Services Company, Oil Gator
T0630	Purgo, Inc., Portable Anaerobic Thermal Desorption Unit (ATDU)
T0633	Pyrovac International, Inc., Pyrocycling Process
T0635	QED Environmental Systems, Inc., Ferret In-Well Separator
T0638	R.E. Wright Environmental, Inc., Steam-Enhanced Recovery
T0639	R.E. Wright Environmental, Inc., In Situ Bioremediation Treatment System
T0641	Radian International, L.L.C., Aquadetox/Soil Vapor Extraction (SVE)
T0644	Recra Environmental, Inc., Alternating Current Electrocoagulation
T0645	Recycling Science International, Inc., Desorption and Vapor Extraction (DAVE) System
T0649	Regenesis Bioremediation Products, Inc., Hydrogen Release Compound (HRC)
T0650	Regenesis Bioremediation Products, Inc., Oxygen Release Compound (ORC)
T0654	Remediation Service International, Internal Combustion Engine (ICE)
T0655	Remediation Service International, Spray Aeration Vacuum Extraction (SAVE) System
T0656	Remtech Engineers, Bubble Lance Low-Profile Diffused Air Stripper
T0660	Retech, Inc., Plasma Arc Centrifugal Treatment (PACT) System
T0664	RKK-SoilFreeze Technologies, L.L.C., CRYOCELL
T0676	Rusmar, Inc., Long-Duration Foam
T0677	Rust Federal Services, Inc., VAC*TRAX Thermal Desorption
T0680	S.S. Papadopoulos & Associates, Inc., DeNAPLs (Detergent Extraction of NAPLs)
T0686	Sanexen Environmental Services, Inc., Ultrasorption
T0689	SBP Technologies, Inc., Membrane Filtration
T0690	SBP Technologies, Inc., Slurry-Phase Bioremediation
T0691	SBP Technologies, Inc., Solid-Phase Bioremediation
T0697	Science Remediation Services, Electro-Migration
T0698	Scientific Ecology Group (SEG), Steam Reforming—Synthetica Technologies Detoxifier (STD)
T0707	Separation Dynamics, Inc., EXTRAN
T0712	SIVE Services, Steam Injection and Vacuum Extraction (SIVE)
T0715	Smith Technology Corporation, Low-Temperature Thermal Aeration (LTTA)