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ROD ANNUAL REPORT
FY 1990

Office of Emergency and Remedial Response
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SECTION I
INTRODUCTION

FY 1990 marks the fourth year since the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), which amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). During this period, the remedial program has modified its approach in site cleanups to reflect mandates in CERCLA, as amended by SARA; for example, Section 121 of CERCLA mandates the selection of a remedial action that is protective of human health and the environment, complies with applicable or relevant and appropriate Federal and State requirements (ARARs), is cost-effective, and utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element, and requires an explanation in those cases in which the selected remedy does not satisfy this preference. The Records of Decision (RODs) listed in this annual report document compliance with these mandates for the remedial program in FY 1990. All of the FY 1990 RODs were approved at the Regional level, which is consistent with the policy initiated in FY 1986 to delegate ROD approval authority to the Regions.

FY 1990 RODs

One hundred sixty-one (161) RODs and seven (7) ROD Amendments, including Fund-lead, Enforcement, and Federal Facility RODs were signed during FY 1990. The data in this ROD Annual Report are based on these 168 RODs and ROD Amendments; for clarity, however, these are collectively referred to as RODs throughout the remainder of the report. Sixty (60) of the FY 1990 RODs addressed source control only, and thirty-four (34) RODs addressed ground water remediation only. Sixty-five (65) RODs selected both source control and ground water remediation components, and the remaining nine (9) RODs were no action/no further action (see Exhibit 1). Of the total 125 source control RODs, 106 addressed a final remedy, and the remaining 19 addressed an interim remedy. Of the total 34 ground water only RODs, 27 addressed a final remedy, and 7 addressed an interim remedy for the site.

In keeping with CERCLA Section 121 and the National Contingency Plan (NCP) program expectations to treat highly toxic, highly mobile wastes and contain low level wastes or large volumes of waste, source control treatment was selected in 88 of the 106 final source control RODs (see Exhibit 1). Also in keeping with NCP program expectations, ground water should be returned to its beneficial uses within a reasonable time frame, when practicable. This expectation has been evidenced by the selection of active ground water restoration, in addition to a source control remedy, in 59 RODs; and selection of active ground water restoration in 32 RODs where source control was not being addressed.

Exhibits 1 through 14 summarize various data from the 168 FY 1990 RODs. Exhibit 1 provides an overview of the types of remedial action selected for all FY 1990 RODs. This Exhibit reflects FY 1990 ROD compliance with the CERCLA mandate to utilize permanent solutions. Exhibit 2 provides a quantitative summary of remedial action components by the number of occurrences in RODs. This exhibit demonstrates that occurrences of the use of treatment technologies (109) in selected source control remedies exceeded that of containment only remedy occurrences (35) by a factor of three. Furthermore, the number of occurrences of ground water treatment was 192 compared with 26 occurrences of nontreatment remedies. Of the 109 occurrences of source control treatment technologies, thermal destruction/incineration treatment was selected most frequently (28 occurrences) with 2 RODs using two types of thermal treatment, followed by immobilization (24 occurrences), and In-situ (19 occurrences). In-situ vitrification was also selected as treatment (4 occurrences), which represents an increase in the use of this treatment technology in the remedial program compared to previous fiscal years. Exhibit 3 compares the number of source control RODs employing 'containment' as a primary component of the remedy with RODs employing 'treatment' as a principal component. Exhibit 4 illustrates the

occurrences of treatment technologies in FY 1990 source control remedies by treatment category. Separation/recovery was the main treatment technology category (33% of total source control remedies), followed closely by destruction/detoxification technologies (32%). Immobilization was employed as a source control treatment in 22% of the remedies. The remaining 13% of technology occurrences were unspecified treatment technologies (9%), or in-situ vitrification (4%). Of the 109 treatment technologies selected, 96 were selected in final source control RODs, while 13 were selected in interim source control RODs.

Exhibit 5 shows the total number of treatment occurrences (192) for ground water remedies in FY 1990 RODs. The majority of ground water treatment occurrences (79%) were physical/chemical treatment technologies including air stripping (46), carbon adsorption (28), and precipitation (19). Biological treatment was employed in 4% of the treatments. Two categories comprised the remaining 17%: unspecified or to be determined treatment technologies (9%), and treatment at a publicly owned treatment works (POTW) facility (8%).

An index of site remedies for FY 1990 is provided in Exhibit 6, which contains RODs grouped by the specific type of source control and/or non-source control remedy selected. To assist in understanding the technology data presented in Exhibits 1 through 6, a description of each source control and ground water treatment category is provided in Exhibit 7.

Historical Overview FY 1982-1990

The passage of SARA strengthened and extended the Superfund program while maintaining the overall framework for implementation. New requirements under CERCLA, as amended by SARA, were intended to ensure protective cleanup standards, permanent remedies, and the use of alternative technologies, where applicable. A historical overview of FY 1982-1990 RODs is provided in Exhibits 8 through 12 to show annual progress in achieving statutory mandates. This overview includes data collected for the FY 1990 RODs in Exhibits 1 through 6. Exhibit 8 depicts the number of RODs signed per fiscal year, which demonstrates that there has been a marked increase in the number of RODs signed since the enactment of SARA (October 17, 1986). Exhibit 9 is a quantitative overview of the occurrences and type of treatment technologies which have been selected in source control RODs. An index of the ROD sites where these treatment technologies were selected is provided in Exhibits 10 and 11.

Comparative data on the number of RODS and number of occurrences of treatment technologies selected for source control remedies in post-SARA RODs (FY 1987-1990) are presented in Exhibit 12. These data demonstrate that, in accordance with SARA, there has been: (1) an increase in the percentage of RODs selecting treatment as a principal element of source control, and (2) an increase in the percentage of innovative treatment technologies selected (see Exhibit 9). Exhibit 13 provides a comparison of FY 1982-1990 ROD data on remedial action costs. Exhibits 14 and 15 show and list the information for FY 1990 treatment train RODs, i.e. RODs which employ a sequence of treatment technologies to a single medium or constituent.

During FY 1990, EPA initiated a comprehensive effort between several offices to achieve consistency of historical ROD data with respect to current definitions of treatment technologies, and interim and final remedial action categories. The results of this effort are evidenced in this report, and in the Exhibit 7 descriptions of treatment categories.

FY 1990 ROD Annual Report Sections

The FY 1990 ROD Annual Report is designed to provide the Regions, Headquarters, and the public with summary information on FY 1990 RODs and historical information on FY 1982-1990 RODs. The report should be used as a reference document. To ensure ease of reference, the material in this report is divided into the following sections:

- Introduction - highlights accomplishments in the remedial program, and compliance with CERCLA and the NCP.

- FY 1990 ROD Abstracts - describes site conditions, key contaminants, selected remedial actions, specific performance standards and goals for key contaminants, institutional controls,

remedial action costs, operation and maintenance costs, and site-specific keywords for each FY 1990 ROD.

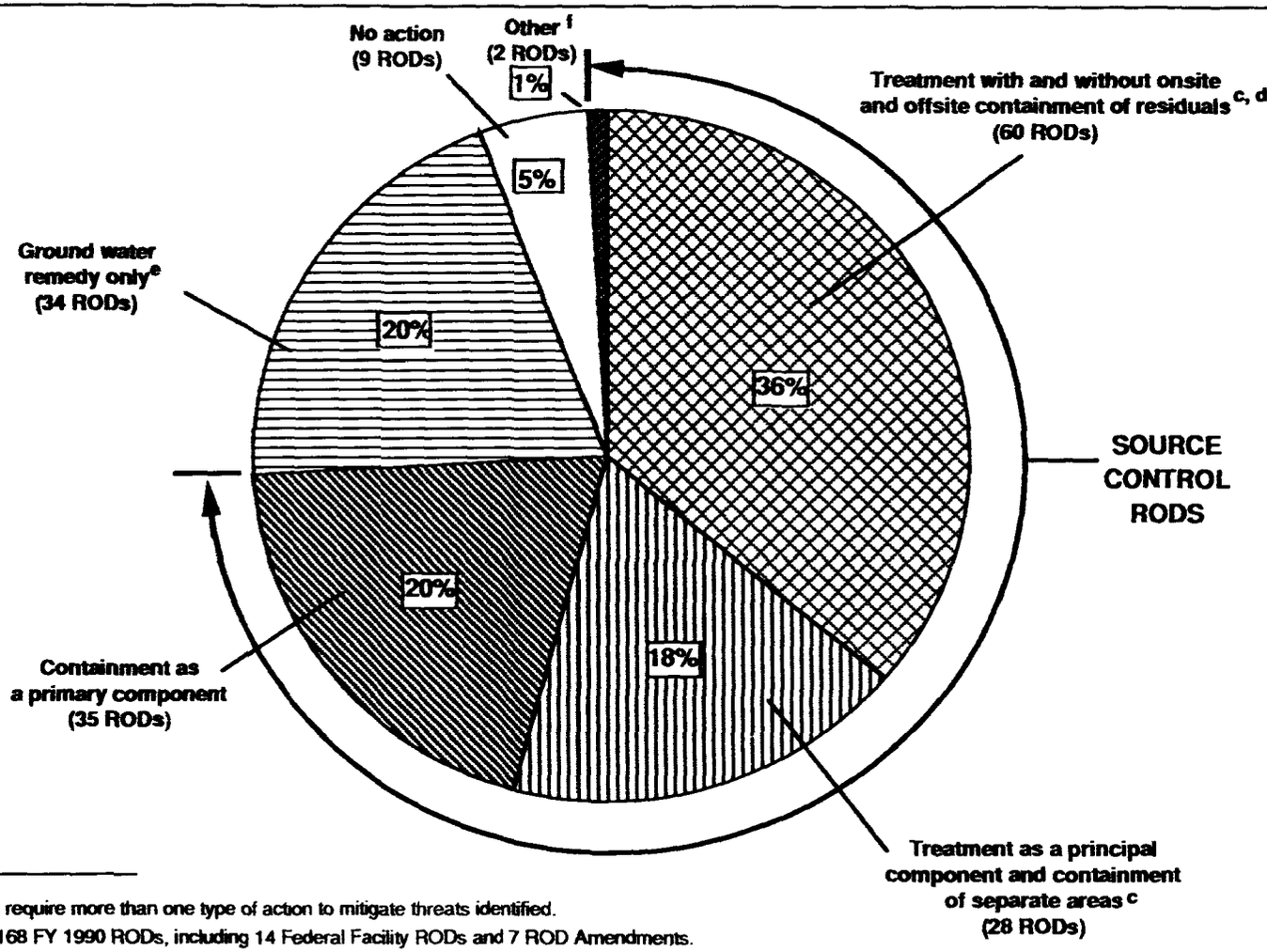
- FY 1990 ROD Summary Table - provides the remedial action number (e.g., 1st, 2nd, etc.), and summarizes the contaminants by media, estimated waste volume, major components of the selected remedy, cleanup goals for key contaminants, present worth or capital costs, and operation and maintenance costs for each FY 1990 ROD.

- FY 1982-1989 ROD Summary Table - provides the remedial action location and date, and summarizes the contaminants by media, estimated waste volume, major components of the selected remedy, cleanup goals for key contaminants, present worth or capital costs, and operation and maintenance costs for each FY 1982-1989 ROD.

- ROD Keyword List - provides a summary listing under each keyword of all RODs that have an association with the keyword based on the selected remedial action. A keyword list index is located at the beginning of the section.

Exhibit 1

FY 1990 RECORDS OF DECISION OVERVIEW [a, b]



a Many sites require more than one type of action to mitigate threats identified.
b Based on 168 FY 1990 RODs, including 14 Federal Facility RODs and 7 ROD Amendments.
c Includes treatment trains for source.
d Many treatments yield a residual that may require further management.
e Includes containment, restoration, and alternate water supply remedies.
f Includes institutional controls, monitoring or relocation remedies.

Exhibit 2

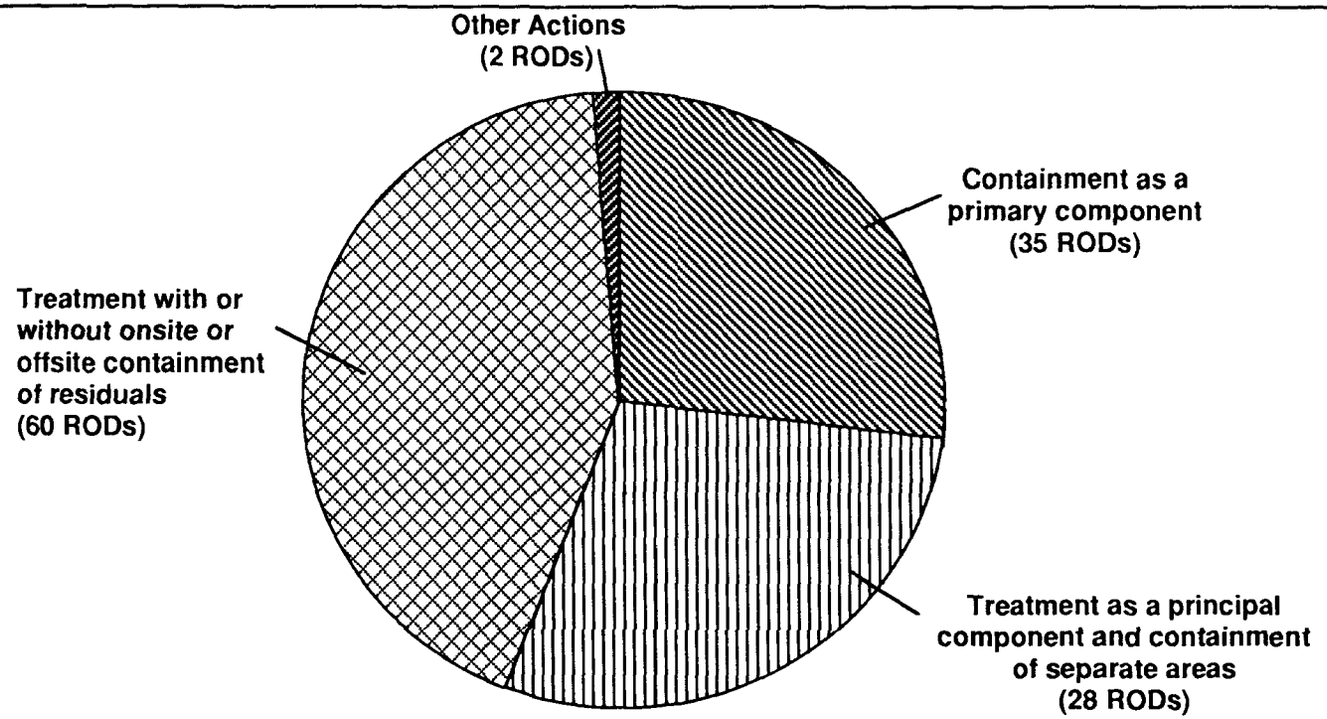
FY 1990 ROD REMEDIAL ACTION SUMMARY TABLE [a, b]

SOURCE CONTROL REMEDIATION	TOTAL NUMBER OF OCCURRENCES
Treatment Technology [c, d, e]	109
Thermal Destruction/Incineration	28
Immobilization	24
In-situ Vacuum/Vapor Extraction	19
Soil Washing	8
Thermal Desorption	6
Bioremediation [f]	5
To Be Determined/Unspecified Treatment Technologies	10
In-situ Vitrification	4
Dechlorination	2
Soil Flushing	2
Volitization/Aeration	1
Other Treatment	31
Decontamination	10
Gas Flaring	6
Recovery/Recycling	7
Surface Water Treatment	5
NAPLs Treatment	3
Containment Only	37
Onsite	28
Offsite	9
Other Actions (e.g., Institutional Controls, Relocation)	2
CONTAMINATED GROUND WATER REMEDIATION	
Active Restoration	192
Physical/Chemical	152
Biological	7
To Be Determined/Unspecified Treatment	18
POTW	15
Alternate Water Supply	6
Natural Attenuation	6
Containment [g]	4
Other Actions (Institutional Controls)	1
NO FURTHER ACTION	9

[a] Includes 129 final and 27 interim action RODs, 9 no action RODs, and 3 RODs with both a final and interim component; more than one remedy may be associated with a ROD.
[b] Based on 168 FY 1990 RODs, including 16 federal facility RODs and 7 ROD Amendments
[c] Includes primary and contingent treatment technologies.
[d] Data reflect occurrences of technologies as selected in the 125 RODs that addressed source control; more than one technology may be associated with a ROD.
[e] For complete descriptions of individual technologies within each group see Exhibit 7, Description of Treatment Technology Categories.
[f] Includes in-situ and ex-situ processes.
[g] Includes management of migration.

Exhibit 3

FY 1990 SOURCE CONTROL REMEDIES [a]

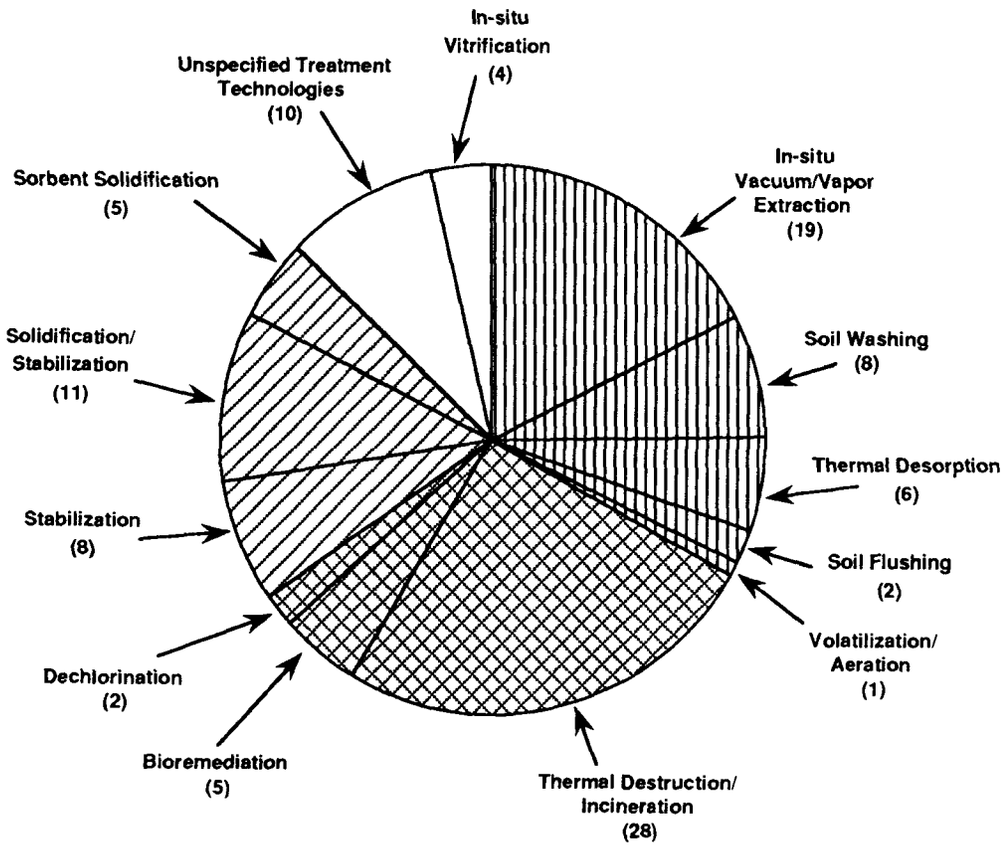


NUMBER OF RODs	PERCENT	SOURCE CONTROL REMEDY
35	28%	Containment as a primary component
28	22%	Treatment as a principal component and containment of separate areas
60	48%	Treatment with or without onsite or offsite containment of residuals
2	2%	Other actions
125	100%	

[a] Includes 125 Source Control RODs from a population of 168 RODs.

Exhibit 4

OCCURRENCES OF TREATMENT TECHNOLOGIES IN FY 1990 SOURCE CONTROL REMEDIES [a,b,c]

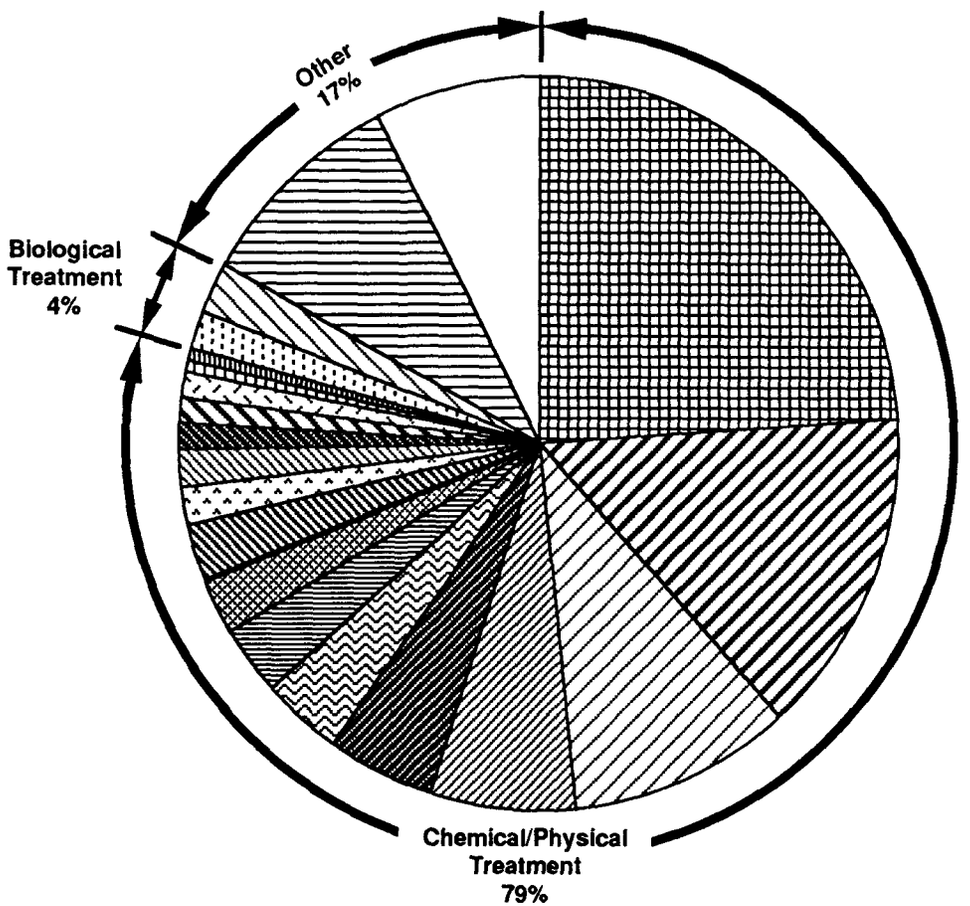


PERCENT	TREATMENT TECHNOLOGIES
33%	**Separation/Recovery (36)** In-situ Vacuum/Soil Vapor Extraction (19) Soil Washing (8) Thermal Desorption (6) Soil Flushing (2) Volatilization/Aeration (1)
32%	**Destruction/Detoxification (35)** Thermal Destruction/Incineration (28) Bioremediation (5) Dechlorination (2)
22%	**Immobilization (24)** Stabilization (8) Solidification/Stabilization (11) Sorbent Solidification (5)
13%	**Other/Unspecified Treatment Technologies (14)** Unspecified Treatment Technologies (10) In-situ Vitrification (4)
100%	

[a] Includes final and interim action RODs.
[b] Data reflect occurrences of treatment technologies as selected in the 125 RODs that addressed source control; more than one technology may be associated with a ROD.
[c] Data in ( ) reflect total occurences.

Exhibit 5

OCCURRENCES OF TREATMENT IN FY 1990 CONTAMINATED GROUND WATER REMEDIES



Technology	Number of Occurrences
Chemical/Physical	
Air Stripping	46
Carbon Adsorption	28
Precipitation	19
Granular Activated Carbon	13
Filtration	9
Ion Exchange	7
Sedimentation	6
UV Peroxidation	5
Chemical Treatment	5
Flocculation	3
Activated Alumina	3
Aeration	2
Incineration	2
pH Adjustment	2
Neutralization	1
Reverse Osmosis	1
Biological	
Biological Treatment	3
Ex-Situ Bioremediation	4
Other	
Other/Unspecified Treatment Technologies	18
POTW	15
Total	192 [a]

[a] More than one technology may be associated with a ROD; includes all components as identified in treatment trains.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Incineration/Thermal Treatment (28)	1	Beacon Heights Landfill, CT
		1	Kearsarge Metallurgical, NH[a]
		1	New Bedford, MA[a]
		2	FAA Technical Center, NJ
		2	Hooker 102nd Street, NY
		2	Hooker Chemical-Ruco Polymer, NJ
		2	Mattiace Petrochemicals, NY
		2	Sayreville Landfill, NJ
		2	Sealand Restoration, NY
		3	Greenwood Chemical, VA[a]
		3	M.W. Manufacturing, PA[a]
		5	Bofors Nobel, MI[b]
		5	Fisher Calo Chem, IN[a]
		5	Pristine (Amendment), OH[a]
		5	St. Louis River, MN
		5	Springfield Township Dump, MI[a]
		6	Hardage/Criner (Amendment), OK[a,c]
		6	Jacksonville Municipal Landfill, AR[a]
		6	Rogers Road Municipal Landfill, AR[a]
		6	Texarkana Wood Preserving, TX
		6	Vertac, AR
		7	Fairfield Coal Gasification Plant, IA[c]
		7	Hastings Groundwater Contamination (East Industrial Park), NE[a]
		7	Missouri Electric Works, MO
		7	Shenandoah Stables, MO[a]
		8	Ogden Defense Depot, UT
		8	Sand Creek Industrial, CO[a]
		10	FMC Yakima Pit, WA
	Immobilization (24)	1	New Bedford, MA[a]
		2	Roebling Steel, NJ[a]
		3	C&R Battery, VA
		3	Greenwood Chemical, VA[a]

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
	Immobilization (24) (Continued)	3	M.W. Manufacturing, PA[a]
		4	62nd Street Dump, FL
		4	Cabot/Koppers, FL[a]
		4	Coleman-Evans Wood Preserving (Amendment), FL[a]
		4	Kassouf-Kimerling Battery Disposal, FL
		4	Schuylkill Metal, FL
		4	Yellow Water Road, FL
		4	Zellwood Groundwater Contamination (Amendment), FL
		5	Oconomowoc Electroplating, WI
		5	Sangamo/Crab Orchard NWR (USDOI), IL[a]
		5	Springfield Township Dump, MI[a]
		5	Wayne Waste Oil, IN[a]
		6	Jacksonville Municipal Landfill, AR[a]
		6	Rogers Road Municipal Landfill, AR[a]
		7	Hastings Groundwater Contamination (East Industrial Park), NE[a]
		7	Shenandoah Stables, MO[a]
		8	Martin Marietta, Denver Aerospace, CO[a]
		8	Rocky Mountain Arsenal (OU17), CO
		9	J.H. Baxter, CA[a]
		10	Teledyne Wah Chang Albany (TWCA), OR
	In-situ Vacuum/Vapor Extraction (19)	1	Stamina Mills, RI
		2	Vestal Water Supply 1-1, NY
		3	Lord Shope Landfill, PA
		4	Jadco-Hughes, NC[a]
		4	SCRDI Bluff Road, SC
		5	Fisher Calo Chem, IN[a]

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
	In-situ Vacuum/Vapor Extraction (19) (Continued)	5	Hagen Farm, WI
		5	Pristine (Amendment), OH[a]
		5	Springfield Township Dump, MI[a]
		5	Wayne Waste Oil, IN[a]
		6	Hardage/Criner (Amendment), OK[a,c]
		6	Tinker AFB (Soldier Creek/Bldg. 3001), OK
		7	Lindsay Manufacturing, NE
		7	Waverly Groundwater Contamination, NE
		8	Martin Marietta, Denver Aerospace, CO[a]
		8	Rocky Mountain Arsenal (OU18), CO
		9	Intersil, CA[a]
		9	Solvent Service, CA[c]
		9	Watkins-Johnson, CA
	Other/Unspecified Treatment Technologies (10)	1	Kearsarge, NH[a]
		2	Mattiace Petrochemical, NY
		2	Radium Chemical, NY
		2	Roebling Steel, NJ[a]
		2	Sarney Farm, NY[a]
		2	Solvent Savers, NY
		3	Avtex Fibers, VA
		6	Jacksonville, AR[a]
		6	Rogers Road Municipal Landfill, AR[a]
		9	Intersil, CA[a]
	Soil Washing (8)	2	King of Prussia, NJ
		2	Myers Property, NJ[a]
		4	Cabot/Koppers, FL[a]
		4	Coleman-Evans Wood Preserving (Amendment), FL[a]
		5	Moss-American Kerr-McGee Oil, WI[a]
		5	Wayne Waste Oil, IN[a]

[*] Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
	Soil Washing (8) (Continued)	6	Arkwood, AR
		8	Sand Creek Industrial, CO[a]
	Thermal Desorption (6)	2	American Thermostat, NY
		2	Claremont Polychemical, NY
		2	Sarney Farm, NY[a]
		5	Bofors Nobel, MI[b,c]
		5	University of Minnesota, MN
		8	Martin Marietta, Denver Aerospace, CO[a,b]
	Bioremediation (5)	4	Cabot/Koppers, FL[a]
		4	Dubose Oil Products, FL
		5	Moss-American Kerr-McGee Oil, WI[a]
		5	Onalaska Municipal Landfill, WI
		9	J.H. Baxter, CA[a]
	In-Situ Vitrification (4)	5	Anderson Development, MI
		5	Sangamo/Crab Orchard NWR (USDOI), IL[a]
		6	Crystal Chemical, TX
		8	Rocky Mountain Arsenal (OU16), CO
	Dechlorination (2)	2	Myers Property, NJ[a]
		4	Tenth Street Dump/Junkyard, OK
	Soil Flushing (2)	3	US Titanium, VA
		3	Jadco-Hughes, NC[a]
	Volatilization/Aeration (1)	3	Howe Valley Landfill, KY
OTHER TREATMENT (30)			
		1	Coakley Landfill, NH*
		2	American Thermostat, NY*
		2	Claremont Polychemical, NY*
		2	Hooker-102nd Street, NY*

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
OTHER TREATMENT (30) (Continued)			
		2	Myers Property, NJ*
		2	Radium Chemical, NY*
		2	Robeling Steel, NJ
		3	Avtex Fibers, VA*
		3	Brown's Battery Breaking, PA*
		3	C&R Battery, VA*
		3	Dover Air Force Base, DE
		3	Fike Chemical, WV
		4	Schuylkill Metal, FL*
		5	Algoma Municipal Landfill, WI*
		5	Anderson Development, MI*
		5	Bofors Nobel, MI*
		5	Hunts Disposal, WI*
		5	Janesville Old Landfill, WI*
		5	Metamora Landfill, MI*
		5	Moss-American Kerr-McGee Oil, WI*
		5	NL Industries/Taracorp Lead Smelt, IL
		5	St. Louis River, MN*
		6	Hardage/Criner (Amendment), OK*
		8	East Helena, MT
		6	Jacksonville Municipal Landfill, AR*
		6	Rogers Road Landfill, AR*
		8	Monticello Mill Tailings (DOE), UT
		8	Rocky Mountain Arsenal (OU16), CO*
		8	Rocky Mountain Arsenal (OU17), CO*
		9	Operating Industries Landfill (Amendment), CA*
CONTAINMENT ONLY			
	Onsite (30)	1	Old Springfield Landfill, VT
		2	Scientific Chemical Processing, NJ
		2	Syosset Landfill, NY

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
CONTAINMENT ONLY (Continued)			
	Onsite (30) (Continued)	3	Coker's Sanitation Service Landfills, DE
		3	East Mt. Zion, PA
		3	Hranica Landfill, PA
		3	Keystone Sanitation Landfill, PA
		3	Osborne Landfill, PA
		3	Walsh Landfill, PA
		4	Bypass 601 Groundwater Contamination, NC[d]
		4	Lewisburg Dump, TN
		4	North Hollywood Dump, TN[d]
		4	Pickettville Road Landfill, FL
		5	Janesville Ash Beds, WI
		5	K&L Landfill, MI
		5	Master Disposal Service Landfill, WI
		5	Wheeler Pit, WI
		7	Midwest Manufacturing/North Farm, IA
		7	Northwestern States Portland Cement, IA
		7	Weldon Spring Quarry/Plant/ Pits (USDOE), MO
		7	Wheeling Disposal Service, MO
		7	White Farm Equipment Dump, IA
		8	Portland Cement (Kiln Dust #2 & #3), UT[d]
		8	Rocky Mountain Arsenal (OU20), CO
		8	Rocky Mountain Arsenal (OU23), CO
		8	Sharon Steel (Midvale Tailings), UT
		8	Silver Bow Creek, MT
		8	Whitewood Creek, SD[d]
		9	Coalinga Asbestos Mine, CA
		10	Silver Mountain Mine, WA

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
CONTAINMENT ONLY (Continued)			
	Offsite (9)	2	Glen Ridge Radium, NJ
		2	Imperial Oil/Champion Chemicals, NJ
		2	Montclair/West Orange Radium, NJ
		2	Woodland Township Route 72, NJ
		2	Woodland Township Route 532, NJ
		4	Bypass 601 Groundwater Contamination, NC[d]
		4	North Hollywood Dump, TN[d]
		8	Portland Cement (Kiln Dust #2 & #3), UT[d]
		8	Whitewood Creek, SD[d]
OTHER ACTIONS (2)			
	(Institutional Controls, Relocation)	2	Forest Glen Subdivision, NY
		10	Louisiana-Pacific, CA
NON-SOURCE CONTROL			
	Pump and Treatment in Addition to a Source Control Remedy (59)	1	Coakley Landfill, NH
		1	Kearsarge Metallurgical, NH
		1	Old Springfield, VT
		1	Stamina Mills, RI
		2	American Thermostat, NY
		2	Claremont Polychemical, NY
		2	FAA Technical Center, NJ
		2	Hooker-102nd Street, NY
		2	King of Prussia, NJ
		2	Myers Property, NJ[a]
		2	Scientific Chemical Processing, NJ
		2	Solvent Savers, NY
		2	Woodland Township Route 72, NJ
		2	Woodland Township Route 532, NJ

