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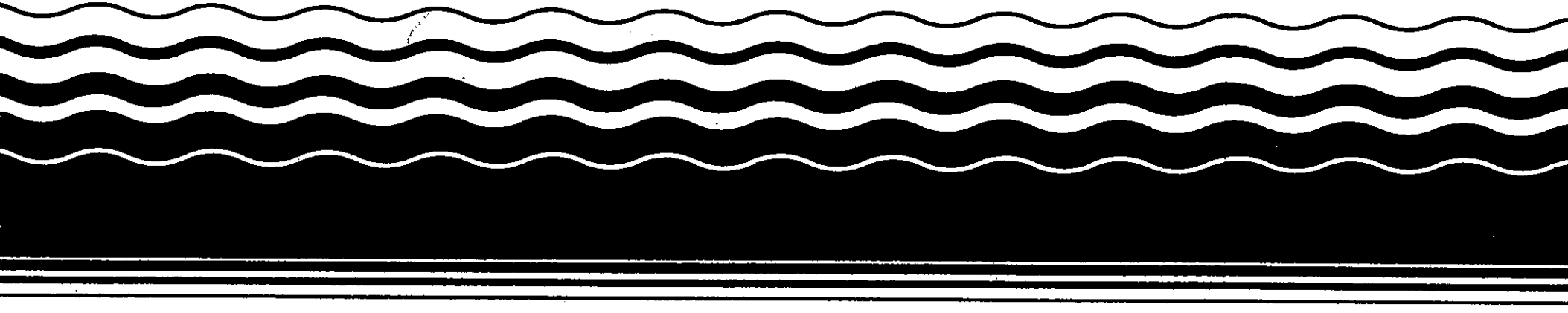
Innovative Treatment Technologies

~~Semi-~~Annual Status Report
(Fourth Edition)



Tom Sinski

EPA-542-R-92-011
Number 4
October 1992

INNOVATIVE TREATMENT TECHNOLOGIES: SEMI-ANNUAL STATUS REPORT (Fourth Edition)

U.S. Environmental Protection Agency
Office of Solid Waste and Emergency Response
Technology Innovation Office
Washington, DC 20460

ACKNOWLEDGEMENTS

This document was prepared under the direction of Ms. Linda Fiedler, work assignment manager for the U.S. Environmental Protection Agency's Technology Innovation Office.

Special acknowledgement goes to the Regional and state staff listed as contacts for individual sites. They provided the detailed information summarized here. Their cooperation and willingness to share their knowledge and expertise on innovative treatment technologies encourage the application of those technologies at other sites.

ABSTRACT

This twice-yearly report documents and analyzes the selection and use of innovative treatment technologies in the Superfund Program. This supplement to the April 1992 report also presents information on the use of innovative treatment at non-Superfund sites within the Departments of Defense (DoD) and Energy (DOE). Status information on selected projects has been updated, and a limited number of the projects selected in fiscal year 1992 Superfund Records of Decision (ROD) are included. This information will allow better communication between experienced technology users and those who are considering innovative technologies to clean up contaminated sites. In addition, the information will enable technology vendors to evaluate the market for innovative technologies in Superfund for the next several years. It also will be used by EPA's Technology Innovation Office to track progress in the application of innovative treatments.

Alternative treatment technologies are alternatives to land disposal. Innovative treatment technologies are alternative treatment technologies for which use at Superfund-type sites is inhibited by lack of data on cost and performance. This report documents the use of the following innovative treatment technologies to treat ground water (in situ), soils, sediments, sludge, and solid-matrix wastes:

- Chemical treatment
- Dechlorination
- Ex situ bioremediation
- In situ bioremediation
- In situ flushing
- In situ vitrification
- Soil vapor extraction
- Soil washing
- Solvent extraction
- Thermal desorption
- Other technologies (air sparging and contained recovery of oily wastes)

The document includes information on 219 applications of innovative treatment technologies for remedial actions, 18 applications for emergency response actions, and 22 additional applications under other federal programs. Table 1 contains detailed, site-specific information for sites for which innovative treatment has been selected. The information for Table 1 was collected through analyses of RODs, review of OSWER tracking systems, and interviews with EPA regional staff. Tables 2 and 3 contain detailed, site-specific information for sites added since the April 1992 report for which innovative treatment has been selected. Table 4 summarizes performance and operating data on the 28 remedial and removal innovative projects that have been completed. In the overview of the document, the information in these tables is analyzed and summarized in both text and figures.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

AM	Action Memorandum
APC	Air pollution control
APEG	Alkaline metal hydroxide/polyethylene glycol
ARCS	Alternative remedial contracts strategy
ATTIC	Alternative Treatment Technology Information Center
BCD	Base catalyzed dechlorination
BTEX	Benzene, toluene, ethylbenzene, xylene
BTX	Benzene, toluene, xylene
cy	Cubic yards
DCA	Dichloroethane
DCE	Dichloroethylene
DEHP	Di(2-ethylhexyl) Phthalate
DLA	Defense Logistics Agency
DNT	Dinitrotoluene
EECA	Engineering Evaluation/Cost Analysis
ESD	Explanation of significant differences
FAA	Federal Aviation Administration
ft	Feet
FUDS	Formerly used defense sites
FY	Fiscal year
gw	Ground water
IRP	Installation Restoration Program
KPEG	Potassium hydroxide/polyethylene glycol
MEK	Methyl ethyl ketone
MBOCA	4,4' Methylenebis(2-chloroaniline)
NAPL	Nonaqueous phase liquids
NFEC	Navy Facilities Engineering Command
NPL	National Priorities List
OERR	Office of Emergency and Remedial Response
OSC	On-scene coordinator
OSWER	Office of Solid Waste and Emergency Response
OU	Operable unit
PAHs	Polynuclear aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PCE	Perchloroethylene (tetrachloroethylene)
PCP	Pentachlorophenol
PRP	Potentially responsible party
RA	Remedial action
RCRA	Resource Conservation and Recovery Act
RD	Remedial design
RODs	Records of Decision
RPM	Remedial project manager
RSKERL	Robert S. Kerr Environmental Research Laboratory, Ada, OK (U.S. EPA)
SARA	Superfund Amendment and Reauthorization Act of 1986
SACM	Superfund Accelerated Cleanup Model
SVOCs	Semivolatile organic compounds
S/S	Solidification and stabilization
TCA	Trichloroethane
TCE	Trichloroethylene
TIO	Technology Innovation Office
USACE	U. S. Army Corps of Engineers
USDA	U. S. Department of Agriculture
VOCs	Volatile organic compounds

OVERVIEW

Introduction

The Technology Innovation Office (TIO) of the U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response (OSWER) has prepared this *Innovative Treatment Technologies: Semi-Annual Status Report* to document the use of the innovative treatment technologies to remediate Superfund sites. The report contains site-specific information on Superfund sites (both remedial and emergency response actions) at which innovative treatment technologies are being used. Site managers can use this report in evaluating cleanup alternatives. Innovative technology vendors can use it in identifying potential markets. TIO also uses the information to track progress in the application of innovative treatment.

The report is updated semi-annually. This October 1992 issue of the report updates and expands information provided in the April 1992 report. Additional information includes 10 innovative treatment technologies selected for remedial actions in fiscal year (FY) 1992 Superfund Records of Decision (ROD)—a ROD is the decision document used to specify the way a site, or part of a site, will be remediated; 21 innovative treatment technologies at non-NPL sites; and information on three additional completed projects. For more complete analysis of technology information, refer to EPA/540/2-91/001, April 1992.

What Are Alternative and Innovative Treatment Technologies?

Alternative treatment technologies are alternatives to land disposal. The most frequently used alternative technologies are incineration and solidification/stabilization. Innovative treatment technologies are alternative treatment technologies—for which Superfund-type applications are inhibited by lack of data on performance and cost. In general, a treatment technology is considered innovative if it has had limited full-scale application. Often, it is the application of a technology or process to soils, sediments, sludge, and solid-matrix waste (such as mining slag) that is innovative. Groundwater treatment after the water has been pumped to the surface often resembles traditional water treatment technologies; thus, in general, pump-and-treat or ex situ groundwater remedies are considered established. In situ bioremediation and other methods to treat ground water in situ are considered innovative technologies.

This report documents the use of the following innovative treatment technologies to treat soils, sediments, sludge, and solid-matrix waste:

- Bioremediation (Ex situ)
- Bioremediation (In situ)
- Chemical treatment
- Dechlorination
- In situ flushing
- In situ vitrification
- Soil vapor extraction
- Soil washing
- Thermal desorption
- Other technologies (air sparging and contained recovery of oily wastes)

In addition, the nine sites using in situ bioremediation for ground water are included with the other in situ bioremediation projects.

Sources of Information for this Report

EPA initially used RODs to compile information on remedial actions, and Pollution Reports, On-Scene Coordinators Reports, and the OSWER Removal Tracking System to compile data on emergency response actions. EPA then verified and updated the draft information by interviews with remedial project managers (RPM) and on-scene coordinators (OSCs). The data concerning project status do not duplicate data in CERCLIS, EPA's Superfund tracking system. This report provides more detailed information on the specific portion of the remedy pertaining to an innovative technology. In addition, information about technologies and sites identified here might differ from information found in the ROD annual reports and the RODs

Database. These differences are the result of design changes in the treatment trains used at sites. Such changes might or might not require official documentation (that is, a ROD amendment or an Explanation of Significant Differences).

Definitions for Specific Innovative Treatment Technologies

The innovative technologies reported in the following tables treat hazardous wastes in very different ways. The following paragraphs and figures define the technologies as they are used in this document and provide summary statistics for the contaminants treated with the technologies.

EX SITU BIOREMEDIATION uses microorganisms to degrade organic contaminants on excavated soil, sludge, and solids. The microorganisms break down the contaminants by using them as a food source. The end products are typically CO_2 and H_2O. Ex situ bioremediation includes slurry-phase bioremediation, in which the soils are mixed in water to form a slurry; and solid-phase bioremediation, in which the soils are placed in a tank or building and tilled with water and nutrients. Variations of the latter process are called land farming or composting.

In IN SITU BIOREMEDIATION, nutrients, an oxygen source, and sometimes microbes are pumped under pressure into the soil or aquifer through wells or they are spread on the surface for infiltration to the contaminated material.

Data in this status report indicate that the most frequent use of BIOREMEDIATION in the Superfund program is in treatment of polynuclear aromatic hydrocarbons (PAH).

In CHEMICAL TREATMENT, the contaminants are converted to less hazardous compounds through chemical reactions. Chemical treatment has been used five times in the Superfund program, usually to reduce a contaminant (hexavalent chromium to the trivalent form) or to oxidize a contaminant (cyanide, for example). Neutralization is considered an available technology and is not included in this report.

DECHLORINATION (another type of chemical treatment) results in the removal or replacement of chlorine atoms bonded to hazardous compounds.

For IN SITU FLUSHING, large volumes of water, at times supplemented with treatment compounds, are introduced to the soil, waste, or ground water to flush hazardous contaminants from a site. This technology is predicated on the assumption that the injected water can be isolated effectively within the aquifer and recovered.

IN SITU VITRIFICATION treats contaminated soil in place at temperatures of approximately 3,000°F (1,600°C). Metals are encapsulated in the glass-like structure of the melted silicate compounds. Organics may be treated by combustion.

SOIL WASHING is used for two purposes. First, the mechanical action and water (sometimes with additives) physically remove the contaminants from the soil particles. Second, the agitation of the soil particles allows the smaller-diameter, more highly contaminated fines to separate from the larger soil particles, thus reducing the volume of material for subsequent treatment.

SOLVENT EXTRACTION operates on the principle that, in the correct solvent, organic contaminants can be preferentially solubilized and removed from the waste. The solvent to be used will vary depending on the waste to be treated.

For THERMAL DESORPTION, the waste is heated in a controlled environment to cause organic compounds to volatilize from the waste. The operating temperature for thermal desorption is less than 1,000°F (550°C). The volatilized contaminants will usually require further control or treatment.

SOIL VAPOR EXTRACTION removes volatile organic constituents from the soil in place through the use of vapor extraction wells, sometimes combined with air injection wells, to strip and flush the contaminants into the air stream for further treatment. Vacuum extraction has been selected with increasing frequency for sites at which volatile organic compounds (VOCs) are present.

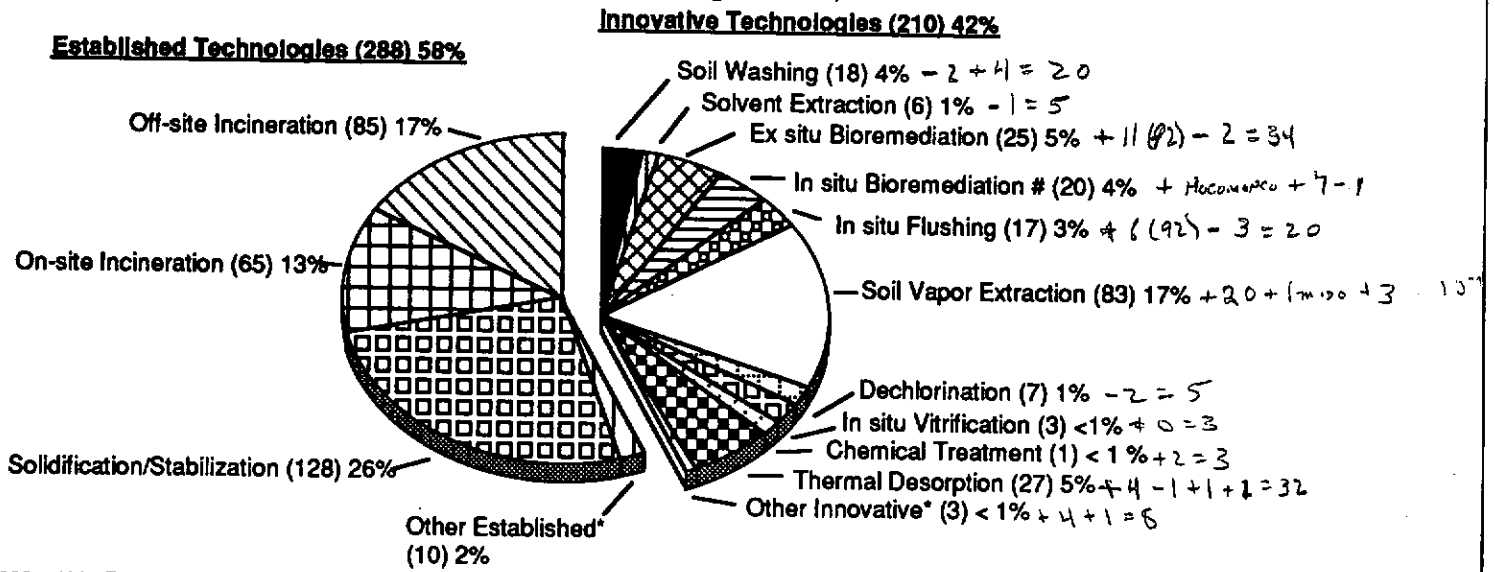
OTHER TECHNOLOGIES include air sparging and the contained recovery of oily wastes (CROW) technologies. Air sparging involves injecting gas into the aquifer to attach to volatile contaminants as the gas percolates up through the ground water and is captured by a vapor extraction system. The CROW process displaces oily wastes with steam and hot water. The contaminated oils and ground water are swept into a more permeable area and are pumped out of the aquifer.

Based on further analysis of the data in this report, Figures 2, 3, 4, and 5 show the most frequently selected technologies for VOCs, metals, PAHs, and PCBs, respectively.

Frequency of Technology Selection

Out of a total of 676 source control RODs signed through FY 91, innovative technologies were selected (and are still being considered or used) for approximately 25 percent of source control RODs. Figure 1

FIGURE 1
SUPERFUND REMEDIAL ACTIONS: SUMMARY OF ALTERNATIVE TREATMENT TECHNOLOGIES THROUGH FISCAL YEAR 1991
(Total Number of Technologies = 498)

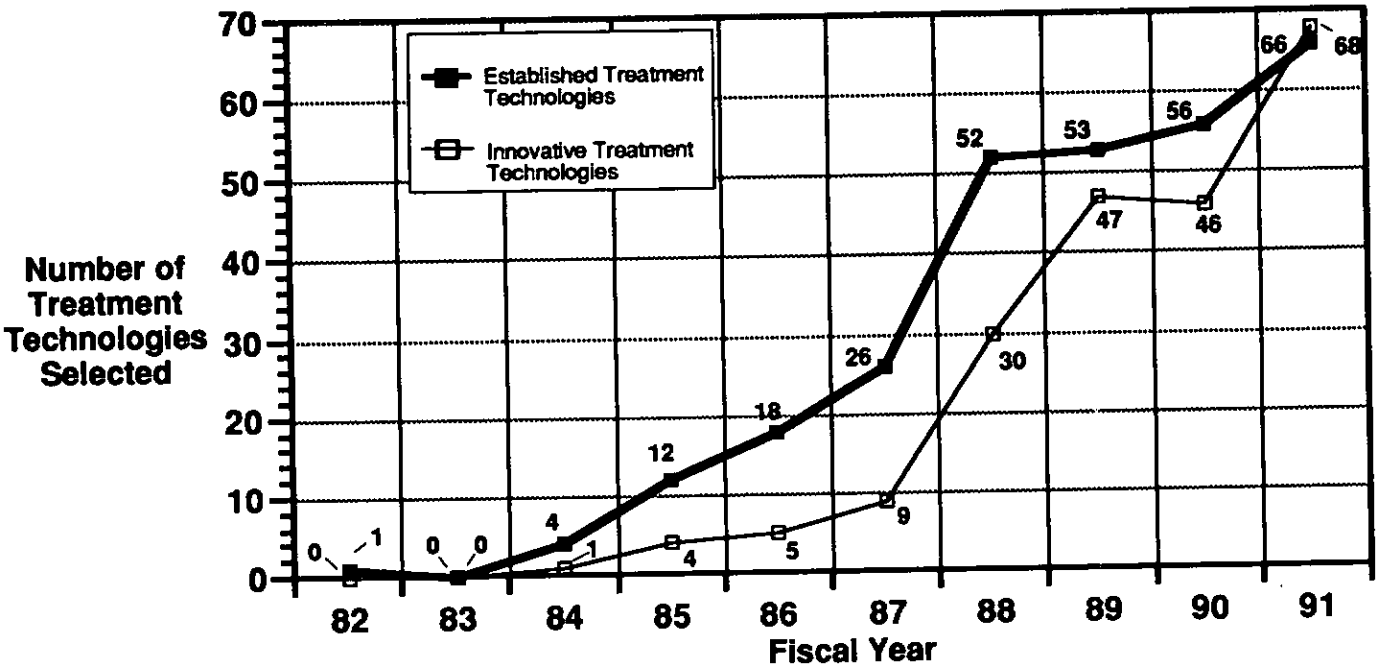


Note: *Data are derived from 1982 – 1991 Records of Decision (RODs) and anticipated design and construction activites as of October 1992. More than one technology per site may be used.*
( ) *Number of times this technology was selected or used.*
*** *"Other" established technologies are soil aeration, in situ flaming, and chemical neutralization. "Other" innovative technologies are air sparging and contained recovery of oily wastes.*
# *Includes nine in situ grounwater treatment remedies.*

gives the current numbers of innovative technologies selected for Superfund remedial actions through FY 91 RODs. Of the 210 technologies, 201 were selected for source control (i.e., treatment of soil, sludge, sediment, or solid-matrix waste), and nine for treatment of ground water in situ. These numbers reflect ongoing changes in the technologies selected or used as a result of design or construction changes. Specific changes made for this report are explained in a later section. This figure does not contain removal actions or non-Superfund sites. The next edition will incorporate all of the innovative technologies selected in FY 92 RODs.