* *Includes treatment component.*

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] *ROD selected onsite and offsite containment remedies.*

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
NON-SOURCE CONTOL (Continued)			
	Pump and Treatment in Addition to a Source Control Remedy (59) (Continued)	3	Keystone Sanitation, PA
		3	Lord Shope Landfill, PA
		3	Osborne Landfill, PA
		3	US Titanium, VA
		4	62nd Street Dump, FL
		4	Cabot/Koppers, FL[a]
		4	Coleman-Evans Wood Preserving (Amendment), FL[a]
		4	Jadco-Hughes, NC[a]
		4	SCRDI Bluff Road, SC
		4	Schuylkill Metal, FL
		5	Bofors Nobel, MI[c]
		5	Fisher Calo Chem, IN
		5	Hunts Disposal, WI
		5	Janesville Ash Beds, WI
		5	Janesville Old Landfill, WI
		5	K&L Landfill, MI
		5	Metamora Landfill, MI
		5	Moss-American Kerr-McGee Oil, WI[a]
		5	Oconomowoc Electroplating, WI
		5	Onalaska Municipal Landfill, WI
		5	Pristine (Amendment), OH[a]
		5	Springfield Township Dump, MI[a]
		5	University of Minnesota, MN
		5	Wayne Waste Oil, IN[a]
		6	Crystal Chemical, TX
		6	Hardage/Criner (Amendment), OK[a,c]
		6	Texarkana Wood Preserving, TX
		6	Tinker AFB (Soldier Creek/Bldg. 3001) OK
		7	Fairfield Coal Gasification Plant, IA[c]

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
NON-SOURCE CONTROL (Continued)			
	Pump and Treatment in Addition to a Source Control Remedy (59) (Continued)	7	Lindsay Manufacturing, NE
		7	Midwest Manufacturing/North Farm, IA
		7	Missouri Electric Works, MO
		7	Northwestern States Portland Cement, IA
		7	Waverly Groundwater Contamination, NE
		7	White Farm Equipment Dump, IA
		8	Martin Marietta, Denver Aerospace, CO[a]
		8	Ogden Defense Depot, UT
		8	Rocky Mountain Arsenal (OU17), CO
		8	Rocky Mountain Arsenal (OU18), CO
		8	Rocky Mountain Arsenal (OU20), CO
		8	Silver Bow Creek, MT
		9	Intersil, CA[a]
		9	J.H. Baxter, CA[a]
		9	Solvent Service, CA[a]
		9	Watkins-Johnson, CA
	Pump and Treatment Only (32) (Continued)	2	Chemical Leaman Tank Lines, NJ
		2	Cinnaminson Groundwater Contamination, NJ
		2	Kentucky Avenue Wellfield, NY[c]
		2	Lone Pine Landfill, NJ
		2	Mannheim Avenue Dump, NJ
		2	Metaltec/Aerosystems, NJ
		3	Army Creek Landfill, DE
		3	Croydon TCE Spill, PA

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
NON-SOURCE CONTROL (Continued)			
	Pump and Treatment Only (32) (Continued)	3	Cryo-Chem, PA
		3	Raymark, PA
		3	Sand Gravel & Stone, MD
		3	Tyson Dump #1, PA
		4	City Industries, FL
		4	Harris/Palm Bay Facility, FL
		4	Hipps Road Landfill (Amendment), FL
		4	Munisport Landfill, FL
		5	Clare Water Supply, MI[c]
		5	Kummer Sanitary Landfill, MN
		5	Naval Industrial Reserve Ordnance Plant, MN
		5	Ott/Story/Cordova Chemical, MI
		5	Reilly Tar & Chemical (St. Louis Park), MN
		5	Spiegelberg Landfill, MI
		5	Tri-State Plating, IN
		6	Cimarron Mining, NM
		8	Mystery Bridge at Highway 20, WY[c]
		8	Rocky Flats Plant (DOE), CO
		8	Rocky Mountain Arsenal (OU19), CO
		9	Applied Materials, CA
		9	Intel (Santa Clara III), CA
		9	Solvent Service, CA[c]
		9	Stringfellow, CA
		10	Fort Lewis Logistic Center, WA
OTHER GROUND WATER REMEDIES			
ALTERNATE WATER SUPPLY (6)			
		2	Higgins Farm, NJ
		3	Butz Landfill, PA
		3	Walsh Landfill, PA
		4	Pickettville Road Landfill, FL
		5	National Presto Industries, WI
		10	Silver Mountain Mine, WA

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990 (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
NATURAL ATTENUATION (6)			
		2	Sarney Farm, NY
		3	East Mt. Zion, PA
		4	Arkwood, AR
		4	Hardage/Criner (Amendment), OK[a,c]
		7	Fairfield Coal Gasification Plant, IA[c]
		8	Mystery Bridge at Highway 20, WY[c]
GROUND WATER CONTAINMENT			
	Management of Migration in Addition to a Source Control and/or Pump and Treatment Remedy (4)	2	Kentucky Avenue Wellfield, NY[c]
		5	Bofors Nobel, MI[c]
		5	Clare Water Supply, MI[b,c]
		5	Master Disposal Service Landfill, WI
NO ACTION/NO FURTHER ACTION (9)			
		1	Baird & McGuire, MA
		2	M&T DeLisa Landfill, NJ
		2	Pomona Oaks Well Contamination, NJ
		3	Westline (Amendment), PA
		4	National Starch & Chemical, NC
		5	Union Scrap Iron Metal, MN
		6	Pagano Salvage, NM
		7	Hastings Groundwater Contamination (FAR-MAR-CO), NE
		8	Rocky Mountain Arsenal (OU22), CO

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 6

INDEX OF SITE REMEDIES FOR FY 1990
(Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
OTHER ACTIONS (1)			
	Institutional Controls	9	Louisiana-Pacific, CA

* Includes treatment component.

[a] ROD selected two or more source control treatment technologies.

[b] ROD selected two types of Incineration/Thermal Treatment.

[c] ROD selected two non-source control measures.

[d] ROD selected onsite and offsite containment remedies.

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER

Source Technologies:

Treatment technology for source material are grouped based on the primary functions for which they are generally used: destruction/detoxification, separation/recovery, immobilization, and other. The specific technologies listed are those identified in the RODs.

I. DESTRUCTION/DETOXIFICATION

A. Bioremediation

Biological treatments use microorganisms to degrade primarily low to moderate levels of organic contaminants in aqueous waste streams and soil. Biological treatments include:

- In-Situ Bioremediation - uses natural populations or seeded bacteria to biodegrade organic compounds. The biological process may be accelerated by introducing nutrients and oxygen. This process is often used in conjunction with a ground water pumping and reinjection system to circulate nutrients and oxygen through a contaminated aquifer and associated contaminated soil.

- Solid/Slurry Phase Bioremediation - involves commingling excavated organic-contaminated soil and sludge with bioactive microorganisms in a mobile batch reactor or an in-ground reactor. Waste is mixed with water to create a slurry composition, and the slurry is mixed to maximize treatment of organic contaminants. Upon completion of the process, the slurry is dewatered and the treated soil is disposed of.

B. Chemical Destruction/Detoxification

Chemical destruction/detoxification processes alter the hazardous substances to produce a by-product residue that is less hazardous than the original waste and may be easier to remove from the waste stream. Chemical destruction/detoxification processes include:

- Chemical Reduction/Oxidation (redox) - a destructive process that changes the chemical nature of the nature of the contaminants.

- Dechlorination - is a destruction process in which chlorine is chemically removed from chlorinated organic compounds. This process converts the more toxic compounds into less toxic, more water soluble products. The transformation of contaminants within the soil produces compounds that are more readily removed from the soil.

C. Thermal Treatment

Thermal treatments use heat to destroy or detoxify hazardous substances, encompassing such technologies as incineration, pyrolysis, and wet air oxidation. Specific incineration types include rotary kiln, liquid injection, fluidized-bed, and infrared treatment.

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER (Continued)

- Incineration - is a controlled flame combustion process in which organics are destroyed producing carbon dioxide, water, and other compounds.

- Pyrolysis - is a decomposition process in which organics are thermally decomposed into their individual elements, in an oxygen deficient atmosphere.

- Wet Air Oxidation - is a process that involves adding high pressure and temperature to a water solution or suspension to destroy organics.

II. SEPARATION/RECOVERY

A. Chemical/Physical Extraction

Chemical/Physical Extraction is a transfer/separation process in which contaminants are dissociated from the matrix either through a chemical or a physical process and are dissolved in a liquid or gaseous phase which may require further treatment. Chemical/physical extraction processes include:

- In-Situ Soil Flushing - is an in-situ extraction process that uses a flushing agent, e.g., water to extract contaminants.

- In-Situ Vacuum/Soil Vapor Extraction - is an in-situ process that involves extraction of VOCs from soil using a vacuum or forced air. This process is generally used with other technologies since it transfers contaminants from the soil to air and water waste streams.

- Soil Washing - is a physical/chemical separation technology in which excavated soil is washed with fluids to remove contaminants. Soil washing is generally followed by other technologies in a treatment train.

B. Thermal Desorption

Thermal Desorption uses heat to extract volatile organics from the matrix and may be followed by other treatments to collect and/or destroy contaminants. Thermal desorption processes include:

- Ex-Situ Thermal Desorption - is a physical transfer process that uses air, heat, and mechanical agitation to change volatile organic compounds (VOCs) in soil into a gas stream, where the contaminants are then further treated.

- In-situ Stream Stripping/Hot Air Stripping - involves the injection of steam or hot air into soil to volatilize VOCs. As VOCs rise to the surface they are condensed or trapped on activated carbon.

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER (Continued)

III. IMMOBILIZATION

Immobilization

The term "immobilization" is used to mean any of the technologies which limit the solubility or mobility of contaminants. The term "fixation" has also been used as a synonym for immobilization. Technology types which fall within the realm of immobilization include:

- Stabilization - involves the addition and mixing of materials that limit the solubility or mobility of the waste constituents even though the physical characteristics of the waste may not be changed.
- Solidification/Stabilization - involves the addition and mixing of materials that limit the solubility or mobility of the waste constituents, and results in a monolithic structure.
- Sorbent Solidification - involves the addition and mixing of materials that limit the mobility of the waste constituents through the action of sorption.

IV. OTHER

In-situ Vitrification (ISV) - is a thermochemical treatment process that destroys, removes, or immobilizes hazardous wastes by electrically melting the waste media (e.g., soil) which upon cooling creates an extremely stable glass-like solid. ISV can be used to treat soil and sludge contaminated with radioactive, inorganic, or organic wastes or mixtures of these contaminants.

Ground Water Technologies:

Treatment technologies for ground water are grouped based on the categories commonly used in the waste water treatment industry: chemical/physical treatment biological, and other. The technologies are listed in their order of appearance in Exhibit 5.

I. CHEMICAL/PHYSICAL

- Air Stripping (Desorption) - is a physical process that involves bringing ground water into close contact with air thereby causing VOCs in the liquid phase to transfer to the gas phase. For ground water, this generally is accomplished by injecting water into an air stream. Exhaust air may have to be treated (e.g., using carbon adsorption) to remove VOCs before discharge to the atmosphere.

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER (Continued)

- Carbon Adsorption - is a physicochemical process that involves using activated carbon as a sorbent to remove primarily soluble organics from air and water. As contaminated ground water contacts activated carbon, organic molecules become physically/chemically attached (i.e., adsorbed) to the carbon surface. There are two basic types of activated carbon: granular and powdered, based on the size of the carbon particles.

- Precipitation - is a physicochemical process that involves transforming a contaminant from solution into a solid phase. Precipitation for ground water remediation is used primarily for the removal of heavy metals using such precipitating chemicals as lime, alum, or iron salts. Chemical precipitation is followed frequently by flocculation to enhance settling of solid particles for subsequent removal by filtration or sedimentation. Physical precipitation, including cooling, heating or altering the solvent concentration, also can be used to alter solubilities and precipitate contaminants.

- Granular Activated Carbon - is carbon prepared by heating various types of woods and coal to drive off hydrocarbons but with insufficient air to sustain combustion. The resulting char is activated by exposure to an oxidizing gas at high temperatures. The carbon particles generally are used in carbon adsorption processes (see above).

- Filtration - is a physical process that involves forcing contaminated ground water through a porous granular-media filter (e.g., sand, anthracite) to remove suspended particles. Several mechanisms are involved in filtering suspended particles from the ground water, including straining, flocculation, and sedimentation.

- Ion Exchange - is a reversible process whereby toxic ions (i.e., anions and cations) in solution are exchanged with less harmful, similarly charged ions electrostatically attached to a solid synthetic resin material. The toxic ions having a stronger affinity to the resin, will replace the original ions that were placed on the resin before treatment. Once the available exchange sites on the resin are filled, the resin can be regenerated.

- Sedimentation - is the removal of suspended solids from wastewaters by the gravitational settling of particles heavier than water. Sedimentation may be used in ground water treatment after biological treatment or precipitation/flocculation to remove biomass or precipitants.

- UV Peroxidation - is a chemical oxidation process that uses hydrogen peroxide in the presence of a catalyst to generate hydroxyl radicals that react with organics and reduced compounds to yield carbon dioxide, water, salts, simple organic acids, and/or sulfates thereby reducing the toxicity and organic content of wastewaters. The application of ultraviolet (UV) light to the waste treatment (photolysis) to enhance/induce chemical

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER (Continued)

transformations can be used in conjunction with peroxidation. A major advantage of UV application is that specific bonds can be targeted by selecting the appropriate frequency of the light source.

- Chemical Treatment - involves chemical reduction-oxidation (redox) reactions in which the oxidation state of at least one reactant is raised while that of another is lowered. Redox reactions can detoxify and enhance biodegradability or adsorption (oxidation), or reduce solubility (reduction).

- Flocculation - is a chemical/physical process that involves agitating chemically treated water to enhance precipitation and induce coagulation. Fine suspended particles formed during precipitation collide during gentle mixing, and agglomerate into larger heavier particles or flocs and settle out. Flocculating agents such as alum, lime, iron salts, and organic flocculating agents are added to reduce natural repelling surface charges on particles, and physical agitation is used for the formation of large flocs.

- Activated Alumina - is an adsorption process that is used to remove dissolved inorganic constituents such as arsenic, fluoride, and selenium. As contaminated ground water contacts activated alumina, inorganics become physically/chemically attached (i.e., adsorbed) to the alumina surface. Activated alumina is a highly porous, granular form of aluminum oxide.

- Aeration - is a gas-liquid mass-transfer process that is used for adding oxygen during biological treatment processes, or for air stripping VOCs from wastewaters.

- Neutralization (pH Adjustment) - is a chemical process that involves adding an acid (e.g., sulfuric acid) or base (e.g., lime) to adjust the pH. Neutralization may be used as a pretreatment before biological or chemical treatment.

- Reverse Osmosis - is a physical separation process involving membrane filtration. Sufficient pressure is applied to a concentrated solution to force the water from the solution to flow through a semi-permeable membrane but selectively prevents impurities from passing through the membrane; concentrations of impurities build up on the pressure induced side of the membrane. Reverse osmosis is generally limited to polishing low flow streams containing highly toxic contaminants, and is especially effective for high molecular weight organics and ions.

Exhibit 7

DESCRIPTION OF TREATMENT TECHNOLOGIES FOR SOURCE CONTROL AND GROUND WATER (Continued)

II. BIOLOGICAL

- Biological Treatment (In-Situ Bioremediation) - is an in-situ process that uses natural populations or seeded bacteria in an aquifer to transform organic contaminants (e.g., petroleum hydrocarbons) into less hazardous compounds thereby reducing the concentration of hazardous substances. The biological process generally involves the aerobic oxidation of organic compounds by bacteria, which produce water, carbon dioxide, and new biomass as products. In-situ biological treatment generally is accomplished via a ground water pump-and-reinjection system and is often limited by the ability to provide additional oxygen and nutrients to the bacteria.

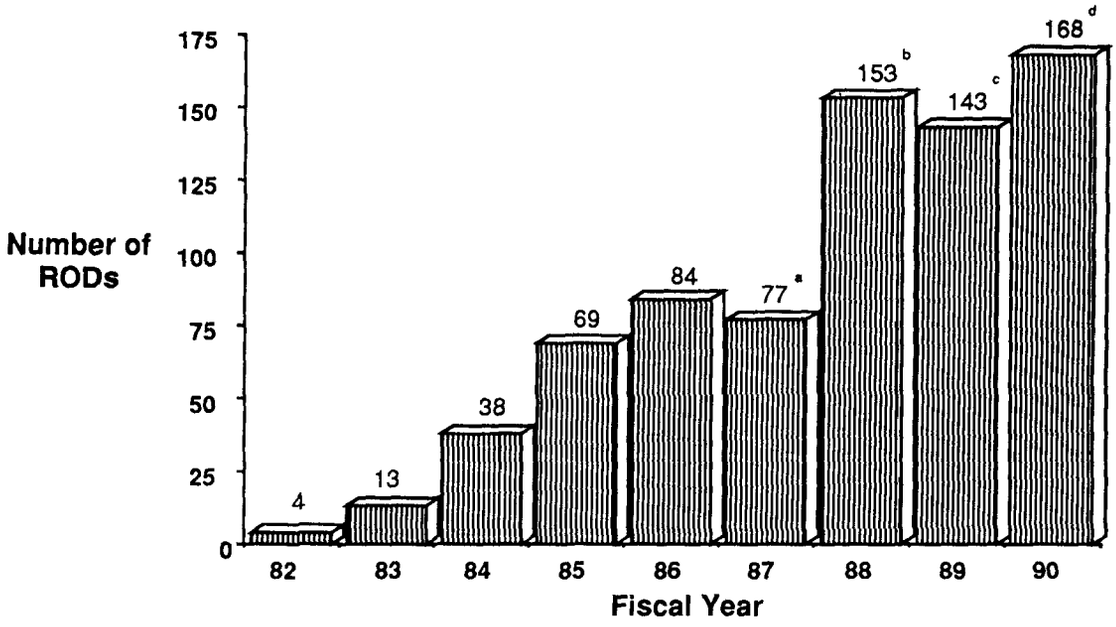
- Ex-situ Bioremediation - is a batch process that uses bacteria to degrade organic matter aerobically or anaerobically. Aerobic bioremediation involves the conversion of organics to carbon dioxide, water, and new bacteria cells. Anaerobic bioremediation generally involves the conversion of organics to carbon dioxide and methane gas in the absence of molecular oxygen. There are several biological treatment processes, including conventional activated sludge systems and fixed film systems (e.g., trickling filter, biotower).

III. OTHER

- Publicly Owned Treatment Works (POTW) - encompasses any device or system used in the treatment (including recycling and reclamation) of municipal or industrial wastes of a liquid nature, that is owned by a State or municipality, including sewers, pipes, or other conveyances if they convey wastewater to a facility providing treatment.

Exhibit 8

RODs SIGNED PER FISCAL YEAR



RODs SIGNED PER FISCAL YEAR BY REGION

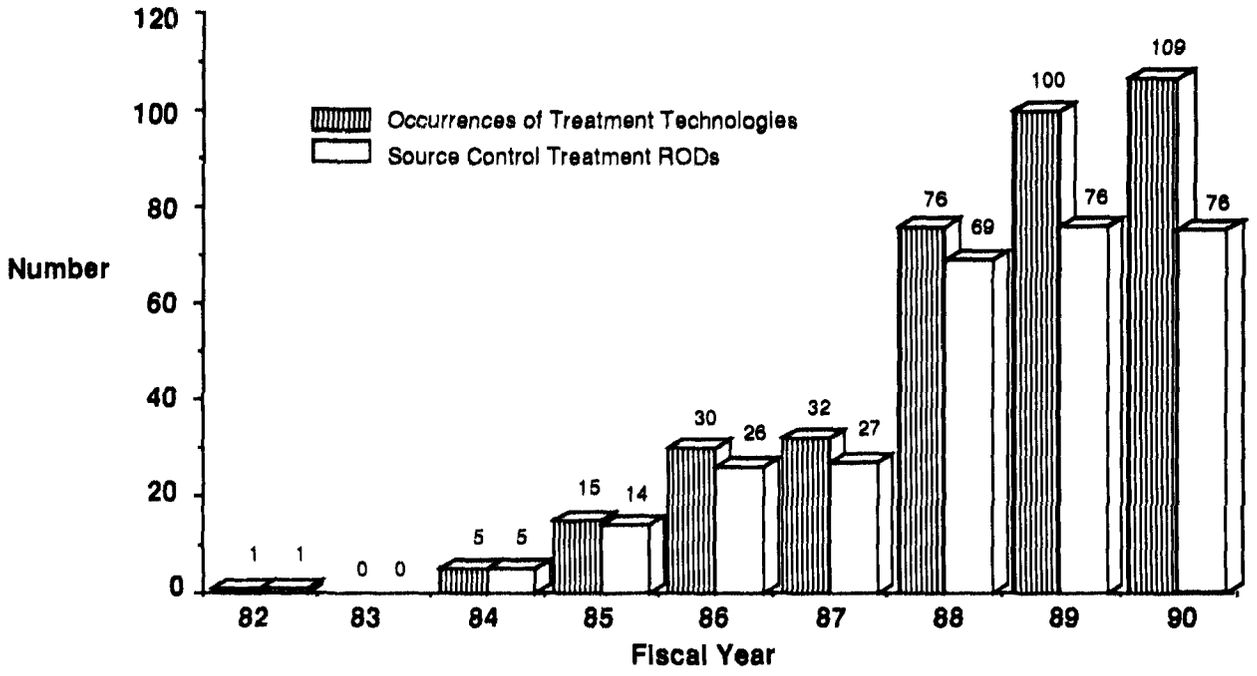
FY	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	TOTAL
1982	1	1	1	1	0	0	0	0	0	0	4
1983	3	2	2	0	2	0	1	0	2	1	13
1984	3	7	5	0	9	4	2	1	5	2	38
1985	7	13	10	5	20	5	1	2	3	3	69
1986	6	15	15	13	16	6	2	7	1	3	84
1987	5	15	5	11	14	11	3	7	5	1	77 [a]
1988	11	22	26	12	25	21	12	4	13	7	153 [b]
1989	11	23	18	15	32	7	11	5	18	3	143 [c]
1990	7	32	23	20	31	11	12	18	10	4	168 [d]

Total RODs 749

[a] Contains one ROD Amendment: Picillo Farm, RI 03/03/87 amends the 09/30/85 ROD.
[b] Contains one ROD Amendment: Tyson's Dump, PA 03/31/88 amends the 12/21/84 ROD.
[c] Contains four ROD Amendments: Ordnance Works, WV 09/29/89 amends the 03/31/88 ROD; Chemtronics, NC 04/26/89 amends the 04/05/88 ROD; Outboard Marine, IL 03/31/89 amends the 05/15/84 ROD; and New Brighton/Arden Hills (Well #7), MN 08/11/89 amends the 06/30/86 ROD.
[d] Contains seven ROD Amendments: Coleman-Evans Wood Preserving, FL 9/26/90 amends the 9/25/86 ROD, Hardage/Criner, OK 11/22/89 amends the 7/14/86 ROD; Hipps Road Landfill, FL 9/21/90 amends the 9/3/86 ROD; Operating Industries, CA 9/27/90 amends the 11/16/87 ROD; Pristine, OH 3/30/90 amends the 12/31/87 ROD; Westline, PA 3/30/90 amends the 6/29/88 ROD; Zellwood Groundwater Contamination, FL 03/01/90 amends the 12/17/87 ROD.

Exhibit 9

OCCURRENCES OF SOURCE CONTROL TREATMENT TECHNOLOGIES PER FISCAL YEAR



OCCURRENCES OF SELECTED SOURCE CONTROL TREATMENT TECHNOLOGIES PER FISCAL YEAR [a]

FY	Incineration/ Thermal Treatment*	Immobilization	In-situ Vacuum/ Vapor Extraction*	Volatilization/ Aeration*	Soil Washing/ Soil Flushing*	Bioremediation Land Application*	Solvent Extraction*	Other/Unspecified**	TOTAL
1982	0	1	0	0	0	0	0	0	1
1983	0	0	0	0	0	0	0	0	0
1984	3	1	0	0	0	1	0	0	5
1985	7	2	1	2	2	1	0	0	15
1986	12	9	0	4	2	3	0	0	30
1987	13	9	1	2	2	1	0	4	32
1988	26	18	10	6	6	6	0	4	76
1989	30	18	17	4	6	10	6	9	100
1990	34	24	19	1	10	5	0	16	109
								Total	368

[a] Data reflect occurrences of technologies as selected in source control RODs; more than one remedy may be associated with a ROD.

* Denotes innovative technologies

** Contains both innovative and non-innovative technologies.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY82	Solidification/ Stabilization (1)	3	Bruin Lagoon, PA
FY83	—		—
FY84	Incineration/Thermal Destruction (3)	5	Berlin & Farro, MI
		5	Laskin/Poplar, OH
		10	Western Processing, WA*
	Solidification/ Stabilization (1)	6	Bioecology, TX
	Biodegradation/Land Application (1)	6	Old Inger, LA
FY85	Incineration/Thermal Destruction (7)	2	Bog Creek Farm, NJ
		2	Bridgeport, NJ
		2	Swope Oil, NJ
		5	Acme Solvents, IL
		6	MOTCO, TX
		6	Triangle Chemical, TX
		8	Woodbury Chemical, CO
	Solidification/ Stabilization (2)	2	Wide Beach, NY
		4	Davie Landfill, FL
	Volatilization/Soil Aeration (2)	1	McKin, ME
		6	Triangle Chemical, TX
	Soil Washing/ Flushing (2)	2	Goose Farm, NJ
		10	South Tacoma/Well 12-A, WA
	Vacuum/Vapor Extraction (1)	5	Verona Well Field, MI

* Enforcement-lead RODs.
** Names of Technology Categories may have changed during 1982-1990.
a RODs may contain non-source control remediation measures.
b ROD allows for implementation of one of two source control treatment technologies.
c ROD selected two or more source control treatment technologies.
d Use of this treatment at the site was retracted in a FY 1989 ROD Amendment.
e ROD selected two or more non-source control measures.
f ROD selected two types of Incineration/Thermal Treatment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY85	Biodegradation/ Land Application (1)	5	Byron/Johnson Salvage, IL
FY86	Incineration/Thermal Destruction (12)	1	Baird & McGuire, MA
		2	Hyde Park, NY*
		3	Drake, PA
		3	Westline, PA
		4	Coleman Evans, FL
		5	Mowbray Engineering, AL[b]
		5	Arrowhead Refinery, MN
		5	Fields Brook, OH[c]
		5	LaSalle Electrical, IL
		5	Metamora Landfill, MI
		5	Spiegelberg Landfill, MI
		6	Sikes Disposal Pit, TX
	Solidification/ Stabilization (9)	2	Marathon Battery, NY
		3	Bruin Lagoon, PA
		4	Mowbray Engineering, AL[b]
		4	Pepper's Steel, FL*
		4	Sapp Battery, FL
		5	Burrows Sanitation, MI
		5	Fields Brook, OH[c]
		5	Forest Waste, MI
		10	Queen City Farms, WA*
	Volatilization/ Soil Aeration (4)	1	Tinkhams Garage, NH[b]
		2	Caldwell Trucking, NJ
		2	Metaltec/Aerosystems, NJ
		4	Hollingsworth Solderless, FL

* Enforcement-lead RODs.
** Names of Technology Categories may have changed during 1982-1990.
a RODs may contain non-source control remediation measures.
b ROD allows for implementation of one of two source control treatment technologies.
c ROD selected two or more source control treatment technologies.
d Use of this treatment at the site was retracted in a FY 1989 ROD Amendment.
e ROD selected two or more non-source control measures.
f ROD selected two types of Incineration/Thermal Treatment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY86	Biodegradation/ Land Application (3)	1	Tinkhams Garage, NH[b]
		3	Leetown Pesticide, WV
		5	Burlington Northern, MN*
	Soil Washing/ Flushing (2)	1	Tinkhams Garage, NH[b]
		10	United Chrome, OR
FY86	Decontamination (1)	10	Western Processing (Amendment), WA
FY87	Incineration/Thermal Destruction (13)	1	Davis Liquid Waste, RI[c]
		1	Ottati & Goss, NH*,[c]
		2	Williams Property, NJ
		4	Geiger (C&M Oil), SC*,[c]
		4	Sodyeco, NC*
		4	Tower Chemical, FL
		5	Laskin/Poplar, OH
		5	Rose Township, MI
		6	Bayou Bonfouca, LA
		6	Cleve Reber, LA
		6	Gurley Pit, AR*,[c]
		6	Hardage/Criner, OK*
		6	Sand Springs Petrochemical Complex, OK
	Solidification/ Stabilization (9)	2	Chemical Control, NJ
		4	Geiger (C&M Oil), SC*,[c]
		4	Gold Coast, FL*
		4	Independent Nail, SC
		5	Liquid Disposal Landfill, MI
		5	Northern Engraving, WI*
		6	Gurley Pit, AR[c]

* Enforcement-lead RODs.
** Names of Technology Categories may have changed during 1982-1990.
a RODs may contain non-source control remediation measures.
b ROD allows for implementation of one of two source control treatment technologies.
c ROD selected two or more source control treatment technologies.
d Use of this treatment at the site was retracted in a FY 1989 ROD Amendment.
e ROD selected two or more non-source control measures.
f ROD selected two types of Incineration/Thermal Treatment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY87	Solidification/ Stabilization (9) (Continued)	6	Mid-South, AR*
		6	Sand Springs Petrochemical Complex, OK[c]
	Other Treatment Technologies (4)	1	Resolve, MA
		3	Palmerton Zinc, PA*
		3	West Virginia Ordnance Works, WV*
		8	Central City/Clear Creek, CO
	Volatilization/ Soil Aeration (2)	1	Ottati & Goss, NH*,[c]
		2	Waldick Aerospace, NJ*
	Soil Washing/ Flushing (2)	1	Davis Liquid Waste, RI[c]
		4	Palmetto Wood, SC
	Vacuum Extraction (1)	5	Seymour, IN*
	Biodegradation/ Land Application (1)	2	Renora, Inc., NJ*
FY88	Incineration/Thermal Destruction (26)	1	Rose Disposal Pit, MA*
		2	Brewster Well Field, NY
		2	Ewan Property, NJ
		2	Lipari Landfill, NJ
		2	Love Canal (10/26/87), NY
		2	Reich Farms, NJ[b]
		2	York Oil, NY[c]
		3	Berk Sand Pits, PA
		3	Delaware Sand & Gravel, DE

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Incineration/Thermal Destruction (26) (Continued)	3	Douglassville Disposal, PA
		3	Drake Chemical, PA
		3	Fike Chemical, WV[b]
		3	Ordnance Works Disposal, WV*,[d]
		3	Southern Maryland Wood, MD
		3	Wildcat Landfill, DE
		4	Zellwood, FL[c]
		5	Forest Waste Disposal, MI
		5	Fort Wayne, IN
		5	LaSalle Electrical, IL
		5	Summit National, OH
		6	Brio Refining, TX*
		6	Old Midland Products, AR
		7	Minker Stout/Romaine, MO
		7	Syntex Verona, MO*
		7	Times Beach, MO
		8	Broderick Wood, CO*
	Solidification/ Stabilization (18)	2	Love Canal (09/26/88), NY
		2	Marathon Battery, NY[c]
		2	York Oil, NY[c]
		3	Aladdin, PA
		3	Fike Chemical, WV
		4	Chemtronics, NC*,[d]
		4	Flowood, MS*
		5	Mid-State Disposal, WI
		5	Velsicol Chemical, IL

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Solidification/ Stabilization (18) (Continued)	6	Bailey Waste Disposal, TX*
		6	Industrial Waste Control, AR*
		7	Arkansas City Dump, KS
		7	Midwest Manufacturing, IA
		9	Selma Pressure Treating, CA*
		10	Commencement Bay/ Nearshore, WA*
		10	Frontier Hard Chrome (12/30/87), WA
		10	Gould, OR*
		10	Pacific Hide & Fur, WA*
	Vacuum/Vapor Extraction (10)	1	Groveland Well, MA
		1	Keefe Environmental, NH
		3	Bendix Flight Systems, PA*,c
		3	Tyson's Dump (Amendment), PA*,d
		4	Airco, KY*
		4	Goodrich, B.F., KY*
		6	South Valley (PL-83), NM*
		7	Hastings (09/28/88), NE
		7	Hastings (09/30/88), NE
		9	Motorola, AZ*
	Volatilization/Soil Aeration (6)	1	Cannon Engineering, MA
		2	Marathon Battery, NYc
		2	Reich Farms, NJb

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY88	Volatilization/Soil Aeration (6) (continued)	3	Bendix Flight Systems, PA*
		4	Wamchem, SC*
		6	Long Prairie, NM
	Soil Washing/ Flushing (6)	3	L.A. Clarke & Son, VA[c]
		4	Zellwood, FL
		5	United Scrap Lead, OH
		5	U.S. Aviex, MI*
		6	Koppers/Texarkana, TX*
		6	South Cavalcade, TX*
	Biodegradation/ Land Application (6)	1	Iron Horse Park, MA[c]
		3	L.A. Clarke & Son, VA
		4	Brown Wood Preserving, FL*
		6	Atchison/Santa Fe (Clovis), NM*
		6	French Limited, TX
		6	North Cavalcade, TX
	Other Treatment Technologies (4)	2	GE Wiring, PR*
		5	Pristine, OH
		6	Sol Lynn (03/25/88), TX
		7	Fulbright, MO*
FY89	Incineration/Thermal Destruction (30)	1	Baird & McGuire, MA
		1	Pinette's Salvage Yard, ME[c]
		1	Wells G&H, MA[c]
		1	W.R. Grace (Acton Plant), MA*,[c]
		2	Bog Creek Farm, NJ

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Incineration/Thermal Destruction (30) (Continued)	2	De Rewal Chemical, NJ[c]
		2	FAA Technical Center, NJ*,[c]
		2	Fulton Terminals, NY
		3	Douglassville Disposal, PA*
		3	M.W. Manufacturing, PA
		3	Whitmoyer Laboratories, PA[b]
		4	Aberdeen Pesticides/Fairway Six, NC
		4	American Creosote Works, TN[c]
		4	Celanese (Shelby Fiber Operations), NC*,[c]
		4	Newsom Brothers/Old Reichhold, MS
		4	Smith's Farm, KY[c]
		5	Alsco Anaconda, OH*,[c]
		5	Big D Campground, OH*
		5	Cliffs/Dow Dump, MI*,[c]
		5	Cross Brothers Pail (Pembroke), IL[c]
		5	Ionia City Landfill, MI*
		5	Laskin/Poplar Oil, OH
		5	New Brighton/Arden Hills TCAAP), MN*
		5	Ninth Avenue Dump, IN
		5	Outboard Marine (Amendment), L[b]
		5	Wedzeb Enterprises, IN

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Incineration/Thermal Destruction (30) (Continued)	7	Vogel Paint & Wax, IA*, b, e
		8	Sand Creek Industrial, CO*,c
		8	Woodbury Chemical, CO*
		10	Northwest Transformer, WA*
	Solidification/ Stabilization (18)	1	Sullivan's Ledge, MA
		1	W.R. Grace (Acton Plant), MA*,c
		2	De Rewal Chemical, NJc
		2	Marathon Battery, NY
		3	Craig Farm Drum, PA*
		3	Hebelka Auto Salvage Yard, PA
		3	Ordnance Works Disposal Areas (Amendment), WV*,c
		4	Amnicola Dump, TN
		4	Celanese (Shelby Fiber Operations), NC*,c
		4	Kassouf-Kimerling, FL
		4	Smith's Farm, KYc
		5	Auto Ion Chemicals, MI*
		5	MIDCO 1, IN*,c
		5	MIDCO 2, IN*
		6	Pesses Chemical, TX
		9	Coast Wood Preserving, CA*
		9	Koppers (Oroville Plant), CA*,c
		9	Purity Oil Sales, CA

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Vacuum/Vapor Extraction (17)	1	Kellogg-Deering Well Field, CT
		1	South Municipal Water Supply Well, NH*
		1	Wells G&H, MA[c]
		2	FAA Technical Center, NJ*,[c]
		5	Kysor Industrial, MI
		5	Miami County Incinerator, OH
		5	MIDCO 1, IN*
		5	Wausau Water Supply (9/29/89), WI NE
		7	Hastings Ground Water,
		8	Sand Creek Industrial, CO*,[c]
		9	Fairchild Semiconductor (Mt. View), CA*,[c] (1st Remedial Action)
		9	Fairchild Semiconductor (Mt. View), CA*,[c] (2nd Remedial Action)
		9	Fairchild Semiconductor (S. San Jose), CA*
		9	IBM (San Jose Plant), CA*,[c]
		9	Intel (Mt. View Plant), CA*
		9	Litchfield Airport Area, AZ*
		9	Raytheon (Mt. View Plant), CA*,[c]

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[b] ROD allows for implementation of one of two source control treatment technologies.
[c] ROD selected two or more source control treatment technologies.
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[f] ROD selected two types of Incineration/Thermal Treatment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Biodegradation/ Land Application (10)	3	Ordnance Works Disposal Areas (Amendment), WV*,c
		3	Whitmoyer Laboratories, PA[b]
		4	American Creosote Works, FL
		5	Cliffs/Dow Dump, MI*,c
		5	Galesburg/Koppers, IL
		6	Sheridan Disposal Services (12/29/88), TX*
		7	Vogel Paint & Wax, IA*,b,e
		8	Burlington Northern (Somers Plant), MT*
		8	Libby Ground Water, MT*
		9	Koppers (Oroville Plant), CA*,c
	Other/Not Specified Treatment Technologies (9)	1	Saco Tannery Waste Pits, ME
		2	Claremont Polychemical, NY
		2	SMS Instruments (Deer Park), NY
		3	Havertown PCP, PA
		3	Publicker/Cuyahoga Wrecking, PA
		4	American Creosote Works, TN[c]
		5	Alsco Anaconda, OH*,c
		7	Doepke Disposal (Holliday), KS*
		7	Findett, MO

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY89	Soil Washing/ Flushing (6)	2	Byron Barrel & Drum, NY
		2	Vineland Chemical, NJ[c] (Soil Washing)
		2	Vineland Chemical, NJ[c] (Soil Flushing)
		4	Cape Fear Wood Preserving, NC
		5	Cross Brothers Pail (Pembroke), IL[c]
		9	Koppers (Oroville Plant), CA*,[c]
	Solvent Extraction (6)	1	Norwood PCBs, MA
		1	O'Connor, ME*
		1	Pinette's Salvage Yard, ME[c]
		2	Ewan Property, NJ
		5	Outboard Marine (Amendment), IL
		6	United Creosoting, TX
	Volatilization/Soil Aeration (4)	9	Fairchild Semiconductor (Mt. View), CA*,[c] (1st Remedial Action)
		9	Fairchild Semiconductor (Mt. View), CA*,[c] (2nd Remedial Action)
		9	Intel (Mt. View Plant), CA*,[c]
		9	Raytheon (Mt. View Plant), CA*,[c]
FY90	Incineration/Thermal Treatment (28)	1	Beacon Heights Landfill, CT

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[f] ROD selected two types of Incineration/Thermal Treatment.

Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Incineration/Thermal Treatment (28) (Continued)	1	Kearsarge Metallurgical, NH[c]
		1	New Bedford, MA[c]
		2	FAA Technical Center, NJ
		2	Hooker 102nd Street, NY
		2	Hooker Chemical-Ruco Polymer, NJ
		2	Mattiace Petrochemicals, NY[b]
		2	Sayreville Landfill, NJ
		2	Sealand Restoration, NY
		3	Greenwood Chemical, VA[c]
		3	M.W. Manufacturing, PA[c]
		5	Bofors Nobel, MI[b]
		5	Fisher Calo Chem, IN[b]
		5	Pristine (Amendment), OH[c]
		5	Springfield Township Dump, MN[c]
		5	St. Louis River, MN
		6	Hardage/Criner (Amendment), OK[c]
		6	Jacksonville Municipal Landfill, AR[c]
		6	Rogers Road Municipal Landfill, AR[c]

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Incineration/Thermal Treatment (28) (Continued)	6	Texarkana Wood Preserving, TX
		6	Vertac, AR
		7	Fairfield Coal Gasification Plant, IA
		7	Hastings Groundwater Contamination (East Industrial Park), NE[c]
		7	Missouri Electric Works, MO
		7	Shenandoah Stables, MO[c]
		8	Ogden Defense Depot, UT
		8	Sand Creek Industrial, CO[c]
		10	FMC Yakima Pit, WA
FY90	Immobilization (24)	1	New Bedford, MA[c]
		2	Roebling Steel, NJ[c]
		3	C&R Battery, VA
		3	Greenwood Chemical, VA[c]
		3	M.W. Manufacturing, PA[c]
		4	62nd Street Dump, FL
		4	Cabot/Koppers, FL[c]
		4	Coleman-Evans Wood Preserving (Amendment), FL[c]
		4	Kassouf-Kimerling Battery Disposal, FL
		4	Schuylkill Metal, FL
		4	Yellow Water Road, FL

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Immobilization (24) (Continued)	4	Zellwood Groundwater Contamination (Amendment), FL
		5	Oconomowoc Electroplating, WI
		5	Sangamo/Crab Orchard NWR (USDOI), IL
		5	Springfield Township Dump, MI[c]
		5	Wayne Waste Oil, IN[c]
		6	Jacksonville Municipal Landfill, AR[c]
		6	Rogers Road Municipal Landfill, AR[c]
		7	Hastings Groundwater Contamination (East Industrial Park), NE[c]
		7	Shenandoah Stables, MO[c]
		8	Martin Marietta, Denver Aerospace, CO[c]
		8	Rocky Mountain Arsenal (OU17), CO
		9	J.H. Baxter, CA[c]
		10	Teledyne Wah Chang Albany TWCA), OR
	Vacuum/Vapor Extraction (19)	1	Stamina Mills, RI
		2	Vestal Water Supply 1-1, NY
		3	Lord Shope Landfill, PA
		4	Jadco-Hughes, NC[c]
		4	SCRDI Bluff Road, SC
		5	Fisher Calo Chem, IN[b]

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Vacuum/Vapor Extraction (19) (Continued)	5	Hagen Farm, WI
		5	Pristine (Amendment), OH[c]
		5	Springfield Township Dump, MI[c]
		5	Wayne Waste Oil, IN[c]
		6	Hardage/Criner (Amendment), OK[c]
		6	Tinker AFB (Soldier Creek/Bldg. 3001), OK
		7	Lindsay Manufacturing, NE
		7	Waverly Groundwater Contamination, NE
		8	Martin Marietta, Denver Aerospace, CO[c]
		8	Rocky Mountain Arsenal (OU18), CO
		9	Intersil, CA[c]
		9	Solvent Service, CA
		9	Watkins-Johnson, CA
	Soil Washing (8)	2	King of Prussia, NJ
		2	Myers Property, NJ[c]
		4	Cabot/Koppers, FL[c]
		4	Coleman-Evans Wood Preserving (Amendment), FL[c]
		5	Moss-American Kerr-McGee Oil, WI[c]
		5	Wayne Waste Oil, IN[c]
		6	Arkwood, AR
		8	Sand Creek Industrial, CO[c]

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
FY90	Thermal Desorption (6)	2	American Thermostat, NY
		2	Claremont Polychemical, NY
		2	Sarney Farm, NY[c]
		5	Bofors Nobel, MI
		5	University of Minnesota, MN
		8	Martin Marietta, Denver Aerospace, CO[c,f]
	Bioremediation (5)	4	Cabot/Koppers, FL[c]
		4	Dubose Oil Products, FL
		5	Moss-American Kerr-McGee Oil, WI[c]
		5	Onalaska Municipal Landfill, WI
		9	J.H. Baxter, CA[c]
	Other/Unspecified Treatment Technologies (5)	1	Kearsarge, NH[c]
		2	Mattiace Petrochemical, NY[b]
		2	Radium Chemical, NY[c]
		2	Roebling Steel, NJ[c]
		2	Sarney Farm, NY[c]
		2	Solvent Savers, NY
		3	Avtex Fibers, VA
		6	Jacksonville, AR[c]
		6	Rogers Road Municipal Landfill, AR[c]
		9	Intersil, CA[c]

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Exhibit 10

SOURCE CONTROL TREATMENT TECHNOLOGIES** SELECTED IN FY 1982-1990 RODs (Continued)

FISCAL YEAR OF ROD SIGNATURE	TECHNOLOGIES[a]	REGION	SITE NAME, STATE
	In-Situ Vitrification (4)	5	Anderson Development, MI
		5	Sangamo/Crab Orchard NWR (USDOI), IL
		6	Crystal Chemical, TX
		8	Rocky Mountain Arsenal (OU16), CO
	Dechlorination (2)	2	Myers Property, NJ[c]
		6	Tenth Street Dump/Junkyard, OK
	Soil Flushing (2)	3	US Titanium, VA
		4	Jadco-Hughes, NC[c]
	Volatilization/ Aeration (1)	4	Howe Valley Landfill, KY

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY**

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (82)	FY82	Bruin Lagoon, PA	3
	FY83	—	
	FY84	Bioecology, TX	6
	FY85	Wide Beach, NY	2
		Davie Landfill, FL	4
	FY86	Marathon Battery, NY	2
		Bruin Lagoon, PA	3
		Mowbray Engineering, AL[b]	4
		Pepper's Steel, FL*	4
		Sapp Battery, FL	4
		Burrows Sanitation, MI	5
		Fields Brook, OH[c]	5
		Forest Waste, MI	5
		Queen City Farms, WA*	10
	FY87	Chemical Control, NJ	2
		Geiger (C&M Oil), SC*,[c]	4
		Gold Coast, FL*	4
		Independent Nail, SC	4
		Liquid Disposal Landfill, MI	5
		Northern Engraving, WI*	5
		Gurley Pit, AR[c]	6
		Mid-South, AR*	6
		Sand Springs Petrochemical Complex, OK[c]	6
	FY88	Love Canal (09/26/88), NY	2
		Marathon Battery, NY[c]	2
		York Oil, NY[c]	2
		Aladdin, PA	3
		Fike Chemical, WV	3
		Chemtronics, NC*,[d]	4
		Flowood, MS*	4
		Mid-State Disposal, WI	5
		Velsicol Chemical, IL	5
		Bailey Waste Disposal, TX*	6
		Industrial Waste Control, AR*	6
		Arkansas City Dump, KS	7

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (82) (Continued)	FY88	Midwest Manufacturing, IA	7
		Selma Pressure Treating, CA*	9
		Commencement Bay/ Nearshore, WA*	10
		Frontier Hard Chrome (12/30/87), WA	10
		Gould, OR*	10
		Pacific Hide & Fur, WA*	10
	FY89	Sullivan's Ledge, MA	1
		W.R. Grace (Acton Plant), MA*,c	1
		De Rewal Chemical, NJc	2
		Marathon Battery, NY	2
		Craig Farm Drum, PA*	3
		Hebelka Auto Salvage Yard, PA	3
		Ordnance Works Disposal Areas (Amendment), WV*,c	3
		Amnicola Dump, TN	4
		Celanese (Shelby Fiber Operations), NC*,c	4
		Kassouf-Kimerling, FL	4
		Smith's Farm, KYc	4
		Auto Ion Chemicals, MI*	5
		MIDCO I, IN*,c	5
		MIDCO II, IN*	5
		Pesses Chemical, TX	6
		Coast Wood Preserving, CA*	9
		Koppers (Oroville Plant), CA*,c	9
		Purity Oil Sales, CA	9
	FY90	New Bedford, MAc	1
		Roebling Steel, NJ	2
		C&R Battery, VA	3
		Greenwood Chemical, VAc	3
		M.W. Manufacturing, PAc	3
		62nd Street Dump, FL	4
		Cabot/Koppers, FLc	4

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ (Immobilization (82) (Continued)	FY90	Coleman-Evans Wood Preserving (Amendment), FL[c]	4
		Kassouf-Kimerling Battery Disposal, FL	4
		Schuylkill Metal, FL	4
		Yellow Water Road, FL	4
		Zellwood Groundwater Contamination (Amendment), FL	4
		Oconomowoc Electroplating, WI	5
		Sangamo/Crab Orchard NWR (USDOI), IL[b]	5
		Springfield Township Dump, MI[c]	5
		Wayne Waste Oil, IN[c]	5
		Jacksonville Municipal Landfill, AR[c]	6
		Rogers Road Municipal Landfill, AR[c]	6
		Hastings Groundwater Contamination (East Industrial Park), NE[c]	7
		Shenandoah Stables, MO[c]	7
		Martin Marietta, Denver Aerospace, CO[c]	7
		Rocky Mountain Arsenal (OU17), CO	8
		J.H. Baxter, CA[c]	9
		Teledyne Wah Chang Albany (TWCA), OR	10
Incineration/Thermal Destruction/Treatment (119)	FY82	----	
	FY83	----	
	FY84	Berlin & Farro, M	4
		Laskin/Poplar, OH	5
		Western Processing, WA*	10
	FY85	Bog Creek Farm, NJ	2
		Bridgeport, NJ	2
		Swope Oil, NJ	2

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (119) (Continued)	FY85	Acme Solvents, IL	5
		MOTCO, TX	6
		Triangle Chemical, TX	6
		Woodbury Chemical, CO	8
	FY86	Baird & McGuire, MA	1
		Hyde Park, NY*	2
		Drake, PA	3
		Westline, PA	3
		Coleman Evans, FL	4
		Mowbray Engineering, AL[b]	5
		Arrowhead Refinery, MN	5
		Fields Brook, OH[c]	5
		LaSalle Electrical, IL	5
		Metamora Landfill, MI	5
		Spiegelberg Landfill, MI	5
		Sikes Disposal Pit, TX	6
	FY87	Davis Liquid Waste, RI[c]	1
		Ottati & Goss, NH*,[c]	1
		Williams Property, NJ	2
		Geiger (C&M Oil), SC*,[c]	4
		Sodyeco, NC*	4
		Tower Chemical, FL	4
		Laskin/Poplar, OH	5
		Rose Township, MI	5
		Bayou Bonfouca, LA	6
		Cleve Reber, LA	6
		Gurley Pit, AR*,[c]	6
		Hardage/Criner, OK*	6
		Sand Springs Petrochemical Complex, OK	6
	FY88	Rose Disposal Pit, MA*	1
		Brewster Well Field, NY	2
		Ewan Property, NJ	2
		Lipari Landfill, NJ	2
		Love Canal (10/26/87), NY	2
		Reich Farms, NJ[b]	2
		York Oil, NY[c]	2

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (119) (Continued)	FY88	Berk Sand Pits, PA	3
		Delaware Sand & Gravel, DE	3
		Douglassville Disposal, PA	3
		Drake Chemical, PA	3
		Fike Chemical, WV[b]	3
		Ordnance Works Disposal, WV*,[d]	3
		Southern Maryland Wood, MD	3
		Wildcat Landfill, DE	3
		Zellwood, FL[c]	4
		Forest Waste Disposal, MI	5
		Fort Wayne, IN	5
		LaSalle Electrical, IL	5
		Summit National, OH	5
		Brio Refining, TX*	6
		Old Midland Products, AR	6
		Minker Stout/Romaine, MO	7
		Syntex Verona, MO*	7
		Times Beach, MO	7
		Broderick Wood, CO*	8
	FY89	Baird & McGuire, MA	1
		Pinette's Salvage Yard, ME[c]	1
		Wells G&H, MA[c]	1
		W.R. Grace (Acton Plant), MA*,[c]	1
		Bog Creek Farm, NJ	2
		De Rewal Chemical, NJ[c]	2
		FAA Technical Center, NJ*,[c]	2
		Fulton Terminals, NY	2
		Douglassville Disposal, PA*	3
		M.W. Manufacturing, PA	3
		Whitmoyer Laboratories, PA[b]	3
		Aberdeen Pesticides/Fairway Six, NC	4
		American Creosote Works, TN[c]	4
		Celanese (Shelby Fiber Operations), NC*,[c]	4

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (119) (Continued)	FY89	Newsom Brothers/Old Reichhold, MS	4
		Smith's Farm, KY[c]	4
		Alsco Anaconda, OH*,[c]	5
		Big D Campground, OH*	5
		Cliffs/Dow Dump, MI*,[c]	5
		Cross Brothers Pail (Pembroke), IL[c]	5
		Ionia City Landfill, MI*	5
		Laskin/Poplar Oil, OH	5
		New Brighton/Arden Hills (TCAAP), MN*	5
		Ninth Avenue Dump, IN	5
		Outboard Marine (Amendment), IL[b]	5
		Wedzeb Enterprises, IN	5
		Vogel Paint & Wax, IA*, [b, e]	7
		Sand Creek Industrial, CO*,[c]	8
		Woodbury Chemical, CO*	8
		Northwest Transformer, WA*	9
	FY90	Beacon Heights Landfill, CT	1
		Kearsarge Metallurgical, NH	1
		New Bedford, MA[c]	1
		FAA Technical Center, NJ	2
		Hooker 102nd Street, NY	2
		Hooker Chemical-Ruco Polymer, NJ	2
		Mattiace Petrochemicals, NY	2
		Sayreville Landfill, NJ	2
		Sealand Restoration, NY	2
		Greenwood Chemical, VA[c]	3

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Exhibit 11

FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (119) (Continued)	FY90	M.W. Manufacturing, PA[c]	3
		Bofors Nobel, MI[c]	5
		Fisher Calo Chem, IN[b]	5
		Pristine (Amendment), OH[c]	5
		Springfield Township Dump, MI[c]	5
		St. Louis River, MN	5
		Hardage/Criner (Amendment), OK[c]	6
		Jacksonville Municipal Landfill, AR[c]	6
		Rogers Road Municipal Landfill, AR[c]	6
		Texarkana Wood Preserving, TX	6
		Vertac, AR	6
		Fairfield Coal Gasification Plant, IA	7
		Hastings Groundwater Contamination (East Industrial Park), NE[c]	7
		Missouri Electric Works, MO	7
		Shenandoah Stables, MO[c]	7
		Ogden Defense Depot, UT	8
		Sand Creek Industrial, CO[c]	8
		FMC Yakima Pit, WA	10
Biodegradation/Land Application/Bioremediation (27)	FY82	----	
	FY83	----	
	FY84	Old Inger, LA	6
	FY85	Byron/Johnson Salvage, IL	5
	FY86	Tinkham Garage, NH[b]	1
		Leetown Pesticide, WV	3
		Burlington Northern, MN*	5
	FY87	Renora, Inc., NJ*	2
	FY88	Iron Horse Park, MA[c]	1

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Biodegradation/Land Application/Bioremediation (27) (Continued)	FY88	L.A. Clarke & Son, VA	3
		Brown Wood Preserving, FL*	4
		Atchison/Santa Fe (Clovis), NM*	6
		French Limited, TX	6
		North Cavalcade, TX	6
	FY89	Ordnance Works Disposal Areas (Amendment), WV*,c	3
		Whitmoyer Laboratories, PA[b]	3
		American Creosote Works, FL	4
		Cliffs/Dow Dump, MI*,c	5
		Galesburg/Koppers, IL	5
		Sheridan Disposal Services (12/29/88), TX*	6
		Vogel Paint & Wax, IA*,b,e	7
		Burlington Northern (Somers Plant), MT*	8
		Libby Ground Water, MT*	8
		Koppers (Oroville Plant), CA*,c	9
	FY90	Cabot/Koppers, FL[c]	4
		Dubose Oil Products, FL	4
		Moss-American Kerr-McGee Oil, WI[c]	5
		Onalaska Municipal Landfill, WI	5
		J.H. Baxter, CA[c]	9
Volatilization/Soil Aeration/ Aeration (19)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	McKin, ME	1
		Triangle Chemical, TX	6
	FY86	Tinkham Garage, NH[b]	1
		Caldwell Trucking, NJ	2
		Metaltec/Aerosystems, NJ	2
		Hollingsworth Solderless, FL	4
	FY87	Ottati & Goss, NH*,c	1
		Waldick Aerospace, NJ*	2

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Volatilization/Soil Aeration/ Aeration (19) (Continued)	FY88	Cannon Engineering	1
		Marathon Battery, NY[c]	2
		Reich Farms, NJ[b]	2
		Bendix Flight Systems, PA*	3
		Wamchem, SC*	4
		Long Prarie, MN	5
	FY89	Fairchild Semiconductor (Mt. View), CA*,[c] (1st Remedial Action)	9
		Fairchild Semiconductor (Mt. View), CA*,[c] (2nd Remedial Action)	9
		Intel (Mt. View Plant), CA*,[c]	9
		Raytheon (Mt. View Plant), CA*,[c]	9
	FY90	Howe Valley Landfill, KY	4
Soil Washing/Flushing (28)	FY82	----	
	FY83	----	
	FY84	----	
	FY85	Goose Farm, NJ	2
		South Tacoma/Well 12-A, WA	10
	FY86	Tinkham Garage, NH[b]	1
		United Chrome, OR	10
	FY87	Davis Liquid Waste, RI[c]	1
		Palmetto Wood, SC	4
	FY88	L.A. Clarke & Son, VA[c]	3
		Zellwood, FL	4
		United Scrap Lead, OH	5
		U.S. Aviex, MI*	5
		Koppers/Texarkana, TX*	6
		South Cavalcade, TX*	6
	FY89	Byron Barrel & Drum, NY	2
		Vineland Chemical, NJ[c] (Soil Washing)	2

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Soil Washing/Flushing (28) (Continued)	FY89	Vineland Chemical, NJ[c] (Soil Flushing)	2
		Cape Fear Wood Preserving, NC	4
		Cross Brothers Pail (Pembroke), IL[c]	5
		Koppers (Oroville Plant), CA*,[c]	9
	FY90	King of Prussia, NJ	2
		Myers Property, NJ[c]	2
		Cabot/Koppers, FL[c]	4
		Coleman-Evans Wood Preserving (Amendment), FL[c]	4
		Moss-American Kerr-McGee Oil, WI[c]	5
		Wayne Waste Oil, IN[c]	5
		Arkwood, AR	6
		Sand Creek Industrial, CO[c]	8
		US Titanium, VA	3
		Jadco-Hughes, NC[c]	4
Vacuum/Vapor Extraction (48)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	Verona Well Field, MI	5
	FY86	-----	
	FY87	Seymour, IN*	5
	FY88	Groveland Well, MA	1
		Keefe Environmental, NH	1
		Bendix Flight Systems, PA*,[c]	3
		Tyson's Dump (Amendment), PA*,[d]	3
		Airco, KY*	4
		Goodrich, B.F., KY*	4
		South Valley (PL-83), NM*	6
		Hastings (09/28/88), NE	7
		Hastings (09/30/88), NE	7
		Motorola, AZ*	9

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Vacuum/Vapor Extraction (48) (Continued)	FY89	Kellogg-Deering Well Field, CT	1
		South Municipal Water Supply Well, NH*	1
		Wells G&H, MA[c]	1
		FAA Technical Center, NJ*,[c]	2
		Kysor Industrial, MI	5
		Miami County Incinerator, OH	5
		MIDCO I, IN*	5
		Wausau Water Supply (9/29/89), WI	5
		Hastings Ground Water, NE	7
		Sand Creek Industrial, CO*,[c]	8
		Fairchild Semiconductor (Mt. View), CA*,[c] (1st Remedial Action)	9
		Fairchild Semiconductor (Mt. View), CA*,[c] (2nd Remedial Action)	4
		Fairchild Semiconductor (S. San Jose), CA*	4
		IBM (San Jose Plant), CA*,[c]	9
		Intel (Mt. View Plant), CA*	9
		Litchfield Airport Area, AZ*	9
		Raytheon (Mt. View Plant), CA*,[c]	9
	FY90	Stamina Mills, RI	1
		Vestal Water Supply 1-1, NY	2
		Lord Shope Landfill, PA	3
		Jadco-Hughes, NC[c]	4
		SCRDI Bluff Road, SC	4
		Fisher Calo Chem, IN[b]	5
		Hagen Farm, WI	5
		Pristine (Amendment), OH[c]	5
		Springfield Township Dump, MI[c]	5
		Wayne Waste Oil, IN[c]	5
		Hardage/Criner (Amendment), OK[c]	6

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Vacuum/Vapor Extraction (48) (Continued)	FY90	Tinker AFB (Soldier Creek/Bldg. 3001), OK	6
		Lindsay Manufacturing, NE	7
		Waverly Groundwater Contamination, NE	7
		Martin Marietta, Denver Aerospace, CO[c]	8
		Rocky Mountain Arsenal (OU18), CO	8
		Intersil, CA[c]	9
		Solvent Service, CA	9
		Watkins-Johnson, CA	9
Solvent Extraction (6)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	-----	
	FY86	-----	
	FY87	-----	
	FY88	-----	
	FY89	Norwood PCBs, MA	1
		O'Connor, ME*	1
		Pinette's Salvage Yard, ME[c]	1
		Ewan Property, NJ	2
		Outboard Marine (Amendment), IL	5
		United Creosoting, TX	6
	FY90	-----	
In-Situ Vitrification (4)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	-----	
	FY86	-----	
	FY87	-----	
	FY88	-----	
	FY89	-----	

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
In-Situ Vitrification (4) (Continued)	FY90	Anderson Development, MI	5
		Sangamo/Crab Orchard NWR (USDOI), IL	5
		Crystal Chemical, TX	6
		Rocky Mountain Arsenal (OU16), CO	8
Dechlorination (2)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	-----	
	FY86	-----	
	FY87	-----	
	FY88	-----	
	FY89	-----	
	FY90	Myers Property, NJ[c]	2
		Tenth Street Dump/Junkyard, OK	6
Other/Not Specified/ Unspecified Treatment Technologies (22)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	-----	
	FY86	-----	
	FY87	Resolve, MA	1
		Palmerton Zinc, PA*	3
		West Virginia Ordnance Works, WV*	3
		Central City/Clear Creek, CO	8
	FY88	GE Wiring, PR*	2
		Pristine, OH	5
		Sol Lynn (03/25/88), TX	6
		Fulbright, MO*	7
	FY89	Saco Tannery Waste Pits, ME	1
		Claremont Polychemical, NY	2
		SMS Instruments (Deer Park), NY	2

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FY 1982-1990 RODs BY SOURCE CONTROL TREATMENT TECHNOLOGY** (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Other/Not Specified/ Unspecified Treatment Technologies (22) (Continued)	FY89	Havertown PCP, PA	3
		Publicker/Cuyahoga Wrecking, PA	3
		American Creosote Works, TN[c]	4
		Alsco Anaconda, OH*,[c]	5
		Doepke Disposal (Holliday), KS*	7
		Findett, MO	7
		Kearsarge, NC[c]	1
		Mattiace Petrochemical, NY[b]	2
	FY90	Radium Chemical, NY[c]	2
		Robeling Steel, NJ[c]	2
		Sarney Farm, NY[c]	2
		Solvent Savers, NY	2
		Avtex Fibers, VA	3
		Jacksonville, AR[c]	6
		Rogers Road Municipal Landfill, AR[c]	6
		Intersil, CA[c]	9
Thermal Desorption (6)	FY82	—	
	FY83	—	
	FY84	—	
	FY85	—	
	FY86	—	
	FY87	—	
	FY88	—	
	FY89	—	
	FY90	American Thermostat, NY	2
		Claremont Polychemical, NY	2
		Sarney Farm, NY	2
		Bofors Nobel, MI[b,c]	5
		University of Minnesota, MN	5
		Martin Marietta, Denver Aerospace, CO[a,b]	8

* Enforcement-lead RODs
** Names of Technology Categories may have changed during 1982-1990
[a] RODS may contain non-source remediation measures.
[b] ROD allows for implementation of one of two source control treatment technologies.
[c] ROD selected two or more source control treatment technologies.
[d] Use of this treatment at the site was retracted in a FY 1989 ROD Amendment.
[e] ROD selected two or more non-source control measures.
[f] ROD selected two types of Incineration/Thermal Treatment.

Exhibit 12

OVERVIEW OF SOURCE CONTROL RODs WITH TREATMENT FOR FY 1987-1990

Column 1

FY	RODs Signed
87	77
88	153
89	143
90	168

Column 2

Data Represent a Subset of Column 1
RODs Selecting One or More Treatment Technologies for Source Control
27
69
76
76

Column 3

Data Represent a Subset of Column 2
RODs Selecting Innovative Treatment Technologies for Source Control
7
28
40
42

OVERVIEW OF SOURCE CONTROL OCCURRENCES WITH TREATMENT TECHNOLOGIES FOR FY 1987-1990

Column A

FY	Occurrences of Source Control
87	50
88	100
89	105
90	125

Column B

Data Represent a Subset of Column A
Occurrences of Treatment Technologies Selected for Source Control
32
76
100
104

Column C

Data Represent a Subset of Column B
Occurrences of Innovative Treatment Technologies for Source Control
7
30
45
47

Exhibit 13

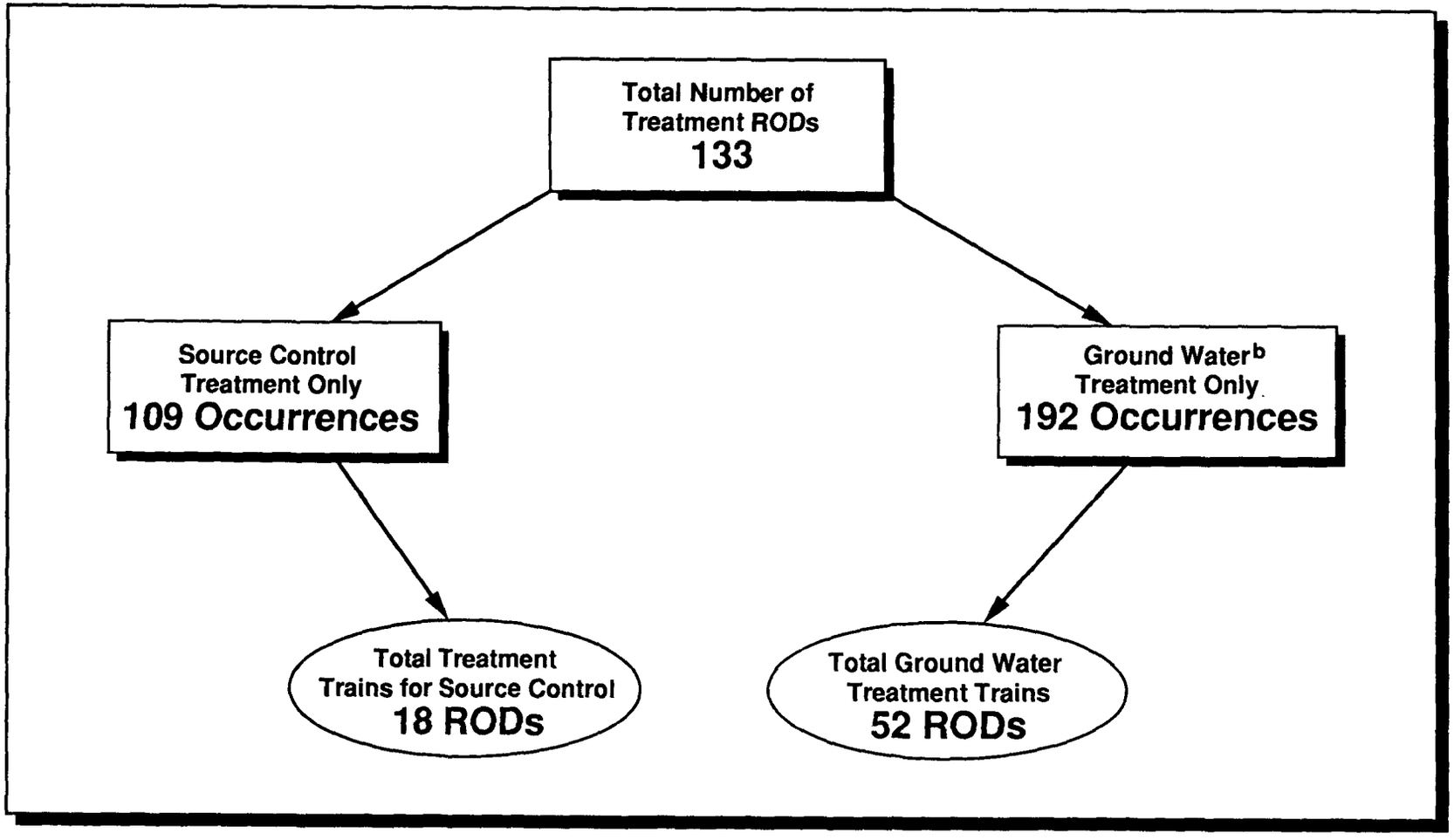
FY 1982-1990 ROD REMEDY COST[a, b]

	0 -$2M	2.1M - $5M	5.1 - $10M	10.1 - $20M	20.1 - $30M	30.1M+	Total RODs Signed
1982	2	1	1	0	0	0	4
1983	8	2	2	1	0	0	13
1984	18	12	3	3	2	0	38
1985[b]	23	16	11	9	4	3	69
1986	31	14	11	13	6	9	84
1987	25	22	12	6	5	5[c]	77
1988	43	44	31	15	14	6	153
1989	44	23	23	20	7	19	143[d]
1990	47	33	30	24	11	17	168[e]
TOTAL	241	167	124	91	49	59	749[d,e]

[a] Estimates are based on present worth costs when available
[b] Data are not available for three sites (Harris Farley, TX and two Westinghouse, IN sites that are confidential).
[c] Includes a combined remedial cost for the Envirochem, IN and Northside, IN, which are both represented in one ROD.
[d] Data are not available for seven FY 1989 RODs.
[e] Data are not available for six FY 1990 Federal Facility RODs

Exhibit 14

TREATMENT TRAINS* IN FY 1990 SOURCE CONTROL AND GROUND WATER TREATMENT RODS [a]



* Treatment train RODs employ a sequence of treatment technologies to address a specific medium or constituent.