The current figures for the number of established versus innovative technologies by fiscal year are presented in Figure 2. In FY 91, for the first time, the innovative treatment technologies accounted for over half of the treatment technologies selected.

FIGURE 2
SUPERFUND REMEDIAL ACTIONS:
NUMBER OF ESTABLISHED VERSUS INNOVATIVE TREATMENT TECHNOLOGIES



Note: Data for innovative technologies are derived from Records of Decision (RODs) for fiscal years 1982 – 1991 and anticipated design and construction activities as of February 1992. More than one technology per site may be used.

Status of Innovative Technology Implementation

Many of the innovative technologies documented in this report have been selected in the last several years. The design of these projects typically takes one to three years. Relatively few innovative technologies have been contracted and installed and even fewer have been completed (Figure 3). In the next several years, however, many projects now in design should become operational.

FIGURE 3
REMEDIAL ACTIONS: PROJECT STATUS OF INNOVATIVE TREATMENT TECHNOLOGIES AS OF OCTOBER 1992*

Technology	Predesign/ In Design	Design Complete/ Being Installed/ Operational	Project Completed	Total
Soil Vapor Extraction	62	18	3	83
Thermal Desorption	19	4	4	27
Ex Situ Bioremediation	17	7	1	25
In Situ Bioremediation #	14	5	1	20
Soil Washing	16	2	0	18
In Situ Flushing	12	5	0	17
Dechlorination	5	1	1	7
Solvent Extraction	5	1	0	6
In Situ Vitrification	3	0	0	3
Other Innovative Treatment	3	0	0	3
Chemical Treatment	0	0	1	1
TOTAL	**156 (74%)**	**43 (21%)**	**11 (5%)**	**210**

* *Data derived from 1982 – 1991 Records of Decision (ROD) and anticipated design and construction activities.*

\# *Includes in situ ground water treatment.*

Contaminants Addressed by Innovative Treatment Technologies

The data collected for this report, including both Superfund and non-Superfund applications, form the basis for an analysis of the classes of contaminants treated by each technology type. Figure 4 provides this information, by technology, for three major contaminant groups: volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and metals. For this report, compounds are categorized as VOCs or SVOCs, using the lists provided in EPA's SW-846 Test Methods 8240 and 8270 respectively. Figures 5 through 8 show the most frequently selected technologies for VOCs, metals, polynuclear aromatic hydrocarbons (PAH), and polychlorinated biphenyls (PCB).

FIGURE 4
APPLICATIONS OF INNOVATIVE TREATMENT TECHNOLOGIES

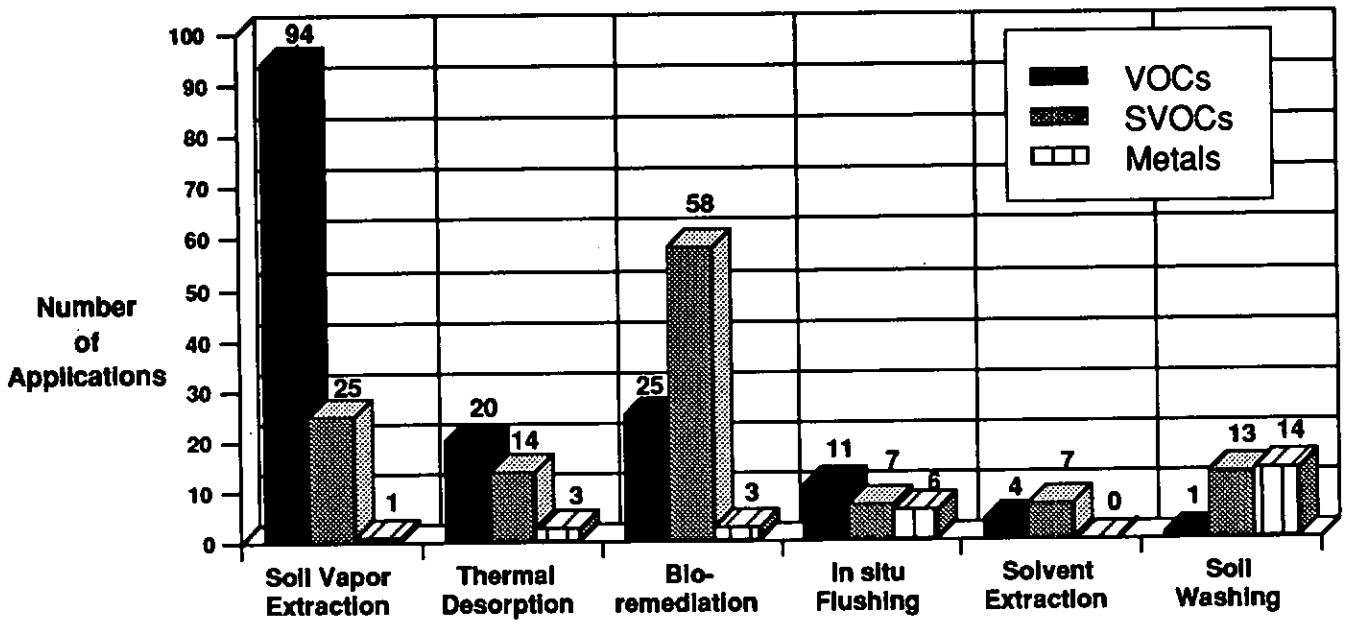
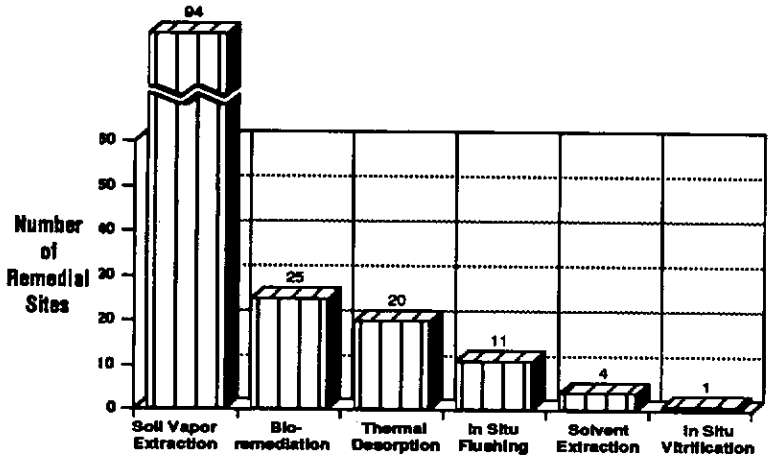
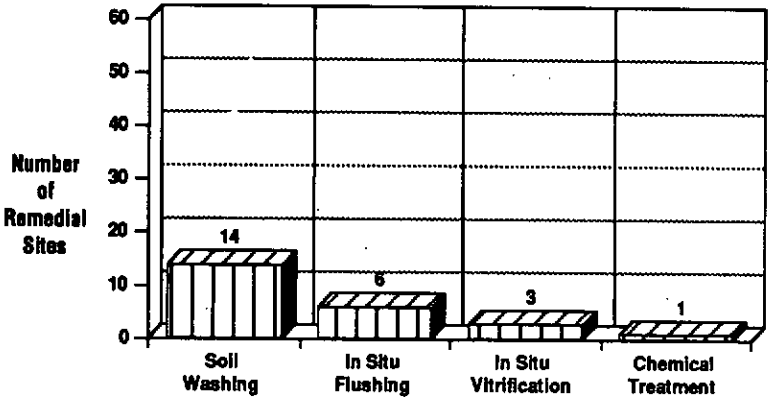


FIGURE 5
INNOVATIVE TREATMENT FOR VOCS



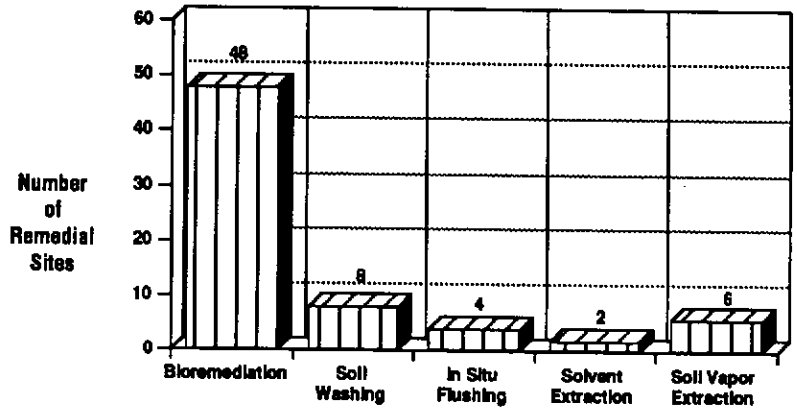
Note: More than one treatment technology may be used at some sites.

FIGURE 6
INNOVATIVE TREATMENT FOR METALS



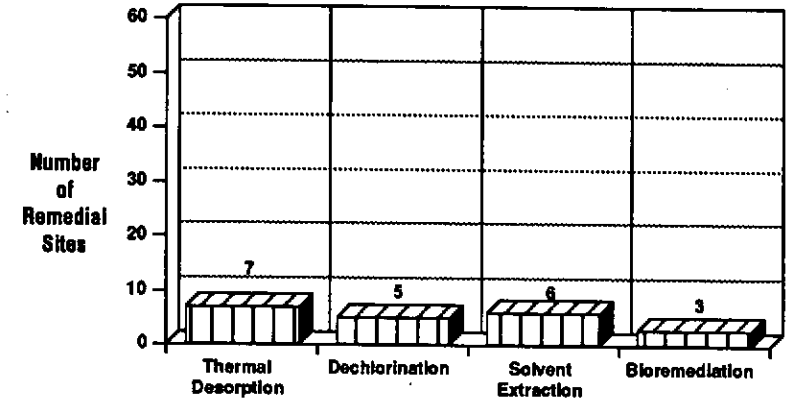
Note: More than one treatment technology may be used at some sites.

FIGURE 7
INNOVATIVE TREATMENT FOR PAHS



Note: More than one treatment technology may be used at some sites.

FIGURE 8
INNOVATIVE TREATMENT FOR PCBS



Note: More than one treatment technology may be used at some sites.

Quantities of Soil Addressed

EPA analyzed the quantity of soil treated at 177 sites (including Superfund and non-Superfund) using innovative technologies (Figure 9). This analysis provides an indication of the scale of the projects involved.

FIGURE 9
QUANTITIES OF SOIL TO BE TREATED BY INNOVATIVE TECHNOLOGIES

Technology	Number of Sites with Data	Quantity (Cubic Yards)	
		Range	Average
Soil Vapor Extraction	58	70 — 1,9000,000	89,000
In Situ Flushing	12	5,200 — 650,000	80,000
In Situ Bioremediation	9	5,000 — 258,000	78,000
Ex Situ Bioremediation	35	700 — 600,000	45,200
Soil Washing	20	1,800 — 200,000	37,000
Solvent Extraction	6	2,000 — 67,000	26,000
Thermal Desorption	26	1,600 — 130,000	21,400
Dechlorination	7	700 — 50,000	13,500
In Situ Vitrification	4	2,000 — 5,000	3,800

Summary of Updates to Last Report

Each edition of this report has added new information on the applications of innovative technologies at Superfund sites and has updated the status of innovative projects. The information added, deleted, or changed in each edition is described below to allow tracking of specific projects from edition to edition.

New in October 1992 report:

Ten (10) innovative treatment technologies selected in FY 92 RODs

Twenty-two (22) innovative treatment technologies selected by other federal programs.

Koppers/Texarkana, TX – In situ flushing

Lipari Landfill Marsh Sediment, NJ – Thermal desorption

Gould Battery, OR – Soil Washing

Deleted from October 1992 report:

Sol Lynn/Industrial Transformers, TX – Dechlorination

University of Minnesota, MN – Thermal desorption

Teledyne Semiconductors, CA – Soil vapor extraction

Changes in October 1992 report:

Poly Carb, NV has been listed as a bioremediation (ex situ) project rather than a bioremediation (in situ) project.

GE Wiring Devices, PR has been listed as a soil washing rather than a thermal desorption project.

APPENDIX A

TABLE 1

DETAILED SITE INFORMATION BY TREATMENT TECHNOLOGY

THROUGH FY 91 RODS

Table 1 is the principal part of this document. It contains the most detailed, site-specific information for sites for which innovative treatment has been selected. The columns of Table 1 present the following information:

Region

This column indicates the EPA Region in which the site is located. A pound sign (#) next to the Region number in Table 1 indicates that information on the site has been updated since April 1992. Tables 2 and 3 contain information on new sites added to this report. Consequently, a pound sign does not appear in this column for tables 2 and 3.

Site Name, State, ROD Date

This column identifies the site and the operable unit for which innovative treatment was selected.

A Record of Decision (ROD) documents the selection of remedy in the remedial program. The date shown in this column is the date on which a ROD was signed by an EPA official. Such a date is not provided for non-Superfund sites in Table 3.

An asterisk (*) in this column indicates that a treatability study has been completed for the particlar technology at the particular site.

Specific Technology

The second column describes the specific technology selected within a general category of innovative treatment. For example, within the general category of bioremediation, the specific technologies of land treatment or slurry-phase bioremediation may be chosen.

Site Description

This column provides information on the industrial source of the contamination at the site and allows analysis of the selection of innovative technologies by site type. For example, by using the information in this column, one can determine the most frequently selected innovative technology for wood preserving sites.

Media (Quantity)

This column provides information on the media and quantity of material to be treated. If a treatment is used in situ, an effort has been made to include the maximum depth of the treatment to provide the reader with another important parameter regarding the application.

Key Contaminants Treated

The major contaminants or contaminant groups targeted by the treatment technology are shown in this column. There may be other contaminants as well that will be treated. Other contaminants that may be present, but that are not being addressed by the listed technology, are <u>not</u> included.

Status

This column gives the status of the application of the innovative treatment technology. **Predesign** indicates that the ROD has been signed, but design has not begun. During predesign, EPA may be negotiating with the potentially responsible parties, procuring the services of a design firm, or collecting information (such as conducting a treatability study) needed in the design stage. If a project is in **design**, the engineering documents needed to contract for and build the remedy are being prepared. If a remedy is **being installed**, the lead agency has signed a contract for the construction work needed to set up the remedy. The remedy is **operational** if construction is complete and it is now being operated as a treatment system; the remedy is **completed** if the goals of the ROD or decision document for that treatment technology have been met and treatment has ceased.

One purpose of this column is to identify for vendors opportunities to become involved in the next phase of the projects. Whenever possible, the season and year that the current phase will end is given. This information is identified as the "completion planned" date.

Lead Agency, Treatment Contractor

The "lead" indicates whether federal dollars are to be used to implement the remedy (Fund lead) or the potentially responsible parties will conduct the remedy with EPA/state oversight (PRP lead). If a remedy is Fund lead, EPA may manage the design and construction through its contractors, the state may manage the project with Superfund dollars, or the U.S. Army Corps of Engineers (USACE) may act for EPA to manage the design or construction. Whichever agency or organization is responsible for managing the remedy, the contractor responsible for the actual installation and operation of the innovative technology also is identified, if the lead agency has selected a contractor.

Contacts/Phone

This final column gives the names and telephone numbers of useful contacts for the site or technology. The first name listed is usually the EPA remedial project manager (RPM) (for remedial actions) or on-scene coordinator (OSC) (for emergency response actions) responsible for the site. If a remedy is being managed by the state, the name and phone number of the state RPM also are provided. Information on any other useful contacts is provided.

= sites in which info is completed

Table 1
Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1	Iron Horse Park*, MA (09/15/88)	Land treatment	Industrial and railyard waste	Sludge (25,000 cy)	VOCs, PAHs	Operational; Completion planned Summer 1995	PRP lead/Federal oversight; ENSR Consulting	Don McElroy 617-223-5571
2	General Motors/Central Foundry Division, OU1, NY (12/17/90)	Slurry phase	Machine shops, Engine casting facility	Soil (100,000 cy), Sludge (91,000 cy from lagoon), Sediments (62,000 cy)	PCBs	In design; Design completion planned Summer 1994	PRP lead/Federal oversight	Lisa Carson 212-264-6857
3	Whitmoyer Laboratories, OU 3, PA (12/31/90)	Bioremediation (Ex Situ) To be used with iron based fixation	Other organic chemical manufacturing	Soil (5,600 cy, combined), Sediments	VOCs (TCE), SVOCs (Aniline)	In design; Design completion planned Winter 1994	PRP lead/Federal oversight	Chris Corbett 215-597-6906
3	L.A. Clarke & Sons, Lagoon Sludge OU, VA (03/31/88)	Slurry phase in tanks	Wood preserving	Sludge (quantity unknown)	PAHs (Creosote)	Predesign; PD completion planned Spring 1993	PRP lead/Federal oversight	Gene Wingert 215-597-1727
3	Ordnance Works Disposal, WV (09/29/89)	Land treatment	Other organic chemical manufacturing, Other inorganic chemical manufacturing	Soil (13,500 cy)	PAHs (Carcinogenic)	Predesign; PD completion planned Summer 1993	PRP lead/Federal oversight	Drew Lausch 215-597-1286

\# Updated from April 1992 report

* Indicates that a treatability study has been completed

Note: Contacts listed are EPA regional staff unless otherwise indicated.