[a] Does not include FY 1990 RODs that do not address treatment of source or ground water.

[b] Ground water treatment only, includes RODs with no treatment of source materials.

Exhibit 15

FY 1990 TREATMENT TRAIN RODS FOR SOURCE AND GROUND WATER CONTROL*

SOURCE CONTROL (18)

1 New Bedford, MA
2 Myers Property, NJ**
2 Solvent Savers, NY
3 Greenwood Chemical, VA
3 M.W. Manufacturing, PA
4 Cabot/Koppers, FL
4 Coleman-Evans Wood Preserving (Amendment), FL
5 Moss-American Kerr-McGee Oil, WI**
5 Sangamo/Crab Orchard NWR (USDOI), IL
5 Springfield Township Dump, MI
5 Wayne Waste Oil, IN
6 Jacksonville Municipal Landfill, AR
6 Rogers Road Municipal Landfill, AR
7 Hastings Groundwater Contamination (East Industrial Park), NE
7 Shenandoah Stables, MO
8 Martin Marietta, Denver Aerospace, CO**
8 Sand Creek Industrial, CO
9 J.H. Baxter, CA

GROUND WATER (52)

1 Coakley Landfill, NH
1 Kearsarge Metallurgical, NH
1 Stamina Mills, RI
2 American Thermostat, NY
2 Chemical Leaman Tank Lines, NJ
2 Cinnaminson Groundwater Contamination, NJ
2 Claremont Polychemical, NY
2 FAA Technical Center, NJ
2 Kentucky Avenue Wellfield, NY
2 Metaltec/Aerosystems, NJ
2 Myers Property, NJ**
2 Solvent Savers, NY
3 Croydon TCE Spill, PA
3 Keystone Sanitation Landfill, PA
3 Lord Shope Landfill, PA
3 Osborne Landfill, PA
3 Raymark, PA
3 Sand Gravel & Stone, MD
3 US Titanium, VA
4 62nd Street Dump, FL
4 City Industries, FL
4 Coleman-Evans Wood Preserving (Amendment), FL
4 Jadco-Hughes, NC
4 SCRDI Bluff Road, SC
4 Schuylkill Metal, FL
5 Fisher Calo Chem, IN
5 K&L Landfill, MI
5 Kummer Sanitary Landfill, MN**
5 Metamora Landfill, MI**
5 Moss-American Kerr-McGee Oil, WI**
5 Naval Industrial Reserve Ordnance Plant, MN
5 Oconomowoc Electroplating, WI
5 Onalaska Municipal Landfill, WI
5 Pristine (Amendment), OH
5 Spiegelberg Landfill, MI**
5 Wayne Waste Oil, IN
6 Crystal Chemical, TX
6 Tinker AFB (Soldier Creek/Bldg. 3001), OK
7 Fairfield Coal Gasification Plant, IA
7 Lindsay Manufacturing, NE
7 Midwest Manufacturing/North Farm, IA
7 Missouri Electric Works, MO
7 White Farm Equipment Dump, IA
8 Martin Marietta, Denver Aerospace, CO**
8 Ogden Defense Depot, UT
8 Rocky Flats Plant (DOE), CO
8 Rocky Mountain Arsenal (OU17), CO
8 Silver Bow Creek, MT
9 J.H. Baxter, CA
9 Solvent Service, CA
9 Stringfellow, CA
10 Fort Lewis Logistic Center, WA

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* Treatment train RODs employ a sequence of treatment technologies to address a specific medium or constituent.

**Selected treatment trains for both source and ground water.

SECTION II

RECORDS OF DECISION ABSTRACTS

ROD summaries are arranged alphabetically by Region. The States in each Region are listed at the beginning of each Region; however, not all States have had a ROD signed in FY 1990.

Each ROD summary presented in this section consists of the following:

- ROD Abstract - summarizing site location and background information, contaminated media, key contaminants, selected remedial action, and present worth or capital costs and O&M costs.
- Performance Standards or Goals - describing qualitative/quantitative cleanup criteria.
- Institutional Controls - describing ordered site restrictions.
- Keywords - highlighting treatment technologies, contaminated media, key contaminants, and major keyword categories for the RODs. A list of RODs by keywords is presented in the last section of this document.

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FY1990

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RECORDS OF DECISION ABSTRACTS
REGION 1
(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)

BAIRD & MCGUIRE, MA
Third Remedial Action - Final
September 27, 1990

The 20-acre Baird & McGuire site is a former chemical manufacturing facility in Holbrook, Massachusetts. The South Street wellfield, part of the municipal water supply for Holbrook, is located within 1,500 feet of the property. Bordering on the east of the site, the Cochato River, which flows down past a sluice gate, is the major water supply source for the towns of Holbrook, Randolph, and Braintree. Products mixed and stored at the Baird & McGuire site included herbicides, pesticides, disinfectants, soaps, floor waxes, and solvents. Waste disposal methods at the site included direct discharge into the soil, nearby brook, and wetlands, as well as a former gravel pit (now covered) in the eastern portion of the site. In 1983, EPA conducted a removal action after a waste lagoon overflowed near the Cochato River and spread contaminants into the river. A second removal action was initiated in 1985 when dioxin was discovered in site soil. Between 1985 and 1987, EPA conducted an Initial Remedial Measure to construct a new water main to replace the main passing through the site and to place temporary caps over some of the site. The 1986 and 1989 Records of Decision (RODs) addressed all of the previous remedial activities at the site including pumping and onsite treatment of ground water (OU1), as well as onsite excavation and incineration of contaminated soil (OU2), and remediation of the sediment of the Cochato River (OU3). This remedial action addresses the fourth operable unit, provision of an alternate water supply to compensate for the loss of the South Street wellfield and provide an additional 0.31 million gallons/day. Since the previous RODs have addressed all of the site-related contamination, there are no contaminants of concern associated with this remedial action.

The selected remedial action for this site includes future reactivation of the Donna Road aquifer, by obtaining Federal and local permits to increase the allowable capacity of water withdrawal; constructing a new well, performing pre-design tests required to obtain the permits, ground water filtration and disinfection, and piping the water to the current distribution system. The estimated present worth cost for this remedial action is $1,188,000, which includes an annual O&M cost of $23,000 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy; O&M; State Permit.

BEACON HEIGHTS LANDFILL, CT
First Remedial Action - Final (Supplemental)
September 28, 1990

The 34-acre Beacon Heights Landfill site is on the northwest corner of an 82-acre property in Beacon Falls, Connecticut. From the 1920s to 1970, a 6-acre area of the site was used as a dumping and incineration area. The site was subsequently expanded to a 34-acre area where waste materials including industrial liquids and chemicals were buried until the State closed the landfill in 1979. Industrial wastewater sludge also was disposed of onsite. Because of a slide of soil and buried waste in 1972, ground water and leachate discharge points were created in the north/northwestern areas of the landfill; several of these discharge points still persist in the slide area. In 1984, sampling of forty-four residential wells downgradient of the site revealed VOC-contaminated water in two residential wells. As a result of the sampling, the State provided bottled drinking water to the affected residents. A 1985 Record of Decision (ROD) documented remedial activities, including consolidation and capping of contaminated soil at the six-acre area; installation of a leachate collection system; and extension of a public water supply line to area residences. This ROD supplements the 1985 ROD by resolving those determinations left open in the 1985 ROD including the manner and locations of leachate treatment/disposal; cleanup levels for soil deemed impracticable to cap in areas contiguous to the landfill; and the need for air pollution controls on the landfill

gas vents. The primary contaminants of concern affecting the soil, ground water, surface water, and air are VOCs including benzene, toluene, and xylenes.

The selected remedial action for this site supplements the remedial actions documented in the 1985 ROD and includes offsite leachate treatment at a wastewater treatment facility prior to offsite discharge of the treated effluent to offsite surface water; offsite incineration of the sludge generated during leachate treatment; monitoring of landfill gases; and providing the criteria for excavation of the contaminated soil deemed impracticable to cap. Although air pollution controls are not currently necessary, the vents to be built into the future cap will be constructed in such a way as to facilitate the addition of pollution control devices should continual monitoring reveal levels of air contaminants exceeding Federal and State standards. The present worth cost for this supplemental remedial action is $2,241,000, with a present worth O&M cost of $951,000.

PERFORMANCE STANDARDS OR GOALS: In order to protect the aquifer underlying the site from further potential contamination, excavation levels for contaminants of concern in soil contiguous to the area of the landfill deemed impracticable to cap are based on leachate modeling. In the absence of a chemical-specific ARAR, cleanup goals will be based on a 10^{-6} excess cancer risk level for carcinogens or a HI=1 for noncarcinogens. Soil excavation levels include benzene 0.08 mg/kg, TCE 0.01 mg/kg, toluene 100 mg/kg, and xylenes 500 mg/kg. No cleanup levels for leachate were set because all but negligible amounts of leachate will be removed and treated offsite. The treatment effluent will meet all NPDES permit requirements prior to discharge to surface water.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air; Air Monitoring; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Leachability Tests; Leachate Collection/Treatment; MCLGs; MCLs; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Organics; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Soil; State Permit; State Standards/Regulations; Surface Water; TCE; Toluene; Treatment Technology; Venting; VOCs; Xylenes.

COAKLEY LANDFILL, NH

First Remedial Action
June 28, 1990

The 92-acre Coakley Landfill site is in the towns of Greenland and North Hampton, Rockingham County, New Hampshire. The site includes a 27-acre landfill, and borders farmland, undeveloped woodlands, and wetlands to the north and west and commercial and residential properties to the east and south. A drainage bounds the southern and western sides of the landfill, channeling surface water runoff into wetlands north of the landfill. Sand and gravel operations were conducted from 1968 to 1972 during which time rock quarrying and landfill operations also were conducted. From 1972 to 1985, the landfill primarily accepted refuse from Pease Air Force Base and neighboring municipalities and later accepted incinerator residue from the refuse-to-energy plant operated at Pease Air Force Base. Much of the refuse disposed of at the landfill was placed in open trenches created by the rock quarrying and sand and gravel operations. In 1979, the State received complaints concerning leachate breakouts in the area, and by 1983 VOC-contamination had been identified in a domestic drinking water well. Subsequent testing confirmed VOC-contamination in the ground water, and public water was extended to area residents and businesses who had previously received water from private wells. This Record of Decision (ROD), the first of two operable units, addresses source control and ground water contamination near the landfill. A subsequent ROD will address offsite ground water contamination should it be determined that a contaminated plume underlying wetlands to the north of the site requires remediation. The primary contaminants of concern affecting the soil, sediment, and ground water below the surface of the landfill are VOCs including benzene and PCE; other organics including phenols; and metals including arsenic and chromium.

The selected remedial action for this site includes excavating and consolidating approximately 2,000 cubic yards of wetlands sediment and 30,000 cubic yards of solid waste and depositing the material into the landfill

prior to capping; collecting and treating landfill gases using a thermal destruction process; ground water pumping and treatment using chemical precipitation for metals removal, air stripping for VOC removal, and biological treatment, if necessary, prior to recharge into the aquifer or discharge to onsite surface water; treating air from the air stripper using incineration or activated carbon filtration prior to release to the atmosphere; implementing site access restrictions; and long-term environmental monitoring including air and ground water monitoring. The estimated present worth cost for the remedial action is $20,200,000, which includes an annual O&M cost of $245,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels were established to measure contaminant levels in the sediment remaining in the wetlands following excavation and will protect the aquifer from potential soil leachate. Soil cleanup values are based on the Organic Leaching Model and incorporates SDWA MCLs/MCLGs and State standards. Chemical-specific soil cleanup goals include benzene 0.055 mg/kg, PCE 0.13 mg/kg, and phenols 2.3 mg/kg. Ground water cleanup goals will meet SDWA MCLs/MCLGs, State standards, and health advisories and include benzene 5 ug/l (MCL), PCE 3.5 ug/l (State), arsenic 50 ug/l (MCL), phenols 280 ug/l (health advisory), and chromium 50 ug/l (MCL). In the absence of a chemical-specific cleanup standard, cleanup levels will be based on a 10^{-6} excess cancer risk level and/or a Hazard Index = 1.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Arsenic; Background Levels; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; PCE; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Treatment Technology; Venting; VOCs; Water Quality Criteria; Wetlands.

KEARSARGE METALLURGICAL, NH

First Remedial Action - Final
September 28, 1990

The nine-acre Kearsarge Metallurgical site is an abandoned foundry in the town of Conway, Carroll County, New Hampshire. The site is located within the 100-year floodplain of the Saco River. Pequawket Pond borders the site to the south. The site contains a drainage pipe with four open-bottomed catch basins, two waste piles, a septic tank and leach field, and forested wetlands. The site was originally operated as a saw mill but from 1964 to 1982 was operated as a foundry. Wastes generated by Kearsarge, the foundry operator, included solid wastes such as ceramics and metal grindings, and hazardous substances including caustic soda, hydrofluoric acid, volatile organic compounds, and flammable liquids. These were disposed of in the septic system and in the waste piles. In 1979, the State ordered Kearsarge to stop disposing of wastes through the septic system. Wastes were subsequently placed in drums and stored onsite, but Kearsarge removed them in 1982. A hydrologic study in 1982 revealed contamination of ground water in the upper aquifer underlying the site, a potential drinking water source. This Record of Decision (ROD) addresses both source control and management of migration of the contaminated ground water plume. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including TCE; and metals including chromium.

The selected remedial action for the site includes removing the septic tank and contents, followed by offsite incineration and ash disposal in a RCRA hazardous waste landfill; excavating and dewatering approximately 250 cubic yards of leach field soil, followed by offsite treatment and disposal; excavating 4,650 cubic yards of waste pile materials with offsite disposal of approximately 4,400 cubic yards in a RCRA solid waste landfill and offsite treatment and disposal of approximately 250 cubic yards in a hazardous waste landfill; ground water pumping and treatment by precipitating metals, air stripping to remove VOCs, using a carbon column to control air emissions from the air stripper, and discharging treated ground water to a publicly owned treatment works; and long-term environmental monitoring. The estimated present worth cost for source control, including O&M, is $3,256,000. The estimated present worth cost

for management of migration is $4,020,000, including an annual O&M cost of $170,000. The total present worth cost of the remedial action is $7,276,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels include TCE 5 ug/l (MCL) and chromium 50 ug/l (National Interim Primary Drinking Water Regulation). For the debris, chromium will be remediated to the level of 1,400 ug/kg, based on a Hazard Index of 1. Soil cleanup levels were also provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Debris; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; VOCs; Wetlands.

NEW BEDFORD, MA
First Remedial Action
April 6, 1990

The New Bedford site is a harbor area in the port city of New Bedford, Massachusetts, approximately 55 miles south of Boston. Two electrical capacitor manufacturing facilities, the Aerovox facility and the Cornell-Dubilier Electronics facility, are located along the New Bedford Harbor and were major PCB users from the 1940s to 1978, when EPA banned the use of PCBs. These manufacturers released PCB-contaminated wastewater onto shoreline mudflats and into the harbor. As a result of the widespread PCB contamination, the State closed three fishing areas in the harbor in 1979, resulting in the loss of approximately 18,000 acres of productive lobstering ground. Between 1982 and 1985, EPA and the Coast Guard posted warnings notifying the public of fishing and swimming restrictions. The site has been divided into three study areas which include the Hot Spot area, the Acushnet River Estuary, and the Lower Harbor and Upper Buzzards Bay. This Record of Decision (ROD), the first of two operable units, is an interim remedy and addresses the 5-acre Hot Spot area, located along the western bank of the Acushnet River Estuary adjacent to the Aerovox facility. This first interim action operable unit will remove approximately 48 percent of the total PCB mass in the sediment from the estuary portion of the site, which is a continuing source of contamination throughout the entire site. A subsequent ROD will address the remediation of the Acushnet River Estuary and the Lower Harbor and Upper Buzzards Bay. The primary contaminants of concern affecting the sediment in the New Bedford Harbor are organics including PCBs and metals including lead.

The selected interim remedial action for the site includes dredging 10,000 cubic yards of contaminated sediment, dewatering the sediment using an existing confined disposal facility (CDF) and incinerating the sediment onsite; solidifying/stabilizing the residual ash to immobilize metals, if a leaching test indicates it is necessary; treating effluent from the dewatering process using the best available control technology prior to discharge into the harbor; and passing exhaust gases from the incineration process through air pollution control devices prior to their release into the atmosphere. During the remedial action the solidified/stabilized ash will be temporarily stored onsite, and following the completion of the remedial action, the ash will be stored and covered in a secondary cell of the CDF. Ultimate disposition of the ash will be addressed in the second operable unit. The estimated total cost for this remedial action is $14,379,300. No O&M costs were specified.

PERFORMANCE STANDARDS OR GOALS: Sediment areas where PCB concentrations exceed 4,000 mg/kg (based on a cancer risk level of 10^{-6}) will be dredged and incinerated.

INSTITUTIONAL CONTROLS: The Coast Guard and EPA have implemented fishing restrictions to prevent ingestion of contaminated aquatic life.

KEYWORDS: Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Dredging; Floodplain; Incineration/Thermal Destruction; Institutional Controls; Interim Remedy; Leachability Tests; Lead; Metals; Onsite Discharge; Onsite Treatment; Organics; PCBs; Public Exposure; RCRA; Sediment; Solidification/Stabilization; State

Standards/Regulations; Temporary Storage; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

OLD SPRINGFIELD LANDFILL, VT
Second Remedial Action - Final
September 29, 1990

The Old Springfield Landfill site is a 27-acre inactive municipal/industrial landfill approximately one mile from the Springfield city center in Windsor County, Vermont. Land use within a one-mile radius of the site includes commercial activities, low density housing, light agriculture, and undeveloped forest land. The landfill was operated by the town of Springfield between 1947 and 1968, accepting industrial waste and municipal trash. The site was closed in 1968, and subsequently sold and developed for use as a mobile home park. Municipal water lines were extended to serve the mobile homes. A nearby resident's complaint about foul-smelling water prompted an investigation of the site by the State, which revealed VOC contamination in a nearby spring and the residential well. Because of the VOC-contaminated water, the affected home near the mobile home park was connected to the public water supply. Currently the mobile home park is unoccupied except for the property owner who still resides onsite. The site has been divided into two operable units. Operable unit one is documented in a 1988 Record of Decision (ROD) which addressed management of migration of the contaminated seeps and ground water from the site and required that additional studies would be conducted to determine the source control remedy for the site. This second operable unit ROD documents the source control remedy, which addresses the risks associated with the inhalation of landfill gases and dermal contact with and ingestion of contaminated soil. In addition, this ROD also addresses risks associated with the ingestion of contaminated ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; and other organics including PAHs and PCBs.

The selected remedial action for this site includes placing a multi-layer cap over approximately eight acres (120,000 cubic yards of contaminated soil) where waste has been disposed of or has come to be located or where the soil cleanup levels are exceeded; collecting ground and surface water in french drains and extracting ground water with source control wells with treatment, as necessary, in the treatment system developed in operable unit one or other equivalent treatment system (not specified); stabilizing the side slopes of the waste mounds; active gas collecting and passive gas venting of landfill gases, followed by treatment using vapor phase carbon adsorption; operating and maintaining these components; ground water and air monitoring; and implementing institutional controls, including deed restrictions. The estimated present worth cost of this remedial action is $8,692,800, which includes an annual O&M cost of $123,000.

PERFORMANCE STANDARDS OR GOALS: Goals for soil cleanup (i.e., areas of contamination to be capped) are based on total carcinogenic risk levels of 10^{-5} and include PCBs 6,000 ug/kg (5×10^{-6} level of risk) and PAHs 3,000 ug/kg (5×10^{-6} level of risk). Chemical-specific ground water treatment goals are based on SDWA MCLs and State standards and include benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), xylenes 400 ug/l (State standard), and PCE 5 ug/l (proposed MCLs/quantitative limit). Because EPA has determined that in this circumstance it is technically impracticable, from an engineering perspective, to establish a standard below a practical quantitative level, EPA is invoking a waiver from compliance with the State standard for PCE.

INSTITUTIONAL CONTROLS: Deed restrictions will be imposed on the use of the land, including restricting excavation that might compromise the integrity of the cap, french drains, or other remedial features and on the use of ground water.

KEYWORDS: Air Monitoring; ARAR Waiver; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; O&M; Onsite Containment; Onsite Treatment; Organics; PAHs; PCBs; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; Cleanup Standards/Regulations; TCE; Toluene; Treatment Technology; Venting; VOCs; Rural/Residential.

STAMINA MILLS, RI
First Remedial Action - Final
September 28, 1990

The five-acre Stamina Mills site is a former textile weaving and finishing facility in North Smithfield, Providence County, Rhode Island. A portion of the site is within the 100-year floodplain and wetland area of the Branch River. The facility was operated from the early 1800s to 1975, and was subsequently destroyed by a fire. The manufacturing process used cleaning solvents, acids, bases and dyes for coloring, pesticides for moth proofing, and plasticizers to coat fabrics. Mill process wastes were landfilled onsite. TCE was used to remove oil and dirt from newly woven fabrics. In 1969, an unknown quantity of TCE was spilled onsite, and migrated into soil and the bedrock aquifer beneath the site with some runoff to the Branch River. EPA initiated three removal actions from 1984 to 1990, including an extension of the municipal water supply to residents obtaining water from the affected aquifer; and treatment of two underground and one above-ground storage tanks, followed by offsite disposal. Subsequent investigations have identified a septic tank that may be contaminated with TCE. This Record of Decision (ROD) provides a final remedy, and addresses both source control and management of contaminated ground water migration at this site. The primary contaminants of concern affecting the soil, debris, sediment, and ground water are VOCs including TCE and PCE; other organics including pesticides; and metals including chromium.

The selected remedial action for this site includes treating VOC-contaminated soil using vacuum extraction, followed by treatment of the extracted gases using an activated carbon filter; excavating approximately 550 cubic yards of landfill wastes, and sediment from the Branch River 100-year floodplain area; placing these within the landfill area outside of the floodplain; capping landfill wastes and installing a leachate collection system to collect runoff from the landfill; testing, removing, and disposing of the septic tanks and their contents offsite; demolishing and removing partially standing structures with onsite disposal of all earthen debris and disposing of all other solid wastes offsite; grading and vegetating the site after remediation; ground water pumping, pressure filtration, and treatment using UV/hydrogen peroxide innovative technology; discharging the treated ground water to surface water, subsurface water onsite, or existing sewer line contingent upon pilot test studies; surface water diversion; long-term monitoring of ground and surface waters; and implementing institutional controls including deed restrictions to limit land use. The estimated present worth cost for this remedial action is $4,316,485, which includes an annual O&M cost of $164,400.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels that will ensure attainment of MCLs in ground water include TCE 195 ug/kg (MCL) and PCE 66 ug/kg (Proposed MCL, PMCL). Soil levels for chromium were not established since elevated levels were detected only in landfill wastes that will be consolidated and capped as part of this remediation. Ground water cleanup levels include TCE 5 ug/l (MCL), PCE 5 ug/l (PMCL), and chromium 50 ug/l (National Interim Primary Drinking Water Regulation).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to regulate land use and prevent disturbance of remediated areas at the site.

KEYWORDS: Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection/Treatment; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; Treatability Studies; Treatment Technology; VOCs; Vacuum Extraction; Wetlands.

RECORDS OF DECISION ABSTRACTS
REGION 2
(New Jersey, New York, Puerto Rico, Virgin Islands)

AMERICAN THERMOSTAT, NY
Second Remedial Action - Final
June 29, 1990

The 8-acre American Thermostat (AT) site is a former thermostat assembly facility in South Cairo, Greene County, New York. Surrounding land use is agricultural and light residential. The site overlies a shallow unconsolidated aquifer and a deeper bedrock aquifer. From 1954 to 1985, thermostats for small appliances were assembled using machine oils, lubricants, and solvents in the process. Waste chemical sludge were disposed of directly into drains and dumped onsite for dust control. In 1981, after employees were observed dumping solvents onsite, a State investigation was conducted, which revealed a high level of VOC contamination in the ground water near the site. As a result, in 1982 AT supplied bottled water to affected residents and installed carbon filters on affected wells. In 1983, an interim consent order was signed requiring AT to cleanup the site; however, this was never implemented before plant operations ceased in 1985. A 1988 Record of Decision (ROD) provided for a permanent alternate water supply for approximately 43 affected residents. This final ROD addresses remediation of all remaining contaminated media at the site. The primary contaminants of concern affecting the soil, sediment, sludge, debris, ground water, and surface water are VOCs including PCE and TCE; other organics; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating and treating 6,500 cubic yards of contaminated soil using low temperature enhanced volatilization; removing 300 cubic yards of contaminated sediment from a residential pond and treating it concurrently with the soil; backfilling the treated soil and sediment and covering the area with clean soil; pumping and treatment of ground water using filtration, air stripping, and carbon adsorption, followed by reinjecting treated water onsite; decontaminating the AT building; removing 18 waste oil drums, debris, and less than 5 cubic yards of drain sludge from the building for offsite treatment and disposal; disposing of all treatment residuals offsite; and conducting ground water and air monitoring. The estimated present worth cost for this remedial action is $26,102,200, which includes an annual O&M cost of $1,304,300 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals for soil include PCE 1.0 mg/kg and TCE 0.4 mg/kg. Ground water chemical-specific cleanup goals include PCE 5.0 ug/l, TCE 5.0 ug/l, arsenic 25.0 ug/l, chromium 50 ug/l, and lead 25 ug/l, all of which are State MCLs.

INSTITUTIONAL CONTROLS: Not provided.

KEY WORDS: Air Monitoring; Air Stripping; Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Closure; Clean Water Act; Chromium; Debris; Decontamination; Direct Contact; Dredging; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; RCRA; Sediment; Sludge; Soil; Solvents; State Standards/Regulations; Surface Water; TCE; Treatment Technology; VOCs; Volatilization/Soil Aeration; Water Quality Criteria.

CHEMICAL LEAMAN TANK LINES, NJ
First Remedial Action
September 28, 1990

The 31-acre Chemical Leaman Tank Lines site is a liquid tanker truck terminal and cleaning operation in Logan Township, Gloucester County, New Jersey. Surrounding land use is primarily rural residential. An extensive wetlands area occupies the southern and eastern portions of the site. An underlying aquifer was used as a local drinking water supply until the late 1970s when ground water contaminants including solvents, were detected in the aquifer. From 1961 to 1975, wastewater from tanker washing and rinsing operations was discharged into a network of seven unlined settling/aeration lagoons, which have been determined to be the source of the present

organic and inorganic contamination of soil, ground water, and adjacent wetlands. In 1975, a rinse-water containment system was installed and the lagoons were no longer used in the wastewater process. In 1977, liquid remaining in the lagoons was drained to the wetlands, sludge was removed from settling lagoons, and these were filled with clean soil and construction debris. Aeration lagoons were filled with perimeter diking materials and construction debris, but the sludge was not removed. In 1982, visible sludge was again removed from the settling lagoons. From 1980 to 1981, the State documented onsite and offsite ground water contamination and consequently, in 1987, six homes were connected to a public water supply as part of a removal action. A current removal action will connect four more homes to this system. This Record of Decision (ROD) addresses remediation of the ground water contaminant plume. Subsequent RODs will address source control, surface water, and sediment contamination. The primary contaminants of concern affecting ground water are VOCs including benzene, PCE, and TCE; other organics; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes pumping and treatment of ground water using chemical precipitation to remove metals, an air stripper to remove VOCs, and granular activated carbon to remove residual organic contaminants; incinerating fumes from the air stripper unit onsite; discharging treated water to onsite surface water; ground water monitoring; and conducting further studies to more thoroughly characterize the contamination and the contaminant plume, and to more thoroughly define the design and operation of the treatment system. The estimated present worth cost of this remedial action is $5,420,000, which includes an estimated annual O&M cost of $320,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Aquifer cleanup levels will utilize both Federal and State Safe Drinking Water Act MCLs, which include benzene 1 ug/l (State MCL), PCE 1 ug/l (State MCL), TCE 1 ug/l (State MCL), arsenic 50 ug/l (MCL), chromium 50 ug/l (State MCL), and lead 15 ug/l (proposed MCL).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PCE; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; VOCs; Wetlands.

CINNAMINSON GROUNDWATER CONTAMINATION, NJ

First Remedial Action
September 28, 1990

The 400-acre Cinnaminson Groundwater Contamination site is in the townships of Cinnaminson and Delran, Burlington County, New Jersey, and is comprised of a landfill, several industrial operations, and residential properties. The site overlies a deep and a shallow aquifer, and the latter is a potential source of drinking water. Furthermore, the site lies within the Delaware River floodplain. Land use in the vicinity of the site is residential, agricultural, and industrial. The onsite landfill was originally used for sand and gravel mining operations. From 1950 to 1980, municipal solid waste and other refuse were deposited in the mining pits, while mining operations continued in other site areas. In 1970, Sanitary Landfill Inc. (SLI) operated an onsite sanitary landfill in the same area, which accepted hazardous industrial waste. In 1980, the State identified improper waste disposal practices onsite, and ordered SLI to close the landfill. In 1981 as part of the closure plan, SLI capped the landfill with 18 inches of clay, installed a gas collection and venting system, and initiated ground water monitoring. Subsequent ground water studies by EPA and SLI identified onsite ground water contamination in the landfill area. Additionally, various onsite industrial operations and local area septic systems were also identified as potential sources of ground water contamination. This Record of Decision (ROD) addresses remediation of onsite contaminated ground water in the shallow and deep aquifers, and prevention of further migration of contamination into municipal wells. The adequacy of the SLI landfill closure will be addressed in a subsequent ROD. The primary contaminants of concern affecting the

ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes pumping and treatment of ground water from the shallow and deep aquifers using chemical precipitation and biological/granular activated carbon; reinjecting the treated water onsite into the deep aquifer; ground water monitoring; and implementing engineering and institutional controls. The estimated present worth cost for this remedial action is $20,500,000, which includes an annual O&M cost of $751,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water cleanup goals are based on the more stringent of SDWA MCLs or State Standards including benzene 1 ug/l (State), xylenes 44 ug/l (State), and arsenic 50 ug/l (State).

INSTITUTIONAL CONTROLS: Institutional controls will be implemented at the site.

Keywords: Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; Mining Wastes; O&M; Onsite Discharge; Onsite Treatment; Organic; PAHs; PCE; Phenols; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Xylenes.

CLAREMONT POLYCHEMICAL, NY

Second Remedial Action - Final
September 28, 1990

The 9.5-acre Claremont Polychemical site is an abandoned production facility in Oyster Bay, Nassau County, New York. Land use in the vicinity of the site is light industrial and commercial. From 1968 to 1980 when onsite operations ceased, Claremont Polychemical manufactured inks and pigments for plastics, coated metallic flakes, and vinyl stabilizers in several onsite buildings, which had asbestos insulation. The principal wastes generated were organic solvents, resins, and mineral spirits wash wastes. In 1979, the State identified improper storage practices onsite, including stockpiles of over 2,000 uncovered or leaking drums of wastes and an onsite spill area. Organic solvents from several onsite spills and discharge incidents may have contaminated onsite soil and ground water. By 1980, most of the onsite drums were sorted and removed offsite, reused, or burned onsite. Subsequently, contaminated soil was excavated and placed on a plastic sterile liner, which has degraded over time. Ground water investigations in 1980 revealed ground water contamination directly under the site. The remedial actions for this site have been divided into two Operable Units (OUs). This Record of Decision (ROD) focuses on OU2, overall remediation of ground water and soil/wastes contained onsite in drums and holding basins. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including PCE, TCE, toluene, and xylenes; other organics; metals including arsenic, chromium, and lead; and inorganics including asbestos.

The selected remedial action for this site includes excavation and onsite treatment of 1,600 cubic yards of contaminated soil using low temperature enhanced volatilization, followed by redeposition of the treated soil in the excavated areas; decontaminating the building, which includes removal, offsite disposal, and treatment of the asbestos insulation; excavating, treating, and disposing of the underground tanks, tank contents, associated equipment, liquid wastes, and contaminated soil offsite; backfilling the excavated area with clean soil; and pumping and treatment of ground water using air stripping, with carbon adsorption to control offgasses, followed by onsite reinjection of the treated ground water. The estimated present worth cost for this remedial action is $16,800,00, which includes an annual O&M cost of $1,100,400 for years 0-10 and $701,900 for years 11-17.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific cleanup levels were provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Arsenic; Asbestos; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Closure Requirements; Debris; Decontamination; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Inorganics; Lead; MCLs;

Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Toluene; VOCs; Volatilization/Soil Aeration; Xylenes.