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4	American Creosote Works*, FL (09/28/89) See also Soil Washing	Slurry phase Preceded by soil washing	Wood preserving	Soil (fines from 36,500 cy)	SVOCs (PCP), Dioxins, PAHs (creosote)	In design; Design completion planned Fall 1992; The design will be a performance spec and is expected to be available for bid Fall/Winter 1992	Federal lead/Fund Financed	Madolyn Streng 404-347-2643 Charles Logan (FL) 904-488-0190 Kelsey Helton (FL) 904-488-0190
4	Brown Wood Preserving*, FL (04/08/88)	Land treatment	Wood preserving, Drum storage / disposal	Soil (7,500 cy)	PAHs (Creosote)	Completed; Operational from 10/88 to 12/91; See Table 4	PRP lead/Federal oversight; Remediation Technology, Inc.	Martha Berry 404-347-2643
4	Cabot Carbon/Koppers, FL (09/27/90) See also Bioremediation (In Situ), Soil Washing	Slurry phase (preceded by soil washing)	Wood preserving, Pine tar and turpentine manufacturing	Soil (fines from approximately 6,400 cy)	SVOCs (PCP, Bis(2-ethyl-hexyl)phthalate, DNT, Dimethylphenol, PAHs	In design; Design completion planned Spring 1994	PRP lead/Federal oversight	Martha Berry 404-347-2643
4	Dubose Oil Products, FL (03/29/90)	Solid phase; Windrowing with aeration and irrigation in a barn	Petroleum refining and reuse	Soil (20,000 cy)	VOCs (Benzenes, Xylenes, TCE, DCE), SVOCs (PCP), PAHs	In design; Design completion planned Spring 1993; Pilot scale work to begin in Summer, 1992. This will be Phase 1 of RA.	PRP lead/Federal oversight; Engineering Science	Mike McKibben 404-347-2643 Joe Wheatley (FL) 904-488-0190

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4	Southeastern Wood Preserving, MS Emergency Response (Action Memo signed 09/30/90) See also Soil Washing	Slurry phase (preceded by soil washing)	Wood preserving	Soil (fines from 8,000 cy soil)	SVOCs (PCP), PAHs (Creosote)	Operational; Completion planned Summer 1993	Federal lead/Fund Financed; OHM Remediation Services Corp	Don Rigger 404-347-3931
4	Cape Fear Wood Preserving, NC (06/30/89) See also Soil Washing	Slurry phase (may be followed by s/s)	Wood preserving	Soil (2,000 cy of fines from 20,000 cy of soil)	VOCs, PAHs	Design completed but not installed; Construction contract being procured	Federal lead/Fund Financed	Jon Bornholm 404-347-7791
4	Charles Macon Lagoon, Lagoon #10, NC (09/30/91)	Bioremediation (Ex Situ)	Oil recycling and reuse	Soil (1,000 cy in a lagoon)	PAHs (Benzo(a)pyrene, Anthracene, Chrysene, Fluoranthene)	Predesign; PD completion planned Fall 1992; Currently negotiating with PRPs	PRP lead/Federal oversight	Jack Butler 919-733-2801
5	Galesburg/Koppers, IL (06/30/89)	Land treatment	Wood preserving	Soil (15,200 cy)	SVOCs (PCP, Creosote, Phenols), PAHs	In design; Design completion planned Fall 1993	PRP lead/Federal oversight; Remediation Technologies, Inc.	Brad Bradley 312-886-4742 Steve Davis 217-785-3913
5	Cliff/Dow Dump, MI (09/27/89) See also Bioremediation (In Situ)	Bioremediation (Ex Situ); Type to be determined	Waste disposal for charcoal manufacturing plant	Soil (9,200 cy)	VOCs (TCE, BTEX), SVOCs (Phenol), PAHs (Naphthalene)	Predesign; PD completion planned 1992; Design to be completed in Winter 1993	PRP lead/Federal oversight	Lida Tan 312-886-1842

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5 #	Burlington Northern Railroad Tie Treating Plant*, MN (06/04/86)	Land treatment	Wood preserving	Soil (9,500 cy), Sludge (9,600 cy)	SVOCs (Phenols), PAHs	Operational; Completion planned 1994	PRP lead/ State-Federal oversight; Remediation Technologies, Inc.	Tony Rutter 312-886-8961 Fred Jenness (MN) 612-297-8470 Richard Truax (RETEC) 303-493-3700
5	Moss-American*, WI (09/27/90) See also soil washing	Slurry phase (preceeded by soil washing)	Wood preserving	Soil (80,000 cy of fines), Sediments (5,200 cy)	PAHs	In design; Design completion planned 1994	PRP lead/Federal oversight; Weston, Inc.	Betty Lavis 312-886-4784
5 #	Joslyn Manufacturing and Supply Co., MN (no ROD signed)	Land treatment; Unlined treatment unit with irrigation and tilling	Wood preserving	Soil (75,000 cy)	SVOCs (PCP), PAHs	Operational; Completion planned Fall 1994	PRP lead/State oversight; BARR Engineering / GL Contracting Inc.	Kevin Turner 312-886-4444 Ann Bidwell (MN) 612-296-7827
6	Old Inger Oil Refinery*, LA (09/25/84)	Land treatment	Petroleum refining and reuse	Soil (120,000 cy, combined), Sludge	VOCs (Benzene, Ethylbenzene), PAHs (Petroleum hydrocarbons)	Operational; Completion planned Spring 1997	State lead/Fund Financed; Westinghouse Haztech (installation), Operation to be awarded Spring,1992	Paul Sieminski 214-655-6710 Mike Hahn (LA) 504-765-0487
6 #	North Cavalcade Street*, TX (06/28/88)	Land treatment	Wood preserving	Soil (22,300 cy)	VOCs (BTEX), PAHs (Creosote)	In design; Design completion planned Spring 1993	State lead/Fund Financed	Deborah Griswold 214-655-8520 Lewis Rogers (TX) 512-463-8188
6	Sheridan Disposal Services*, TX (12/29/88)	Slurry phase	Industrial landfill	Sludge (3,000 cy of oils and sludge), Solids (40,000 cy of soils and sludgey material)	VOCs (Benzene, Toluene), SVOCs (Phenols), PCBs	Predesign; PD completion planned Summer 1992	PRP lead/State oversight	Ruth Israeli 214-655-6735

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
7	Vogel Paint & Wax*, IA (09/25/89)	Land treatment	Paint/ink formation CP	Soil (10,000 cy)	VOCs (Methyl ethyl ketone, BTX)	Being installed; Completion planned Spring 1992; One cell is constructed.	PRP lead/State oversight; Geoteck Engineering and Testing Services, Inc.	Steve Jones 913-551-7755 Bob Drustrup (IA) 515-281-8900
7	Scott Lumber, MO Emergency Response (Action Memo signed (07/10/87)	Land treatment	Wood preserving W	Soil (16,000 cy)	SVOCs (Phenols), PAHs (Benzo-a-pyrene)	Completed; Operational from 1987 to Fall 1991	Federal lead/Fund Financed; Remediation Technologies	Bruce Morrison 913-551-5014
8	Burlington Northern (Somers Plant)*, MT (09/27/89) See also Bioremediation (In Situ)	Land treatment	Wood preserving W	Soil (12,000 cy)	PAHs (Creosote)	In design; Design completion planned Fall 1992; Operational beginning Spring, 1993.	PRP lead/Federal oversight; Remediation Technologies, Inc.	Jim Harris 406-449-5414
8	Libby Ground Water Contamination*, MT (12/30/88) See also Bioremediation (In Situ)	Land treatment; using two 1-acre cells, soil is excavated & mixed	Wood preserving W	Soil (45,000 cy)	VOCs (Benzene), SVOCs (PCP), PAHs (Creosote)	Operational; Completion planned 1999	PRP lead/Federal oversight; Woodward-Clyde	Jim Harris 406-449-5414 Bert Bledsoe (RSKERL) 405-332-2313
8	Wasatch Chemical*, UT (03/29/91) See also In situ Vitrification	Land treatment on an asphalt pad	Pesticide CF manufacturing/use/ storage, Other organic chemical manufacturing, Other inorganic chemical manufacturing	Soil (1,100 cy)	VOCs (Toluene, Xylene)	Predesign; PD completion planned Spring 1992	PRP lead/Federal oversight	Bert Garcia 303-293-1526

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (Ex situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	J.H. Baxter*, CA (09/27/90)	Land treatment; Bioremediation to be followed by fixation for metals	Wood preserving	Soil (quantity unknown)	Dioxins, PAHs	In design; Design completion planned Summer 1993	PRP lead/Federal oversight	Mary Masters 415-744-2370
9	Koppers Company, Inc. (Oroville Plant), CA (04/04/90) See also Bioremediation (In Situ), Soil Washing	Slurry phase (preceded by soil washing)	Wood preserving	Soil (fines from 200,000 cy to be soil washed)	Biocides, Dioxins, SVOCs (Polychlorinated phenols)	In design; Design completion planned Spring 1993; This project is being considered as part of the soil wash. project; the final decision has not been made	PRP lead/Federal oversight	Fred Schauffler 415-744-2365
9	Poly-Carb, NV Emergency Response (Action Memo signed 05/14/87) See also soil washing	Land treatment	Commercial waste management	Soil (1,500 cy)	SVOCs (Phenols), PAHs (Cresol)	Completed; Operational from 7/87 to 8/88	Federal lead/Fund Financed; Reidel Environmental Services	Bob Mandel 415-744-2290

Bioremediation (In situ)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2 #	FAA Technical Center*, NJ (09/26/89) See also Soil Vapor Extraction	In situ ground water	Jet fuel tank farm	Soil, Ground Water (extraction wells at 30 to 40 ft deep)	PAHs (JP-4)	In design; Design completion planned Fall 1992	Federal facility, FAA lead	Carla Struble 212-264-4595 Keith Buch (FAA) 609-484-6644
2	Swope Oil & Chem Co., OU2, NJ (09/27/91) See also Soil Vapor Extraction	In situ soil; Bioventing with soil vapor extraction	Chemical reclamation	Soil (2 acres to a depth of 80 ft, approximately 258,000 cy)	SVOCs (Naphthalene, DEHP, Bis (2-ethylhexyl) phthalate)	Predesign; PD completion planned 1992	In negotiation	Joseph Gowers 212-264-5386
2	Applied Environmental Services (Ground water), NY (06/24/91)	In situ ground water	Petroleum refining and reuse	Ground Water	VOCs (TEX)	Predesign; PD completion planned 1992	PRP lead/State oversight	Andrew Anglish (NY) 518-457-5637
2	Applied Environmental Services, OU1, NY (06/24/91) See also Soil Vapor Extraction	In situ soil	Petroleum refining and reuse	Soil (quantity unknown)	VOCs, SVOCs (Naphthalene, Bis(2-ethylhexyl) phthalate, Benzo(b) Fluoroanthene)	Predesign; PD completion planned 1992	PRP lead/State oversight	Andrew Anglish (NY) 518-457-5637
3	L. A. Clarke & Sons, OU #1 (Soils)*, VA (03/31/88) See also In situ Flushing	In situ soil; Follows creosote recovery and in situ flushing	Wood preserving	Soil (15,000 cy, maximum depth 8 - 10 ft)	VOCs (Benzene), PAHs (Creosote, carcinogenic PAHs)	Predesign; PD completion planned Summer 1993	PRP lead/Federal oversight	Eugene Wingert 215-597-1727
4	Cabot Carbon/Koppers, FL (09/27/90) See also Bioremediation (Ex Situ), Soil Washing	In situ soil; Treating above/below gw table by nutrient addition	Wood preserving, Pine tar and turpentine manufacturing	Soil (5,000 cy), Ground Water	SVOCs (PCP, Bis(2-ethyl hexyl)phthalate, DNT, Dimethylphenol), PAHs	In design; Design completion planned Spring 1994	PRP lead/Federal oversight	Martha Berry 404-347-2643

Bioremediation (In situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4	Cabot Carbon/Koppers (Ground water), FL (09/27/90)	In situ ground water; Treating above and below gw table with nutrients	Wood preserving, Pine tar and turpentine manufacturing CWD	Ground Water	SVOCs (PCP, Bis(2-ethylhexyl) phthalate, DNT), PAHs	In design; Design completion planned Spring 1994	PRP lead/Federal oversight	Martha Berry 404-347-2643
5	Seymour Recycling, IN (09/30/87) See also Soil Vapor Extraction	In situ soil; Nutrients plowed into soil	Chemical waste management and incineration CWD	Soil (12 acres to 10 ft deep, approximately 200,000 cy)	VOCs (TCA, Carbon tetrachloride, TCE)	Completed; Operational, Summer 1990, August-October 1986, January-February 1987	PRP lead/Federal oversight; ABB Environmental Services	Jeff Gore 312-886-6552
(5)	Seymour Recycling (Ground water), IN (09/30/87)	In situ ground water; GW treatment incidental to soil treatment	Chemical waste management and incineration CWD	Ground Water (under approx. 12 acres)	VOCs, SVOCs, PAHs	Operational; GW treatment was not designed but appears to be occuring as a result of in situ soil treatment	PRP lead/Federal oversight	Jeff Gore 312-886-6552
(5)	Cliff/Dow Dump, MI (09/27/89) See also Bioremediation (Ex Situ)	In situ ground water without addition of nutrients, oxygen, or microbes	Waste disposal for charcoal manufacturing plant CWD	Ground Water	VOCs (BTEX), SVOCs (Phenol), PAHs	Predesign; PD completion planned 1992; Design to be completed in Winter 1993	PRP lead/Federal oversight	Lida Tan 312-886-1842
(5)	Allied Chem & Ironton Coke, OU2*, OH (12/28/90)	Bioremediation (In Situ) of lagoon sediments	Coke manufacturing CF	Sediments (457,000 cy from a lagoon)	PAHs	Predesign; PD completion planned Winter 1993	PRP lead/Federal oversight; IT Corporation	Jim Van der Kloot 312-353-9309

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Bioremediation (In situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5 #	Onalaska Municipal Landfill, WI (08/14/90)	In situ soil; Air injection but no nutrient or microbe addition	Municipal landfills	Soil (16,000 cy, 11 - 15 ft. deep)	SVOCs (Naphthalene), PAHs	Design completed but not installed; Completion planned Spring 1993; Completed 3 month column study with higher contamination.	Federal lead/Fund Financed	Kevin Adler 312-8 6-7078
6 #	Atchison/Santl Fe/Clovis, NM (09/23/88)	In situ soil; landfarm sludges and cap	Railyard wastes (diesel spills)	Soil, Sludge (28,600 cy combined, 6-feet deep)	PAHs (petroleum hydrocarbons, diesel fuel)	Operational; Bioremediation began in July 1992, will end when petroleum hydrocarbons are less than 1,000 ppm	PRP lead/State oversight; Radian Corporation	Susan Webster 214-655-6730
6 #	French Limited, TX (03/24/88)	In situ lagoon bioremediation; in situ ground water bioremediation enhanced with pump and treat	Petrochemical	Sludge and Sediments (70,000 cy, to 10 feet deep	VOCs, PAHs	Operational	PRP lead/Federal oversight	Judith Black 214-655-6735
7	Fairfield Coal and Gas, IA (09/21/90)	In situ soil; Injecting hydrogen peroxide, nutrients & effluent from gw treatment	Coal gasification	Sludge (Coal tars at 22 - 27 ft deep)	VOCs (BTEX), PAHs (Naphthalene)	In design; Design completion planned Summer 1994; Field scale pilot test underway, scheduled to be complete in January, 1994	PRP lead/Federal oversight	Steve Jones 913-551-7755

Bioremediation (In situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
7	People's Natural Gas, IA (09/16/91)	In situ ground water	Coal gasification	Ground Water	VOCs (Benzene), PAHs	Predesign; PD completion planned Winter 1992	PRP lead/Federal oversight	Bill Bunn 913-551-7792
8 #	Burlington Northern (Somers Plant)*, MT (09/27/89) See also Bioremediation (Ex Situ)	In situ ground water	Wood preserving	Ground Water (2 areas, 20 ft deep and 30 ft deep)	SVOCs (Phenols), PAHs (Creosote)	In design; Design completion planned Winter 1992; Construction planned for the spring of 1993.	PRP lead/Federal oversight; Remediation Technologies, Inc.	Jim Harris 406-449-5414
8	Libby Ground Water Contamination*, MT (12/30/88) See also Bioremediation (Ex Situ)	In situ ground water Injection of hydrogen peroxide and potassium tripolyphosphate	Wood preserving	Ground Water (targeting 40 - 80 ft deep)	VOCs (Benzene), SVOCs (PCP), PAHs (Creosote)	Operational; Operation begun September, 1991; Completion planned 2001	PRP lead/Federal oversight; Woodward-Clyde	Jim Harris 406-449-5414 Bert Bledsoe (RSKERL) 405-332-2313
9	Gila River Indian Reservation, AZ Emergency Response (Action Memo signed (07/31/84) See also Chemical Treatment	In situ soil preceded by chemical treatment	Drum storage/ disposal	Soil (3,200 cy)	Biocides (Toxaphene, Ethyl and Methyl parathion)	Completed; Operational from 6/85 to 10/85	PRP lead/Federal oversight	Richard Martin 414-744-2288
9 #	Castle Air Force Base, OU 1, CA (09/30/91)	In situ ground water; Treated gw to be reinjected w/ nutrients and hydrogen peroxide	Federal facility	Ground Water	VOCs (TCE, PCE, DCE, DCA, Carbon tetrachloride, Benzene)	In design; Design completion planned Fall 1992	Federal facility, U.S. Air Force lead; James Montgomery/ PRC Environmental Management, Inc.	Michael Work 415-744-2392

Bioremediation (In situ) (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	Koppers Company, Inc. (Oroville Plant), CA (04/04/90) See also Bioremediation (Ex Situ), Soil Washing	In situ soil; Surface application of nutrients & electron donors	Wood preserving	Soil (110,000 cy, to a depth of 10 ft)	Biocides, Dioxins, SVOCs (Polychlorinated phenols)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Fred Schauffler 415-744-2365
9	Roseville Drums, CA Emergency Response (Action Memo signed (03/03/88)	In situ soil	Midnight Dump on Dirt Road	Soil (14 cy)	SVOCs (Dichlorobenzene, Phenols)	Completed Fall 1988; Operational from 2/88 to 11/88	Federal lead/Fund Financed	Brad Shipley 415-744-2287

Table 1
Detailed Site Information by Treatment Technology through FY 91

October 1992

Chemical Treatment

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
3	Avtex Fibers, VA Emergency Response (Action Memo signed 11/14/89)	Chemical treatment	Rayon manufacturing facility/ wastewater treatment	Sludge (39,000 gallons)	VOCs (Carbon disulfide)	Completed August 1991	Federal lead/Fund Financed; OH Materials	Vincent Zenone 215-597-3038
4	Palmetto Wood Preserving*, SC (09/30/87)	Reduction of Cr(6) to Cr(3) using sodium metaphosphate	Wood preserving	Soil (12,700 cy)	Metals (Chromium, Arsenic, Copper)	Completed; Operational from 9/88 to 2/89	Federal lead/Fund Financed; Roy F. Weston	Al Cherry 404-342-7791
5	PBM Enterprises (Van Dusen Airport Service), MI Emergency Response (Action Memo signed 04/10/88)	Oxidation using sodium hypochlorite	Silver Recovery Facility	Solids (Cyanide Tainted X-ray Chips)	Organic cyanides	Completed; Operational from 5/85 to 10/85	Federal lead/Fund Financed; American Environmental Service, Inc.	Ross Powers 312-378-7661
9	Gila River Indian Reservation, AZ Emergency Response (Action Memo signed 07/31/84) See also Bioremediation (In Situ)	Reduction using sodium hydroxide	Drum storage/ disposal	Soil (3,200 cy)	Biocides (Toxaphene, Ethyl and Methyl parathion)	Completed; Operational from 4/85 to 10/85	Federal lead/Fund Financed	Richard Martin 414-744-2288
9	Stanford Pesticide #1, AZ Emergency Response (Action Memo signed 04/20/87)	In situ	Pesticide manufacturing/use/ storage, Farm Equipment Storage	Soil (200 cy)	Biocides (Methyl parathion)	Completed; Operational from 7/87 to 9/87	Federal lead/Fund Financed; Crosby and Overton	Dan Shane 415-744-2286