FAA TECHNICAL CENTER, NJ
First Remedial Action - Final
September 28, 1990

The 5,000-acre FAA Technical Center site is 8 miles northwest of Atlantic City, in Atlantic County, New Jersey. The site is comprised of several installations including the Atlantic City International Air Terminal, the Upper Atlantic City Reservoir, and the facilities of the FAA Technical Center. Forested land, commercial, and residential areas are adjacent to the site. A salvage yard (Area 2OA), located southeast of the Atlantic City International Terminal, has been used for storing old aircraft parts, automobiles, scrap metal, and empty 55-gallon drums. Soil contamination of Area 20A by PCBs and VOCs has resulted from leaking and deteriorating drums that have been stored onsite. The total volume of contaminated soil was estimated to be 930 cubic yards. Additionally, onsite ground water has been contaminated by VOCs leaching out of the contaminated soil and into the shallow and intermediate aquifers. A ground water contaminant plume, identified during State site investigations in 1983, is limited to the shallow aquifer below the salvage yard area. This Record of Decision (ROD) addresses soil and ground water contamination. The primary contaminants of concern affecting the soil and ground water are VOCs including TCE and toluene; other organics including PCBs; and metals including chromium.

The selected remedial action for this site includes excavating 930 cubic yards of contaminated soil, temporarily storing the soil onsite before transporting the soil offsite for rotary kiln incineration, followed by offsite disposal of residual ash; pumping and onsite treatment of contaminated ground water using air stripping and emissions controls, if necessary; reinjecting onsite the treated ground water from the upper aquifer (located upgradient of the contaminated area); discharging the treated ground water from the intermediate aquifer to an existing borrow pit area; and continuing site access restrictions. The estimated present worth cost for this remedial action is $6,300,000, which includes an annual O&M cost of $86,000 for eight years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water cleanup levels are based on SDWA MCLs or stricter State standards, including 1,1,1-TCA 26 ug/1 (State MCL), PCBs 0.5 ug/1 (State MCL), toluene 2,000 ug/1 (SDWA MCL) and chromium 50 ug/1 (SDWA MCL). Soil cleanup levels are based on State action levels including PCBs 5 mg/kg for the 0 to 0.5-foot interval and 25 mg/kg for soil at greater depths.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Chromium; Clean Air Act; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Incineration/Thermal Destruction; MCLs; Metals; Offsite Disposal; Offsite Treatment; O&M; Organics; Onsite Discharge; Onsite Treatment; PCBs; Plume Management; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Temporary Storage; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs.

FOREST GLEN SUBDIVISION, NY
First Remedial Action
December 29, 1989

The Forest Glen Subdivision site consists of 21 acres of developed residential properties and undeveloped land in Niagara Falls, Niagara County, New York. Land in the area surrounding the Forest Glen subdivision is used for residential and industrial purposes, including a mobile home park, small shopping mall, and the CECOS Landfill. Also, northwest of the subdivision is the New Road Landfill, which is currently under investigation by the State. Chemical companies reportedly disposed of wastes onsite from the early 1950s to the early 1970s. Evidence of past waste disposal became apparent in 1973 when utility installation workers encountered resinous and powder-like wastes, drums, and battery casing parts. Residents also encountered wastes on their properties and contacted the county, which responded to complaints regarding drum tops and resinous materials in June 1980. Ten truckloads of a yellow, resin-like material were subsequently excavated and transported to the CECOS Landfill by the property owner at the

time. Sampling by EPA's Field Investigation Team revealed the presence of high concentrations of unknown and tentatively identified compounds (TICs) in August 1987, and further soil sampling was conducted to identify the TICs. EPA has executed interim measures to stabilize site conditions including collecting, staging, and securing drums in areas north and east of the subdivision and temporarily covering visibly contaminated soil with concrete. This remedial activity is the first of two planned operable units and addresses resident relocation only. A subsequent operable unit will address the remediation of site contamination once the relocation is complete. The primary contaminants of concern affecting the soil are organics including PAHs; metals including lead; and other inorganics.

The selected remedial action for this site includes permanently relocating all Forest Glen subdivision residents; sampling and, if necessary, decontaminating, salvaging, or disposing of mobile homes remaining onsite after completion of resident relocation; and implementing site access restrictions. The estimated present worth cost for this remedial action ranges from $4,710,000 to $6,020,000, depending on the relocation options selected. No O&M costs are associated with this first operable unit.

PERFORMANCE STANDARDS OR GOALS: This operable unit only addresses the permanent relocation of the residents. Therefore, no cleanup standards or goals were applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Direct Contact; Inorganics; Lead; Metals; Organics; PAHs; Relocation Soil.

GLEN RIDGE RADIUM, NJ
Second Remedial Action - Final
June 1, 1990

The 90-acre Glen Ridge Radium site is a residential community in the Borough of Glen Ridge, Essex County, New Jersey. The site is adjacent to another Superfund site, the Montclair/West Orange site. The Glen Ridge site includes a community of 274 properties serviced by surface reservoirs in northern New Jersey. In the early 1900s, a radium processing or utilization facility was located in the vicinity of the site. It is suspected that radioactive waste material from the facility was disposed of in then rural areas within the community. Some of the radioactive-contaminated soil is believed to have been moved from the original disposal location, used as fill material in low-lying areas, or mixed with Portland cement to make concrete sidewalks or foundations. Houses were subsequently constructed on or near the radium waste disposal areas. EPA investigations in 1981 and 1983 confirmed the presence of gamma radiation contamination in the Glen Ridge area and in several adjacent houses. Subsequently, EPA established a quality air monitoring program to determine the levels of radon decay products in the contaminated houses. In 1984, EPA installed and maintained temporary radon ventilation systems, and gamma radiation shielding in twenty residences. In 1985, the State excavated contaminated onsite soil from 12 Glen Ridge properties and disposed of the soil offsite. This ROD complements the previous 1989 ROD for this site and provides a final remedy. The primary contaminant of concern affecting the soil is radium ^{226}. The public drinking water supply was tested and no contamination was detected, therefore, a ground water action was not implemented at the Glen Ridge site.

The selected interim remedial action for this site includes excavating and disposing of 323,000 cubic yards of contaminated soil and other radium-contaminated materials from residential and public properties, followed by disposing of the soil offsite; filling the excavated areas; environmental monitoring; and continued treatment technology studies, which may reduce the volume of materials disposed of offsite. The estimated present worth cost for this remedial action ranges from $252,700,000 to $348,700,000, based on the selected transportation method. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Soil contaminated with concentrations greater than radon 5.0 pCi/g of soil to a depth of 6 inches and radon 15 pCi/g in subsurface soil will be removed and disposed of offsite.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Direct Contact; Excavation; Filling; Offsite Disposal; Radioactive Materials; Soil; State Standards/Regulations; Treatability Studies.

HIGGINS FARM, NJ
First Remedial Action
September 24, 1990

The 75-acre Higgins Farm site is a cattle farm in Franklin Township, Somerset County, New Jersey. The site is primarily pasture land with poor onsite drainage. Approximately 3,200 residents living within a three-mile radius of the site rely on ground water as their drinking water source. In 1985, after receiving reports of ground water contamination near the farm, the State investigated the area and found a drum burial area. In 1986, the site owner began to remove the drums from the site, and ten drums were removed, crushed and placed in a roll-off container. Later in 1986, another 50 drums were excavated, and during the excavation, the drums were punctured and their contents spilled onto the ground. Fluids from the pit formed during excavation activities were subsequently pumped to a holding tank while excavation continued. In addition to excavating the drums, visibly contaminated soil was placed in roll-off containers. In late 1986, State site inspections revealed ground water and soil contamination by VOCs, pesticides, metals, and dioxins. Bottled water was temporarily provided to affected residents until 1989, when the State installed carbon filter units on affected wells. In 1987, EPA initiated stabilization activities at the site, including construction of a barn to store dioxin-contaminated material such as overpacked drums and roll-off containers; draining, lining, and backfilling of the excavation pit; treatment of the pumped liquids and storage of the treated liquids in a holding tank; and implementing site access restrictions. This Record of Decision (ROD) provides a permanent safe drinking water supply source for affected residents as part of an interim remedy. A future ROD will address remediation of final ground water and all remaining onsite contamination including soil, sediment, surface water, and ground water. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and xylenes; other organics; and metals including lead.

The selected interim remedial action for this site includes developing, designing, and constructing a water main extension and distribution system; installing new carbon adsorption units, as necessary; operating and maintaining existing carbon adsorption units until construction is completed; conducting environmental sampling of residential wells; removing carbon units and private well connections once the permanent water supply is installed; and implementing institutional controls including ground water use restrictions. Since the proposed remedy would not restore ground water to beneficial use levels, an interim ARAR waiver will be invoked as part of this remedial action. The total present worth cost for this remedial action is $1,716,000, which includes a total O&M cost of $28,200 for 2 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ARARs for drinking water are based on SDWA MCLs and the more stringent State standards including benzene 1.0 ug/l (State MCL), PCE 1.0 ug/l (State MCL), and TCE 1.0 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Ground water use restrictions will be implemented to limit new well installation within the affected area.

KEYWORDS: Alternate Water Supply; ARAR Waiver; Benzene; Carcinogenic Compounds; Carbon Adsorption (GAC); Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; Interim Remedy; Lead; MCLs; Metals; O&M; Organics; PCE; State Standards/Regulations; TCE; VOCs; Xylenes.

HOOKER - 102nd STREET, NY
First Remedial Action - Final
September 26, 1990

The 22-acre Hooker - 102nd Street site is a former industrial landfill in the city of Niagara Falls, Niagara County, New York. The site is adjacent to, and partially within the Niagara River's 100-year floodplain. Surrounding land use is industrial and residential. From 1943 to 1970, the site was used by Occidental Chemical Corporation (formerly Hooker Chemicals and Plastics Corporation) and Olin Corporation as a disposal area for at least 159,000 tons of solid and liquid industrial wastes including benzene, chlorobenzene and hexachlorocyclohexanes. In

1970, the U.S. Army Corps of Engineers ordered landfilling operations to cease temporarily until a bulkhead between the landfill and the river could be constructed. The bulkhead was completed in 1973, but landfill operations were not resumed. In 1973, a series of investigations were conducted by EPA to characterize site subsurface conditions. These studies and the Remedial Investigation (RI) initiated in 1984, identified contamination in ground water, onsite and offsite soil, rivershore sediment, and within a storm sewer. Additionally, the presence of a leachate plume of non-aqueous phase liquids (NAPLs) was discovered emanating from the landfill area. This Record of Decision (ROD) is the final remedy, which addresses all of the contaminated media. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, TCE, and toluene; other organics including PCBs and phenols; and metals including arsenic.

The selected remedial action for this site includes consolidating offsite soil and lesser contaminated sediment within the landfill area then capping the landfill and perimeter soil; constructing a slurry wall around the site perimeter to contain the NAPL plume; extracting NAPLs from the landfill and dredging "hot spot" river sediment, transporting sediment and leachate offsite for incineration; dredging and dewatering remaining sediment and consolidating them within the landfill area; recovering ground water with an interception drain, followed by onsite discharge to the Niagara River or offsite treatment and discharge to a city sewer; cleaning the storm sewer, and placing a plastic slipliner within the sewer; extracting and incinerating offsite NAPLs within consolidated river or sewer sediment; long-term ground water monitoring; and implementing institutional controls including deed and land use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $30,080,000, which includes an annual O&M cost of $7,209,600.

PERFORMANCE STANDARDS OR GOALS: Cleanup goals for ground water will be the more stringent of Federal MCLs or State regulated levels. Chemical-specific ground water goals include benzene to detection limits (State), TCE 5.0 ug/l (State), PCBs 0.1 ug/l (State), phenols 1 ug/l (State), and arsenic 25.0 ug/l (State). Sediment remedial levels will be the solid phase concentrations necessary to potentially exceed State Ambient Water Quality Standards in the liquid phase. Chemical-specific cleanup levels for sediment include benzene 40 ug/kg, TCE 111 ug/kg, and PCBs 42.4 ug/kg.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented at the site.

KEYWORDS: Arsenic; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Dredging; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Slurry Wall; Soil; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs.

HOOKER CHEMICAL/RUCO POLYMER, NY
First Remedial Action
September 28, 1990

The 14-acre Hooker Chemical/Ruco Polymer site is an active polymer production facility in Hicksville, Nassau County, New York. Surrounding land use is primarily industrial and commercial, and a residential area is located near the site. Since 1946, the facility has produced various plastics, polymers and resins, including polyvinyl chloride, styrene/butadiene latex, vinyl chloride/vinyl acetate copolymer, and polyurethanes. From 1956 to 1975, plant wastewater containing VOCs and heavy metals was discharged into six onsite ground water recharge basins, which has led to contamination of the onsite ground water. From 1946 to 1978, the onsite plant utilized a heat transfer fluid that contained PCBs. Since 1984, site investigations have identified four onsite areas of PCB contamination. These include a direct spill area where releases of heat transfer fluid escaped through a relief valve at the pilot plant, a transport area contaminated by PCBs spread from the direct spill area by onsite truck traffic, the recharge basin that was contaminated by surface runoff, and soil contamination around an underground fuel storage tank, which was disposed of offsite in 1989. Contaminated soil

from the tank excavation is currently stored onsite. This Record of Decision (ROD) addresses remediation of Operable Unit 2 (OU2), the PCB-contaminated soil at the above locations. Remediation of remaining site areas, VOC-contaminated soil, and ground water will be addressed as OU1 in a subsequent ROD. The primary contaminants of concern affecting the soil and debris are PCBs.

The selected remedial action for this site includes excavating all soil contaminated with greater than 10 mg/kg PCBs from the direct spill and transport areas, and the soil from the recharge basin to a depth of 10 feet; disposing of approximately 1,100 cubic yards of soil contaminated with 10 to 500 mg/kg PCBs at an offsite landfill along with the stockpiled soil from the earlier tank excavation; treating approximately 36 cubic yards of soil contaminated with PCB levels greater than 500 mg/kg offsite using incineration, followed by offsite disposal of the residual ash; and backfilling and paving all excavated areas, except for the recharge basin. The estimated present worth cost for this remedial action is $995,650. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: The excavation level, PCBs greater than 10 mg/kg, and treatment level, PCBs greater than 500 mg/kg, are based on the TSCA Spill Cleanup Policy and EPA's "Guidance on Selecting Remedies for Superfund Sites with PCB Contamination," respectively.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Debris; Direct Contact; Excavation; Incineration/Thermal Destruction; Offsite Disposal; Offsite Treatment; Organics; PCBs; Soil; Temporary Storage; Toxic Substances Control Act; Treatment Technology.

IMPERIAL OIL/ CHAMPION CHEMICALS, NJ

First Remedial Action
September 26, 1990

The 15-acre Imperial Oil/Champion Chemicals site is an active oil blending facility in Marlboro Township, Monmouth County, New Jersey. Surrounding land use is primarily residential, and several contaminated wetland areas are located to the north of the site. Since 1912, a variety of operations have taken place onsite, including food processing, chemical manufacturing, and flavor and essence production. In 1950, the plant was modified for oil reclamation during which time used oil was washed and distilled onsite. Residual sludge and oily filter clay were disposed of onsite and wash water was discharged to an onsite settling lagoon. Wash water and used oil were also reportedly spread on area roads to control dust. In 1969 Imperial Oil began onsite oil blending operations that included mixing and repacking unused oil. Currently, chemicals are delivered by truck and transferred to 56 onsite above-ground tanks. The resulting oil/water separator sludge reportedly has been disposed of onsite near the oily filter clay pile. Several private and State investigations from 1981 to 1990 revealed contamination in onsite soil and ground water, as well as contamination by oily sludge in two of the offsite wetland areas. Probable sources of the contamination include leaching and erosion of material from an onsite waste pile, overflowing of oil/water separators, and improper treatment of separator effluent for arsenic. This Record of Decision (ROD) addresses remediation of the contaminated offsite wetland areas. Remediation of onsite sources and contaminated ground water will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil are VOCs including benzene, toluene, and xylenes; other organics including PAHs and PCBs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating approximately 3,700 cubic yards of soil from the offsite wetlands area contaminated with greater than 1 mg/kg PCBs; temporarily storing the excavated material onsite in a dewatering and staging area before disposing of the material offsite in a hazardous waste landfill; air monitoring and soil sampling; restoring the wetlands after completion of excavation; and controlling site access with fencing until remediation has been completed. A contingency for soil treatment has been included if leachability studies determine treatment is necessary to meet land disposal restrictions. The estimated present worth cost for this remedial action is $6,889,985, which includes an annual O&M cost of $1,700 for 10 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for soil have been based on State Soil Cleanup Objectives and include lead 250-1,000 mg/kg, PAHs 10 mg/kg and PCBs 5 mg/kg. The actual excavation volume of 3,700 cubic yards of soil has been based on a PCB level of 1 mg/kg, which is designed to account for all soil contaminated above Soil Cleanup Objectives for any contaminant of concern.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Contingent Remedy; Direct Contact; Excavation; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Oils; Organics; PAHs; PCBs; RCRA; Soil; State Standards/Regulations; Temporary Storage; Toluene; Toxic Substances Control Act; VOCs; Wetlands; Xylenes.

KENTUCKY AVENUE WELLFIELD, NY
Second Remedial Action
September 28, 1990

The Kentucky Avenue Wellfield site is an inactive municipal water supply in Horseheads, Chemung County, New York. The site is in a low-relief area, part of which lies within a 100-year floodplain. In addition, several wetland areas are onsite. Surrounding land use is mixed residential, commercial, and industrial. The site overlies the Newtown Creek Aquifer, a major source of water in the area. The wellfield was established in 1962, when a water supply was needed for a food processing plant. In 1980, elevated levels of TCE were discovered in ground water, and the wellfield was closed. Subsequent onsite investigations by the State and EPA identified additional onsite contamination by VOCs and metals. In 1985 and 1986, a removal action by EPA required the connection of 56 homes that were served by the wellfield to the public water distribution system as an alternate water supply. A 1986 Record of Decision (ROD) documented the selection of ground water monitoring, identification of contaminant sources, and the provision of public water to 46 additional residences as part of the remedy for this site. The primary source of this contamination was determined to be from the disposal of industrial wastes in lagoons or land areas and from industrial spills, including ones from a nearby Westinghouse facility. This ROD addresses management of migration of ground water contaminants. A subsequent ROD will address source and final ground water cleanup activities. The primary contaminants of concern affecting the ground water are VOCs including TCE and xylenes; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes restoring the Kentucky Avenue wellfield as a public drinking water supply well by constructing two treatment plants, one near the well and one between the well and the adjacent Westinghouse facility; pumping and treatment of ground water using filtration to remove inorganics and air stripping/carbon adsorption or UV-oxidation to remove organics; disposing of any treatment residuals offsite; discharging the treated water to the public water supply, to surface water, or reinjecting the treated water onsite; ground water monitoring; and investigating an additional possible source of onsite contamination. The estimated present worth cost for this remedial action is $14,963,900, which includes an annual O&M cost of $905,300 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Goals for discharge of treated ground water were chosen as the most stringent of Federal or State MCLs or MCLGs, or other State ground water standards. Chemical-specific goals for ground water include TCE 5 ug/l (MCL), arsenic 25 ug/l (State), chromium 50 ug/l (MCL), and lead 25 ug/l (State).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Stripping; Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; MCLGs; MCLs; Metal; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatment Technology; VOCs; Venting; Water Quality Criteria; Wetlands; Xylenes.

KING OF PRUSSIA, NJ
First Remedial Action
September 28, 1990

The 10-acre King of Prussia (KOP) site is an abandoned waste disposal and recycling facility in Winslow Township, Camden County, New Jersey. The nearest residence is one mile northeast of the site, and the nearest surface water body is the Great Egg Harbor River, which flows 1,000 feet southwest of the site. In addition, an onsite swale, which directs site runoff toward the river, has been dammed by two fire roads resulting in the formation of onsite wetlands. Site features include three man-made, former lagoons, two rusting and torn tankers on a concrete pad, and an area with an undetermined number of buried drums and containers. The waste recycling facility was operated from 1970 to 1974 by the KOP Corporation. Past waste handling and disposal practices at the facility, as well as suspected illegal dumping of trash and hazardous materials after the facility closed, have resulted in organic and inorganic contamination of site soil, sediment, and ground water. Soil and ground water contamination were detected by the State in 1976, and subsequently confirmed by EPA during site investigations conducted from 1978 to 1982. As a result of these investigations, buried plastic containers and visibly contaminated soil west of the lagoons were excavated and removed in late 1989 or 1990. However, several additional discrete areas of contamination have been identified including: metal-contaminated soil adjacent to the lagoons, lagoon sludge, swale sediment, and soil near the tankers; VOC-contaminated soil in the drum disposal area; organic- and metal-contaminated ground water; and possible contamination of the surface water and sediment in the river. This Record of Decision (ROD) addresses the first operable unit for the site, including the contaminated ground water, soil, sediment, sludge, drums and tankers. A future ROD will address contaminated soil associated with the buried drum area. The primary contaminants of concern affecting the soil, sediment, sludge, debris, and ground water are VOCs including benzene, PCE, and TCE; and metals including chromium and lead.

The selected remedial action for this site includes excavating lagoon sludge, soil adjacent to the lagoons, and sediment in the swale, treating these materials using soil washing for metals removal, and redepositing the residual materials in their original location onsite; excavating and disposing of buried drums, their contents, and associated visibly contaminated soil onsite; removing tankers for offsite disposal; ground water pumping and treatment using air stripping, followed by reinjection of ground water and offsite disposal or treatment of residuals; conducting additional sampling and analysis of surface waters and sediment of the Great Egg Harbor River and soil in the buried drums area to determine the need for further site remediation; and implementing institutional controls including ground water use restrictions. The estimated present worth cost for this remedial action is $14,889,000, which includes an estimated annual O&M cost of $285,000.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup objectives are based on a 10^{-6} cancer risk to human health, an HI less than 1, or State Action Levels and include chromium 483 mg/kg (Health-Based level), copper 3,571 mg/kg (Health-Based level), lead 500 mg/kg (State) and nickel 1,935 mg/kg (Health-Based level). Ground water cleanup levels are based on State and Federal MCLs, whichever is more stringent, including PCE 1 ug/l (State MCL), TCE 1 ug/l (State MCL), chromium 50 ug/l (State MCL), copper 1,000 ug/l (State MCL), and nickel 210 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Ground water use restrictions will be implemented until remediation goals are achieved.

KEYWORDS: Air Monitoring; Air Stripping; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Closure; Debris; Direct Contact; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; PCE; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Soil Washing; State Standards/Regulations; Surface Water Monitoring; TCE; Treatability Studies; Treatment Technology; VOCs; Wetlands.

LONE PINE LANDFILL, NJ
Second Remedial Action - Final
September 28, 1990

The 45-acre Lone Pine Landfill site is an abandoned, privately owned waste disposal facility in Freehold Township, Monmouth County, New Jersey. The site lies within a semi-wooded wetlands area, and in the Manasquan River floodplain. Contaminated ground water underlies the site within the surficial Water Table Aquifer and the deeper Red Bank Aquifer. Ground water from both aquifers discharges into the Manasquan River downgradient from the site. From 1959 to 1979, municipal, commercial, and industrial wastes, including approximately 17,000 drums containing hazardous waste, tanks containing liquid chemicals, and containers of chemical sludge, were disposed of onsite. Following a chemical fire in 1977 and an explosion at the site in 1978, the State ordered the owner to mitigate the potential environmental damage. In 1979, when the owner failed to comply, the State ordered the landfill closed, and the site was abandoned. A 1984 Record of Decision (ROD) addressed Operable Unit One (OU1), the source control remedy, which included constructing a landfill containment system; capping the landfill; installing a slurry wall around the landfill perimeter; and collecting and treating leachate from within the slurry wall containment area. This ROD addresses OU2, contaminated ground water outside of the containment system. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, phenols, TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes pumping and treating ground water after installation of an interceptor drain parallel to the Manasquan River that is keyed into the Water Table Aquifer to capture contaminated ground water; supplementing the drain with extraction wells screened within the Red Bank Aquifer; constructing an onsite wastewater treatment plant consisting of an air stripper to remove VOCs, precipitation/filtration for removal of metals, and carbon adsorption to treat recovered ground water; dewatering and testing of residual solids to determine proper method for offsite disposal; reinjecting the treated ground water into the Red Bank Aquifer or discharging into a recharge trench onsite; conducting long-term monitoring of ground water, surface water, river sediment and biota; and implementing institutional controls including deed restrictions and land and ground water use limitations. The estimated present worth cost for this remedial action is $10,267,661, which includes an annual O&M cost of $482,600.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water cleanup goals include benzene 1 ug/l (State MCL), PCE 1 ug/l (State MCL), phenols 0.0035 ug/1 (State), TCE 1 ug/l (State MCL), toluene 50 ug/l (State MCL), xylenes 44 ug/l (State MCL), arsenic 50 ug/l (State MCL), chromium 50 ug/l (State MCL), and lead 50 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Institutional controls including land use, ground water use, and deed restrictions will be implemented at the site.

KEYWORDS: Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachability Tests; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; Phenols; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; Surface Water Monitoring; TCE; Toluene; VOCs; Water Quality Criteria; Wetlands; Xylenes.

M&T DELISA LANDFILL, NJ
First Remedial Action - Final
September 20, 1990

The 132-acre M&T DeLisa Landfill site is northwest of the city of Asbury Park in Ocean Township, New Jersey. The 39-acre M&T DeLisa landfill was operated with a State permit from 1914 until 1974. After the landfill was closed, a private company constructed a shopping mall on 30 acres of the landfill. The developer took control measures to protect against the generation of landfill gases and leachate. Although landfill gas is generated at the site and slightly elevated levels of VOC accumulation were detected on the northern edge of the mall, sampling and analysis indicate that the landfill is not the source of detectable levels of VOCs in the mall. The

developer installed storm drainage from the parking lot to protect Deal Lake Brook, which is the nearest surface water and is immediately south of the mall. Onsite surface water and ground water are not used as sources of potable water. Site investigations and historical research onsite activities revealed no evidence to indicate that the landfill was used for hazardous waste disposal. There are no contaminants of concern affecting the site, therefore, this is a no action Record of Decision (ROD).

The selected remedial action for this site includes a no further action scenario. Although no significant contamination is present at the site, EPA recommends that environmental controls be implemented, including continued surface and ground water monitoring, restricting possible future use of onsite ground water, continued sampling and monitoring of the leachate collection system, replacing a gas vent, sealing cracks in building floors and walls in contact with subsurface soil, improving detention ponds leading into Deal Lake Brook, venting of the north corridor area of the mall, and periodic indoor and outdoor air monitoring. EPA has determined that such actions will not be implemented under the authority of the Superfund program, and responsibility for the site has been transferred to the State. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: EPA recommends modifying the property deed to restrict the possible use of onsite ground water.
KEYWORDS: Institutional Controls; No Action Remedy.

MANNHEIM AVENUE DUMP, NJ
First Remedial Action - Final
September 27, 1990

The 2-acre Mannheim Avenue Dump site is a former municipally-owned industrial waste landfill in Galloway Township, Atlantic County, New Jersey. Surrounding land use is rural residential, and many residents and facilities in the area use ground water as their drinking water supply. The site is adjacent to a wooded wetland area which overlies a shallow unconsolidated sand and gravel aquifer and a deeper aquifer separated from the shallow zone by a semi-permeable clay layer. Prior to 1964, the site was used as a sand and gravel quarry. Beginning in 1964, drummed industrial wastes, including TCE degreasing sludge, leaded porcelain fragments, and municipal waste were buried onsite in 35 waste mounds. In 1982, a State survey indicated the presence of many unburied and leaking drums onsite. In 1984, EPA ordered a removal action that required cleanup of the drummed waste, including 25,000 pounds of degreasing sludge. Subsequent sampling from 1985 to 1986 revealed ground water contamination onsite. In 1989, 35 mounds of contaminated soil were disposed of offsite. This Record of Decision (ROD) addresses ground water contamination at the site. The primary contaminants of concern affecting the ground water are VOCs including benzene and TCE.

The selected remedial action for this site includes ground water pumping and treatment using air stripping, with pretreatment for removal of iron, if necessary; reinjecting the ground water onsite with an evaluation of the feasibility of using infiltration basins as an alternate means of discharge; covering the disposal area with clean fill; developing a contingency plan for the installation of individual carbon adsorption units on residential wells, which may become affected by migration of the contaminant plume; monitoring ground and surface waters; sampling the sediment; performing a treatability study to investigate the need for further treatments to remove toluene, lead, and chromium from ground water; and determining the need for off-gas controls on air stripper units. The estimated present worth cost for the remedial action is $4,217,100, which includes an annual O&M cost ranging from $18,600 to $394,100 based on differences in treatment and monitoring systems over a period of 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals for ground water include TCE 1 ug/l (State MCL) and benzene 1 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Carcinogenic Compounds; Contingent Remedy; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite

Disposal; Onsite Containment; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; State Guidance; State Standards/Regulations; Surface Water Monitoring; TCE; Treatability Studies; VOCs; Wetlands.

MATTIACE PETROCHEMICAL, NY
First Remedial Action
September 27, 1990

The 2-acre Mattiace Petrochemical site is an inactive liquid storage and redistribution facility in Glen Cove, Nassau County, New York. Surrounding land use is primarily industrial. The site overlies a system of three unconsolidated sedimentary aquifers, which may be affected by onsite contamination. From the mid-1960s to 1986, organic solvents were stored, blended, and repackaged onsite. Onsite features involved with the operation included a metal Quonset hut, a concrete fire shed, a leaching pond, a partially covered concrete loading dock, and 32 underground and 24 aboveground storage tanks. Drums were reconditioned onsite, and resulting water/solvent mixtures were discharged to above-ground tanks or to an onsite leaching pond. A solvent water separator was used to collect overflow from the above-ground tanks for discharge to the leaching pond. There is evidence, however, that overflow from these tanks may have been discharged directly into the soil. In 1988, EPA characterized and disposed of 100,000 gallons of hazardous liquids offsite from approximately 24 above- and 32 below-ground storage tanks. In 1989, a second investigation identified approximately 25 buried drums and numerous other containers that were leaking contaminated material into the surrounding soil and ground water. This Record of Decision (ROD) addresses Operable Unit 2 (OU2) and includes removal of drummed sludge and highly contaminated soil. A subsequent ROD will address all remaining sources of contamination including ground water as OU1. The primary contaminants of concern affecting the soil, sludge, and debris are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating all drums, containers, and highly contaminated soil; consolidating the waste and overpacking drums as necessary; containing contaminated soil, and transporting the material offsite for treatment (possibly incineration) and disposal. The estimated present worth cost for this remedial action is $322,300. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carcinogenic Compounds; Chromium; Debris; Direct Contact; Excavation; Incineration/Thermal Destruction; Lead; Metals; Offsite Disposal; Offsite Treatment; Organics; PCE; Phenols; Sludge; Soil; Solvents; TCE; Toluene; VOCs; Xylenes.

METALTEC/AEROSYSTEMS, NJ
Second Remedial Action - Final
September 27, 1990

The 15.3-acre Metaltec/Aerosystems site is a former metal products manufacturing operation in the Borough of Franklin, Sussex County, New Jersey. A marshy wetlands area is southeast of the site, and surrounding land use is primarily semi-rural residential. The Metaltec plant was operated from 1965 to 1980. The area surrounding the plant included a process well, a wastewater lagoon, a drum storage area, soil saturated with wastewater, and two piles of waste material. In 1980, the State detected VOCs in the wastewater lagoon, surrounding soil, and in onsite ground water. In 1981, the State ordered Metaltec/Aerosystems to remove waste material from the wastewater lagoon, and in 1982 the lagoon was partially excavated and filled. A 1986 Record of Decision (ROD) addressed the remediation of soil, provided an alternate water supply for nearby residents, and required a supplemental remedial investigation/feasibility study to determine the extent of the ground water contamination. This ROD addresses final ground water remediation at the site. The primary contaminants of concern affecting the ground water are VOCs including PCE, TCE, toluene, and xylenes; and metals including chromium and lead.

The selected remedial action for this site includes onsite ground water pumping and treatment using precipitation, air stripping, and

carbon adsorption, followed by discharge of the treated water to onsite surface water; disposing of precipitated sludge from the ground water treatment process offsite; regenerating the spent carbon, and disposing of the residual offsite; and ground water monitoring. The estimated present worth cost for this remedial action is $4,348,900, which includes an annual O&M cost of $466,300 for 10 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water goals are based on Federal or State MCLs and include PCE 1 ug/l (State MCL), TCE 1 ug/l (State MCL), toluene 2,000 ug/l (MCL), and xylenes 44 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Wetlands; Xylenes.

MONTCLAIR/WEST ORANGE RADIUM, NJ
Second Remedial Action
June 1, 1990

The 120-acre Montclair/West Orange Radium site is comprised of 239 residential properties in the Town of Montclair and 127 residential properties in the Town of West Orange, Essex County, NJ. The site is located in proximity to the Glen Ridge Radium Superfund site. In the early 1900s, a radium processing or utilization facility was located near the site. It is suspected that radioactive waste material from the facility was disposed of in then rural areas within the community. Some of the radioactively-contaminated soil is believed to have been moved from the original disposal location, used as fill materials in low-lying areas, or mixed with Portland cement to make concrete sidewalks or foundations. Subsequently, houses were constructed on or near the radium waste disposal areas. EPA investigations in 1981 and 1983, confirmed the presence of gamma radiation contamination in the Glen Ridge area and in several adjacent houses. Subsequently, EPA established an air quality monitoring program to determine the levels of radon decay products in the contaminated houses. In 1984, EPA initiated a remedial investigation/feasibility study to determine the nature and extent of the problem and develop remedial alternatives for the site. Also in 1984, the Agency installed and maintained temporary radon ventilation systems, and gamma radiation shielding in twenty residences. In 1985, the State implemented the pilot study, which included excavating and disposing of contaminated soil offsite from 12 Glen Ridge site properties and several properties in Montclair. A 1989 Record of Decision (ROD) addressed partial excavation and offsite disposal of contaminated soil from a number of residences as the selected remedial action. This ROD also addresses contaminated onsite soil, and is a final source control remedy. A separate ground water study has been initiated, and will be addressed in a subsequent ROD, if necessary. The primary contaminants of concern affecting the soil are radioactive materials, especially radium 226; and metals including lead.