Table 1
Detailed Site Information by Treatment Technology through FY 91

October 1992

In situ Flushing

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2	Lipari Landfill*, NJ (09/30/85)	Soil flushing; Flushing of area within the slurry wall, including soil and wastes.	Industrial landfill, Municipal landfills	Soil (650,000 cy, 16 acres to 15 ft deep)	VOCs (DCA, Dichloromethane), SVOCs (Phenol Bis(2-chloroethyl) ether), Metals (Chromium, Lead, Nickel, Mercury)	Operational; Completion planned 1999	State lead/Fund Financed; Bechtel Environmental, Inc.	Fred Cataneo 212-264-9542
2	Naval Air Warfare Center, OU 1, NJ (02/04/91)	Soil flushing; Reinject treated gw through trenches (winter) & spray irrigation (summer) with capture downgradient	Federal facility	Soil (2 acres, to 4 feet deep, approximately 12,900 cy)	VOCs	Operational; Completion planned Summer 1995; Reinjection will continue for 3 years and re-evaluated.	Navy lead/EPA oversight; Moretrench Environmental	Jeff Gratz 212-264-6667
2 #	Naval Air Warfare Center, OU 2, Area H, NJ (02/04/91)	Soil flushing; Reinject treated gw through trenches (winter) & spray irrigation (summer) w/capture downgradient	Federal facility	Soil (2 acres, to 4 ft deep, approximately 12,900 cy)	VOCs	Operational in Area H. This technology will be applied for 3 years and re-evaluated.	Navy lead/EPA oversight; Moretrench Environmental	Jeff Gratz 212-264-6667
2 #	Naval Air Warfare Center, OU 4, Site 28, NJ (09/30/91)	Soil flushing; Reinject treated gw through trenches (winter) & spray irrigation (summer) with capture downgradient	Federal facility	Soil (2 acres, to 4 ft deep, approximately 12,900 cy)	VOCs	Being installed; Completion planned Fall 1992; This technology will be applied for 3 years and re-evaluated	Navy lead/EPA oversight; Moretrench Environmental	Jeff Gratz 212-264-6667

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

In situ Flushing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2	Vineland Chemical, OU 1 and OU 2, NJ (09/29/89) See also Soil Washing	Soil flushing; Flushing lagoons using treated gw	Pesticide manufacturing/ use/storage	Soil (126,000 cy, to 15 ft in sandy soil)	Metals (Arsenic)	In design; Design completion planned Spring 1993	Federal lead/Fund Financed	Matthew Westgate 212-264-3406 Steve Hadel (USACE-Kansas City) 816-426-5221
2	Byron Barrel & Drum, NY (09/29/89)	Soil flushing	Drum storage/ disposal	Soil (5,200 cy)	VOCs (TCE, DCE, TCA, MEK), Metals (Chromium, Lead)	Predesign; PD completion planned Spring 1992	PRP lead/Federal oversight	Eduardo Gonzales 212-264-5714
3	L. A. Clarke & Sons, OU #1 (Soils)*, VA (03/31/88) See also Bioremediation (In Situ)	Soil flushing with surfactants, after creosote recovery and before in situ bioremediation	Wood preserving	Soil (15,000 cy, maximum depth 8 - 10 ft)	VOCs (Benzene), PAHs (Creosote, carcinogenic)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Eugene Wingert 215-597-1727
3	U.S. Titanium, VA (11/21/89)	Dissolution of wastes (EPA is considering excavation and ex situ dissolution of wastes)	Titanium oxide production from ore digested with sulfuric acid	Soil (16,000 cy, to 25 ft deep), Solids (16,000 cy ferrous sulfate)	Inorganics (Ferrous sulfate)	Predesign; PD completion planned Summer 1992	PRP lead/State oversight	Darius Ostrausuas 215-597-1727 Tim Longe (VA) 804-225-3258
4 #	Ciba-Geigy Corp. (MacIntosh Plant), AL (09/30/91) See also Thermal Desorption	Soil flushing (to be evaluated in treatability study)	Pesticide manufacturing/ use/storage	Soil (Depth to groundwater; no maximum)	VOCs (Benzene, Chloroform, Toluene), Biocides (DDD, DDT, DDE, BHCs), Metals (Lead), Diazinon	Predesign	PRP lead/Federal oversight	Charles Kane 404-347-2643

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

In situ Flushing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4 #	JADCO-Hughes, NC (09/27/90) See also Soil Vapor Extraction	Soil flushing preceded by vacuum extraction from same ports	Plastics manufacturing, Other organic chemical manufacturing, Other inorganic chemical manufacturing, Drum storage/ disposal, Municipal water supply	Soil (6,000 cy)	VOCs (TCE, Vinyl chloride, Carbon tetrachloride, Chloroform, BTX), SVOCs (Dichlorobenzene, Trichlorobenzene)	In design; Design completion planned late 1992; The horizontal wells used for SVE will become ports for flushing	PRP lead/Federal oversight	Barbara Benoy 404-347-7791 Bruce Nicholson (NC) 919-733-2801
5	Ninth Avenue Dump, IN (06/30/89)	Soil flushing	Industrial landfill	Soil (64,000 cy, maximum depth - 30 ft.)	VOCs (TCE, BTEX)	In design; Design completion planned Winter 1993	PRP lead/Federal oversight; Fluor-Daniel	Bernard Schorle 312-886-4746
5	Rasmussen Dump, MI (03/28/91)	Soil flushing (flushing part of reinjection of treated gw)	Industrial landfill, Paint/ink formulation	Soil (quantity unknown, gw table at 50 ft)	VOCs (Vinyl chloride, Benzene)	In design; Design completion planned 1994	State lead/Fund Financed	Ken Glatz 312-886-1434
6	Koppers/Texarkana, TX*, (09/23/88) See also Soil Washing	Soil flushing using surfactants	Wood preserving	Soil (19,400 cy Reinjecting gw to treat DNAPLs)	PAHs (Benzo(a)pyrene, DNAPLs, Creosote), Metals (Arsenic)	Predesign; Project is on hold while EPA relocates the affected community	In negotiation	Ursula Lennox 214-655-6735
6	South Cavalcade Street*, TX (09/26/88) See also Soil Washing	Soil flushing with the same surfactants used for the soils treated by soil washing	Wood preserving	Soil (20,000 cy)	SVOCs (Benzo(a)pyrene, Benzo(a)anthracene, Chrysene), PAHs	In design; Design completion planned Summer 1994	PRP lead/Federal oversight	Mark Fite 214-655-6715

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

In situ Flushing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
7	Lee Chemical, MO (03/21/91)	Soil flushing	Solvent Manufacturer/ Packing	Soil (from 10 to 20 ft deep)	VOCs (TCE, DCE, PCE, TCA)	Predesign; PD completion planned Spring 1992	PRP lead/State oversight	Gene Gunn 913-551-7776 Jim Kavanaugh (MO) 314-751-4029
10	Union Pacific Railroad Sludge Pit, ID (09/10/91)	Soil flushing	Railroad operations, cleaning and fueling	Soil (quantity unknown)	PAHs (Petroleum hydrocarbons)	Predesign; PD completion planned Spring 1993	PRP lead/Federal oversight	Anne Williamson 206-553-2739
10	United Chrome Products*, OR (09/12/86)	Soil flushing	Chrome plating facility	Soil (quantity not available), Ground Water	Metals (Chromium)	Operational; Operations began during Summer 1988 and will continue indefinitely.	New Consent Decree, now PRP financed; CH2MHill & subcontractors	Loren McPhillips 206-553-4903

Table 1
Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

In situ Vitrification

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	Parsons Chemical (ETM Enterprise), MI Emergency Response (Action Memo signed)	In situ Vitrification	Agricultural chemical facility	Soil (2,000 cy)	Biocides (Pesticides), Dioxins, Metals (Mercury)	Design completed but not installed; Completion planned Summer 1993; Waste has been staged. On hold pending reentry of vendor into the market.	Federal lead/Fund Financed; Geosafe Corp.	Len Zentack 312-886-4246
5	Ionia City Landfill*, MI (09/29/89)	In situ Vitrification	Municipal landfills	Soil (w/ debris 5,000 cy, to 15 ft deep)	VOCs (Methylene chloride, TCA, Styrene, Toluene), Metals (Lead)	In design; Design completion planned Summer 1994	PRP lead/Federal oversight	Michael Gifford 312-886-7257
8 #	Rocky Mountain Arsenal, M-1 Basins (OU 16), CO (02/26/90)	In situ Vitrification	Federal Facility/ miscellaneous wastes dumping location	Soil (4,600 cy, to 10 ft deep), Sludge (5,800 cy, to 10 ft deep)	Biocides (pesticides), Metals (Arsenic, Mercury)	In design; Design completion planned 1993; On hold pending reentry of vendor into the market	U. S. Army (PRP) lead/Federal oversight	Connally Mears 303-293-1528
8	Wasatch Chemical*, UT (03/29/91) See also Bioremediation (Ex Situ)	In situ Vitrification	Pesticide manufacturing/use/ storage, Other organic chemical manufacturing, Other inorganic chemical manufacturing	Soil (3,600 cy combined, to 5 ft deep), Sludge, Solids (drain pipes, etc.)	SVOCs (Hexachloro benzene, PCP), Biocides (Pesticides), Dioxins	Predesign; PD completion planned Summer 1992	PRP lead/Federal oversight	Bert Garcia 303-293-1526

Table 1

Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1	Kellogg-Deering Well Field, CT (09/29/89)	Soil vapor extraction	Solvent recovery facility, Industry cluster	Soil (quantity not available)	VOCs (TCE, PCE, DCE, TCA, DCA, Vinyl chloride, BTEX)	In design; Design completion planned Winter 1993	PRP lead/Federal oversight; GZA Geoenviron -mental	Leslie McVickar 617-573-9689
1 #	Groveland Wells*, MA (09/30/88)	Soil vapor extraction With carbon adsorption for air emissions	Manufacturing	Soil (19,000 cy to 25-30 ft deep)	VOCs (TCE, Methylene chloride, DCE)	Installation complete September 1992	PRP lead/Federal oversight; TerraVac	Bob Leger 617-573-5734
1	Silresim*, MA (09/19/91)	Soil vapor extraction	Chemical waste reclamation	Soil (137 cy)	VOCs (TCE, TCA, Carbon tetrachloride, Chloroform, Styrene)	Predesign; PD completion planned Summer 1992	In negotiation	Leslie McVikar 617-573-9689
1	Wells G&H, MA (09/14/89)	Soil vapor extraction with air flushing	Inorganic/organic pigments, Drum storage/disposal	Soil (7,400 cy, to 3 ft deep)	VOCs (PCE, TCE)	Predesign; PD completion planned Summer 1992	PRP lead/Federal oversight	Barbara Newman 617-573-5736
1	Mottolo Supply, NH (03/29/91)	Soil vapor extraction with horizontal wells	Uncontrolled waste site	Soil (3,400 cy)	VOCs (TCE, TCA, Vinyl chloride, DCA, DCE, Toluene, Ethylbenzene)	Predesign; PD completion planned Spring 1992	In negotiation	Roger Duwart 617-573-9628
1 #	South Municipal Water Supply Well*, NH (09/27/89) See also Other Technologies	Soil vapor extraction; Air sparging of ground water	Solvent recovery facility, Ball bearing manufacturing	Soil (7,500 cy), Ground Water	VOCs (PCE, TCA, TCE)	In design; Design completion planned October 1992;	PRP lead/Federal oversight	Roger Duwart 617-573-9628

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1 #	Tinkham Garage*, NH (09/30/86)	Soil vapor extraction with carbon adsorption for air emissions	Industrial landfill, Drum storage/disposal	Soil (9,000 cy up to 40,000 cy)	VOCs (Chloroform, DCE, Vinyl chloride, Benzene)	In design; Design completion planned September 1992; Construction is scheduled to begin September 1992	PRP lead/Federal oversight; Terra Vac	Diana King 617-573-9676
1	Stamina Mills, RI (09/28/90)	Soil vapor extraction	Textile manufacturing	Soil (6,000 cy, to 12 ft deep)	VOCs (DCE, TCE)	Predesign; PD completion planned Fall 1993	PRP lead/Federal oversight	Neil Handler 617-573-9636
2	A O Polymer, Soil treatment phase, NJ (06/28/91)	Soil vapor extraction with carbon adsorption for vapors	Polymer manufacturing	Soil (7,500 cy, to 30 ft deep)	VOCs (TCE, TCA, Trichlorofluoro-methane, Toluene, Ethylbenzene), SVOCs (Naphthalene, 4-Methylphenol)	Predesign; PD completion planned Summer 1992	In negotiation	Rich Puvogel 212-264-9836
2 #	FAA Technical Center*, NJ (09/26/89) See also Bioremediation (In Situ)	Soil vapor extraction	Jet fuel tank farm	Soil (33,000 cy)	VOCs (BTEX), SVOCs (Chlorophenol, Phenol)	In design; Design completion planned Fall 1992	Federal facility, FAA lead	Carla Struble 212-264-4595 Keith Buch (FAA) 609-484-6644
2	Garden State Cleaners, NJ (09/26/91)	Soil vapor extraction	Dry cleaners	Soil (300 cy, to 25 ft deep)	VOCs (PCE)	In design; Design completion planned Spring 1993; The USACE is doing the design for EPA	Federal lead/Fund Financed	Sharon Atkinson 212-264-1217

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2	South Jersey Clothing, NJ (09/26/91)	Soil vapor extraction	Dry cleaners, Clothing manufacturer	Soil (1,400 cy, to 25 ft deep)	VOCs (TCE)	In design; Design completion planned Spring 1993; The USACE is doing the design for EPA.	Federal lead/Fund Financed	Sharon Atkinson 212-264-1216
2	Swope Oil & Chem Co., OU2, NJ (09/27/91) See also Bioremediation (In Situ)	Soil vapor extraction; Vacuum extraction with bioventing	Chemical reclamation	Soil (2 acres, to a depth of 80 ft, approximately 258,000 cy)	VOCs (TCE, PCE, Toluene, Ethylbenzene, Xylene)	Predesign; PD completion planned 1992	In negotiation	Joseph Gowers 212-264-5386
2	Applied Environmental Services, OU1, NY (06/24/91) See also Bioremediation (In Situ)	Soil vapor extraction	Petroleum refining and reuse	Soil (quantity unknown)	VOCs, SVOCs	Predesign; PD completion planned 1992	PRP lead/State oversight	Andrew Anglish (NY) 518-457-5637
2	Circuitron Corporation, OU 1, NY (03/29/91)	Soil vapor extraction	Electroplating	Soil (900 cy, to a depth of 30 ft)	VOCs (TCA, PCE, TCE, DCA)	In design; Design completion planned Spring 1993	Federal lead/Fund Financed; ICF	Niko Fayon 212-264-4706
2 #	Genzale Plating Company, OU1, NY (03/29/91)	Soil vapor extraction precedes excavation for off-site solidification	Electroplating	Soil (275 cy, to a depth of 30 ft)	VOCs (TCE, TCA)	In design; Design completion planned Spring 1993	Federal lead/Fund Financed	Janet Cappelli 212-264-8679
2	Mattiace Petrochemicals Company, OU1, NY (06/27/91)	Soil vapor extraction	Municipal water supply, Organic chemicals blending	Soil (17,000 cy, to 40 ft deep)	VOCs (PCE, TCE, Benzene, Xylene)	Predesign; PD completion planned Winter 1993	Federal lead/Fund Financed	Edward Als 212-264-0522

17

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2 #	SMS Instruments (Deer Park), NY (09/29/89)	Soil vapor extraction with catalytic combustor	Military aircraft component overhauler	Soil (1,250 cy to 25 ft deep)	VOCs (TCE), SVOCs (Dichlorobenzene)	Operational; Completion planned Spring 1993; Will be evaluated in Spring 1993	Federal lead/Fund Financed; Four Seasons	Miko Fayon 212-264-4706
2	Solvent Savers, NY (09/30/90) See also Thermal Desorption	Soil vapor extraction	Solvent recovery facility, Chemical reclamation	Soil (to 40 ft deep)	VOCs (DCE, TCE)	Predesign; PD completion planned Summer 1993	PRP lead/Federal oversight	Lisa Wong 212-264-5712
2	Vestal Water Supply 1-1, NY (09/27/90)	Soil vapor extraction	2 acres within industrial park	Soil (Both areas = 25,000 cy, to 28 ft deep)	VOCs (DCA, TCA, TCE, DCE)	Predesign; PD completion planned Summer 1993	Area 2 - Fund lead; Area 4 - PRP lead	Ed Als 212-264-0522
2	Upjohn Manufacturing Co., PR (09/30/88)	Soil vapor extraction	Industrial facility, chemical leak	Soil (quantity not available)	VOCs (Carbon tetrachloride, Acetonitrile)	Completed	PRP lead/Federal oversight; Terra Vac	Alison Hess 212-264-6040
3	Bendix, PA (09/30/88)	Soil vapor extraction with air flushing	Aircraft instrumentation manufacturing	Soil (33,000 cy, to 10 ft deep)	VOCs (PCE, TCE, Vinyl chloride)	Predesign; PD completion planned Winter 1992; Treatability study completed, and currently being reviewed	PRP lead/Federal oversight; ERM, Inc.	Humane Zia 215-597-0913
3	Cryochem, OU3, PA (09/30/91)	Soil vapor extraction	Machine shops	Soil (70 cy, up to 4 ft deep)	VOCs (TCA, TCE, PCE, DCA)	In design; Design completion planned Winter 1992	Federal lead/Fund Financed	Lisa Nichols 215-597-3216

23

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
3 #	Henderson Road*, PA (06/30/88)	Soil vapor extraction with air flushing (Treating unsaturated soil and bedrock)	Injection well	Soil (74,000 cy, to 100 ft deep)	VOCs (DCA, TCA, Toluene)	Operational; Completion date unknown	PRP lead/Federal oversight; RT Environmental System	Michael Towle 215-597-8309
3	Lord-Shope Landfill*, PA (06/29/90)	Soil vapor extraction (method to be determined in design)	Industrial landfill	Soil (270,000 cy, to 30 ft deep)	VOCs (PCE, TCE, Vinyl chloride, Alcohols, n-Butanol, Ketones)	In design; Design completion planned Winter 1993	PRP lead/Federal oversight	Jim Feeney 215-597-8257
3 #	Tyson's Dump*, PA (03/31/88)	Soil vapor extraction with air flushing (The system has been modified during operations)	Industrial landfill	Soil (30,000 cy with some DNAPL, to 30 ft deep)	VOCs (Benzene, Toluene, Xylene, Trichloropropane)	Operational; Completion date unknown	PRP lead/Federal oversight; Terra Vac	Eugene Dennis 215-597-8555
3	Arrowhead Associates/Scovill, OU1, VA (09/30/91)	Soil vapor extraction with air flushing	Electroplating	Soil (1,000 cy, depth unknown)	VOCs (TCE, PCE)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Phil Rotstein 215-597-9023
4	Robins AFB, Landfill and Sludge Lagoon, OU 1, GA (06/28/91)	Soil vapor extraction	Federal facility, sludge from an industrial waste water treatment plant	Soil (15,000 cy, combined, to 8 ft deep), Sludge	VOCs (TCE, PCE, Vinyl chloride, Carbon tetrachloride)	Predesign; PD completion planned Summer 1992	Federal Facility, U.S. Air Force	Roseanne Rudd 404-347-7791
4	Charles Macon Lagoon, Lagoon #7, OU1, NC (09/30/91)	Soil vapor extraction with air flushing	Petroleum refining and reuse	Soil (1,300 cy, combined), Sludge	VOCs (PCE)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Jack Butler 919-733-2801