The selected remedial action for this site includes excavating 323,000 cubic yards of contaminated soil (including Glen Ridge Radium site soil, which will be remediated concurrently) and disposing of the soil offsite; restoring the excavated areas; and conducting environmental monitoring. The estimated present worth cost for this remedial action ranges from $252,700,000 to $348,700,000 for the Montclair/West Orange and Glen Ridge Radium sites combined. No O&M costs are associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: All material contaminated with concentrations of radon greater than 5.0 pCi/g of soil in the first 6 inches, and 15 pCi/g in subsurface soil will be excavated and removed offsite.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Carcinogenic Compounds; Direct Contact; Excavation; Lead; Metals; Offsite Disposal; Radioactive Materials; Soil; State Standards/Regulations.

MYERS PROPERTY, NJ
First Remedial Action
September 28, 1990

The 7-acre Myers Property site is a former pesticide and industrial chemical manufacturing facility in Franklin Township, Hunterdon County, New Jersey. The site lies adjacent to, and in the 100-year floodplain of the Cakepoulin Creek which flows to the north of the site. The site is comprised of adjourning private lands, two acres of wetlands, and five acres of residential property with onsite residents. The estimated 250 people who reside within one mile of the site use the underlying sole-source aquifer as their drinking water supply. From 1928 to 1959, the site was used intermittently by several companies to manufacture pesticides and industrial chemicals. Improper handling by facility owners and operators of hazardous substances including components used to manufacture DDT and its by-products (e.g., PCBs), and asbestos, has resulted in onsite contamination. In 1978, State investigations identified 20 unlabeled drums of chemicals containing metals, DDT, other organic chemicals in a shed, and 24 cubic yards of asbestos material in an onsite warehouse. In addition, surface soil and debris were found to be contaminated with high levels of DDT, other organics, and metals. In 1985, EPA performed the first of two removal actions at the site, which included repackaging the deteriorating drums, solid DDT, lead compounds, asbestos, soil, and debris into fifty-five gallon drums followed by offsite disposal at a hazardous waste landfill. In 1987, the second EPA removal action was performed, which included implementing site access restrictions by installing a security fence. This Record of Decision (ROD) addresses the first of two operable units, and includes remediation of the soil, sediment, buildings, and shallow ground water aquifer. This ROD also addresses interim remedial activities for the second operable unit, the ground water in the bedrock aquifer, which will be fully addressed in a future ROD. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs including benzene; other organics including PCBs, PAHs, dioxin, and pesticides such as DDT; and metals including arsenic and lead.

The selected remedial action for this site includes excavating 48,700 cubic yards of organic- and inorganic-contaminated soil and sediment; treating the soil/sediment using chemical dechlorination to remove organics followed by soil washing to remove dechlorination process reagents, soluble reaction by-products and metals; onsite backfilling of treated soil; restoring designated wetlands, if affected by the remedy; shallow and deep ground water pumping and treatment using ion exchange and granular activated carbon, followed by reinjection to the aquifer, or offsite discharge to Cakepoulin Creek; conducting an additional study of deep bedrock ground water to determine the need for subsequent remedial actions; performing ground water and other appropriate environmental monitoring; and decontaminating onsite buildings with disposal of contaminated debris offsite. A contingency to this remedial action is the provision of point-of-use treatment of residential wells should drinking water supplies become contaminated. The total present worth cost for this remedial action is $45,918,000 which includes a total O&M cost of $3,053,00 for years 0-5 and $441,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for soil and sediment are based on State Soil Action levels and include total DDT 10 mg/kg, total VOCs 1 mg/kg, total carcinogenic and noncarcinogenic PAHs 10 mg/kg, arsenic 20 mg/kg, cadmium 3 mg/kg, copper 170 mg/kg, and lead 250-1,000 mg/kg. Chemical-specific ground water cleanup goals for discharge are based on Federal and State MCLs and State Ground Water Quality Criteria (GWQC) and include benzene 1 ug/l (State MCL), DDT 0.001 (State GWQC), arsenic 50 ug/l (Federal and State MCL), and lead 50 mg/l (Federal and State MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Contingent Remedy; Debris; Decontamination; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Leachability Tests; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; Plume Management; Safe Drinking Water Act; Sediment; Soil; Soil

Washing/Flushing; Sole-Source Aquifer; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs; Wetlands.

POMONA OAKS WELL CONTAMINATION, NJ
First Remedial Action - Final
September 26, 1990

The 354-acre Pomona Oaks Well Contamination site is comprised of a 193-residence subdivision and an adjacent shopping center in Galloway Township, Atlantic County, New Jersey. The site overlies a surficial unconsolidated sand aquifer. Home construction at the site began in 1972, and private wells within the surficial aquifer were initially used as the water supply. In 1982, onsite residents complained of foul tasting well water, and subsequent investigations from 1982 to 1985 confirmed the presence of onsite ground water contamination. Possible contamination sources include two nearby gas stations, a salvage yard, a dry cleaner, and onsite residential septic tanks. In 1985, all homes were hooked to a municipal water supply by the State, eliminating public exposure to ground water contamination. Further sampling conducted from 1986 to 1990 revealed only low-level ground water contamination. This Record of Decision (ROD) provides a final remedy for the ground water. Because ground water contaminant levels no longer exceed health-based or State standards, there are no contaminants of concern at the site.

The selected remedial action for this site is no further action, because onsite investigations revealed that the source of contamination was a singular event, and that the contamination dispersed through natural attenuation and/or biodegradation. Ground water monitoring will be continued. No costs are associated with this no action remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy.

RADIUM CHEMICAL, NY
First Remedial Action - Final
June 21, 1990

The Radium Chemical site consists of a one-story brick building in a light industrial/residential section in Woodside, Queens County, New York. The Radium Chemical Company (RCC) produced luminous paint beginning in 1913 and later manufactured, leased, and sold radium^{226} to hospitals, medical centers and research laboratories. The radium sources were stored onsite in lead containers in a poured concrete vault. In 1983, the State suspended the RCC operating license due to disposal and safety infractions and in 1987 ordered RCC to remove the radium sources and decontaminate the building. RCC abandoned the building without complying leaving a large number of radium-containing sealed devices, some of which were suspected of releasing radium and radon gas. Also onsite were hundreds of containers of laboratory chemicals. From 1988 to 1989, EPA undertook a limited emergency removal action to secure the facility and remove the radioactive sources. In 1989, a Public Health Advisory was issued for the site based on the threatened release of radium^{226}. This Record of Decision (ROD) supplements the emergency removal action by addressing the remaining residual radioactive contamination at the site including drummed hazardous waste contaminated with radium. The primary contaminants of concern affecting the soil and debris are radioactive materials including radium^{226} and its decay products, including radon gas.

The selected remedial action for this site includes partial decontamination and complete dismantling of the contaminated building, followed by offsite disposal of debris as appropriate based on a contamination level; excavation and offsite disposal of contaminated soil and subsurface piping, followed by replacement of piping and backfilling with clean soil; and treatment of some radium-contaminated hazardous waste, followed by offsite disposal of treated and untreated radium-contaminated hazardous wastes in approved facilities. The estimated total cost for this remedial action is $18,699,000. O&M costs are included in the total cost estimate.

PERFORMANCE STANDARDS OR GOALS: All soil will be excavated and disposed of offsite that exceeds 5 pCi/g above background

at the surface in the first six inches and 15 pCi/g above background at the subsurface (i.e, subsequent 6-inch layers). Building masonry with less than 5 pCi/g radium[226] will be disposed of in a sanitary landfill, masonry exceeding this level and other material (e.g., steel) exceeding specific surface contamination levels will be disposed of offsite along with the soil at a radioactive waste disposal facility. Chemical-specific goals for radium-contaminated hazardous waste were not specified.

INSTITUTIONAL CONTROLS: Institutional controls were not specified as a component of the selected remedy.

KEYWORDS: Clean Air Act; Debris; Decontamination; Direct Contact; Excavation; Metals; Offsite Disposal; Offsite Treatment; Public Health Advisory; RCRA; Radioactive Materials; Soil; State Standards/Regulations; Treatment Technology.

ROEBLING STEEL, NJ
First Remedial Action
March 29, 1990

The 200-acre Roebling Steel site is a former steel wire and cable manufacturing facility in the village of Roebling, Florence Township, Burlington County, New Jersey. The site abuts the Delaware River to the north and Crafts Creek to the east, and lies adjacent to Roebling Park, a public playground. From 1906 to 1982, the facility was operated primarily to produce steel products, but in recent years, portions of the site have been used for various other industrial operations that have resulted in the onsite generation, storage, or burial of raw materials and wastes. Two removal actions were performed as a result of these industrial operations. In 1985, the State removed picric acid and other explosive chemicals from one onsite laboratory and detonated the chemicals offsite. From 1987 to 1988, EPA performed a second removal action which included the offsite disposal of lab pack containers and drums; recycling/reuse of metallic mercury, gas cylinders, sulfuric acid, and phosphoric acid; and onsite containment of baghouse dust and exposed asbestos. This interim operable unit will address those areas where contaminant sources pose a sufficiently imminent hazard to require expedited remediation. These areas include the remaining drums and exterior tanks, transformers containing PCB-contaminated oils, a baghouse dust pile, chemical piles, tires, and the soil under the water tower in Roebling Park. Additional operable units will address the remaining sources of contamination and those areas where contaminant migration has occurred. The primary contaminants of concern affecting the soil and debris are organics including acids and PCBs; metals including arsenic, chromium, and lead; and oils.

The selected interim remedial action for this site includes offsite incineration and disposal at a RCRA-permitted facility of the contents of 757 drums and 67,000 gallons of PCB-contaminated oil found in 183 transformers; dismantling and decontaminating the transformers and disposing of the transformer housings at a RCRA-permitted facility; offsite disposal at a RCRA-permitted facility of 150,000 gallons of tanked material; offsite stabilization and disposal at a RCRA-permitted facility of 530 cubic yards of baghouse dust and 120 cubic yards of excavated surface soil from Roebling Park; offsite treatment and disposal at a RCRA-regulated landfill of 40 cubic yards of metal-contaminated materials from 79 chemical piles and offsite disposal of 10,000 tires. The estimated total cost for this remedial action is $5,003,400. No O&M costs are associated with this operable unit.

PERFORMANCE STANDARDS OR GOALS: Surface soil under the water tower at Roebling Park will be excavated if lead levels exceed 250 mg/kg. Because the remaining components of the remedy involve removal of contaminant sources to prevent additional migration, no other specific performance goals were given.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; Arsenic; Carcinogenic Compounds; Chromium; Debris; Decontamination; Direct Contact; Excavation; Incineration; Inorganics; Interim Remedy; Leachability Tests; Lead; Metals; Offsite Disposal; Offsite Treatment; Oils; Organics; PCBs; RCRA; Soil; Solidification/Stabilization; Temporary Storage; Toxic Substances Control Act; Treatment Technology.

SARNEY FARM, NY
First Remedial Action - Final
September 27, 1990

The 143-acre Sarney Farm site includes a former 5-acre landfill in Amenia, Dutchess County, New York. Land use in the area is agricultural and includes wetlands. The site overlies a bedrock aquifer, which is currently used as a drinking water source. Approximately 2,000 residences are located within one mile of the site. In 1968, the portion of the site that included a 5-acre sanitary landfill was purchased by Harris Haul-A-Way. Investigations later that year revealed that industrial wastes including approximately 40 drums of waste solvents were being disposed of illegally in several onsite areas. In 1970, the State ordered the illegal dumping to cease. Site studies by private parties have identified two trench areas used for hazardous waste disposal, and acting as localized sources of onsite soil contamination. In both areas, soil contaminants have infiltrated into the onsite ground water, but only in limited amounts. Approximately 40 drums were crushed or buried onsite in the two disposal areas. In 1987, EPA initiated a removal/treatment action for organic contamination, including installing an in-situ soil washing system at two areas. One of these areas is addressed in this Record of Decision (ROD). This ROD addresses the remediation of onsite contaminated soil, debris, and ground water in two source areas. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including toluene; other organics including pesticides; and metals including lead.

The selected remedial action for this site includes removing waste drums from trench areas 2 and 4 and disposing of these offsite at a permitted facility; treating onsite approximately 2,365 cubic yards of contaminated soil from the areas surrounding the drums storage area using low temperature thermal treatment, or if soil contamination is at highly elevated levels, the surrounding soil may be removed offsite and disposed of with the drums; backfilling the excavated areas with any onsite-treated soil; allowing for natural attenuation of ground water; conducting hydrogeologic studies onsite to better define the hydrologic condition of the site; ground water and surface water monitoring; and implementing institutional controls including deed restrictions. The present worth cost for this remedial action is $907,500, which includes an annual O&M cost of $15,300 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup levels for soil are based on risk-based levels (10^{-5}) and include TCE 0.2 ug/l, and toluene 3.3 ug/l. These levels are based on the maximum soil concentrations needed to reach a 99.9% treatment efficiency. Ground water contaminant levels are expected to decrease once source contamination is eliminated. The estimated time frame for ground water attenuation to acceptable levels is 30 years.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent ground water use at source areas.

KEYWORDS: Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water Monitoring; Ground Water; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Lead; Metals; O&M; Offsite Treatment; Offsite Disposal; Onsite Disposal; Onsite Treatment; Organics; Pesticides; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; Treatment Technology; Toluene; VOCs.

SAYREVILLE LANDFILL, NJ
First Remedial Action
September 28, 1990

The 35-acre Sayreville Landfill site is an inactive municipal and industrial landfill in the Borough of Sayreville, Middlesex County, New Jersey. The site overlies several sedimentary aquifers, includes a tidal wetlands area, and lies within the 500-year floodplain of the South River, which forms the western boundary of the site. Surrounding land use is industrial. Beginning in 1971, the landfill was used to dispose of municipal and hazardous wastes, including an estimated 50 to 150 drums containing hazardous wastes. The drums were buried in a 20-acre area of the site. In 1977, landfill operations ceased, but subsequent unauthorized dumping of hazardous waste may have occurred. In 1980, a landfill closure plan was implemented by the borough, but was not properly completed. In 1981, the State excavated 30 drums containing benzene,

pesticide-, and acid-contaminated liquids. Investigations from 1986 to 1990, revealed ground and surface water contamination as a result of migration of onsite landfill contaminants, and the data were used to further characterize contaminant sources within the landfill. This Record of Decision (ROD) addresses remediation of onsite drummed wastes. A subsequent ROD will address further source remediation (leachate) and remediation of ground and surface waters. The primary contaminants of concern affecting the soil and debris are VOCs including benzene, toluene, and xylenes; other organics including pesticides and phenols; acids; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating the remaining 50 to 150 drums buried onsite, and thermally treating the drummed waste offsite; disposing of the residual ash offsite; installing a multi-media cap over the landfill; constructing passive gas collection and surface runoff control systems at the landfill; monitoring ground and surface waters, stream sediment, and air to determine the need for subsequent remedial activities and/or a leachate collection and treatment system; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $16,516,600, which includes a present worth O&M cost of $746,400 for year one, $431,800 for years 2-5, and $354,600 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels will be based on the State Interim Soil Action Levels (ISALs) including arsenic 20 mg/kg (ISAL), chromium 100 mg/kg (ISAL), and lead 250–1,000 mg/kg (ISAL).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site to restrict landfill property and ground water usage.

KEYWORDS: Acids; Air Monitoring; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Disposal; Organics; Pesticides; Phenols; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Monitoring; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Wetlands; Xylenes.

SCIENTIFIC CHEMICAL PROCESSING, NJ

First Remedial Action
September 14, 1990

The 6-acre Scientific Chemical Processing site is a former chemical handling, treatment, and disposal facility in Carlstadt, Bergen County, New Jersey. The site is in a light industrial area adjacent to an extensive salt marsh and wetlands area, and is also considered to be within the floodplain of tributaries to the Hackensack River. The site is underlain by a system of three aquifers, all of which have been contaminated by the site. The water table aquifer flows into a Hackensack River tributary; the bedrock aquifer is a current drinking water source for the vicinity. Prior to 1970, and until its closure in 1980, a wide variety of industrial and chemical wastes were disposed of at the site. Many of these wastes were apparently released onsite. In 1985, EPA required the removal of five tanks of waste containing numerous hazardous materials including PCBs; and four were removed. At present, one tank remains onsite due to the complex mixture and high concentrations of wastes present, and the failure to locate an appropriate treatment and disposal facility to accept the waste. This Record of Decision (ROD) outlines an interim remedy for source control and management of contaminant migration while further study is conducted to find a suitable treatment technology for the onsite wastes. Future RODs will address final source and ground water remedial activities. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, phenols, TCE, toluene, and xylenes; other organics including PAHs, PCBs, and pesticides; metals including arsenic, chromium, and lead; and other inorganics.

The selected remedial action for this site is an interim remedy, which includes installing a slurry wall around the site perimeter to a depth of 15 to 20 feet (corresponding to the top of a confining clay layer); installing a temporary infiltration barrier over the site surface to minimize entry of precipitation; extracting ground water from within the slurry wall boundary for the purpose of dewatering

onsite soil and controlling movement of contaminated ground water away from the site; transporting extracted ground water offsite for pretreatment, treatment, and disposal; ground water and surface water monitoring; and maintaining a fence around the site. The estimated present worth cost for this remedial action is $2,933,000, which includes an annual O&M cost of $42,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for the contaminants of concern have not been set due to the interim nature of this remedy. Chemical-specific ARARs will be met for final remedies, and will be presented in subsequent RODs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Water Act; Deferred Decision; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Inorganics; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Organics; PAHs; PCBs; PCE; Pesticides; Phenols; Plume Management; RCRA; Slurry Wall; Soil; State Standards/Regulations; Surface Water Monitoring; TCE; Toluene; Treatability Studies; VOCs; Wetlands; Xylenes.

SEALAND RESTORATION, NY
First Remedial Action
September 28, 1990

The 210-acre Sealand Restoration site is a former liquid waste disposal and storage facility in the town of Lisbon, St. Lawrence County, New York. Both wetland and woodland areas are onsite. The site is underlain by a shallow alluvial aquifer and a deeper bedrock aquifer, which may be hydraulically connected to one another in the site area. Approximately 25 private wells and one municipal well are within one mile of the site. The municipal water system draws from the bedrock aquifer. In 1979, supposedly uncontaminated liquid petroleum wastes and mineral oils were disposed of in several locations, including a land application/disposal area, a cell disposal area, and a drum storage area. In 1980, the State found Sealand to be in non-compliance by accepting contaminated wastes, their permits were revoked, and onsite disposal operations ceased. From 1983 to 1984, the State conducted a remedial investigation that identified several onsite areas of concern. The land application area was contaminated with PCBs as a result of improper landspreading practices. The cell disposal area was found to have sediment contaminated with potentially high levels of a chemical solvent. The drum storage area contained 200 empty or nearly empty drums seeping tar-like residue onsite, a tanker trailer containing less than 1,000 gallons of waste oil, and a storage tank containing 5,000 gallons of waste oil. From 1987 to 1990, the State removed the contaminated soil and debris and documented these as part of this Record of Decision (ROD). The purpose of this ROD is to review the State action and to determine its appropriateness for reimbursement of costs under CERCLA. A follow-up investigation will be conducted to determine the extent of ground water and wetlands contamination, as well as any remaining soil contamination. A subsequent ROD will address these media, if deemed necessary. The primary contaminants of concern potentially affecting the soil and debris are VOCs including benzene, TCE, toluene, and xylenes; other organics including PCBs, and pesticides; and metals including chromium and lead.

The selected remedial action for the site, performed by the State, was found to be appropriate as an interim action, and included excavating 1,445 drums and 4,762 cubic yards of contaminated soil, along with the removal of 375,000 gallons of liquid waste from the cell disposal area, incinerating these wastes offsite, and disposing of residuals at a RCRA hazardous waste facility; capping the cell disposal area with a multi-layer cap; installing a leachate monitoring system; removing 200 empty or nearly empty drums, 5,000 gallons of oily waste from an above-ground storage tank, and 1,000 gallons of waste oil from the tanker trailer, along with the excavation and removal of 20 cubic yards of contaminated soil all from the drum storage area; treating and disposing of these wastes offsite in a RCRA-permitted Subtitle C facility; and backfilling the area with clean soil. The estimated capital cost of this remedial action is $20,000,000. The cost of O&M as well as the total present worth cost associated with the remedy have not yet been determined.

PERFORMANCE STANDARDS OR GOALS: No contaminant-specific goals were provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Capping; Chromium; Closure Requirements; Debris; Direct Contact; Excavation; Incineration/Thermal Destruction; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Containment; Organics; PCBs; Pesticides; RCRA; Soil; Solvents; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

SOLVENT SAVERS, NY
First Remedial Action - Final
September 28, 1990

The 13-acre Solvent Savers site is a former chemical waste recovery facility in Lincklaen, Chenango County, New York. The site is bordered by Mud Creek to the east and by an intermittent stream to the north. Between 1967 and 1974, a variety of wastes including solids, liquids, and sludge from a distillation process used to recover solvents were disposed of at the facility. Concurrently, a drum reconditioning process was also operated onsite. EPA and State investigations conducted from 1981 to 1982 revealed metals, VOCs, and other organic compounds including PCBs in onsite soil, and metals and VOCs in the ground water. The site has been separated into five principal source areas, which contain a total of 59,000 cubic yards of contaminated soil, 300 buried and 100 surficial drums, and 578,000,000 gallons of contaminated ground water. In 1989, EPA required seven Potentially Responsible Parties (PRPs) to conduct an extensive removal action, which included removing and/or treating all drums and the associated contaminated soil. To the extent that the work is not completed by the PRPs in a timely fashion or to the extent that any soil contamination will remain onsite following completion of that work, the remedial action documented in this ROD will be implemented. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including PCE and TCE; other organics including carcinogenic and noncarcinogenic PAHs, PCBs, and phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating 300 buried drums, followed by treating and disposing of the drums and associated wastes at an offsite RCRA facility; excavating 59,000 cubic yards of contaminated soil from two highly contaminated source areas, followed by treating soil highly contaminated with VOCs onsite using low temperature thermal extraction; treating approximately 1,000 cubic yards of the excavated PCB-contaminated soil using the same thermal process or by incinerating the soil offsite, based on the results of a treatability study; treating soil contaminated with low levels of VOCs using soil flushing and/or vapor extraction processes, based on the results of a treatability study; treating any organic vapors from the soil treatment using an as yet undetermined air pollution control system; backfilling excavated areas with treatment residuals and clean fill; ground water pumping and treatment onsite using chemical precipitation, air stripping, and carbon adsorption, followed by reinjection and/or discharge to surface water; disposing of ground water treatment residuals offsite; and monitoring air and ground water. The estimated present worth cost for this remedial action is $29,350,000, which includes an estimated annual O&M cost of $523,000 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Initial soil cleanup levels are based on an average of model-derived cleanup levels to prevent further contamination of ground water, and include PCE 2.2 mg/kg, TCE 0.8 mg/kg, toluene 1.5 mg/kg and xylenes 3.1 mg/kg. PCB-contaminated soil will be treated to attain the level of 1 mg/kg (TSCA PCB policy). Chemical-specific goals for ground water are based primarily on the more stringent of SDWA MCLs or State standards. Cleanup goals for over 50 contaminants are provided in the ROD, including PCE 5 ug/l (CLP Quantitation Limit), TCE 5 ug/l (MCL), arsenic 25 ug/l (State), noncarcinogenic PAHs 32,340 ug/l (health-based), and phenols 48,500 ug/l (health-based).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Closure Requirements; Debris; Direct Contact; Excavation; Offsite Disposal; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Phenols; RCRA; Safe

Drinking Water Act, Soil; Soil Washing/Flushing; Solvents; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Wetlands.

SYOSSET LANDFILL, NY
First Remedial Action
September 27, 1990

The 35-acre Syosset Landfill site is a closed municipal landfill in Syosset, Oyster Bay, New York. Surrounding land use is high-density residential and industrial. The site overlies a sole-source aquifer, and eight public supply wells are located within 3 miles of the site. From 1933 to 1975, commercial, industrial, residential, demolition, and agricultural wastes, sludge, and ash were disposed of in the onsite landfill. Typical wastes included heavy metals, solvents, organics, oils, sludge, and metal hydroxides. The county closed the landfill in 1975 because of suspected ground water contamination. Subsequent studies have confirmed ground water contamination beneath and downgradient of the site resulting from landfill leachate. This Record of Decision (ROD) addresses source control at the site. A subsequent ROD will address onsite ground water contamination. The primary contaminants of concern affecting the soil are VOCs including benzene, PCE, TCE, and toluene; other organics; and metals including arsenic.

The selected remedial action for this site includes placing a geosynthetic membrane cap over the landfill area; installing a passive gas venting system, in addition to the venting system installed during the 1975 landfill closure; maintaining the cap and venting system; conducting air and ground water monitoring; and implementing institutional controls including land use restrictions, and site access restrictions including fencing. The estimated present worth cost for this remedial action is $26,200,000, which includes an annual O&M cost of $222,000.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Institutional controls including land use restrictions will be implemented.

KEYWORDS: Air Monitoring; Arsenic; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Direct Contact; Ground Water Monitoring; Institutional Controls; Metals; O&M; Onsite Containment; Organics; PCE; RCRA; Soil; Sole-Source Aquifer; Solvents; State Standards/Regulations; TCE; Toluene; Venting; VOCs.

VESTAL WATER SUPPLY 1-1, NY
Second Remedial Action - Final
September 27, 1990

The Vestal Water Supply 1-1 site is located in Vestal, Broom County, New York. The site is on the south bank of the Susquehanna River, and lies east of Choconut Creek. The site lies within the floodplain of the Susquehanna River, and contains several wetland areas. Well No. 1-1 is one of three production wells that provide drinking water to several water districts in the Vestal area. A State Road Industrial Park thought to be a source of contamination is located 1,500 feet southeast of the Vestal Well No. 1-1. Chlorinated solvents were first detected in Well No. 1-1 in 1978, after a chemical spill at a plant in nearby Endicott led to the testing of wells in the vicinity for specific synthetic compounds. Subsequently, contaminated ground water was pumped from this well and discharged offsite to the Susquehanna River. Further investigations determined that the chlorinated solvents present in Well No. 1-1 could not be attributed to the chemical spill at the IBM plant. A 1986 Record of Decision (ROD) documented the selection of ground water treatment using air stripping to remove VOCs, addressed Well 1-1 contamination, and required additional studies of four potential source areas in the State Road Industrial Park. This ROD addresses contaminated soil in the four source areas and is a final remedy. This ROD also addresses a contingency remedy for potable water, if needed. The primary contaminants of concern affecting the soil are VOCs including TCE and PCE; other organics including PAHs; and metals including chromium and lead.

The selected remedial action for this site includes treating the soil by in-situ vacuum extraction to remove VOCs in two of the four source areas within the State Road Industrial Park, followed by carbon absorption to control air emissions; disposing of the residual carbon

offsite; and ground water monitoring. This ROD provides a contingency remedy for ground water treatment using precipitation and filtration to remove heavy metals in addition to the current treatment, as necessary. The estimated present worth cost for this remedial action is $1,700,000. There are no annual O&M costs associated with this selected remedial action. The estimated present worth cost for the contingency remedy is $17,900,000, which includes an estimated annual O&M cost of $925,000.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for soil in the two source areas include TCE 140 ug/kg, 1,1,1-TCA 170 ug/kg, and 1,2-DCE 188 ug/kg (for Area 2 only).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Background Levels; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Contingency Remedy; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PAHs; PCBs; PCE; Safe Drinking Water Act; Soil; TCE; Treatment Technology; Vacuum Extraction; VOCs; Wetlands.

WOODLAND TOWNSHIP
ROUTE 72 DUMP, NJ
First Remedial Action
May 16, 1990

The 12-acre Woodland Township Route 72 Dump site is an abandoned hazardous waste dump in Woodland Township, Burlington County, New Jersey. The site is being remediated concurrently with another abandoned dump, the 20-acre Woodland Township Route 532 Dump site, located 3 miles from the Route 72 site. Both sites are in the Pinelands Preservation Area District of New Jersey. Several chemical manufacturing firms dumped chemicals and other wastes into trenches and lagoons or burned the waste at the sites from the early 1950s to 1962. An estimated total of 54,000 cubic yards (Route 72, 28,000 cubic yards; Route 532, 26,000 cubic yards) of surface material including surface soil, stream sediment, sludge, and debris at the sites are contaminated with wastes including tarry substances and paint residues. Furthermore, leaching from surface materials has resulted in the contamination of 300,000 cubic yards (Route 72, 130,000 cubic yards; Route 532, 170,000 cubic yards) of subsurface soil and ground water beneath both sites. This Record of Decision (ROD) addresses surface material and ground water remediation at both sites. A subsequent ROD will address subsurface soil. The primary contaminants of concern affecting the surface soil, sediment, sludge, debris, and ground water are VOCs including benzene, toluene, TCE and xylenes; organics including PAHs, pesticides, and phenols; radionuclides (e.g., uranium and thorium series); and metals including lead and chromium.

The selected remedial action for this site includes excavation, further characterization, and offsite disposal at a permitted facility of 54,000 cubic yards (total from both sites) of contaminated surface soil, sludge, debris and sediment; offsite disposal of 19 cubic yards (total from both sites) of radiologically contaminated surface materials including a drum of radioactive pellets; ground water pumping and treatment with treatment to be determined during design (but anticipated to include air stripping, metals removal, biological treatment, and advanced oxidation or carbon adsorption) and reinjection of treated ground water; and ground and surface water monitoring. The total estimated present worth cost for the concurrent remedial actions at the Route 72 and Route 532 sites is $142,200,000, which includes an estimated present worth O&M cost of $114,000,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup objectives have been based primarily on State standards and background levels including total VOCs 1 mg/kg, total chromium 100 mg/kg, pesticides (DDT and metabolites) 10 mg/kg, and lead 250-1,000 mg/kg (based on State risk assessment). Ground water nondegradation remedial goals are based on natural background levels for the Pine Barrens area including benzene 0.88 ug/l, pesticides (DDT and metabolites) 0.001 ug/l, toluene 1.2 ug/l, TCE 0.38 ug/l, total xylenes 1.0 ug/l, and phenols 0.15 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Background Levels; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; Pesticides; Phenols; Radioactive Materials; RCRA; Sediment; Sludge; Soil; State Standards/Regulations; Surface Water Monitoring; TCE; Toluene; Treatability Studies; VOCs; Wetlands; Xylenes.

WOODLAND TOWNSHIP
ROUTE 532 DUMP, NJ
First Remedial Action
May 16, 1990

The 20-acre Woodland Township Route 532 Dump site is an abandoned hazardous waste dump in Woodland Township, Burlington County, New Jersey. The site is being remediated concurrently with another abandoned dump, the 12-acre Woodland Route 72 Dump site, located 3 miles from the Route 532 site. Both sites are in the Pinelands Preservation Area District of New Jersey. Several chemical manufacturing firms dumped chemicals and other wastes into trenches and lagoons or burned the waste at the sites from the early 1950s to 1962. An estimated total of 54,000 cubic yards (Route 72, 28,000 cubic yards; Route 532, 26,000 cubic yards) of surface material including surface soil, stream sediment, sludge, and debris at the sites are contaminated with wastes including tarry substances and paint residues. Furthermore, leaching from surface materials has resulted in the contamination of 300,000 cubic yards (Route 72, 130,000 cubic yards; Route 532, 170,000 cubic yards) of subsurface soil and ground water beneath both sites. Contaminated ground water discharges to a cranberry bog and an adjacent bog reservoir. This Record of Decision (ROD) addresses surface material and ground water remediation at both sites. A subsequent ROD will address subsurface soil. The primary contaminants of concern affecting the surface soil, sediment, sludge, debris, and ground water are VOCs including benzene, TCE, toluene, and xylenes; organics including PAHs, pesticides, and phenols; radionuclides (e.g., uranium and thorium series); and metals including chromium and lead.

The selected remedial action for this site includes excavation, further characterization, and offsite disposal at a permitted facility of 54,000 cubic yards (total from both sites) of contaminated surface soil, sediment, sludge, and debris; offsite disposal of 19 cubic yards (total from both sites) of radiologically contaminated surface materials including a drum of radioactive pellets; ground water pumping and treatment with treatment to be determined during design (but anticipated to include air stripping, metals removal, biological treatment, and advanced oxidation or carbon adsorption) and reinjection of treated ground water; and ground and surface water monitoring. The total estimated present worth cost for the concurrent remedial actions at the Route 72 and Route 532 sites is $142,200,000, which includes an estimated present worth O&M cost of $114,000,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup objectives have been based primarily on State standards and background levels including total VOCs 1 mg/kg, total chromium 100 mg/kg, pesticides (DDT and metabolites) 10 mg/kg, and lead 250 to 1,000 mg/kg (based on State risk assessment). Ground water nondegradation remedial goals are based on natural background levels for the Pine Barrens area including benzene 0.88 ug/l, pesticides (DDT and metabolites) 0.001 ug/l, toluene 1.2 ug/l, TCE 0.38 ug/l, total xylenes 1.0 ug/l, and phenols 0.15 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Background Levels; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; Pesticides; Phenols; Radioactive Materials; RCRA; Sediment; Sludge; Soil; State Standards/Regulations; TCE; Surface Water Monitoring; Toluene; Treatability Studies; VOCs; Wetlands; Xylenes.

ARMY CREEK LANDFILL, DE
Second Remedial Action - Final
June 29, 1990

The Army Creek Landfill site, a former sand and gravel quarry, is approximately two miles southwest of New Castle, Delaware. The site abuts Army Creek/Pond and high quality wetlands to the south and east and lies adjacent to Delaware Sand & Gravel Landfill, another Superfund site. From 1960 to 1968, when the landfill reached capacity and closed, the 44-acre municipal landfill accepted approximately 1.9 million cubic yards of municipal and industrial wastes. Ground water problems first became apparent in 1971, when a residential well downgradient of the site developed water quality problems. Since 1972, EPA, the State, and the county have continued to sample the ground water and have identified ground water contaminants indicative of hazardous waste disposal. A contaminant plume has also been identified downgradient of the landfill. In 1973, the county installed recovery wells to intercept the contaminant plume and to create a ground water divide between the Army Creek Landfill and nearby potable water supply wells. A 1986 Record of Decision (ROD) provided for capping of the landfill and for the continued operation of the recovery well network to maintain the ground water divide. The extracted ground water currently discharges untreated into Army Creek/Pond. This ROD, the second of two operable units, addresses the need to treat the recovered ground water prior to onsite discharge into Army Creek/Pond. The primary contaminant of concern with respect to the impact of discharge to surface water is iron.