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4 #	JADCO-Hughes, NC (09/27/90) See also In situ Flushing	Soil vapor extraction with horizontal wells followed by in situ flushing with same ports	Plastics manufacturing, Other organic chemical manufacturing, Other inorganic chemical manufacturing, Drum storage/ disposal, Municipal water supply	Soil (6,000 cy)	VOCs (Carbon tetrachloride, Chloroform, Vinyl chloride, TCE, BTX), SVOCs (Dichlorobenzene, Trichlorobenzene)	In design; Design completion planned late 1992	PRP lead/Federal oversight	Barbara Benoy 404-347-7791 Bruce Nicholson (NC) 919-733-2801
4	Hinson Chemical, SC Emergency Response (Action Memo signed 11/28/88)	Soil vapor extraction with air flushing	Waste reclaiming facility	Soil (60,000 cy, to 50 ft deep)	VOCs	Completed March 1992; Operational December 1988 through March 1992	Federal lead/Fund Financed; OH Materials	Fred Stroud 404-347-3136
4	Medley Farm, OU1, SC (05/29/91)	Soil vapor extraction	Other organic chemical manufacturing, Rubber manufacturing, Drum storage/ disposal	Soil (50,000 cy, maximum depth 60ft)	VOCs (DCA, DCE, TCA, Benzene, Toluene), SVOCs (Phthalates)	Predesign; The design is planned for completion in Summer, 1993.	PRP lead/Federal oversight	Ralph Howard 404-347-7791 Richard Haynes (SC) 803-734-5487
4 #	SCRDI Bluff Road, SC (09/12/90)	Soil vapor extraction with air flushing	Drum storage/ disposal, Solvent recovery facility	Soil (45,000 cy, to 12 ft deep)	VOCs (TCA, TCE, PCA, PCE, DCA, DCE, BTEX, Chlorobenzene, MEK)	Predesign; PD completion planned Winter 1992; Litigation from surrounding landowners has delayed progress.	PRP lead/Federal oversight	Steve Sandler 404-347-7791

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	Acme Solvent Reclaiming, Inc. (OU2), IL (12/31/90) See also Thermal Desorption	Soil vapor extraction with air flushing	Industrial landfill, Municipal water supply	Soil (quantity unknown)	VOCs (DCA, TCA, DCE, TCE, PCE, Vinyl chloride, Benzene)	Predesign; PD completion planned Fall 1993	PRP lead/Federal oversight; Geo Syntec	Dennis Dalga 312-886-5116
5	Enviro. Conservation and Chemical (ROD Amendment), IN (06/07/91)	Soil vapor extraction with air flushing	Industrial landfill, Municipal water supply	Soil (quantity unknown)	VOCs (Toluene, Ethylbenzene, Xylene), SVOCs (Dichlorobenzene, Phenol), Organics	Predesign	PRP lead/Federal oversight	Karen Vendl 312-886-4739
5	Fisher Calo Chem, IN (08/07/90)	Soil vapor extraction	Municipal water supply	Soil (29,500 cy)	VOCs (PCE, DCA, TCA)	In design; Design completion planned Fall 1993	Federal lead/Fund Financed	Brad Bradley 312-886-4742
5	MIDCO I, IN (06/30/89)	Soil vapor extraction	Industrial landfill	Soil (10,000 cy, 4 - 8 feet deep)	VOCs (TCE, Dichloromethane, MEK, Chloro-benzene, BTX), SVOCs (Phenols), PAHs	Predesign	PRP lead/Federal oversight	Richard Boice 312-886-4740
5	Main Street Well Field, IN (03/29/91)	Soil vapor extraction with air flushing	Solvent recovery facility; Water supply contamination from many sources	Soil (22,000 cy, to 10 ft deep)	VOCs (TCE)	Predesign; PD completion planned Fall 1992; EPA is negotiating with the PRP, a Consent Decree is expected in the Fall, 1992	PRP lead/Federal oversight	Cindy Nolan 312-886-0400

37

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	Seymour Recycling, IN (09/30/87) See also Bioremediation (In Situ)	Soil vapor extraction; No need for emissions treatment	Chemical waste management and incineration	Soil (approximately 200,000 cy, 12 acres to 10 ft deep)	VOCs (TCA, Carbon tetrachloride, PCE, TCE, Vinyl chloride, Benzene)	Operational; Completion planned Spring 1994	PRP lead/Federal oversight; Canonie Engineering (installation), Geraghty & Miller (operation)	Jeff Gore 312-886-6552
5	Wayne Waste Reclamation, IN (03/30/90)	Soil vapor extraction with air flushing	Municipal landfill, Oil reclamation	Soil (300,000 cy, 10 acres to 20 ft deep)	VOCs (TCE, DCE, Vinyl chloride, BTEX)	In design; Design completion planned Fall 1993; 30% design completion by November 1992	PRP lead/Federal oversight; Warzyn, Inc.	Beverly Kush 312-886-6945
5	Chem Central, MI (09/30/91)	Soil vapor extraction	Chemical packaging and distribution	Soil (6,200 cy; to 8 ft deep)	VOCs (DCE, TCE, TCA, BTEX), SVOCs (Naphthalene, 2-methyl naphthalene)	Predesign; Design completion scheduled for Summer 1994	PRP lead/Federal oversight	Mike McAteer 312-886-4663
5	Kysor Industrial*, MI (09/29/89)	Soil vapor extraction	Machine shops, Truck parts manufacturing	Soil (13,200 cy)	VOCs (TCE, Xylene, Toluene, Ethylbenzene)	In design; Design completion planned Summer 1993	PRP lead/Federal oversight	Mary L. Gustafson 312-886-6144
5	Springfield Township Dump, MI (09/29/90)	Soil vapor extraction with air flushing	Industrial landfill	Soil (100,000 cy)	VOCs (TCE, TCA, MEK, Toluene, Chlorobenzene)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Mary Lou Martin 312-353-6284
5	Sturgis Municipal Well Field, MI (09/30/91)	Soil vapor extraction with air flushing	Solvent recovery facility	Soil (Area and depth unknown, < 200 ft. deep)	VOCs (TCE, PCE, TCA)	Predesign; PD completion planned 1993	Federal lead/Fund Financed	Terese Van Donsel 312-353-6564

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5 #	ThermoChem, Inc. (OU1), MI (09/30/91)	Soil vapor extraction with air flushing, may include biological enhancement	Municipal water supply	Soil (50,000 cy, 17 ft -32 ft deep)	VOCs (PCE, TCE, Ethylbenzene, Xylene)	Predesign; PD completion planned Fall 1992.	Federal lead/Fund Financed	Jim Hahnenberg 312-353-4213
5	Verona Well Field (Thomas Solvent/Raymond Road)*, MI (08/12/85)	Soil vapor extraction (with nitrogen sparging)	Municipal water supply	Soil (35,000 cy, one half acre to 18 ft deep)	VOCs (Dichloromethane, Chloroform, Carbon tetrachloride, DCA, TCA, BTEX, Vinyl chloride), SVOCs (Naphthalene)	Completed Spring 1992	Federal lead/Fund Financed; Terra Vac (subcontractor to CH2M Hill)	Margaret Guerriero 312-886-0399
5	Verona Well Field, OU2, MI (06/28/91)	Soil vapor extraction with air flushing	Machine shops, Municipal water supply	Soil (30,000 cy)	VOCs (PCE, TCA, Toluene)	Predesign; Design will be completed in Spring, 1993.	Federal lead/Fund Financed	Margaret Guerriero 312-886-0399
5 #	Long Prairie Groundwater Contamination, MN (06/27/88)	Soil vapor extraction with air flushing followed by GAC for off-gas	Dry cleaners	Soil (3,600 cy, to 15 ft deep)	VOCs (DCE, PCE, TCE, Vinyl chloride)	Design completed but not installed; Completion planned Spring 1992	State lead/Fund Financed	Jan Bartlett 312-886-5438 Maureen Johnson (MN) 612-296-7353
5 #	Miami County Incinerator, OH (06/30/89)	Soil vapor extraction with air flushing (treatment of off-gas determined in design)	Municipal landfill, Surface impoundment	Soil (98,000 cy, combined), Solids	VOCs (TCE, PCE, Toluene)	Predesign; No schedule until a Consent Decree is entered.	PRP lead/Federal oversight; Connestogo Roveis-Prime	Anthony Rutter 312-886-8961
5	Pristine (ROD Amendment), OH (03/30/90)	Soil vapor extraction with horizontal wells	Industrial landfill, Drum storage/disposal	Soil (quantity unknown, 4-12 ft deep)	VOCs (Chloroform, DCA, PCE, TCE, Benzene), SVOCs (Phenol)	In design; Design completion planned Summer 1993	PRP lead/Federal oversight; Hydrogeo-Chem	Thomas Alcamo 312-886-7278

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	Zanesville Well Field, OH (09/30/91) See also Soil Washing	Soil vapor extraction with horizontal wells followed by soil washing	Solvent recovery facility, Auto parts manufacturing	Soil (36,000 cy)	VOCs (TCE, DCE)	Predesign; PD completion planned Fall 1992; A CD with the PRPs is expected in the Fall, 1992	PRP lead/Federal oversight	Dave Wilson 312-886-1476
5 #	Hagen Farm*, WI (09/17/90)	Soil vapor extraction with air flushing	Industrial and municipal waste disposal	Soil (24,000 cy, to 18 ft deep)	VOCs (Vinyl chloride, MEK, BTEX), Tetrahydrofuran	In design; Design completion planned Spring 1993; Pilot test completed Fall 1992	PRP lead/Federal oversight; Warzyn-Prime	Steve Padovani 312-353-6755 Don DiGulim (RSKERL) 405-332-8800
5 #	Wausau Groundwater Contamination, WI (09/29/89)	Soil vapor extraction with air flushing	Machine shops, Bulk chemical distribution	Soil (1,300 cy; to 30 ft depth)	VOCs (TCE, DCE, PCE)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight; Hydrogeo-Chem (sub to Conestoga-Rovers & Associates)	Margaret Guerriero 312-886-0399
6 #	South Valley, NM (09/30/88)	Soil vapor extraction	Aircraft engine manufacturing	Soil (to a depth of 20 ft)	VOCs (PCE, TCE, DCE, TCA)	Design completed but not installed; Completion planned Spring 1993; Pilot tests will be completed in October; SVE on north end will be in by 12/92, on south end by 3/93	PRP lead/Federal oversight	Bert Gorrod 214-655-6730

53

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
6 #	Tinker AFB (Soldier Creek Bldg. 3001), OK (08/16/90)	Soil vapor extraction	Maintenance facility for aircraft	Soil (quantity not available), Soil (Perched heavy fuel product phase)	VOCs (BTEX)	In design; Data on viability of SVE for the heavy fuel oil contamination being evaluated. Decision in Fall 1992	Air Force lead	Susan Webster 214-655-6730 Capt. Dan Welch (USAF) 405-734-3058
6	Petro-Chemical Systems, Inc., OU2, TX (09/06/91) See also Other Technologies	Soil vapor extraction with air flushing with air sparging of ground water	Petroleum refining and reuse	Soil (300,000 cy, to 30 ft deep), Ground Water	VOCs (BTEX), SVOCs (Naphthalene), Metals (Lead)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Chris Villareal 214-655-6735
7 #	Hastings GW Contamination (Colorado Ave)*, NE (09/28/88)	Soil vapor extraction	Industrial metal finishing/cleaning	Soil (42,700 cy)	VOCs (PCE, TCE, DCE, TCA)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Darrel Sommerhauser 913-551-7711 Richard Schlenker (NE) 402-471-3388
7 #	Hastings GW Contamination (Far-Mar Co.)*, NE (09/30/88)	Soil vapor extraction	Former grain storage area (fumigants)	Soil (Targeting layers at 35 ft and 110 ft)	VOCs (Carbon tetrachloride, Ethylene dibromide)	In design; Design completion planned Summer 1993; Consent Decree will deal with costs and remediation.	PRP lead/Federal oversight	Susan Hoff 913-551-7786

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
7 #	Hastings GW Contamination, Well No. 3*, NE (09/26/89)	Soil vapor extraction	Former grain storage area (fumigants)	Soil (100 ft radius, up to 110 ft deep)	VOCs (Carbon tetrachloride, Chloroform)	Operational; SVE began operation on July 1, 1992. The State will take over the project in March, 1993.	Federal lead/Fund Financed; Morrison Knudsen, EPA contractor	Diane Easley 913-551-7797 Steve Roe (Morrison Knudsen) 303-793-5054 Richard Schlenker 402-471-3388
7	Lindsay Manufacturing, NE (09/28/90)	Soil vapor extraction with air flushing	Electroplating, galvanized pipes for irrigation systems	Soil (targeting soil 25- 40 ft deep)	VOCs (DCA, DCE, TCE, PCE)	Predesign; PD completion planned Fall 1992; Pilot study planned October 1992.	PRP lead/Federal oversight	Cecelia Tapia 913-551-7733
7	Waverly Groundwater Contamination, NE (09/26/90)	Soil vapor extraction	Grain storage (fumigants)	Soil (5 acres, 20 to 30 ft deep, approxi-mately 80,000 cy)	VOCs (Carbon tetrachloride, Chloroform)	Operational; Completion planned 2001; This project began in February, 1988.	PRP Lead - USDA	Gene Gunn 913-551-7776 Jim Hallett (USDA) 202-690-0715 Mary Hansen (Argonne National Lab) 708-972-4938
8	Chemical Sales Company, OU1*, CO (06/27/91)	Soil vapor extraction with air flushing (will recirculate treated emissions)	Chemical sales and distribution, spillage at tank farm	Soil (360,000 cy, to 35 ft deep)	VOCs (PCE, TCE)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Jim Berkley 303-293-1817
8	Martin Marietta (Denver Aerospace), CO (09/24/90) See also Thermal Desorption	Soil vapor extraction	Aerospace equipment manufacturer - Bulk storage facility and industrial landfill	Soil (less than one acre, depth unknown)	VOCs (TCE)	Predesign; PD completion planned Winter 1992	State lead under RCRA	George Dancik 303-293-1506 Susan Chaki 303-331-4832

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
8 #	Rocky Mountain Arsenal (OU 18), interim response, CO (02/26/90)	Soil vapor extraction	Motor pool area	Soil (4,000 cy at two depths 20 ft and 45 ft)	VOCs (TCE, Benzene)	In design; Design completion planned Fall 1992; Report from pilot study complete.	U. S. Army (PRP) lead/EPA oversight	Stacey Eriksen 303-294-1083
8	Sand Creek Industrial (OU1)*, CO (09/29/89)	Soil vapor extraction	Pesticide manufacturing/use/ storage, Refinery	Soil (38,000 cy)	VOCs (TCE, PCE, Methylene chloride, Chloroform)	Design completed but not installed; Completion planned Spring 1993	Federal lead/Fund Financed; URS	Erna Acheson 303-294-1719
9 #	Indian Bend Wash, South Area (OU1), AZ (09/12/91)	Soil vapor extraction (may vary technology at different units within area)	Dry cleaners, Electroplating, Industrial landfill, Municipal landfill	Soil (Maximum depth - 90 ft)	VOCs (PCE, TCE, TCA)	Predesign; Pilot project under the SACM initiative, schedules for different units may vary.	Mixed funding; PRP lead/Federal oversight	Jeff Dhont 415-744-2363
9 #	Motorola Mesa Ground Water Contamination, AZ (09/30/91)	Soil vapor extraction	Semiconductor manufacturing	Soil	VOCs (TCE, PCE, 1,1-DCE)	Predesign	PRP Lead/state oversight	Richard Oln (AZ) 602-207-4197
9 #	Motorola 52nd Street, AZ (09/30/88)	Soil vapor extraction	Manufacturing Facility	Soil (60 ft radius to 25 ft depth)	VOCs (TCA, TCE, DCE, PCE, Carbon tetrachloride, Ethylbenzene)	Predesign; A pilot system is operational but the full scale technology is still being evaluated.	PRP lead/State oversight; Dames and Moore	Mike Montgomery 415-744-2403 Jackie Maye (AZ) 602-207-4179 Hotline 602-207-4360

67

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9 #	Phoenix-Goodyear Airport Area (North & South Fac), AZ (09/26/89)	Soil vapor extraction	Defense related manufacturing	Soil (North: 1,200 cy, South: 270,000 cy, 60 ft deep)	VOCs (TCE, TCA, MEK)	In design; Design completion planned Fall 1992; Operation to begin in 1993.	PRP lead/Federal oversight	Craig Cooper 415-744-2370
9 S	Fairchild Semiconductor (San Jose)*, CA (03/20/89)	Soil vapor extraction with air flushing	Semiconductor manufacturing	Soil (Approximately 20 acres, 60 to 120 feet deep)	VOCs (TCA, 1,1-DCE, Freon)	Completed Fall 90; Remedial efforts will be reevaluated in January 1994	PRP lead/State oversight; Canonie Engineering	Helen McKinley 510-744-2236 Steve Hill (CA) 510-286-0433 Dennis Curran (Canonie) 510-960-1640
9	Fairchild Semiconductor/MTV-I*, CA (06/09/89)	Soil vapor extraction	Semiconductor manufacture and metal finisher	Soil (Quantity not available)	VOCs (TCE, PCE, Vinyl chloride, DCA, DCE, Freon), SVOCs (Phenol)	In design; Design completion planned 1993	PRP lead/Federal oversight	Pattie Collins 415-744-2229
9	Fairchild Semiconductor/MTV-II*, CA (06/30/89)	Soil vapor extraction	Semiconductor manufacturing, Metal finishing facility	Soil (Quantity not available)	VOCs (TCE, PCE, Vinyl chloride, DCA, DCE, Freon), SVOCs (Phenol)	In design; Design completion planned 1993	PRP lead/Federal oversight	Pattie Collins 415-744-2229
9 #	IBM (San Jose)*, CA (12/15/88)	Soil vapor extraction	Computer manufacture	Soil (24,000 cy)	VOCs (TCA, Acetone, Freon, Isopropyl alcohol, Xylenes)	Operational; Completion planned Spring 2001	PRP lead/State oversight; Terra Vac	Helen McKinley 415-744-2236 Steve Morris (CA) 415-464-0304
9	Intel, Mountain View*, CA (06/09/89)	Soil vapor extraction	Semiconductor manufacturing, Metal refinishing facility, aircraft maintenance	Soil (Quantity not available)	VOCs (TCE, PCE, Vinyl chloride, DCA, DCE, Freon), SVOCs (Phenol)	In design; Design completion planned 1993	PRP lead/Federal oversight	Pattie Collins 415-744-2229