The selected remedial action for this site includes ground water pumping using the recovery well network and treatment using a modified conventional precipitation water treatment plant which involves aeration, precipitation, sedimentation, and filtration followed by onsite discharge of the effluent to Army Creek/Pond; sampling and offsite disposal of the sludge generated during the treatment process; and monitoring of the sediment, recovered ground water, surface water, and wetlands. The estimated present worth cost for this remedial action is $4,900,000, which includes an annual O&M cost of $294,000.

PERFORMANCE STANDARDS OR GOALS: The recovered ground water will meet State water quality criteria prior to onsite discharge into Army Creek/Pond. Chemical-specific goals include iron 1,000 ug/l.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Aeration; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; State Standards/Regulations; Surface Water Monitoring; Wetlands.

AVTEX FIBERS, VA
Second Remedial Action
September 28, 1990

The 440-acre Avtex Fibers site is a former synthetic fibers manufacturing facility in Front Royal, Warren County, Virginia. The site is bounded by the South Fork of the Shenandoah River to the west and northwest, and by residential areas to the south, northeast, and east. A section of the site lies within the 100-year Shenandoah River floodplain. The plant produced rayon (1940-1989), polyester (1970-1977), and polypropylene fibers (1985-1989). Until 1983, the by-products, including sodium cellulose xanthate-based viscose waste and zinc hydroxide sludge, were disposed of onsite in unlined surface impoundments or landfills. Subsequently, the waste was routed to an onsite wastewater treatment facility. Fly ash (from incinerator exhaust air pollution control devices) and boiler house solids were disposed of in four other surface impoundments and one fly ash waste pile. In 1982, a State investigation identified carbon disulfide, a constituent of viscose waste, in residential wells located across the river from the plant. In 1983 and 1984, in response to the result of this investigation, Avtex implemented interim measures to address this ground water contamination by purchasing 23 subdivision properties in the area with

contaminated ground water, providing an alternate water supply to permanent residents, and implementing a ground water pumping and treatment program. A 1988 Record of Decision (ROD) addressed further remediation of ground water and dewatering of 3 onsite viscose basin surface impoundments. In 1989, State site investigations identified PCB contamination in the soil and in Shenandoah River fish. This contamination may have been the result of a transformer explosion, general maintenance practices within the facility's polyester drying area, and subsequent discharge of PCB-contaminated wastewater from the plant's sewer system to the Shenandoah River. In October 1989, EPA issued an Administrative Order (AO) to the site owners, Avtex Fibers Inc., requiring PCB cleanup and identification and disposal of drummed wastes present onsite. The State revoked the plant's NPDES permit, and Avtex subsequently ceased operations. In 1989, EPA initiated a removal action to stabilize the drummed wastes. In 1990, EPA issued another AO and the former site owners took over the maintenance of freeboard in sulfate basins and the continuation of wastewater treatment onsite. This ROD addresses the removal of PCB-contaminated soil, breakdown of the acid reclamation facility, and the disposal of drummed wastes thought to contain oils, bases, acids, solvents, and PCBs. Also, this ROD addresses site security, control, maintenance, and health and safety measures. A subsequent ROD will address possible remediation of remaining contamination of onsite structures, surface water, sediment, ground water, sewer system, and waste disposal areas. The primary contaminants of concern affecting the soil and debris are organics including PCBs.

The selected remedial action for this site includes excavation and offsite disposal of approximately 5,000 cubic yards of soil contaminated with PCB levels exceeding 10 mg/kg, followed by restoration of excavated areas; identification of drum contents, treatment and offsite disposal of drum contents that are RCRA wastes; decontaminating and recycling or crushing the empty drums followed by incineration or disposal in a RCRA landfill; dismantlement of the unstable acid reclamation facility with decontamination, as necessary; and disposing of unusable rubble and machinery onsite. Drums containing nonhazardous substances will remain onsite and available for liquidation by the corporate trustee upon EPA's approval. The fourth component of this ROD is site security, maintenance, control, and health and safety measures. The estimated capital cost for this remedial action is $8,708,400. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for PCB-contaminated soil are based on EPA published guidance on "Remedial Actions for Superfund Sites with PCB Contamination." The recommended action level for industrial land use soil is PCB 10-25 mg/kg. For this site, all soil in excess of 10 mg/kg of PCB will be removed.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Acids; Carcinogenic Compounds; Debris; Decontamination; Direct Contact; Excavation; Floodplain; Incineration/Thermal Destruction; Offsite Disposal; Offsite Treatment; Oils; Onsite Disposal; Organics; PCBs; RCRA; Soil; Solvents; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology.

BROWN'S BATTERY BREAKING, PA

First Remedial Action
September 28, 1990

The 14-acre Brown's Battery Breaking site is an inactive lead-acid battery processing facility in Tilden Township, Berks County, Pennsylvania. The area surrounding the site is primarily agricultural with scattered rural residences. The site is bordered by Conrail tracks, Mill Creek, and the Schuylkill River. The site lies within the 100-year floodplain of the Schuylkill River. From 1961 to 1971, the facility recovered lead-bearing materials from automobiles and truck batteries by breaking the battery casings, draining the acid, and recovering the lead alloy grids, plates, and plugs. During this time, the crushed casings were used as a substitute for road gravel or disposed of onsite. The State conducted onsite and offsite investigations during the 1980s that identified lead concentrations in excess of acceptable limits in residents, livestock, soil, and surface waters. A 1983 EPA investigation revealed extensive lead contamination in onsite soil and sediment located in the Schuylkill River. As a result of the investigation, EPA initiated an Immediate Removal Request to relocate three families and to excavate and consolidate 13,000 cubic yards

of contaminated soil and battery casings into an onsite containment area, that was covered with a low permeability cap. A second removal, initiated in 1990, consisted of temporarily relocating all onsite residents. The cleanup strategy for the site consists of three operable units: site access; remediation of onsite soil and battery casings; and ground water remediation. This Record of Decision addresses site access; subsequent actions will address soil and ground water remediation. The primary contaminant of concern affecting the soil and sediment is lead.

The selected remedial action for this site includes permanently relocating all onsite residents and businesses to compatible offsite locations; decontaminating personal belongings, as appropriate; and implementing site access restrictions including fencing and institutional controls including deed restrictions. The present worth cost for this remedial action is $342,900. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: There are no chemical- specific ARARs for this operable unit. The initial remedy will eliminate human contact with the soil and sediment. Site use and access restrictions will reduce the potential for transport of contaminants offsite.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent future residential and industrial use of the site.

KEYWORDS: Carcinogenic Compounds; Decontamination; Direct Contact; Floodplain; Institutional Controls; Lead; Metals; Public Exposure; Relocation; Sediment; Soil.

BUTZ LANDFILL, PA
First Remedial Action
September 28, 1990

The Butz Landfill site is an inactive landfill in Jackson Township, Monroe County, Pennsylvania. The sole-source aquifer underlying the site supplies drinking water for the vicinity, which includes approximately 3,300 people who live within three miles of the site and an additional 3,000 people during tourist seasons. Beginning in 1965, municipal waste, sewage sludge/liquids, and possibly some industrial wastes were accepted at the landfill. During the years the landfill was operated, the waste was disposed of without a State permit. In 1971, onsite investigations revealed well water contamination and the presence of leachate seeps. By 1973, the State ordered the landfill closed and required that corrective measures be taken, including the development of a surface water management plan, ground water monitoring, and placement of a cover over the landfill. Additional onsite investigations in 1986 revealed high TCE levels in domestic wells to the south of the landfill, which prompted a request to EPA that the site be considered for emergency action. In 1986, the State and EPA initiated emergency response activities, including additional sampling, installing water coolers, and supplying bottled water or carbon filters to homes with contaminated well water. This Record of Decision addresses the first Operable Unit (OU), which establishes an alternate water supply. Subsequent OUs will address remediation of the contaminated soil, surface water, and ground water. The primary contaminants of concern affecting the ground water are VOCs, including PCE and TCE.

The selected remedial action for this site includes construction of new water service lines and replacement of pumps, valves, and drinking water storage tanks; connection of new water supply wells to approximately 49 residences; and construction of access roads, as required. The total cost for this remedial action is $5,910,000, which includes an annual O&M cost of $23,000 for 50 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals were not provided because this remedial alternative will not address ground water contamination but rather will mitigate and/or prevent human exposure to currently used contaminated ground water. The selected alternative will provide potable water that will meet SDWA MCLs. Water from the water supply system will meet State standards.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; MCLs; O&M; PCE; Safe Drinking Water Act; Sole-Source Aquifer; State Standards/Regulations; TCE; VOCs; Wetlands.

C & R BATTERY, VA
First Remedial Action - Final
March 30, 1990

The 11-acre C & R Battery site is a former battery-sawing and shredding facility in Chesterfield County, Virginia. Open fields and woods border the site on the north, south, and west, a small fuel oil distributor borders the site on the east, and the James River is approximately 650 feet north of the site. From the early 1970s to 1985 the facility was used to recycle discarded batteries. Site operations included draining battery acids into onsite ponds, recovering and stockpiling lead and lead compounds from the batteries, and shredding and stockpiling battery casings onsite. The State began monitoring the site in the late 1970s and detected elevated lead levels in the soil, surface water, and ground water. An OSHA inspection revealed indoor air levels of lead to be more than twice the OSHA standards of 50 ug/m^3. Also, facility employees were found to have elevated lead levels in their blood. In response to public health concerns, EPA conducted a removal action in 1986, which included extracting acidic liquid from onsite lagoons and raising the pH level of the liquid before discharging the neutralized liquid into onsite ditches. Lagoon sludge was neutralized and returned to the lagoon, and surface soil was also neutralized. In addition, shredded battery casings, soil, and debris found east of the drainage ditch, were consolidated into two debris piles and remain onsite. This remedial action addresses the former acid pond area, the debris piles, and a drainage ditch. The primary contaminants of concern affecting the soil, sediment, debris, and surface water are metals including lead and arsenic.

The selected remedial action for this site includes the demolition of a concrete pad and dismantlement of a storage shed followed by offsite disposal of the debris, and offsite treatment, if necessary, of surface water from the drainage ditch prior to the excavation of contaminated soil and sediment; excavation and stabilization of approximately 36,800 cubic yards of contaminated soil, sediment, and debris piles followed by offsite disposal in a permitted landfill; backfilling of all excavated areas; soil cover over all areas with lead contamination above background; hybrid closure (soil cover) for residual contamination of lead-contaminated soil outside the acid pond area; clean closure of the acid pond area; offsite treatment and disposal of 350 batteries; ground and surface water monitoring; and implementing institutional controls including site use restrictions. The estimated present worth cost for this remedial action is $15,572,000, which includes an annual O&M cost of $14,550.

PERFORMANCE STANDARDS OR GOALS: Soil will be excavated if the soil contaminants exceed established action levels, which are based on a 10^{-6} risk level and include lead 1,000 mg/kg and arsenic 10 mg/kg. Accidental ingestion route of exposure will be eliminated. Sediment will be excavated if sediment contaminants exceed action levels, which were derived from a Puget Sound Estuary Program study, and include lead 450 mg/kg and arsenic 57 mg/kg. By remediating the soil and sediment to these levels, exposure via inhalation of suspended particulates should also be acceptable. The soil action levels will remove the threat of ground water contamination.

INSTITUTIONAL CONTROLS: Institutional controls will be used to control future site use.

KEYWORDS: Arsenic; Carcinogenic Compounds; Clean Air Act; Clean Closure; Debris; Direct Contact; Excavation; Ground Water Monitoring; Hybrid/Alternate Closure; Institutional Controls; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; Treatability Studies; Treatment Technology.

COKER'S SANITATION SERVICE LANDFILLS, DE
First Remedial Action - Final
September 28, 1990

The Coker's Sanitation Service Landfills site is comprised of two inactive landfills, the 10-acre landfill #1 and the 15-acre landfill #2, located approximately 0.5 miles apart, in Kent County, Delaware. Landfill #1 is bordered to the north by a forested wetland that includes a shallow stream known as the Willis Branch of the Lepisc River. Land use in the area is primarily agricultural and residential. Each landfill contains approximately 45,000 cubic yards of

latex sludge waste in addition to the contaminated soil/waste. From 1969 to 1977, latex rubber waste sludge was disposed of at Landfill #1 into unlined trenches, which were topped off with local soil when nearly filled with sludge. From 1976 to 1980, latex sludge was also disposed of in lined trenches at Landfill #2. The landfill operating permit required a leachate collection and treatment system and a ground water monitoring system to be installed. Subsequently, the latex sludge waste in both landfills gradually settled and compacted reducing permeability and minimizing the amount of leachate from the site. Excess levels of styrene and ethylbenzene were found in the waste trenches of both landfills and in the leachate collection system of landfill #2. This Record of Decision (ROD) addresses contamination in both landfills and in the leachate collection system at Landfill #2. The primary contaminants of concern affecting the soil and sludge are VOCs including benzene and metals.

The selected remedial action for this site includes covering the seeps at Landfill #1; backfilling depressed areas of Landfill #2 and sealing the Landfill #2 leachate collection system; monitoring ground and/or surface water; and implementing institutional controls including deed restrictions on land use and site access restrictions. The estimated total cost for this remedial action is $653,000, with total O&M costs of $527,257.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals are not applicable, since this remedial action uses no treatment technologies. The remedial activities will reduce the cancer risk level to less than 10^{-6}, and the Hazard Index to less than 1.0.

INSTITUTIONAL CONTROLS: Deed restrictions limiting future land use will be implemented at both landfill properties.

KEYWORDS: Benzene; Carcinogenic Compounds; Direct Contact; Ground Water Monitoring; Institutional Controls; Metals; O&M; Onsite Containment; Sludge; Soil; Surface Water Monitoring; VOCs.

CROYDON TCE, PA

Second Remedial Action - Final
June 29, 1990

The Croydon TCE site is in Bristol Township, Bucks County, Pennsylvania. A series of studies conducted by EPA beginning in 1984 led to the detection of VOC contamination in the ground water over a 3.5-square mile area referred to as the study area. The study area is predominantly residential with an estimated 3,000 residents. A small southeastern portion of the study area containing elevated levels of VOCs, particularly TCE, and numerous potential source areas have been identified and are referred to collectively as the "focused area of investigation." This smaller area is composed of the Croydon residential community and several manufacturing and commercial establishments. The study area is bordered on the south by the Delaware River. Neshaminy Creek, which borders the study area to the west, and Hog Run Creek, which flows through the focused area of investigation, both discharge to the river. Although the source of contamination has not been identified, the contaminant plume appears to be flowing south-southeast into the East Branch of Hog Run Creek and probably into the Delaware River. A 1988 Record of Decision (ROD) documented the provision of a public water supply to 11 residents within the identified ground water contaminant plume area. This 1990 ROD addresses remediation of the ground water contamination at the site. The primary contaminants of concern affecting the ground water are VOCs including TCE and 1,1-DCE.

The selected remedial action for this site includes ground water pumping and onsite treatment using air stripping, followed by carbon adsorption as an ancillary treatment step before onsite discharge of the treated ground water; vapor-phased carbon adsorption treatment of air stripper exhaust, followed by offsite disposal or treatment of spent carbon; implementation of institutional controls to prevent the use of contaminated ground water during remediation; and ground water monitoring. The estimated present worth cost for this remedial action is $1,345,000, which includes an estimated annual O&M cost of $46,709 for 45 years (i.e., assuming that the State ARARs of remediating ground water to background levels are to be met by extending treatment from 30 to 45 years).

PERFORMANCE STANDARDS OR GOALS: The ground water remedy is designed to contain further migration of the plume while attempting to restore ground water to the State ARAR of background levels, including TCE 1 ug/l and 1,1-DCE 1 ug/l (assuming no additional release of contaminants to the aquifer). However, because the source of ground water contamination has not been identified, a permanent solution may not be achieved.

INSTITUTIONAL CONTROLS: State and local authorities will implement institutional controls, including ground water use restrictions, in the affected area to prevent the use of contaminated ground water during remediation.

KEYWORDS: Air Stripping; Background Levels; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; VOCs.

CRYO-CHEM, PA
Second Remedial Action
September 28, 1990

The 19-acre Cryo-chem site is a metal fabricating facility in Worman, Earl Township, Berks County, Pennsylvania. A woodland area is located northeast of the site, and an onsite stream has been identified west of the contaminant area. Between 1970 and 1982, chemical solvents were used at the facility at a rate of two to three 55-gallon drums per year. During this time, a chemical spill occurred at Cryo-chem, but cannot be definitely linked to the source of contamination. Well sampling conducted during 1985 and 1987 showed ground water contamination in monitoring and residential wells within 1 mile of the site, which led to a removal action that required the installation of activated-carbon filter units in 14 affected homes. In 1989, a Record of Decision (ROD) was signed for Operable Unit One (OU1), which provided for the installation of a new water supply well outside of the contaminant plume and hookups for all affected and potentially affected residents. This ROD addresses OU2, the treatment of the ground water and containment of the contaminant plume. A subsequent ROD will address remediation of the source of the contamination onsite (OU3). The primary contaminants of concern affecting the ground water are VOCs including PCE, TCE, DCA, DCE, and TCA.

The selected remedial action for this site includes pumping and treatment of ground water using air stripping, followed by carbon adsorption, if emissions are above Clean Air Act levels, with onsite discharge of treated water to surface water; other discharge options will be considered as necessary, including offsite discharge to a downstream wastewater treatment facility or reinjection at the site, depending on the discharge rate; and ground water and surface water monitoring. The estimated present worth cost for this remedial action is $2,065,000, which includes an annual O&M cost of $75,200 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water will be remediated to meet SDWA MCLs, or to an excess cancer-risk level of 10^{-6} or less, if no current MCL exists for a particular contaminant. Specific goals for ground water include DCE 0.007 mg/l (MCL), PCE 5 ug/l (proposed MCL), TCA 0.2 mg/l (MCL), TCE 5 ug/l (MCL). Surface water must meet Clean Water Act Federal Water Quality Criteria (FWQC) including PCE 0.8 ug/l (FWQC) and TCE 2.7 ug/l (FWQC) for both water and fish ingestion.

INSTITUTIONAL CONTROLS: No institutional controls are planned at this time. However, future need for these restrictions will be determined at the five-year review.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Onsite Discharge; PCE; Plume Management; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; Surface Water Monitoring TCE; VOCs; Water Quality Criteria.

DOVER AIR FORCE BASE, DE
First Remedial Action
September 28, 1990

The 3,734-acre Dover Air Force Base site is an active military base in Dover, Kent County, Delaware. Surrounding land use is primarily agricultural/residential, and wetlands associated with stream floodplain areas are located onsite. Since 1941, the base has operated as a military air field and has served several different functions including present day cargo operations. Hazardous waste has been generated at the base from industrial operations, fuels management, fire training, and pesticide use. These wastes have been handled in various manners since 1941, including disposal in onsite landfills and pits, use in fire training exercises, and discharge to surface drainage ditches. A 1.3-acre area referred to as Fire Training Area #3 (FT-3), located in the northeastern portion of the site, was used to conduct fire training exercises, and currently contains several waste pits, an oil/water separator, dumpsters, and an underground storage tank used during the exercises. From 1962 until 1970, contaminated waste oils and fuels were placed on an old aircraft or spread in a pit and ignited for fire training exercises in FT-3. Approximately 1,000 gallons of waste material were used per exercise, with two exercises being performed each week. In 1970, the original pit was filled in, and a new pit was excavated. Metal dumpsters were placed in the pit and waste JP-4 fuel was ignited on them during quarterly training exercises. Drainage from the pit was collected in an underground oil/water separator, and was removed from the site by a waste oil recovery contractor. An underground storage tank, used to store JP-4 fuel used in the exercises, and underground pipes, also are located near the pit. Fire training exercises ceased in 1989. Investigations in 1989 by Dover Air Force Base revealed the presence of contaminated soil in the pit area. Residual waste fuel, oil, and sludge still remain in underground piping, creating a fire and explosion hazard. This Record of Decision (ROD) addresses remediation of soil and structures within the FT-3 area. Subsequent RODs will address other sources of contamination and contaminated ground water in other site areas. The primary contaminants of concern affecting the soil, sludge, and debris are VOCs including benzene, toluene, and xylenes; metals including lead; and oils.

The selected remedial action for this site includes removing residual liquids, sludge, and solids from the underground tank, oil/water separator, and piping, and transporting these materials offsite for disposal; excavating the underground tank, oil/water separator, dumpsters, and piping, and decontaminating them using high-temperature steam cleaning equipment; disposing of the contaminated steam cleaning solution and excavated debris and structures offsite; backfilling and grading excavated areas; and placing a revegetated soil cover over the FT-3 area. The estimated present worth cost for this remedial action is $100,000, which includes a total O&M cost of $5,000 over 20 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals were not provided.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Benzene; Carcinogenic Compounds; Clean Air Act; Debris; Decontamination; Direct Contact; Excavation; Floodplain; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Oils; Onsite Disposal; RCRA; Sludge; Soil; State Standards/Regulations; Toluene; VOCs; Wetlands; Xylenes.

EAST MT. ZION, PA
First Remedial Action - Final
June 29, 1990

The 10-acre East Mt. Zion site is a privately owned, inactive landfill in Springettsbury Township, York County, Pennsylvania. The landfill is on a forested ridge along with recreational park lands and a residential subdivision. From 1955 to 1972, domestic, municipal, and industrial wastes were disposed of onsite. In 1969 and 1971, the landfill was cited for improper disposal practices and was subsequently closed by the State in 1972. In 1983 and 1988, State investigations identified several contaminants in onsite ground water and leachate. This Record of Decision (ROD) addresses the ground water contamination by inhibiting the mobility of contaminants from the landfill. The primary contaminants of concern affecting the ground water are VOCs including vinyl chloride and benzene.

The selected remedial action for this site includes capping the landfill with an impermeable multi-layer cap; constructing a passive vent system to control methane offgasses; installing surface water control systems for the cap; allowing natural attenuation to reduce ground water contamination to background levels; conducting ground water monitoring to monitor natural attenuation of contaminants; and implementing institutional controls including deed restrictions, and site access restrictions, such as fencing. The estimated present worth cost for this remedial action is $2,230,000, which includes an annual O&M cost for ground water monitoring.

PERFORMANCE STANDARDS OR GOALS: Based on ground water velocity and the elimination of the source, ground water concentrations are expected to meet background levels within five years through natural attenuation. Chemical-specific goals for ground water include benzene 5 ug/l (MCL), and vinyl chloride 2 ug/l (MCL).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit site usage.

KEYWORDS: Background Levels; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; MCLs; Metals; O&M; Onsite Containment; Safe Drinking Water Act; State Standards/Regulations; Surface Water Collection/Diversion; Venting; VOCs.

FIKE CHEMICAL, WV
Second Remedial Action - Final
September 28, 1990

The 11.9-acre Fike Chemical site is an abandoned chemical manufacturing facility in Nitro, West Virginia. The site is comprised of an 11-acre chemical plant and a 0.9-acre Cooperative Sewage Treatment plant (CST). Onsite features include several chemical production areas, process control equipment, various onsite structures, drum and waste burial areas, over 400 storage tanks, and 3 inactive waste lagoons. During operating years, the CST facility treated the sewage and industrial wastewater generated by the chemical manufacturing processes and onsite truck terminal operations. The CST facility currently treats contaminated storm water generated onsite. From 1951 to 1988, Fike Chemical manufactured more than sixty different chemicals. Hazardous wastes generated from onsite operations were discharged onsite to the nearby Kanawha River. In 1983, EPA identified onsite dioxin-contaminated soil. In addition, asbestos was found in several onsite structures and was used as insulation for onsite pipes, tanks, and cooling towers. A 1988 Record of Decision (ROD) addressed the disposal of bulk chemicals stored in onsite tanks and drums. In 1989, an Explanation of Significant Differences modified the 1988 ROD, documenting that drum contents would not be consolidated prior to disposal. In 1990, a Focused Feasibility Study (FFS) was completed by EPA to evaluate remedial alternatives for the tanks, equipment, and structures. This ROD addresses the tanks, equipment, and structures evaluated in the 1990 FFS report. Future RODs will address other onsite areas of concern including contaminated soil and sludge. The primary contaminants of concern contained in the waste/debris include organics and asbestos.

The selected remedial action for this site includes removing 5.5 tons of onsite asbestos material from various site areas; dismantling and decontaminating 400 onsite storage tanks, approximately 130 pieces of equipment, and 39 buildings and disposing of the debris offsite; treating and if necessary, discharging the decontamination fluids; and implementing site access restrictions including fencing. The estimated present worth cost for this remedial action is $2,830,000, which includes an annual O&M cost of $5,200 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Any tanks, equipment, or structure identified as a safety hazard and health risk and/or an obstacle to future investigation will be dismantled, decontaminated, if necessary, and removed to an offsite facility for disposal or salvaging. Any waste, which cannot be treated onsite will be removed to an offsite facility for treatment.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Asbestos; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; RCRA; State Standards/Regulations.

GREENWOOD CHEMICAL, VA
First Remedial Action
December 29, 1989

The five-acre Greenwood Chemical site is a former chemical plant in Newton, Virginia. Adjoining lands to the east, west, and south are used for rural, residential, and agricultural purposes, and the Blue Ridge Mountain Range bounds the site to the north. Ground water is used by all persons within a three-mile radius for drinking water purposes. The closest residential well is within 400 feet of the site, and the closest downgradient well is approximately 2,500 feet from the site. The chemical plant was used primarily for the production of industrial, pesticide, pharmaceutical, and photographic products from 1947 until 1985, and produced waste solvents including listed RCRA F002 and F005 wastes. Plant operations were terminated in April 1985, after a toluene fire killed four employees. Contaminated areas at the site include seven lagoons used to store wastewaters generated during plant operations, and a buried drum area. To mitigate threats due to contamination, EPA emergency response activities were conducted between 1987 and 1988. These activities included removing surface drums and other stored chemicals; excavating lagoon sludge from three lagoons and stabilizing the underlying soil before disposing of the treated soil onsite in a lined vault constructed in one of the lagoons; and capping a lagoon. This operable unit addresses approximately 1.5 acres of the most contaminated portions of the site including the contaminated soil associated with three of the former lagoons, a backfilled lagoon now referred to as the backfilled area, and contained chemicals in the buildings. A second operable unit will address the remainder of the site including additional soil and sediment, and ground water underlying and downgradient of the contaminated soil. The primary contaminants of concern affecting the soil are VOCs including benzene, PCE, and TCE; other organics including PAHs; metals including arsenic; and other inorganics including cyanide.

The selected remedial action for this operable unit includes excavation and offsite incineration of approximately 4,500 cubic yards of contaminated soil, backfilling with clean soil, and revegetating; removal of chemicals stored in onsite buildings; and surface water collection/diversion during remedy implementation. The estimated present worth cost for this remedial action is $8,787,900. There are no O&M costs associated with the remedial action for this operable unit.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil will be excavated to levels where leachate contamination will not raise ground water levels above the associated MCLs, WQC, or health-based criteria. For individual contaminants in the soil, the cleanup goals and associated target criteria include benzene 0.83 mg/kg, TCE 0.13 mg/kg, PCE 0.07 mg/kg, and PAH 5,000 mg/kg. The cleanup level for arsenic was set at 25 mg/kg, based on a non-lethal excess lifetime cancer risk of 10^{-5}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Closure; Clean Water Act; Direct Contact; Excavation; Filling; Incineration/Thermal Destruction; Inorganics; MCLs; Metals; Offsite Disposal; Offsite Treatment; Organics; PAHs; PCE; RCRA; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water Collection/Diversion; TCE; VOCs.

HRANICA LANDFILL, PA
First Remedial Action
June 29, 1990

The 15-acre Hranica Landfill site is an inactive landfill 21 miles north of Pittsburgh, in Butler County, Pennsylvania. The site is in a rural agricultural setting with 4,000 people residing within a two-mile radius of the site. Between 1966 and 1974, both municipal and industrial wastes were accepted onsite including paint and solvent wastes, plating wastes, metal sludge, and waste oils. The wastes were incinerated and/or stored onsite in surface impoundments until 1981. Liquid wastes were then directly discharged into surface impoundments causing ground, surface, and soil cover contamination. The surface impoundments were subsequently abandoned and the wastes were then openly burned. The residual ash from the incineration process was stored onsite in unprotected piles. Numerous drums of unprocessed wastes were also staged onsite without further treatment. In 1983, removal activities were performed which included removing and disposing of more than

19,000 drums and 4,000 cubic yards of contaminated soil; incinerating oil and paint sludge and consolidating the incinerator ash onsite; and capping the site. Although the removal action reduced the extent of the contamination, further site studies revealed elevated levels of contamination in the ash pit area, the landfill, and the former drum storage areas. This first operable unit Record of Decision addresses the soil contamination in the ash pile area and other areas where the lead concentration exceeds the background range. The primary contaminant of concern affecting the soil is lead.

The selected remedial action for this site includes repairing the 29,000-square foot ash pile cover, capping other areas where lead contamination exceeds 300 mg/kg; monitoring ground water and surface water; implementing site access restrictions and institutional controls including land and ground water use and deed restrictions; and performing a ground water verification study to determine whether any ground water remediation is necessary. The estimated present worth cost for this remedial action is $1,037,000, which includes an annual O&M of $81,450 for year 0-1 and $30,550 for years 2-30.

PERFORMANCE STANDARDS OR GOALS: By repairing the ash cover and capping the lead-contaminated areas exceeding lead 300 mg/kg, the remedial action will reduce the Hazard Index to below the target of 1.

INSTITUTIONAL CONTROLS: Deed restrictions including water and land use restrictions will be implemented.

KEYWORDS: Background Levels; Capping; Carcinogenic Compounds; Direct Contact; Closure Requirements; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Onsite Containment; RCRA; Soil; State Standards/Regulations; Surface Water Monitoring.

KEYSTONE SANITATION LANDFILL, PA
First Remedial Action
September 30, 1990

The 40-acre Keystone Sanitation Landfill site, an inactive, privately owned landfill, is in Union Township, Adams County, Pennsylvania. Surrounding land use is primarily agricultural with scattered residences. From 1966 to 1990, the unlined landfill accepted household and municipal wastes as well as industrial and construction debris, including phosphorus-contaminated sand, potato sludge, resin sludge, incineration ash, and dried latex paint. The volume of non-homogeneous waste at the site currently is 1.7 million cubic yards. In 1982, State investigations revealed onsite ground water contamination and a contaminated onsite residential well attributable to leachate from the landfill contents. In 1984, EPA found low-level contamination in nearby residential wells. As a result of the ground water contamination, EPA ordered Keystone to install an onsite spray irrigation system and a leachate collection system to prevent migration of contaminants offsite. This Record of Decision (ROD) addresses Operable Unit 1 (OU1), the containment of onsite source area and remediation of onsite contaminated ground water. A subsequent ROD will address offsite ground water contamination in monitoring and residential wells (OU2). The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, and vinyl chloride; other organics including acids and phenols; and metals including chromium and lead.

The selected remedial action for this site includes excavating approximately 4,150 cubic yards of contaminated surface soil with consolidation of the soil in the landfill; placing a cap on the landfill and subsequent revegetation; installing an active gas extraction system to collect gases emitted from the landfill; pumping and treatment of ground water using equalization, flocculation/precipitation, filtration, ion exchange, air stripping, and filter press technologies, followed by offsite disposal of any sludge produced by these processes; discharging the treated water onsite to a surface stream; monitoring ground water, surface water, and sediment; installing an in-home water treatment system for the onsite resident; and implementing site access restrictions and institutional controls, including deed, land use, and ground water restrictions. The estimated present worth cost for this remedial action is $9,156,950, which includes an annual O&M cost of $217,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific cleanup goals were stated in the ROD. For carcinogenic compounds,

cleanup goals were established to reduce the excess lifetime cancer risk to 10^{-4} to 10^{-6}. For non-carcinogenic compounds, the goal is a Hazard Index (HI) equal to 1 or less. Individual ground water remediation standards are based on the more stringent of SDWA MCLs or non-zero MCLGs, or State background levels. If these levels cannot be met, the ROD will be amended.

INSTITUTIONAL CONTROLS: Deed, land use, and ground water use restrictions will be implemented.

KEYWORDS: Acids; Air Stripping; Background Levels; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Phenols; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria.

LORD SHOPE LANDFILL, PA

First Remedial Action - Final
June 29, 1990

The 25-acre Lord Shope Landfill site is an inactive hazardous waste landfill in Girard Township, Erie County, northwestern Pennsylvania. The site consists of a 4-acre landfill and adjacent areas of contaminated soil, surface water and ground water. The surrounding area is primarily agricultural and residential, with two unnamed tributaries of Elk Creek bordering the site to the north and west. From the mid-1950s to 1979, industrial wastes, including spent adhesives, degreasing solvents, acids, caustics, and some drummed wastes were disposed of onsite from nearby facilities. During 1982 and 1983, responsible parties, under an agreement with the State, implemented a remedial alternative, which included removing 81 exposed drums, capping the landfill, and installing a low permeability ground water cutoff wall to reduce leachate production from the landfill and to divert ground water flow around the site. Landfill leachate has, however, resulted in VOC and inorganic ground water contamination both beneath and to the north of the landfill, with a contaminant plume migrating towards the north. Surface soil around the landfill has also been found to contain elevated levels of VOCs. The primary contaminants of concern affecting the landfill material, surrounding soil, and ground water are VOCs including benzene, PCE, and TCE; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes in-situ vapor stripping using vacuum wells to volatize and remove VOCs from the landfill material and the surrounding soil; collection and treatment of gas emissions generated by the vapor stripping process using carbon filtration; ground water pumping and treatment including pretreatment for metal removal, followed by air stripping, to halt plume migration, with final discharge of treated ground water into the nearby surface tributaries; implementation of site access restrictions and institutional controls including ground water use restrictions. The estimated present worth cost for the remedial action is $5,760,000, which includes an annual O&M cost of $420,000 for years 0-2, and $310,000 for years 3-50.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil criteria for the landfill material and the surrounding soil were not provided, but will be determined during the remedial design and will be based on soil contaminant levels that will not significantly impact the underlying ground water. Ground water cleanup goals will meet SDWA MCLs or proposed MCLs (PMCLs), and a 10^{-4} excess cancer risk or a Hazard Index = 1. Target ground water cleanup levels include PCE 5 ug/l (PMCL), TCE 5 ug/l (MCL), benzene 5 ug/l (MCL), arsenic 20 ug/l (based on an excess cancer risk of 10^{-4}), chromium 50 ug/l (MCL), and lead 15 ug/l (risk-based calculation). Ground water goals will be revised to meet background levels in accordance with State ARARs. Air emissions from the air stripping of the ground water treatment system and the gas released from the in-situ vapor stripping process will be treated to meet State standards.