13

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	Intersil/Siemens, CA (09/27/90)	Soil vapor extraction	Semiconductor manufacturing	Soil (Quantity not available)	VOCs	Operational	State lead/Fund Financed; Levine-Frisks	Marie Lacey 415-744-2234 Steve Morse 415-464-0304
9 #	Monolithic Memories/AMD - Arques, CA (09/11/91) B SUBOU,+2	Soil vapor extraction	Semiconductor manufacturing	Soil (Quantity unknown), Ground Water (Quantity unknown)	VOCs (PCE, TCE, TCA)	Design completed but not installed; Completion planned Winter 1992; Awaiting permits for project.	State lead/Fund Financed	Helen McKinley 415-744-2236 Cecil Felix 510-464-1249
9 #	National Semiconductor and Advanced Micro Device, CA (09/11/91) SUBOU,+1	Soil vapor extraction	Semiconductor manufacturing	Soil (Quantity unknown), Ground Water (Quantity unknown)	VOCs (PCE, DCE, Toluene, Ethylbenzene, Xylene), SVOCs	Operational; Completion planned Spring 1996	State lead/Fund Financed	Helen McKinley 415-744-2236
9	Raytheon, Mountain View*, CA (06/09/89)	Soil vapor extraction	Semiconductor manufacturing, Metal Refinishing and Aircraft Maintenance	Soil (Quantity not available)	VOCs (TCE, PCE, Vinyl chloride, DCA, DCE, Freon), SVOCs (Phenol)	In design; Design completion planned 1993	PRP lead/Federal oversight	Pattie Collins 415-744-2229
9	Signetics (Advanced Micro Devices), CA (09/11/91)	Soil vapor extraction	Semiconductor manufacturing	Soil (Quantity unknown)	VOCs (TCE, DCE, DCA, TCA)	Operational; Although the ROD was signed in FY 91, the PRP has operated the remedy for several years	PRP lead/State oversight; M-Con Associates	Joe Healy 415-744-2231 Ron Jervasom (CA) 510-464-0688
9	Solvent Service, CA (09/27/90)	Soil Vapor Extraction with heat enhancement	Municipal water supply	Soil	VOCs (TCA, Acetone, Ethylbenzene, Xylene), SVOCs (Dichlorobenzene)	Operational	State lead under RCRA authority	Marie Lacey 415-744-2234 Steve Morse (CA) 415-464-0304

79

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

Soil Vapor Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	Spectra Physics, OU1, CA (03/22/91)	Soil vapor extraction with horizontal wells	Semiconductor manufacturing, Laser manufacturing	Soil (Quantity not available)	VOCs (TCE)	Operational; Completion planned Winter 1997	PRP lead/State oversight; Levine - Fricke	Sean Hogan 415-744-2233
9	Van Waters and Rogers, CA (09/30/91)	Soil vapor extraction	Chemical packaging facility	Soil (Quantity unknown), Ground Water (Quantity unknown)	VOCs (PCE, TCE, TCA)	In design; Design completion planned Spring 1993	PRP lead/State oversight	Marie Lacey 415-744-2234 Susan Gladstone 415-464-0840
9	Watkins-Johnson*, CA (06/29/90)	Soil vapor extraction	Semiconductor manufacturing	Soil (Quantity not available)	VOCs (DCE, TCA, TCE)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Elizabeth Kelcher 415-744-2361
10	Commencement Bay/South Tacoma Channel/Well 12A*, WA (06/01/87)	Soil vapor extraction with air flushing	Municipal water supply, Waste oil and solvent reclamation; Paint and lacquer thinner manufacturing	Soil (100,000 cy to 35 ft deep)	VOCs (PCE, TCE, TCA)	Operational; Completion planned Fall 1998	Federal lead/Fund Financed; AWD Technologies, Inc.	Kevin Rochlin 206-553-2106

63

Table 1
Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

Soil Washing

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2 #	Ewan Property*, NJ (09/29/89) See also Solvent Extraction	Water only; preceded by solvent extraction	Industrial waste dumping	Soil (22,000 cy)	Metals (Chromium, Lead, Copper, Barium)	Predesign; Start date contingent upon progresss in OU-1. Completion estimate 1995.	In negotiation	Dave Rosoff 212-264-5397
2	King of Prussia, NJ (09/28/90)	Water with washing agents as an additive; sludges to be land disposed	Recycling facility	Soil (20,000 cy, combined), Sludge, Sediments	Metals (Chromium, Copper, Silver)	In design; Design completion planned Summer 1993	PRP lead/Federal oversight	Gary Adamkiewicz 212-264-7592
2	Myers Property, NJ (09/28/90) See also Dechlorination	Soil washing preceded by dechlorination, may be followed by s/s	Pesticide manufacturing/ use/storage	Soil (50,000 cy, combined), Sediments	Metals (Aluminum, Cadmium, Chromium, Silver)	Predesign; PD completion planned Summer 1992; Consent Decree signed by EPA and PRP 9/91; the design will begin as soon as the Court approves	PRP lead/Federal oversight	John Prince 212-264-1213
2	Vineland Chemical, OU 1 and OU 2, NJ (09/29/89) See also In situ Flushing	Soil washing	Pesticide manufacturing/ use/storage	Soil (62,000 cy of sandy soil)	Metals (Arsenic)	In design; Design completion planned Spring 1993	Federal lead/Fund Financed	Matthew Westgate 212-264-3406 Steve Hadel (USACE - Kansas City) 816-426-5221

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Washing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2 #	GE Wiring Devices, PR (09/30/88)	Water with potassium iodide solution as an additive	Wiring services facility	Soil (5,500 cy combined), Sludge	Metals (Mercury)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Caroline Kwan 212-264-0151
4 #	American Creosote Works*, FL (09/28/89) See also Bioremediation (Ex Situ)	Water with surfactants as an additive; followed by slurry-phase bioremediation for fines	Wood preserving	Soil (36,500 cy)	SVOCs (PCP), Dioxins, PAHs (Creosote)	In design; Design completion planned Fall 1992; The design will be a performance spec and is expected to be available for bid Fall/Winter 1992	Federal lead/Fund Financed	Madolyn Streng 404-347-2643 Charles Logan (FL) 904-488-0190 Kelsey Helton (FL) 904-488-0190
4	Cabot Carbon/Koppers, FL (09/27/90) See also Bioremediation (Ex Situ), Bioremediation (In Situ)	Soil washing; followed by bioremediation of fines	Wood preserving, Pine tar and turpentine manufacturing	Soil (6,400 cy)	SVOCs (PCP, Bis(2-ethylhexyl) phthalate, DNT, Dimethylphenol), PAHs, Metals (Arsenic, Chromium)	In design; Design completion planned Spring 1994	PRP lead/Federal oversight	Martha Berry 404-347-2643
4	Southeastern Wood Preserving, MS Emergency Response (Action Memo signed 09/30/90) See also Bioremediation (Ex Situ)	Soil washing (desanding, followed by bioremediation of fines)	Wood preserving	Solids (8,000 cy of soils, sludges, and kiln ash)	SVOCs (PCP), PAHs (Creosote)	Operational; Completion planned Summer 1993	Federal lead/Fund Financed; OHM Remediation Services Corp.	Don Rigger 404-347-3931
4 #	Cape Fear Wood Preserving, NC (06/30/89) See also Bioremediation (Ex Situ)	Water with sodium hydroxide or hydrochloric acid as an additive; may be followed by s/s	Wood preserving	Soil (20,000 cy)	VOCs (Benzene), PAHs (Creosote), Metals (Copper, Chromium, Arsenic)	Design completed but not installed; Currently procuring construction contractor	Federal lead/Fund Financed	Jon Bornholm 404-347-7791

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Washing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	United Scrap Lead/SIA, OH (09/30/88)	Soil washing	Battery recycling/ disposal	Soil (109,000 cy, combined), Solids (55,000 cy of battery casing chips), Sediments	Metals (Lead)	In design; Design completion planned Spring 1993	Federal lead/Fund Financed	Anita Boseman 312-886-6941
5	Zanesville Well Field, OH (09/30/91) See also Soil Vapor Extraction	Soil washing preceded by vacuum extraction	Solvent recovery facility, Auto parts manufacturing	Soil (1,800 cy)	Metals (Lead, Mercury)	Predesign; PD completion planned Fall 1992; A Consent Decree with the PRPs is expected in Fall, 1992	PRP lead/Federal oversight	Dave Wilson 312-886-1476
5	Moss-American*, WI (09/27/90) See also Bioremediation (Ex Situ)	Soil washing followed by slurry phase bioremeditation of fines	Wood preserving	Soil (80,000 cy)	PAHs	In design; Design completion planned1994	PRP lead/Federal oversight; Weston, Inc.	Betty Lavis 312-886-4784
6 #	Arkwood, AR (09/28/90)	Soil washing (incineration of residuals)	Wood preserving	Soil (20,400 cy)	SVOCs (PCP), Dioxins	Predesign; PD completion planned Fall 1994	PRP lead/Federal oversight	Rick Erhart 214-655-6582
6 #	Koppers/Texarkana, TX*, (09/23/88) See also In situ Flushing	Water with a surfactant as an additive; Waste water to be treated and discharged	Wood preserving	Soil (19,400 cy)	PAHs (Benzo(a)pyrene, DNAPLs, Creosote), Metals (Arsenic)	Predesign; Soil washing project is on hold while EPA relocates community affected by the site	In negotiation	Ursula Lennox 214-655-6735
6	South Cavalcade Street*, TX (09/26/88) See also In situ Flushing	Water with surfactants as an additive followed by incineration of contaminated residual	Wood preserving	Soil (11,000 cy)	SVOCs (Benzo(a)pyrene, Benzo(a)-anthracene, Chrysene), PAHs	In design; Design completion planned Summer 1994	PRP lead/Federal oversight	Mark Fite 214-655-6715

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Soil Washing (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
8 #	Sand Creek Industrial (OU 5)*, CO (09/28/90)	Soil washing followed by incineration of contaminated residual	Pesticide manufacturing/ use/storage	Soil (14,000 cy)	Biocides, Metals (Arsenic, Cadmium, Chromium)	In design; Design completion planned Winter 1992	Federal lead/Fund Financed	Erna Acheson 303-294-1971
9	Koppers Company, Inc. (Oroville plant), CA. (04/04/90) see also Bioremediation (In Situ), Bioremediation (Ex Situ)	Soil washing (method to be determined)	Wood preserving	Soil (200,000 cy)	SVOCs (PCP), Pesticides, Dioxins	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Fred Schauffler 415-744-2365
9 #	FMC (Fresno)*, CA (06/28/91)	Soil washing followed by s/s	Pesticide manufacturing/ use/storage	Soil (30,000 cy)	Biocides (DDT, EDB, Toxaphene, Chlordane)	Predesign; PD completion planned Fall 1992	PRP lead/State oversight	Tom Dunkelman 415-744-2395
9	Poly-Carb, NV Emergency Response (Action Memo signed 05/14/87) See also Bioremediation (Ex Situ)	Soil washing	Commercial waste management	Soil (1,500 cy)	SVOCs (Phenols), PAHs (Cresol)	Completed; Operational 7/87 to 8/88	Federal lead/Fund Financed; Reidel Environmental Services	Bob Mandel 415-744-2290
10 #	Gould Battery, OR (03/31/88)	Debris washing Solids will be s/s	Battery recycling/ disposal	Soil, Solids (battery casings), including Ebonite (71,000 tons); plastics (10,000 tons)	Metals (Lead)	Being installed; Scheduled to be in operation from Spring 1993 to 1995.	PRP lead/ Federal oversight	Chip Humphries 503-326-2678 Jerry Balcom (Portland USACE) 503-326-4192

Table 1
Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

Solvent Extraction

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1	Norwood PCBs, MA (09/29/89)	Solvent extraction	Industrial waste dumping	Soil (28,000 cy), Sediments (3,000 cy)	VOCs (TCE), SVOCs (Trichlorobenzene), PCBs, PAHs	Predesign; PD completion planned Fall 1993	Federal lead/Fund Financed	Jane Downing 617-573-5708
1	O'Connor*, ME (09/27/89)	Solvent extraction (may be followed by s/s for lead)	Salvage and electrical transformer recycling	Soil (23,500 cy, combined), Sediments	PCBs, PAHs	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Ross Gilleland 617-573-5766
1 #	Pinette's Salvage Yard*, ME (05/30/89)	Solvent extraction	Salvage and vehicle repair	Soil (2,000 cy)	VOCs (Chlorobenzene), SVOCs (Dichlorobenzene, Trichlorobenzene), PCBs	Design completed but not installed; Completion planned November 1992; Installation operational by Spring 1993	Federal lead/Fund Financed; Swenson Extraction Technology (Terrakleen process)	Ross Gilleland 617-573-5766
2 #	Ewan Property*, NJ (09/29/89) See also Soil Washing	Solvent extraction (Followed by soil washing to treat the inorganics)	Industrial waste dumping	Soil (22,000 cy)	VOCs (PCE, TCE, TCA, Methylene chloride, BTX)	Predesign; Start date contingent upon progress in OU-1. Completion estimate 1995.	In negotiation	Dave Rosoff 212-264-5397
4	General Refining*, GA Emergency Response (Action Memo signed 08/13/85)	Solvent extraction (oil used as fuel, solids treated with s/s)	Waste oil recycling facility	Sludge (2,700 cy), Solids (700 cy), Soil (6,600 gallons of waste oil)	PCBs	Completed; Operational from 8/86 to 2/87	Federal lead/Fund Financed; Resource Conservation Co.	Shane Hitchcock 404-347-3136
4	Carolina Transformer, NC (08/29/91)	Solvent extraction (may be followed by s/s)	Transformer repair	Soil (15,000 cy)	PCBs	Predesign; PD completion planned Fall 1992	Federal lead/Fund Financed	Michael Townsend 404-347-7791

Solvent Extraction (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
6	Traband Warehouse, OK Emergency Response (Action Memo signed 01/01/88)	Solvent extraction	Storage management complex	Solids	PCBs	Completed; Project ended in February, 1989	Federal lead/Fund Financed; Terra-Clean	Pat Hammack 214-655-2270
6 #	United Creosoting*, TX (09/29/89)	Solvent extraction (Critical fluid extraction, followed by incineration of fluids)	Wood preserving	Soil (w/ "tar mats", combined volume 67,000 cy)	VOCs, Dioxins	In design; Design completion planned Summer 1993	State lead/Fund Financed; C.F. Systems	Deborah Griswold 214-655-8520 LaReine Pound (TX) 512-467-7897

Table 1
Detailed Site Information by Treatment Technology through FY 91 RODs

October 1992

Thermal Desorption

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1	Cannon Engineering/ Bridgewater, MA (03/31/88)	Thermal aeration (vapors captured on carbon)	Chemical waste storage and incineration facility	Soil (11,000 cy)	VOCs (TCE, Vinyl chloride, Benzene, Toluene)	Completed	PRP lead/Federal oversight; Canonie Engineering	Richard Goehlert 617-573-5742
1 #	Re-Solve*, MA (09/24/87) See also Dechlorination	Thermal aeration followed by dechlorination of the residuals	Chemical reclamation facility	Soil (22,500 cy)	PCBs	Design; Installation early 1993; Pilot scale studies completed Spring 1992.	PRP lead/Federal oversight; Chemical Waste Management, Inc.	Lorenzo Thantu 617-223-5500
1	McKin*, ME (07/22/85)	Thermal aeration (vapors captured on carbon)	Industrial landfill	Soil (11,500 cy)	VOCs (TCE, BTX)	Completed	PRP lead/Federal oversight; Canonie Engineering	Sheila Eckman 617-573-5784
1	Union Chemical Co., OU1, ME (12/27/90)	Low temperature thermal Treatment	Municipal water supply, Paint stripping	Soil (10,000 cy)	VOCs (TCE, DCE, PCE, Xylene)	In design	PRP lead/Federal oversight	Mike Jasinski 617-573-5786
1	Ottati & Goss, NH (01/16/87)	Thermal aeration	Drum storage/ disposal	Soil (16,000 cy)	VOCs (TCE, PCE, DCA, Benzene)	Completed	PRP lead/Federal oversight; Canonie Engineering	Stephen Calder 617-573-9626
2 #	Caldwell Trucking*, NJ (09/25/86)	Low temperature thermal treatment	Unpermitted septic waste facility	Soil (35,000 cy)	VOCs (TCE, PCE, TCA)	Design completed but not installed; Completion planned Spring 1993	In negotiation	Ed Finnerty 212-264-3555

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

Thermal Desorption (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2 #	Lipari Landfill Marsh Sediment*, NJ (07/11/88)	Low temperature thermal treatment	Industrial landfill, municipal landfill	Sediments (Marsh Sediment, 60,000-80,000 cy)	VOCs, SVOCs	In design; Pending decision on PRP takeover.	Army (USACE)/FUND Financed pending possible PRP takeover; Dames & Moore/ES & E	Tom Graff (USACE, Kansas City) 816-426-2296
2 #	Metaltec/Aerosystems, OU1 - Soil Treatment, NJ (06/30/86)	Low temperature thermal treatment (vapors captured on carbon)	Metal manufacturing	Soil (9,000 cy)	VOCs (TCE)	Design completed. Installation date undetermined	Federal lead/Fund Financed	Ron Rusin 212-264-1873 Natalie Tillman (USACE) 816-426-5805
2	Reich Farms, NJ (09/30/88)	Thermal desorption (vapors will be captured on carbon)	Uncontrolled waste disposal	Soil (6,000 cy)	VOCs (TCE, PCE, TCA), SVOCs	Predesign; PD completion planned Fall 1992; The design will begin after the treatability studies and will be complete in Winter 1993	PRP lead/Federal oversight	Gary Adamkiewicz 212-264-7592
2 #	Waldick Aerospace Devices*, NJ (09/29/87)	Low temperature thermal treatment (followed by offsite s/s and disposal)	Manufacture/ electroplating of plane parts	Soil (2,000 cy)	VOCs (TCE, PCE), Metals (Cadmium, Chromium)	Design completed but not installed; No estimate on installation start.	Federal lead/Fund Financed; Chemical Waste Management	George Buc (USACE-NY District) 908-249-3040 Ron Ackerman (USACE-NY District) 908-249-3040
2 #	American Thermostat, NY (06/29/90)	Low temperature thermal treatment	Thermostat manufacturing	Soil (15,000 cy), Sediments (300 cy)	VOCs (PCE, TCE, DCE)	In design; Design completion planned September 1992	Federal lead/Fund Financed	Christos Tsiamis 212-264-5713

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Thermal Desorption (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
2	Claremont Polychemical - Soil Remedy, NY (09/28/90)	Low temperature thermal treatment	Paint/ink formulation	Soil (1,600 cy)	VOCs (PCE)	In design; Design completion planned Fall 1993	State lead/Fund Financed; USACE	Carlos R. Ramos 212-264-5636
2	Fulton Terminals, Soil Treatment, NY (09/29/89)	Low temperature thermal treatment	Former hazardous waste storage facility	Soil (4,000 cy)	VOCs (TCE, DCE, Benzene, Xylene)	In design; Design completion planned Summer 1993	PRP lead/Federal oversight	Christos Tsiamis 212-264-5713
2	Sarney Farm, NY (09/27/90)	Thermal desorption (followed by onsite incineration of organics)	Industrial landfill, Municipal landfill	Soil (2,000 - 8,000 cy)	VOCs (Chloroform, TCE, PCE, Toluene), SVOCs (Phthalates)	In design; Design completion planned Winter 1992	Federal lead/Fund Financed	Kevin Willis 212-264-8777
2	Solvent Savers, NY (09/30/90) See also Soil Vapor Extraction	Low temperature thermal treatment	Solvent recovery facility, Chemical reclamation	Soil (60,000 cy)	VOCs (DCE, TCE), PCBs	Predesign; PD completion planned Summer 1993	PRP lead/Federal oversight	Lisa Wong 212-264-5716
3	U.S.A. Letterkenny SE Area, OU1, PA (06/28/91)	Low temperature thermal treatment (may need s/s for metals after thermal desorption)	Munitions manufacturing/ storage, Drum storage/disposal	Soil (8,000 cy)	VOCs (TCE, Ethylbenzene, Xylene)	Predesign; PD completion planned Spring 1992	Federal facility	Denis Orenshare 215-597-7858 Peg Geiseking (Letterkenny) 717-267-8483
3	Saunders Supply Co, OU1, VA (09/30/91) See also Dechlorination	Low temperature thermal treatment Residuals will be captured with carbon	Wood preserving	Soil (25,000 cy)	SVOCs (PCP), Metals (Arsenic)	Predesign; PD completion planned Spring 1992	Federal lead/Fund Financed	Andy Palestini 215-597-1286

Thermal Desorption (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
4 #	Ciba-Geigy Corp. (MacIntosh Plant), AL (09/30/91) See also In situ Flushing	Low temperature thermal treatment	Pesticide manufacturing/use/ storage	Soil (130,000 cy; to 20 ft depth)	Biocides	Predesign	PRP lead/Federal oversight	Charles Kane 404-347-2643
4	Aberdeen Pesticide Dumps, OU 4, NC (09/30/91)	Thermal desorption (treatment for organic residuals is undecided now)	Pesticide manufacturing/use/ storage, Plastics manufacturing	Soil (124,000 cy)	Biocides (DDT, Toxaphene, Benzene hexachloride)	Predesign; PD completion planned Summer 1992	PRP lead/Federal oversight	Kay Crane 404-347-7791 Jack Butler 919-733-2801
4	Sangamo/Twelve-Mile/ Hartwell PCB, OU 1, SC (12/19/90)	Thermal desorption; Organic vapors will be captured on carbon	Transformer manufacturer	Soil (100,900 cy)	VOCs, PCBs	Predesign; PD completion planned Spring 1993; The Consent Decree will be lodged during the summer, the treatability study will be complete 240 days later	PRP lead/Federal oversight	Bart Reedy 404-347-7791
4	Wamchem*, SC (06/30/88)	Thermal aeration (vapors captured on carbon)	Former dye manufacturing plant	Soil (2,000 cy)	VOCs (BTX)	In design; Design completion planned Winter 1992; 60% design expected shortly	PRP lead/Federal oversight	Bart Reedy 404-347-7791
4	Arlington Blending & Packaging Co., OU1*, TN (06/28/91) See also Dechlorination	Thermal desorption (the residuals will be dechlorinated)	Pesticide manufacturing/use/ storage, Other organic chemical manufacturing	Soil (24,000 cy)	VOCs (DCE), SVOCs (PCP), Biocides (Chlordane, Heptachlor), Metals (Arsenic)	Predesign; PD completion planned Winter 1992	PRP lead/Federal oversight	Derek Matory 404-347-7791

Table 1
Detailed Site Information By Treatment Technology through FY 91 RODs

October 1992

Thermal Desorption (continued)

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
5	Acme Solvent Reclaiming, Inc. (OU2), IL (12/31/90) See also Soil Vapor Extraction	Low temperature thermal treatment (followed by s/s for lead)	Industrial landfill, Municipal water supply	Soil (6,000 cy combined), Sludge	VOCs (TCA, DCE, DCA, TCE, PCE, Vinyl chloride, 4-methyl-2-pentanone, Benzene), SVOCs (Naphthalene), PCBs	Predesign; PD completion planned Fall 1993	PRP lead/Federal oversight	Dennis Dalga 312-886-5116
5 #	Outboard Marine/Waukegan Harbor (OU #3)*, IL (03/31/89)	Low temperature thermal treatment	Marine products manufacturing	Soil (16,000 cy, combined), Sediments	PCBs	Completed Summer 1992 See Table 4	PRP lead/Federal oversight; Soiltech	Cindy Nolan 312-886-0400
5 #	Anderson Development (ROD Amendment)*, MI (09/30/91)	Low temperature thermal treatment with off-site disposal of residuals	Other organic chemical manufacturing	Soil (8,000 cy combined), Sludge	Organics (MBOCAs)	Operational; Completion planned Winter 1992; Treatment began Jan. 5, 1992.	PRP lead/Federal oversight; Weston Services, Inc	Jim Hahnenberg 312-353-4213
5 #	Carter Industries*, MI (09/18/91)	Low temperature thermal treatment (followed by s/s of soils and incineration of PCB oil)	Scrap metal salvager	Soil (46,000 cy combined), Solids (debris)	PCBs	Predesign; Some predesign has begun. A schedule has not been set because EPA is negotiating with the PRPs.	PRP lead/Federal oversight	John Peterson 312-353-1264
8	Martin Marietta (Denver Aerospace), CO (09/24/90) See also Soil Vapor Extraction	Low temperature thermal treatment (followed by s/s of soils and incineration of vapors)	Aerospace equipment manufacturer - Bulk storage facility and industrial landfill	Soil (2,300 cy)	VOCs (TCE), PCBs	Predesign; PD completion planned Winter 1992	State Lead under RCRA	George Dancik 303-293-1506 Susan Chaki (CO) 303-331-4832

Table 1
Detailed Site Information by Treatment Technology through FY 91

Other

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1#	South Municipal Water Supply Well*, NH (09/27/89) See also Soil Vapor Extraction	Air sparging of ground water	Solvent recovery facility, Ball bearing manufacturing	Ground Water	VOCs (PCE, TCA, TCE)	In design; Design completion planned October 1992	PRP lead/Federal oversight	Roger Duwart 617-573-9826
3	Brodhead Creek, OU 1, PA (03/29/91)	CROW technology using hot water injection to mobilize coal tar	Coal gasification	Soil (200 cy up to 40 ft deep)	PAHs	Predesign; PD completion planned Summer 1992	PRP lead/Federal oversight; Remediation Technologies	John Banks 215-597-8555
6	Petro-Chemical Systems, Inc., OU2, TX (09/06/91) See also Soil Vapor Extraction	Air sparging of ground water	Petroleum refining and reuse	Ground Water (to 30 ft deep)	VOCs (BTEX), SVOCs (Naphthalene), Metals (Lead)	Predesign; PD completion planned Fall 1992	PRP lead/Federal oversight	Chris Villareal 214-655-6735

\# Updated from April 1992 report
* Indicates that a treatability study has been completed
Note: Contacts listed are EPA regional staff unless otherwise indicated.

TABLE 2

DETAILED SITE INFORMATION FOR

SOME TREATMENT TECHNOLOGIES IN FY 92 RODS

Table 2 contains detailed, site-specific information for some sites for which innovative treatment has been selected in FY 92. The format for Table 2 is similar to the format in Table 1. See pages 9 through 11 for a detailed explanation of the format.

Table 2

Detailed Site Information for Some Treatment Technologies in FY 92 RODs**

October 1992

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
1	Hocomonco Pond, MA, ESD (07/30/92), (ROD signed 09/30/85)	Bioremediation (In situ); If bioremediation fails will try in situ flushing	Wood preserving	Soil (to 140 feet), Ground Water	PAHs (Creosote, DNAPLs)	In design; Design completion planned Spring 1993	PRP lead/Federal oversight	Bob Leger 617-573-5734
2	General Motors-Central Foundry Division, OU 2, NY (03/31/92)	Bioremediation (Ex Situ)	Aluminum casting plant	Soil (600,000 cubic yards, combined), Sludge, Solids (debris)	PCBs	Predesign; Pilot-scale study will be complete in 12/93	PRP lead/Federal oversight	Lisa Carson - 212-264-6857
3	Raymark Site, PA (12/30/91)	Soil vapor extraction with air flushing	Metal fabrication facility	Soil (and bedrock)	VOCs (TCE, PCE, DCE), PAHs	In design; Performance specs being used to select vendor	Federal lead/Fund Financed	Mike Towle 215-597-8309
3	Defense General Supply Center, OU 5, VA (03/25/92)	Soil vapor extraction	Cleaning and repainting of combat helmets and gas cylinders	Soil	VOCs (PCE, TCE), SVOCs (Phthalates, Naphthalene)	In design; 35 % of design complete. Design scheduled to be complete with construction starting in 6/1/1993	DLA Lead/USACE oversight	Bill Sadington (DLA) 804-279-3781
5	Midco II, IN (04/13/92)	Soil vapor extraction with ground water pump and treat	Drum storage/disposal	Soil (12,200 cy)	VOCs (Methylene chloride, TCE, MEK, Toluene)	In design; Design completion planned Spring 1996	PRP lead/Federal oversight	Rich Boice 312-886-4740

** Table does not include all 92 FY RODs

* Indicates that a treatability study has been completed

Note: Contacts listed are EPA regional staff unless otherwise indicated.

Table 2
Detailed Site Information for Some Treatment Technologies in FY 92 RODs** (continued)

October 1992

Region	Site Name, State, (ROD Date)	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	Pacific Coast Pipeline, CA (03/31/92)	Soil vapor extraction	Petroleum refining and reuse; Petroleum pumping station	Soil	VOCs (Methlyene chloride, DCA, Benzene, Toluene, Ethylbenzene)	Pilot-scale in design; CD in negotiation	PRP Lead/Federal Oversight	Mike Montgomery 415-744-2403
9	Sacramento Army Depot, Oxidation Lagoons, CA (09/30/92)	Soil washing	Evaporation ponds for metal plating wastewater	Soil (12,000 cy)	Metals (Chromium, Lead)	Predesign; Pilot-scale study being conducted. Full-scale operation scheduled to start in March 1993	Army (USACE)/DoD Financed - IRP Program	Marlin Mezquita 415-744-2393 George Siller (USACE) 916-557-7418 Dan Oburn (Sacramento Army Depot) 916-388-4344
10	Naval Submarine Base, Bangor Site A, OU1, WA (12/06/91)	Soil washing with uv/ oxidation of gw	Federal facility; Ordnance detonation	Soil (7,100 cubic yards)	Explosives (TNT, RDX, DNT)	Predesign; PD Completion planned December 1992; Design will begin after completion of a treatability study	Navy Lead/DoD Funded IRP	Jeff Rodin 206-553-4497 Patti Kelly (DoD) 206-369-5099 Harry Craig 503-326-3689
10	IDEL (Idaho Energy Laboratory) Warmwaste Pond, ID (12/05/91)	Soil washing followed by physical separation & acid extraction	DOE facility; Waste pond containing radioactive water and sediment	Sediments (14,500 cy)	Radioactive Contaminants (Cesium-137, Cobalt-60)	In design; Currently conducting treatability studies	DOE Lead/Federal oversight	Linda Meyer 206-553-6636 Nolan Jenson (DOE) 208-526-0436
10	IDEL (Idaho Energy Laboratory) Warmwaste Pond, ID (12/05/91)	Acid extraction	DOE facility; Waste pond containing radioactive water and sediment	Residuals of soil washing of sediments (14,500 cy)	Radioactive Contaminants (Cesium-137, Cobalt-60)	In design; Currently conducting treatability studies	DOE Lead/Federal oversight	Linda Meyer 206-553-6636 Nolan Jenson (DOE) 208-526-0436

TABLE 3

DETAILED SITE INFORMATION FOR SOME TREATMENT TECHNOLOGIES UNDER OTHER FEDERAL PROGRAMS

Table 3 contains detailed, site-specific information for some non-Superfund sites for which innovative treatment has been selected. The format for Table 3 is similar to the format in Table 1. See pages 9 through 11 for a detailed explanation of the format.

Table 3
Detailed Site Information for Some Treatment Technologies Under Other Federal Programs

October 1992

Region	Site Name, State	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
3	Tobyhanna Army Depot, PA	Bioremediation (In situ) with bioventing	Army depot	Soil	VOCs (TCE, PCE)	In design	USACE/DoD Financed - IRP Program	Bob More (USACE, Huntsville Div) 205-955-5802
3	Langley AFB, VA	Soil vapor extraction	Federal facility	Soil, Ground Water (at 3 to 6 feet)	VOCs, Gasoline	Design completed but not installed; A corrective action plan has been approved (date unknown).	USACE/Air Force Funded	Tom Zink (USACE, Omaha) 402-342-0051
4	Savannah River DOE, M Area Settling Basin, SC	Soil vapor extraction with horizontal wells and ground water sparging	Leaking solvent line	Soil, Ground Water	VOCs (TCE, PCE approximately 500,000 lbs), PAHs (DNAPLs)	Operational; Operation of the SVE system began in 1990	DOE Lead/DOE Funding; Westinghouse Savannah River Company (WSRC)	Nate Ellis (DOE) 803-952-4846 Brian Looney (WSRC) 803-725-5181
5	Saginaw Bay Confined Disposal Facility, MI	Soil washing	Confined disposal island	Sediments (150 cy)	PCBs	Completed Summer 92	USACE/Army funded; Bergmann, USA	Jim Galloway (USACE) 313-226-6760 Rick Traver (Bergmann) 203-684-6844
6	Kelly AFB, Site 1100*, TX See also Soil vapor extraction	Bioremediation (In situ) with bioventing	Federal facility	Soil (unknown quantity, 1 acre site)	PAHs (JP-4)	Operational; Completion planned 1994	USACE/Air Force Funded; IT Corporation	Ted Streckfuss, (USACE, Omaha) 402-342-0051
6	Kelly AFB, Site 1100*, TX See also Bioremediation (In Situ)	Soil vapor extraction	Federal facility	Soil (unknown quantity, 1 acre site)	PAHs (JP-4)	Operational; Vacuum extraction done before with bioventing, information the same.	USACE/Air Force Funded	Ted Streckfuss (USACE, Omaha) 402-342-0051

* Indicates that a treatability study has been completed

Note: Contacts listed are EPA regional staff unless otherwise indicated.

Joe Laird
402-221-7772

Table 3
Detailed Site Information For Some Treatment Technologies Under Other Federal Programs (continued)

Region	Site Name, State	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
6	Matagonda Island AF Range, TX	Bioremediation; Solid phase	Federal facility	Soil (700 cy, 3-4 ft deep)	PAHs (TPH)	Operational; Completion planned Spring 1993	USACE/DoD Financed - IRP Program	Vic Heister (USACE) 918-581-6115
8	Former Glasgow AFB, MT	Bioremediation; Land treatment	UST removal site	Soil (5 acres, 6 inches deep, approximately 4,000 cy)	VOCs, PAHs (petroleum hydrocarbons)	In design; Design completion planned Winter 1992; Contractor will be selected in Spring 1993	USACE/DoD Financed FUDS Program	Martin Rasmussen (USACE, Omaha) 402-342-0051 Steve Ott (USACE, Omaha) 402-342-0051
8	Ft. Carson*, CO	Bioremediation (In situ) with bioventing	UST Remediation	Soil	PAHs (JP-4)	In design; Design completion planned Fall 1992	USACE/DoD Financed - IRP; Woodward Clyde	Stephans Myer (USACE, Omaha) 402-342-0051
9	Aua Fuel Farm, Aua Village, American Somoa,	Bioremediation (In Situ)	Fuel farm	Soil	PAHs (Diesel fuel)	Operational	USACE/DoD Financed - FUDS Program	Helene Takemoto (USACE, pac div) 808-438-6931
9	Davis Monthan AFB, AZ	Bioremediation (In Situ) land treatment	Federal facility	Soil	PAHs (petroleum hydrocarbons), Metals	Operational; Completion date unknown	USACE/Air Force Funded	Jerry Trease (USACE, Omaha) 402-342-0051
9	Davis Monthan AFB, Site 35, AZ See also Bioremediation (In Situ)	Soil vapor extraction with bioventing	JP-4 Pump House	Soil (63,000 cy)	VOCs (Benzene 110ug/kg @ 140ft.), Organics (TPH 320,000 ug/kg @ 140ft) (JP-4 apprx. 800,000 gal.)	Predesign; Had to back up and address some groundwater contamination by installing a pump and treat system.	USACE/Air Force Funded; out for bid	Linda White (USACE, Omaha) 402-342-0051

Table 3
Detailed Site Information For Some Treatment Technologies Under Other Federal Programs (continued)

October 1992

Region	Site Name, State	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
9	Davis Monthan AFB, Site 35, AZ See also Soil vapor extraction	Bioremediation (In situ) with bioventing	JP-4 Pump House	Soil (63,000 cy)	PAHs (JP-4), Metals	Predesign; Preparing RFR for design. Bid will be awarded in Summer 1993	USACE/ Air Force Funded	Linda White (USACE, Omaha) 402-342-0051
9	Ft. Ord Marina, Fritzche AAF Fire Drill Area, CA	Bioremediation; Land treatment	Fire drill area	Soil (4,000 cy)	VOCs (TCE, MEK), PAHs (petroleum hydrocarbons)	Completed Winter 1991	USACE/Army - IRP Program	Gail Youngblood 408-242-8017
9	Luke AFB, AZ	Soil vapor extraction with air flushing and incineration of off-gas	Air Force fire training pit	Soil (35,000 cy)	VOCs (2-Hexanone, MEK, 4-Methyl 2-Pentanone), PAHs (petroleum hydrocarbons)	Operational; Completion planned Spring 1993; Will conduct long-term monitoring afterward	USACE Air Force funded; Envirocon	Jerome Stolinsky (USACE) 402-342-7657 Dan McCafferty (Envirocon) 406-523-1150
9	Marine Corps., Mountain Warfare Center, Bridgeport, CA	Bioremediation (Ex Situ); Heap pile bioreactor with aeration and irrigation	Federal facility	Soil (7,000 cy)	PAHs (petroleum hydrocarbons, diesel), Metals (Lead)	Completed 1989	Navy; ENSR	Bill Major (DoD) 805-982-1808
9	McClellan AFB, CA	Soil vapor extraction	Former fuel and solvent disposal site	Soil (12,000 cy)	VOCs (TCE, DCE, Vinyl chloride, Toluene, Chlorobenzene)	Pilot-scale test to be complete in Spring 1993	Air Force; CH2M Hill	Fran Slavich Jerry Styles 916-643-0533 Joseph Danko (CH2M Hill) 503-742-4271
9	Seal Beach Navy Weapons Station, CA	Soil vapor extraction with combustion of air emissions	Federal facility	Soil, Ground Water	VOCs (BTEX), PAHs (petroleum hydrocarbons)	Operational; Full-scale operation began in 1991	Navy; RSI	Vern Novstrup 805-982-2636 Mike Joy (RSI) 805-644-5892
9	U. S. Public Works Center, Guam	Dechlorination	Federal facility	Soil (5,500 tons)	PCBs	Installation underway	Navy; Battelle NW Lab	D.B. Chan 805-982-4191

Table 3
Detailed Site Information For Some Treatment Technologies Under Other Federal Programs (continued)

October 1992

Region	Site Name, State	Specific Technology	Site Description	Media (Quantity)	Key Contaminants Treated	Status	Lead Agency and Treatment Contractor (if available)	Contacts/Phone
10	Ft. Wainwright*, AK	Bioremediation Land treatment	Federal facility	Soil (3,000 - 4,500 cy)	PAHs (Diesel and petroleum hydrocarbons)	Design completed but not installed; Completion planned Spring 1993	Army (USACE)/DoD Financed - IRP Program	David Williams (USACE) 907-753-5657
	Naval Communication Station, Scotland	Bioremediation (In situ)	Diesel fuel storage tanks and piping	Soil (7,000 cy)	PAHs (No. 2 diesel fuel)	Completed Fall 1985	Naval Civil Engineering Lab/DoD Funded; Polybac	Deh Bin Chan 805-982-4191

TABLE 4

SUMMARY INFORMATION ON COMPLETED PROJECTS

Table 4 provides detailed information on the performance and operating parameters for applications of innovative treatment technologies that have been completed. It is intended to supplement, not replace, the information included in Tables 1, 2, and 3.

TABLE 4
COMPLETED PROJECTS

October 1992

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
1	Cannon Engineering/ Bridgewater, MA 5/90 to 10/90	Thermal soil aeration/ Canonie Environmental Services Corp., Porter, IN	Soil (11,300 tons)	Criteria: 0.1 ppm - TCE, DCE, PCE 0.2 ppm - Toluene, Xylene 0.5 ppm - Vinyl Chloride SVOCs - 3ppm (total) Input 500 - 3,000 ppm (Total VOCs) Output - <0.025 ppm (Total VOCs)	Continuous operation 40 tons/hr 450 - 500° F Moisture content before treatment - 5% - 25% moisture Additives - dry soil (to reduce moisture content)	Excavation Screening Mixing Dewatering	Residuals from air pollution control - treated on site, disposed of off site Wastewater - treated on site, disposed of off site	The waste feed size limitation for the equipment, 1.875 inches, was an important consideration. More information is available in the RA report available from Region 1.
1	McKin, ME 7/86 - 2/87	Thermal desorption/ Canonie Env. Services Corp., Porter, IN	Soil (11,500 cy to a depth of 10 ft.)	VOCs Criteria: 0.1 ppm TCE Input: up to 1,000 ppm TCE Output: 0.1 ppm	Continuous operation 6-8 minutes retention time 300°F	Excavation	Soils - Solidified and disposed onsite Vapors - Air carbon capture	
1	Ottati & Goss, NH 6/89 - 9/89	Thermal desorption/ Canonie Engineering	Soil (6,000 cy)	TCE, PCE, DCA, Benzene Criteria: 1 ppm - Total VOCs and <100 ppb - Each individual VOC Output: <1ppm - Total VOCs	Batch process	Excavation Screening	Carbon from air pollution control unit regenerated offsite	For more information on this project, see the close out report available from Region 1.
2	Wide Beach Development, NY 9/90 to 9/91	APEG dechlorination/ Soil Tech Denver, CO	Soil (40,000 cy)	Criteria: PCB - <10 ppm (1 composite sample/day) Input - 10 to 100 ppm PCB Output - 2 ppm PCB	Continuous process 8 tons/hour 200° - 580°C (450° - 1100°F) Ambient pH and moisture Additives - Alkaline polyethylene glycol (APEG)	Excavation Screening Staging	Treated soil - disposed of on site	If on-site disposal is planned, perform tests of the treated material appropriate to intended use. For further information on this dechlorination project, see the Demonstration Test Report produced by Region 2, EPA.

Newly added or completed projects

TABLE 4
COMPLETED PROJECTS (continued)

October 1992

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
2	Upjohn Manufacturing Company, PR 1/83 to 3/88	Soil Vapor Extraction Terra Vac, Inc. Costa Mesa, CA	Soil (16,000 sq ft to approximately 100 ft deep)	Criteria: Initially: Undefined, end point of treatment was subject to long debate. Final criteria: Carbon tetrachloride (in exhaust stacks) - nondetectable for three consecutive months Initial concentrations - 70 ppm (carbon tetrachloride to air) Final concentrations - nondetect (<0.002 ppm)	Ambient conditions		Discharge of soil vapors through 30-ft stack	For further information on this application, see the Applications Analysis Report for the Terra Vac In situ Vacuum Extraction System (EPA/540/A5-89/003).
2	Signo Trading International, Inc., NY 10/20/87 - 10/21/87 (Removal)	KPEG dechlorination/ Galson Remediation, Syracuse, NY	Sludge (15 gallons)	Dioxin Input - 135 ppb Output - 1 ppb	Temperature: 150°C Time: Overnight	None	Incineration of residuals (without dioxin contamination) at treatment, storage, and disposal facility	

TABLE 4
COMPLETED PROJECTS (continued)

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
3	Avtex Fibers, VA 4/90 - 8/91 (Removal)	Chemical treatment (oxidation using NaClO) OH Materials, Findlay, OH (ERCS Contractor)	Sludge/water from storage unit (2 million gallons)	Carbon disulfide Criteria: ≤10 ppm - Carbon disulfide in the effluent Input: 50-200,000 ppm Carbon disulfide Output: ≤10 ppm Carbon disulfide	Batch operation average retention time - 1 hour pH - 10 Additives: Sodium hypochloride. The retention time and reagent feed rates increased with increasing concentration of sludge in the contaminated water.	Pumping	Salts from the reaction were removed with flocculation and clarification at existing treatment plant, pH adjustment	Carbon disulfide is unstable and will be found with other contaminants in aqueous waste stream. For additional information on this project, see the Removal Close Out Report available from EPA - Region III or OH Materials.
4	Brown Wood Preserving, FL 10/88 to 12/91	Land treatment/ Remediation Technologies, Seattle, Washington	Soil/pond sediment (7,500 cy)	Criteria: 100 ppm total carcinogenic PAHs as sampled on 8 subplots on each lift Input - 800 to 2,000 ppm total creosote contaminants Output - 10 to 80 ppm total carcinogenic indicators	Retention time - 3 to 6 months Additives - water and nutrients	Excavation Screening Tilling	Treated material vegetated with grass (no cap)	Further information on this project is available from the Remedial Action Close Out Report. The vendor, RETEC, is expected to prepare a paper.

TABLE 4
COMPLETED PROJECTS (continued)

October 1992

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
4	Palmetto Wood Preserving, SC 9/28/88 to 2/8/89	Chemical treatment and soil washing Reduction of hexavalent chromium to trivalent chromium En-site (ERCS contractor) Atlanta, GA	Soil (13,000 cy)	Health-based criteria - Actual concentrations unknown Input: Arsenic - 2 to 6,200 ppm Chromium - 4 to 6,200 ppm Output: Arsenic - less than 1 ppm Chromium - 627 ppm	Soil - Batch process Treatment for aqueous waste from soil washing - 25 gallons per minute pH - 2 to 9	Neutralization Mixing Dewatering	Soil - solidified and replaced on site Wastewater - permitted discharge to the sewer line Sludges - off site disposal	(1) Used sodium meta-phosphate to lower pH to 2.0 and wash the Chromium from the soil, (2) separated the soil and solution, (3) solidified the soils, and (4) used the ferrous ion method of reduction to precipitate the chromium from solution in trivalent form. This treatment system is unique in the method of generating ferrous ion for the reducing step. The waste stream passed through an electrolytic cell containing consumable steel electrodes where the ferrous ions were electrically introduced into the waste stream.

TABLE 4
COMPLETED PROJECTS (continued)

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
4	General Refining Company, GA August-October, 1986 January-February, 1987 (Removal)	Solvent extraction Resource Conservation Technology Company, Bellevue, WA	Sludge (3,448 tons)	Input: PCB - 5.0 ppm Lead - 10,000 ppm Output: PCB - insignificant Lead - concentrated in solids	Continuous operation Time: 2 hours pH: 10 Temp: 20°C Rate: 27 tons/day Moisture content - 60% Additives: Sodium hydroxide Triethylamine	Excavation Screening Neutralization Size Reduction Mixing	Oil - used as fuel for kiln Water - treated, discharged off site Solids - solidified and disposed of on site	The oil recovered from the extractions process could not be sold because of an elevated metals content. The solvent could not be recovered due to leaks in system seals. The unit required a relatively uniform material so materials handling of the sludges proved difficult in the beginning of the project. The lead-bearing solids produced by the dryer also required special handling. Finally, detergents in the sludge hindered oil/water separation.
4	Hinson Chemical, SC 12/88 - 3/92 (Removal)	Soil vapor extraction OH Materials Atlanta, GA	Soil (60,000 cy, up to 50 ft deep)	Benzene, TCE, PCE, DCA, MEK At completion: <10 ppm Total VOCs (In all samples); average <1 ppm Total VOCs	In situ; continuous operation (except for occasional shut downs to allow soil gas to reach equilibrium in the pore spaces)		Air emissions captured on vapor phase carbon No cap needed	
5	Seymour Recycling, IN Summer - 1990 August-October, 1986 January-February, 1987	In situ soil bioremediation ABB Environmental Services	Soil (12 acres to 10 ft deep, approximately 43,500 cy)	54 contaminants present, including TCE, TCA, and Carbon Tetrachloride No standards or criteria for this OU in ROD	Additives - nitrogen, phosphorus, potassium, sulfur as fertilizer (200,000 gallons of nutrients added)	Tilling	Capping in place	The soil became saturated quickly during this project, creating surface pools. The specially designed tractor got stuck.

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
5	PBM Enterprises, MI 3/25/85 - 10/28/85 (Removal)	Neutralization with hypochlorite process Mid-American Environmental Service, Riverdale, IL	Film chips (464 tons or 1,280 cy)	Cyanide Input: 200 ppm Output: 20 ppm	Time: 2-3 hours Additives: sodium hydroxide	Agitation	Rinse water, runoff and waste hypochlorite - treated off site Treated chips - landfilled (Subtitle D)	
5 #	Saginaw Bay Confined Disposal Facility, MI October 1991 - June 4, 1992 (Army)	Soil washing; Water with flocculant and surfactant as an additive Bermann USA Stafford Springs, CT	Sediment (150 cy)	PCBs	30 cy of sediment treated per day	Dredging Screening Size Reduction	Residuals were left at the facility Wastewater discharged to confined disposal facility	Forced cold-weather shut down is a limitation
5 #	Outboard Marine/Waukegan Harbor (OU #3), IL 1/92 - 7/92	Thermal Desorption Canonie Environmental Services Porter, IN	Soil/Sediments (16,000 cy)	PCBs Initial 20,000 - 10,000 ppm 99% removal	Continuous with a retention time of 15 minutes and throughput of 8-10 tons/hr. Temperature 1100°F Moisture content 20% or less Soda ash added to waste to meet DRE of 99.9999%	Excavation Mixing Dewatering	Cleaned soil and sediment stored in on-site containment cells. Waste water discharged to POTW.	Reduced PCB levels much more than expected.

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
5 #	Verona Well field (Thomas Solvent/Raymond Road), MI March 1988 to May 1992	Soil vapor extraction (attempted nitrogen sparging) Terra Vac, Inc. Costa Mesa, CA	Soil (35,000 cy, 1/2 acre to 18 ft. deep)	Initial soil concentration TCE 550,000 ppb; PCE 1.8 million ppb; Toluene 730,000 ppb; Xylene 500,000 ppb Criteria in all post remedial soil samples; Total Xylenes 6,000 ppb; Toluene 15,000 ppb; Benzene 20 ppb; Ethylbenzene 14,000 ppb; 1,1- DCE 10 ppb; trans-1,2-DCE 2,000 ppb; 1,1,1-TCA 4,000 ppb; Carbon tet., 10 ppb; 1,2-DCA 10 ppb; 1,1-DCA 20 ppb; Methylene chloride 100 ppb; cis-1,2 DCE 20 ppb; PCE 10 ppb; TCE 60 ppb	60 - 160 cu ft/min of air Started >4,400 lbs/day removed Shut off 5 lbs/day removed Total removed 65,000 lbs	No materials handling; required installing extraction wells	Spent carbon was regenerated (and eventually incinerated)	Initial estimate of 7,000 lbs of VOCs product too low. Treatment equipment undersized. Needed better quantification of VOCs in soils to design appropriate size. Plan for enhancing system to deal with saturated soils and free product. Public information available includes performance report, and technical memo.
6	Traband Warehouse PCBs, OK (Removal) 2/90 - 9/90	Solvent Extraction/ Terra Kleen	Solids	PCBs Initial: 7,500 ppm				
7	Crown Plating, MO 10/1/89 to 12/31/89 (Removal)	Dechlorination using the KPEG process EPA removal contractor	Liquid (5 gallons)	Criteria: Dioxin - <1 ppb Input: Silvex - 10,000 ppm Dioxin equivalents - 24.18 ppb Output: Silvex - 32 ppb Dioxin equivalents - 0.068 ppb	Batch operation Retention time - 36 hours (including time of equipment breakdown) Temperature - 72°C pH - 13 Moisture content - 100%		Built an on-site vacuum for emissions control Contaminated residual oil incinerated off-site	

TABLE 4
COMPLETED PROJECTS (continued)

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
7	Scott Lumber, MO 8/87 - Fall, 91 (Removal)	Land Treatment RETEC Chapel Hill, NC	Soil (16,000 cy)	Criteria: 500 ppm - Total PAH 14 ppm - Benzo(a)pyrene Output: 160 ppm Total PAH 12 ppm Benzo(a)pyrene	Additives: Water phosphates	Tilling	None	
9	Gila River Indian Reservation, AZ 3/28/85 - 6/24/85 (Removal)	In situ chemical treatment (followed by anaerobic bio-remediation) EPA removal contractor	Soil (3,220 cy)	Input: Toxaphene - 1,470 ppm Ethyl parathion - 86 ppm Methyl parathion - 24 ppm Output: Toxaphene - 470 ppm Ethyl parathion - 56 ppm Methyl parathion - 3 ppm	pH: 10.2 to 11.8 Moisture: wet Additives to soil: Sodium hydroxide, Water		Bioremediation	
9	Gila River Indian Reservation, AZ 6/24/85 - 10/23/85 (Removal)	In situ anaerobic biological treatment (preceded by chemical treatment) EPA removal contractor	Soil (3,220 cy)	Toxaphene Input: 470 ppm Output: 180 ppm	pH: 8.3 to 9.8 Additives to soil: Sulfuric acid, manure, sludge	Tilling	Capped in place	The biological treatment would have been more successful if the neutralization after the chemical treatment had been more complete. The tearing of the plastic sheets covering the soils allowed air in and prevented anaerobic activity.

TABLE 4
COMPLETED PROJECTS (continued)

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
9	Roseville Drums, CA 2/12/88 - 11/9/88 (Removal)	In situ Bioremediation EPA removal contractor	Soil (14 cy)	Input: Dichlorobenzene - 4,000 ppm Phenol - 12,000 ppm Output: Dichlorobenzene - 140 ppm Phenol - 6 ppm	Additives to soil: manure, water	Tilling		
9	Stanford Pesticide Site #1, AZ 3/20/87 - 11/4/87 (Removal)	Chemical treatment - alkaline hydrolisis EPA removal contractor	Soil (200 cy)	Methyl parathion Input: 24.2 ppm Output: 0.05 ppm	pH: 9.0 Moisture: wet Additives to soil: soda ash, water, activated carbon	Tilling (in situ, 3 times per week)		
9	Poly-Carb, Inc., NV 7/22/87 - 8/16/88 (Removal)	Land treatment and soil washing EPA removal contractor	Soil (1,500 cy)	Input: Phenol 1,020 ppm o-cresol - 100 ppm m- and p-cresol - 409 ppm Output: Phenol - 1 ppm o-cresol - 1 ppm m- and p-Cresol - 0.92 ppm	Additives: water	Excavation Placement in double-lined pit Irrigation Tilling	Leachate collection and treatment with granular activated carbon	This treatment used both bioremediation and soil flushing in one step.
9 #	Ft. Ord Marina, Fritzche AAF Fire Drill Area, CA Winter 1991 (Army)	Land farming	Soil (4,000 cy)	TCE, MEK, TPH, BTEX	Initial concentration > 1,000 ppm End concentration < 200 ppm	None	None	Gail Youngblood 408-242-8017

TABLE 4
COMPLETED PROJECTS (continued)

October 1992

Region	Site Name, State, Dates of Operation	Technology/ Vendor	Media Treated (Quantity)	Key Contaminants Treated	Operating Parameters	Materials Handling Required	Residuals Management	Comments
9 #	Marine Corps. Mountain Warfare Center Bridgeport, CA 8/89 - 11/89 (Navy)	Bioremediation (ex situ); heap pile bioreactor	Soil (7,000 cy)	PAHs (petroleum hydrocarbons, diesel), Metals (Lead) After 2 months of operation the TPH levels were 120 ppm		Excavation		Temperature, pressure and moisture content are monitored Bill Major (DoD) 805-982-1808
9 #	Fair Child Semiconductor San Jose, CA 1989 - June 1990	Soil vapor extraction with air flushing Carbon cannister air stripping for pump and treat	Soil (10,000 cy)	Initial concentration TCA 670,000 ppb; 1,1-DCE 6,400 ppb freon 113 7,200 ppb Final concentrations unknown Target was 1 ppm	In situ	Excavation dewatering of soil where leaking UST was discovered		Will re-evaluate the remediation in 1994.
#	Naval Communication Station, Scotland February - October 1985 (Navy)	Bioremediation In situ soil, in situ ground water	Soil, Ground water Soil quantity approximately 800 m^2 in area, depth unknown	TPH (No. 2 diesel fuel)	Microorganisms function best between 20°C and 35°C.	Run-off water collected in a trench	None	The contaminated area had considerable slope, and the contaminated soil was a thin layer over a relatively impermeable rock substrate.

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October 1992

APPENDIX B
REQUEST TO BE ON MAILING LIST
INNOVATIVE TREATMENT TECHNOLOGIES:
SEMI-ANNUAL STATUS REPORT
EPA-542-R-92-011

This report is distributed twice a year to Superfund management in U.S. EPA Headquarters and Regional offices, pertinent EPA laboratories, states, EPA libraries, and representatives of other federal agencies. All project contacts listed in the report also receive copies. If you would like to be added to or deleted from the mailing list for future reports, please complete the following form and send it to:

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