INSTITUTIONAL CONTROLS: Ground water use restrictions will be implemented to prevent permitting and construction of ground water wells in the contaminated plume area.

KEYWORDS: Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Ground Water; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs.

M.W. MANUFACTURING, PA
Second Remedial Action
June 29, 1990

The 15-acre M.W. Manufacturing site is a former copper recovery facility in Montour County, Pennsylvania, two miles north of Danville. The Pennsylvania Department of Transportation (PennDOT) maintains a storage area immediately north of the site, and farmlands and wooded lots are adjacent to the site on the west and south. Mauses Creek flows in a southerly direction past the site. Several private residences, motels, gas stations, restaurants, and a Head Start school are located just north of the Penn DOT storage area and rely on private ground water wells for drinking water. From 1966 to 1972, M.W. Manufacturing was engaged in secondary copper recovery from scrap wire, using both mechanical and chemical processes. Granular carbon wastes generated by the chemical process were dumped onsite, and spent solvents and acids were allegedly disposed of onsite. In 1972, M.W. Manufacturing filed for bankruptcy and the Philadelphia National Bank acquired the property. Warehouse 81, Inc., acquired the site in 1976 and unsuccessfully attempted to recover copper from the large waste piles of fluff material (fibrous insulation materials contaminated with metals and solvents). The initial remedial investigation revealed several areas posing potential threats to public health: the carbon waste pile, four wire-fluff waste piles, a surface impoundment, a buried lagoon, and contaminated soil, drums and storage tanks. A 1989 remedial action addressed the concerns for direct contact with, and migration of contaminants from, the carbon waste pile by excavating the carbon waste pile and incinerating the waste offsite. This second remedial action addresses the remaining principal threats at the site by treating the onsite waste and contaminated soil. A subsequent remedial action will address possible remediation of contaminated ground water and offsite soil, sediment, and surface water contamination. The primary contaminants of concern affecting the soil, debris, and lagoon water are VOCs including PCE and TCE; other organics including PCBs; and metals including lead.

The selected remedial action for this site includes excavation and onsite incineration of approximately 32,000 cubic yards of fluff waste, followed by stabilization of the lead-contaminated ash and offsite disposal of residual ash; excavation and onsite incineration of approximately 13,000 cubic yards of contaminated soil, followed by onsite stabilization, as necessary, before offsite disposal; backfilling and capping the soil (landfill closure) under the fluff waste piles; covering the soil not under the fluff piles using hybrid closure (topsoil cover and revegetation); onsite treatment of approximately 86,000 gallons of lagoon water using carbon adsorption and metal removal, followed by onsite discharge to surface water; and onsite incineration of approximately 40 cubic yards of waste contained in tanks and drums, followed by stabilization of the ash and offsite disposal; and ground water monitoring. The estimated present worth cost for this remedial action is $35,950,000, which includes an estimated annual O&M cost of $39,000 and an additional estimated $20,000 every 5 years.

PERFORMANCE STANDARDS OR GOALS: Action levels have been established for soil/waste based on a 10^{-6} cancer risk level or an HI of 1.0, where technically feasible. If soil cannot be feasibly cleaned to the 10^{-6} risk level (e.g., excessive volume of contaminated soil in one particular area onsite), cleanup will reduce the additional incremental risk to the ground water to 10^{-4} levels or to MCLs, whichever are more stringent. Chemical- specific cleanup levels for soil, fluff waste, and drummed and tanked wastes were provided for eight indicator contaminants including PCE, TCE, PCB, and lead.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Closure Requirements; Debris; Dioxin; Direct Contact; Excavation; Ground Water Monitoring; Hybrid/Alternate Closure; Incineration/Thermal

Destruction; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PCBs; PCE; RCRA; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Treatment; TCE; Treatability Studies; Treatment Technology; VOCs.

OSBORNE LANDFILL, PA
First Remedial Action
September 28, 1990

The 15-acre Osborne Landfill site is an inactive abandoned coal strip mine in Pine Township, Mercer County, Pennsylvania. The site is in a semi-rural area with a large natural pond, woodlands, and wetlands bordering the site to the west. The shallow Clarion aquifer is present east of the strip mine highwall. The portion of the aquifer that formerly overlaid the site was excavated during stripping activities. After the mine was abandoned, the strip mine pit filled with ground water. From the late 1950s to 1978, contaminated spent foundry sand and other industrial and municipal wastes were disposed of into the pit. Other wastes including trash and drums containing solvents, wastewater, and coolants, were disposed of onsite, gradually filling the strip mine and displacing the water. The site holds an estimated 233,000 cubic yards of fill material. In 1983, Cooper Industries, an operator of the site, removed approximately 600 drums of waste and 45 cubic yards of soil from the site and installed a fence to restrict site access. EPA has divided the remedial action into five operable units. Operable Unit 2 (OU2), which addresses contaminated wetland sediment, and OU5, which addresses the contaminated Homewood aquifer will be implemented in a subsequent Record of Decision (ROD). This ROD addresses the remaining three operable units. OU1 addresses solid waste fill material including foundry sand and other onsite pond sediment, OU3 addresses leachate associated with the onsite water table, and OU4 addresses the Clarion aquifer. The primary contaminants of concern affecting the sediment and ground water are VOCs including benzene and TCE; other organics including PCBs and PAHs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site is comprised of three operable units. The primary remedy for OU1 includes constructing a slurry wall barrier around the perimeter of the fill, constructing a clay cap over the fill material, ground water pumping and treatment using equalization, pH adjustment, chemical precipitation, clarification, sand filtration, and carbon adsorption, followed by injection into the onsite mine pit; offsite disposal of ground water treatment residues; ground water monitoring; and implementing institutional controls including deed restrictions. A contingency remedy for OU1 will be implemented if performance standards cannot be met during the pre-design stage of remedy implementation and includes regrading the site, excavating and placing solid waste in a RCRA Subtitle-C onsite landfill; long-term ground water monitoring; and implementing institutional controls. If the primary remedy for OU1 is implemented, no additional action, other than the primary OU3 remedy of ground water monitoring, is necessary for OU3. If the contingency remedy for OU1 is implemented, the contingency remedy for OU3 also must be implemented. The contingency remedy for OU3 includes dewatering the site during excavation; isolating the fill area from the onsite mine pools; treating the ground water using equalization, clarification, and sand filtration for solids removal, and carbon adsorption for organics removal, followed by onsite discharge; and ground water monitoring. The selected remedy for OU4 includes pumping and treatment of ground water in the Clarion Formation using air stripping, onsite air emissions treatment, onsite injection of treated ground water, and ground water monitoring. The estimated present worth cost for the primary remedies is $18,681,000 with an annual O&M cost of $904,000 for 30 years. If the contingency remedies are implemented, the estimated present worth cost is $17,811,000, which includes an annual O&M cost of $940,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The selected source remedy will not reduce the current level of contamination in the fill area, but will maintain an average PCB concentration level of 23 mg/kg. EPA's PCB Spill Cleanup Policy for a reduced access area is met by this alternative. Ground water contaminants will be remediated to the following background levels: TCE 0.2 ug/l, benzene 0.2 ug/l, PCBs 1 ug/l, chromium 50 ug/l, lead 15 ug/l, and arsenic 22 ug/l. If any ground water contaminants exceed SDWA MCLs or MCLGs, the remedy will continue until these goals are met.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to reduce exposure to the site. The State has required that mining within a 1/2-mile of the site be restricted.

KEYWORDS: Air Stripping; Arsenic; Background Levels; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Contingency Remedy; Direct Contact; Drinking Water Contaminants; Excavation; Offsite Disposal; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; MCLGs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Slurry Wall; Solvents; State Standards/Regulations; TCE; Toxic Substances Control Act; VOCs.

RAYMARK, PA
First Remedial Action
September 28, 1990

The 7-acre Raymark site is an active metal manufacturing and electroplating plant in the Borough of Hatboro, Montgomery County, Pennsylvania. The site is in an industrial area and is approximately 100 feet from the nearest residence. The nearest surface water is Pennypack Creek, which flows 4,000 feet southwest of the site. As part of the rivet manufacturing process at the plant, VOCs, including 30 to 40 gallons of TCE, were used daily at the site to clean and degrease metal parts. In 1979, when EPA discovered TCE in the Hatboro public water supply wells, the Hatboro Borough Water Authority removed these wells from operation, and supplemented the water supply using an interconnection with a neighboring water company. Further EPA site investigations from 1980 to 1987 identified TCE in soil and other wells onsite and adjacent to the property and seem to indicate that contaminants from the site may have been at least a contributing source of contamination in the downgradient public water supply wells. Other chemical contaminants identified in samples from the public water supply wells, including TCA, did not seem to originate at the site, thus indicating several distinct sources for this contamination. In 1987, the site owners agreed to install ground water treatment units with air stripping towers, and, as necessary, air emission control units, at two Hatboro public supply wells to return these to routine operation. This Record of Decision (ROD) addresses contaminated drinking water and ground water, which are referred to as Operable Units 2 and 3 (OU2 & OU3), respectively. The soil/source contamination (OU1), will be addressed in a subsequent ROD. The primary contaminants of concern affecting the ground water are VOCs including TCE and PCE.

The selected remedial action for this site includes continuing the operation and maintenance of the Hatboro public supply and the existing air stripping towers at the wells and the installation of new vapor phase carbon adsorption units; completing a ground water remedial design study to determine the number, location, and construction of new extraction wells with corresponding installation and implementation; onsite pumping and treatment of ground water with air stripping and vapor phase carbon adsorption units with onsite discharge to Pennypack Creek; and implementing institutional controls. The estimated present worth cost for this remedial action is $2,700,000, which includes an annual O&M cost of $125,000.

PERFORMANCE STANDARDS OR GOALS: The ground water will be remediated until contaminant levels reach SDWA MCLs, non-zero MCLGs, or background levels, whichever are more restrictive. The residual excess cancer risk resulting from site-related contamination will be reduced to a 10^{-6} level and non-carcinogenic levels will be reduced to a Hazard Index = 1. Chemical-specific standards for ground water include TCE 5 ug/l (MCL) and PCE 5 ug/l (proposed MCL). Additional still-undefined, aquifer contamination at the site may make it technically impracticable to attain these levels, and if so, an ARAR waiver will be enacted and the ROD amended.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to restrict access to the contaminated aquifer.

KEYWORDS: Air Stripping; Background Levels; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls;

MCLs; MCLGs; O&M; Onsite Discharge; PCE; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatment Technology; VOCs.

SAND, GRAVEL AND STONE, MD
Second Remedial Action
September 28, 1990

The 200-acre Sand, Gravel and Stone site is a former sand and gravel quarry three miles west of the town of Elkton, in Cecil County, Maryland, along a tributary to Mill Creek. Surface water in Mill Creek eventually flows to the Elk River and the Chesapeake Bay. Beginning in 1969, hazardous materials were disposed of onsite. In 1974, a pool of chemical waste burned in an onsite fire, the cause of which has yet to be determined. Subsequently, 200,000 gallons of this liquid waste were removed to an offsite landfill and the remaining drums and sludge were buried onsite in two excavated pits (eastern and western). The site has been separated into three operable units (OUs). A 1985 Record of Decision (ROD) addressed OU1, the remediation of shallow ground water contamination near the eastern excavated pit, source control (i.e., removal of buried drums), and site access restrictions. This ROD focuses on OU2, the threat posed by soil and ground water contamination migrating from the eastern portion of the site, including remediation of ground water contamination in the lower aquifers if needed, and evaluation of contaminant sources near the western excavation pit. Soil sampling analyses and geophysical studies now show that there are no unacceptable risks associated with soil in the western area of the site. A future ROD will address OU3, the contaminated soil, source control, final site closure, and post-closure operation and maintenance activities. The primary contaminants of concern affecting the ground water are VOCs including benzene, TCE, toluene and xylenes; and metals.

The selected remedial action for this site includes onsite and offsite ground water monitoring. If this monitoring data demonstrate that remediation is required, ground water may be treated either onsite, or offsite at point of use, and bottled water will be supplied to affected residences and businesses. The onsite treatment system installed as a result of the first remedial action would be expanded and modified, as necessary, to treat the ground water in the lower aquifer. Treatment measures may utilize granular activated carbon, air stripping, ion exchange, or any combination of these techniques. The estimated present worth cost of this remedial action ranges from $702,000 to $7,125,000, depending on the extent and nature of treatment required, and an annual O&M cost ranging from $102,000 to $625,900 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Action levels that will trigger the implementation of onsite and/or offsite ground water treatment include concentrations of chemicals of concern in excess of MCLs, a cumulative carcinogenic risk in excess of 10^{-4}, or a non-carcinogenic Hazard Index greater than 1.0.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ACL; Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatment Technology; VOCs; Wetlands; Xylenes.

TYSON DUMP #1, PA
Third Remedial Action
September 28, 1990

The 4-acre Tyson Dump #1 site is an abandoned septic and chemical waste disposal area in Upper Merion Township, Montgomery County, Pennsylvania. The site consists of a series of abandoned unlined lagoons in a former sandstone quarry, and is bordered by unnamed tributaries to the Schuylkill River on the east and west, and a railroad switching yard to the north. Beyond the railroad yard is a floodplain/wetlands area and the Schuylkill River, which flows southeast toward Philadelphia. The river is the main source of drinking water in the area. Barbadoes Island lies in the center of the river in the site vicinity and is used as an electrical substation. From 1960 until 1973, the privately owned site was used for the disposal of liquid septic tank wastes, sludge, and chemical wastes that were hauled onsite in bulk tank trucks. In 1973, the

State ordered the site owner to close the facility. In 1983, EPA required that immediate removal measures be taken, including constructing a leachate collection and treatment system with drainage controls, covering the site, and implementing site access restrictions. In 1984, the first Record of Decision (ROD) for the site was issued for Operable Unit 1 (OU1), which documented a remedy that included excavation and offsite disposal of lagoon materials. In 1988, a second ROD was signed, which documented a remedy for treating the ground water contamination under the offsite areas (OU2), including the railroad yard and wetlands areas, using steam stripping followed by liquid-phase carbon adsorption as a polishing step. This third ROD addresses OU3, the further remediation of the contaminated ground water that has migrated under the Schuylkill River. Additional ground water investigations will be conducted on the north side of the river, and based on the results, a fourth operable unit may be identified. The primary contaminants of concern affecting the ground water are VOCs including toluene and xylenes.

The selected remedial action for this site includes installing additional recovery wells on the south bank of the Schuylkill River and on Barbadoes Island, followed by treating the contaminated ground water at the existing treatment facility on the south bank of the river; expanding the capacity of the existing treatment facility; investigating hydrogeologic conditions on the north side of the river to assess environmental impact and the need for additional RODs; and implementing institutional controls to restrict ground water use. The estimated present worth cost for this remedial action is $10,100,000, which includes an annual O&M cost of $834,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Discharge limits for treated ground water were calculated by the State based on risk factors, dilution within the river, and State and Federal standards. These limits are toluene 1.52 mg/l (based on a chronic WQC of 0.33 mg/l) and xylenes 0.97 mg/l (based on an MCL of 10.0 mg/l).

INSTITUTIONAL CONTROLS: Ground water use on Barbados Island and on the north side of the river within the contaminated ground water plume will be restricted.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Onsite Discharge; Onsite Treatment; Plume Management; State Standards/Regulations; Toluene; VOCs; Wetlands; Xylenes.

U.S. TITANIUM, VA

First Remedial Action - Final
November 21, 1989

The 175-acre U.S. Titanium site, in Nelson County, Virginia, is a former titanium dioxide manufacturing plant which was operated from 1931 to 1971. The facility has had a succession of owners and is currently owned by U.S. Titanium Corporation. Approximately 50 acres of the site will be addressed by this remedial action, including seven waste storage areas containing process wastes. These seven areas include: Area 1, a burial pit containing 16,000 cubic yards of solid ferrous sulfate (copperas); Area 2, a former copperas stockpile area; Area 3, an evaporation pond; Area 4, a 1-acre ore waste pile; Area 5, sedimentation ponds containing fine-grained sediment composed of unreacted ore, filter cake, and gypsum; Area 6, a settling pond used to recover phosphate ore; and Area 7, a drainage area, which received surface water runoff. Several of these areas lie within the 100-year floodplain of the nearby Piney River. After a large fish kill in 1979, the State ordered U.S. Titanium to bury the copperas waste from Area 2 by December 1980. The copperas waste was collected and buried in Area 1, the onsite burial pit. A supplemental remedial investigation revealed the presence of acidified soil underlying the waste storage areas that contributes to ground water contamination. The primary contaminants of concern affecting the soil, ground water, and surface water are metals including arsenic and chromium; and other inorganics including acids.

The selected remedial activities for the seven areas within this site include: Area 1, in-situ dissolution of copperas waste and treatment of resulting leachate using physical and chemical processes; Areas 2, 3, 4, and 5, diversion of surface water flow using drainage controls followed by revegetation; and Area 7, excavation and neutralization of acidified soil, followed by placement of the mixed material

around a wetland that will be constructed onsite. Area 6 requires no remedial action. Ground water will be collected passively using subsurface drains and trenches and treated passively in an oxidation/settling pond, a constructed wetland, and a limestone neutralization bed. The oxidation/settling pond will be capable of completely removing iron and sulfur elements from the collected ground water and will make up for any loss in the performance of the wetland. Wetland vegetation and anaerobic bacteria will remove iron and sulfur species from the water. As a result of this process, an increase in pH can be expected. The limestone bed will act as a final polishing step for pH adjustment before the effluent is discharged to the Piney River. The estimated present worth cost for this remedial action is $5,895,000, which includes present worth O&M costs for 30 years.

PERFORMANCE STANDARDS OR GOALS: Action levels for in-situ dissolution and leachate collection for Area 1 will ensure that leaching of contaminants to ground and surface waters will not exceed State water quality standards which include arsenic 0.19 mg/l and chromium 0.011 mg/l. Effluent limits for discharge from the ground water treatment system into the surface water include iron 97,583 mg/l and pH ranging from 6.0 to 9.0

INSTITUTIONAL CONTROLS: Local deed restrictions may be implemented to prohibit excavation at any of the contaminated areas and at the wetland area that will be constructed onsite. Site access restrictions will also be implemented around the wetland.

KEYWORDS: Acids; Arsenic; Capping; Chromium; Excavation; Floodplain; Ground Water; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Leachability Tests; Leachate Collection/Treatment; Metals; O&M; Offsite Discharge; Onsite Discharge; Onsite Treatment; Soil; Soldification/Stabilization; State/Standards/Regulations; Surface Water; Treatment Technology.

WALSH LANDFILL, PA
First Remedial Action
June 29, 1990

The 7-acre Walsh Landfill site encompasses an approximately 1.5-acre landfill and surrounding area in a heavily wooded region of Honeybrook Township, Chester County, Pennsylvania. The landfill reportedly received mixed municipal and industrial wastes for disposal between 1963 and 1976, although State investigations in 1979 revealed that disposal of hazardous waste at the site had resumed after that period. Investigations by the State revealed the presence of fifteen to twenty drums containing various hazardous substances, including VOCs. Fumes from the drums reportedly sickened local residents, and organic and inorganic compounds were detected in monitoring wells and private wells. In addition to waste disposal, open burning of material was conducted in the southeastern portion of the landfill. Residential well sampling from 1987 through 1989 resulted in an interim remedial measure in 1989 to provide bottled water to 44 residences. Currently, the site is being operated as a solid waste transfer station and salvage yard, and operations are increasing the volume of landfill/junkyard debris, and the overall size of the site. This Record of Decision (ROD) addresses final source control for the landfill and allows for expedited action on the contaminated drinking water supply. A second ROD will address the contaminated ground water. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, PCE, and TCE; other organics including PAHs; and metals including arsenic and lead.

The selected remedial action for this site includes removal of bulky items and debris from the landfill surface for resource recovery, followed by construction of an approximately 5.2-acre landfill cap; provision of an alternate water supply to approximately 50 residences by extending the municipal water system; ground water monitoring; and implementing institutional controls including land use, ground water use, and deed restrictions, and site access restrictions. The estimated present worth cost of this remedial action is $3,768,000, which includes an estimated annual O&M cost of $63,090 for 25 years except years 5, 10, 15, 20, and 25, which will have an estimated O&M cost of $108,950 due to the five-year reviews.

PERFORMANCE STANDARDS OR GOALS: Provision of an alternate water supply will ensure availability of water meeting SDWA MCLs.

INSTITUTIONAL CONTROLS: Institutional controls including land use, ground water use, and deed restrictions will be implemented.

KEYWORDS: Alternate Water Supply; Arsenic; Benzene; Capping; Carcinogenic Compounds; Closure Requirements; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Containment; Organics; PAHs; PCE; Sediment; Soil; State Standards/Regulations; TCE; VOCs.

WESTLINE, PA
First Remedial Action (Amendment)
March 30, 1990

The Westline site is a former chemical plant in the rural community of Westline, LaFayette Township, McKean County, Pennsylvania. The site is situated along Kinzua Creek and is completely surrounded by the Allegheny National Forest. From 1901 to 1952, the Day Chemical Company plant was operated to convert lumber to charcoal, methanol, and acetic acid. The Day Chemical Company deposited tar material containing phenolic compounds and PAHs into onsite lagoons and into small canals to allow the tar material to migrate downhill towards the banks of Kinzua Creek. In 1983, EPA conducted an immediate removal action to remove 2,000 tons of tar and contaminated soil from the largest lagoon of tar deposits. Although a 1986 Record of Decision (ROD) addressed the remediation of an additional 2,340 tons of tar and soil found in an onsite tar pit and in some of the interpersed tar deposits along Kinzua Creek, there was still an estimated 4,000 tons of tar material left at the site in the areas planned for excavation. Most of the remaining tar, however, is three feet below the surface and is not a dermal contact threat. Based on an updated risk assessment using more recent risk criteria for PAHs, EPA has determined that the residual soil and tar material presents no potential carcinogenic risk greater than the range of acceptable risks found at other Superfund sites and will thus discontinue excavating soil and tar material. This ROD amends a July 1986 ROD, which called for the excavation and offsite incineration and disposal of waste tar from an onsite tar pit and the interspersed tar deposits along Kinzua Creek. There are no longer any primary contaminants of concern affecting the soil at the site.
The selected remedial action for this ROD amendment is no further action. Because some tar material will remain onsite, EPA will monitor the site to prevent unacceptable exposure from the waste tar, and a five-year review will be scheduled. No costs were specified for this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy; ROD Amendment.

RECORDS OF DECISION ABSTRACTS
REGION 4
(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)

62nd STREET DUMP, FL
First Remedial Action - Final
June 27, 1990

The 5-acre 62nd Street Dump site is an inactive industrial waste disposal area in Tampa, Hillsborough County, Florida. Several marsh areas and a series of fish breeding ponds lie adjacent to the site. Surrounding land use is mixed light industrial and residential. The site overlies a series of sedimentary rock aquifers, which are currently used as drinking water sources. In the mid-1970s, the site was used as a sand borrow pit. After this operation halted, industrial wastes, including auto parts, batteries, and kiln dust were dumped onsite. Industrial dumping ceased in 1976, but unauthorized onsite dumping of construction materials and household garbage continued. In 1976, fish kills occurred in the adjacent ponds, which lead to site investigations in 1979 and 1980 by private groups. Based on these investigations, the contamination was determined to be the result of waste material leaching from the landfill. Several additional investigations were conducted from 1983 to 1989 to identify and further characterize contaminant sources and contaminated media. This Record of Decision (ROD) addresses source remediation and onsite and offsite ground water contamination. The primary contaminants of concern affecting the soil, debris, and ground water are organics including PCBs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes dewatering and excavating approximately 48,000 cubic yards of contaminated soil and non-cement debris, followed by onsite treatment using solidification/stabilization, and placing the treated material onsite within the original dump area; capping the site with an impermeable membrane and vegetative soil cover; pumping and onsite treatment of contaminated ground water using chromium reduction, flocculation, sedimentation, and filtration, followed by offsite discharge to a publicly owned treatment works (POTW) or onsite discharge to surface water; disposing of residual sludge onsite; monitoring ground water; and implementing institutional controls including land use restrictions. The estimated present worth cost for this remedial action is $16,460,000, which includes an estimated present worth O&M cost of $690,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Federal MCLs were chosen as cleanup standards for ground water. Chemical-specific goals include chromium 50 ug/l (MCL) and lead 15 ug/l (proposed MCL). Soil cleanup criteria were chosen as the more stringent of health-based criteria or values calculated from a leachate model. Chemical-specific goals for soil include PCBs 0.33 mg/kg, arsenic 3.5 mg/kg, chromium 8.8 mg/kg, and lead 17.4 mg/kg.

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented at the site.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/Regulations; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

BYPASS 601 GROUNDWATER CONTAMINATION, NC
First Remedial Action
August 31, 1990

The Bypass 601 Groundwater Contamination site, is in Concord, Cabarrus County, North Carolina. One of the potential sources of onsite contamination is the 13-acre Martin Scrap Recycling Facility (MSR) facility, an inactive battery salvage and recycling operation.

Ground water at the site has also been found to be contaminated with heavy metals by several unknown sources. The MRS Facility consists of two tracts of land; the larger tract includes a main facility that was used for lead reclamation activities; and the second lot encompasses the floodplain area. The immediate area surrounding the MSR Facility is commercial, light industrial and residential with 1,400 persons residing within a 3-mile radius of the site. The Main Facility is comprised of several lead-contaminated buildings including a scale house, several garages and sheds, as a result of onsite battery cracking operations. Contaminated debris including old tanks, drums, wires, casings, and trash is spread throughout the Main Facility area. The southeastern corner of the Main Facility has been backfilled with cracked battery casings to a depth of 20 feet. Approximately 57,000 cubic yards of lead-contaminated soil remains onsite from previous battery salvage activities. A 1984 EPA site investigation found high levels of metals in nearby wells. This Record of Decision (ROD) addresses Operable Unit 1 (OU1), which will contain the source contamination from the MSR facility to minimize the continued degradation of ground water and surface water. Subsequent RODs will address the final action and remediation of other onsite contaminant sources (OU2) and ground water contamination (OU3). The primary contaminants of concern affecting the soil and debris are metals including chromium and lead.

The selected remedial action for this site is an interim action, which includes demolishing and disposing of debris from four onsite buildings; excavating and consolidating the contaminated surface soil; regrading the site, covering with area with 6 inches of clean fill, covering the soil with a HPDE liner, with 18 inches of drainage soil and 6 additional inches of clean topsoil; revegetating the area; backfilling excavated areas, realigning an adjacent stream to minimize the erosion of the cap; maintaining the soil cover; and enacting public awareness programs; and implementing institutional controls including deed restrictions and site access restrictions including fencing. The present worth cost for this remedial action is $738,821, which includes an annual O&M cost of $9,700.

PERFORMANCE STANDARDS OR GOALS: Soil contaminated with lead will be remediated to 500 mg/kg (EPA Interim Guidance).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Direct Contact; Excavation; Filling; Floodplain; Institutional Controls; Interim Remedy; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Soil; State Standards/Regulations.

CABOT/KOPPERS, FL
First Remedial Action - Final
September 27, 1990

The 99-acre Cabot/Koppers site is a pine tar and charcoal generation facility in Gainesville, Alachua County, Florida. The site is underlain by shallow and intermediate aquifers. Land in the site vicinity is used for commercial and residential purposes. The site is comprised of 2 distinct areas, the inactive Cabot Carbon property to the southeast, and the industrial zoned and currently operating Koppers area to the west. North Main Street borders the entire site to the west as does a drainage ditch, which drains into nearby Springstead and Hogtown creeks. Pine tar and charcoal generation operations began at the Cabot Carbon facility in the early 1900s and generated a large number of blended solvents as by-products. Resultant wastewaters were treated onsite in a lagoon. The Koppers portion of the site has been operated since 1916 as a wood preserving operation, primarily for utility poles and timbers. The main processing facilities at the Koppers area include a tank farm, a former cooling water pond, cylinder drip tracks, a wastewater management system comprised of a north and south lagoon, a wood shavings pile, and drying kilns. Between 1980 and 1989, various site investigations by the State, EPA and private parties identified soil contamination in the three lagoons, the inactive cooling pond, the drip tracks, and a wood shavings pile. Ground water contamination also was identified in both the onsite shallow and intermediate aquifers. In addition, in 1986 the State identified organics and heavy metal contamination in offsite soil west of the site. This Record of Decision (ROD) addresses contaminated onsite soil and ground water. The primary contaminants of concern affecting

the soil and ground water are VOCs including benzene; other organics including oils, phenols, and PAHs; and metals including arsenic and chromium.

The selected remedial action for this site includes excavating 6,400 cubic yards of onsite contaminated soil from the north and south Koppers lagoon areas, treating the soil using soil washing and bioremediation if necessary, followed by solidifying/stabilizing the residual material and disposing of these residuals onsite; treating soil from the cooling pond and drip track areas by in-situ bioremediation; lining the North Main Street ditch to prevent further discharge of leachate (if the ditch is to remain intact); pumping and treatment of ground water followed by offsite discharge to a publicly owned treatment works (POTW); operating and maintaining the North Main Street lift station as needed until the ground water remediation system renders it superfluous; monitoring ground water and surface water; and implementing institutional controls including land use restrictions. The estimated present worth cost for this remedial action is $4,192,000, which includes an annual O&M cost of $388,000.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil cleanup goals were developed based on ground water protection and include carcinogenic PAHs 0.59 mg/kg, phenols 4.28 mg/kg, arsenic 27 mg/kg, and chromium 92.7 mg/kg. Chemical-specific ground water cleanup goals include carcinogenic PAHs 0.003 ug/l (health-based), phenols 2,630 ug/l, arsenic 50 ug/l, chromium 50 ug/l (MCL), and benzene 1 ug/l (State). Total noncarcinogenic risk will result in a HI < 1.0.

INSTITUTIONAL CONTROLS: Institutional controls including land use restrictions will be implemented to prevent exposure to onsite contamination.

KEYWORDS: Arsenic; Benzene; Biodegradation/Land Application: Carcinogenic Compounds; Chromium; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection/Treatment; MCLs; Metals; O&M; Offsite Discharge; Oils; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Soil Washing/Flushing; Soil; Solidification/Stabilization; Surface Water Monitoring; Treatment Technology; VOCs.

CITY INDUSTRIES, FL
First Remedial Action - Final
March 29, 1990

The City Industries site is a former hazardous waste recycling and transfer facility in Goldenrod Township, Orange County, Florida, near the cities of Winter Park and Orlando. The city of Winter Park's water supply well field is located approximately 1,900 feet west of the site. These wells draw from the deep Floridan aquifer, which is separated from a surficial aquifer by a 140-foot-thick confining layer. In 1971, a former fuel oil business at the site was developed into a waste-handling facility. Activities at the site included receiving, handling, storing, reclaiming, and disposing of various waste chemicals. Improper disposal practices and intentional dumping led to onsite soil and surficial ground water contamination. In 1983, after the State ordered the business closed, the site was abandoned. The State subsequently removed the onsite waste drums, some contaminated soil, and waste sludge. In 1984, EPA removed and thermally treated 1,670 tons of contaminated soil and disposed of the residuals onsite. Additionally, EPA removed 180 cubic yards of highly contaminated soil and transported the soil to an offsite hazardous waste landfill. This Record of Decision (ROD) addresses contaminated ground water, which is migrating through the surficial aquifer, a potential drinking water source, and prevention of contaminant migration to the deeper Floridan aquifer. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and toluene.

The selected remedial action for this site includes pumping and treatment of ground water using air stripping, followed by offsite discharge to a publicly owned treatment works (POTW), if treatability studies show the discharged water meets pretreatment standards; and ground water monitoring. If a local POTW will not accept the treated effluent, a contingency remedy will be instituted, which includes ground water pumping and treatment using air stripping followed by precipitation, filtration, carbon adsorption, and possibly biological oxidation; conducting treatability

studies to ensure compliance with surface water discharge criteria; and discharging the treated effluent offsite to a nearby drainage canal. Both the selected and contingency remedies include implementation of institutional controls, including land use and deed restrictions, and securing construction rights-of-way and easements at the site. The estimated present worth cost for the selected remedial action is $4,575,632, which includes an annual O&M cost of $292,500 for 15 years. The estimated present worth cost for the contingency remedy is $4,262,101, which includes present worth O&M costs of $2,849,191 for 15 years.

PERFORMANCE STANDARDS OR GOALS: The surficial aquifer is a potential source of drinking water, therefore, contaminant levels must be reduced to drinking water standards, including benzene 1.0 ug/l (State drinking water standard), PCE 3.0 ug/l (State drinking water standard), TCE 3.0 ug/l (State drinking water standard), and toluene 2,000 ug/l (Proposed MCLG).

INSTITUTIONAL CONTROLS: Deed and land use restrictions, as well as construction easements and other rights-of-way, will be implemented.

KEYWORDS: Air Stripping; Benzene; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingency Remedy; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLGs; MCLs; O&M; Offsite Discharge; Onsite Treatment; PCE; Plume Management; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; Treatability Studies; VOCs.

COLEMAN-EVANS WOOD PRESERVING, FL

First Remedial Action - Final (Amendment)
September 26, 1990

The 11-acre Coleman-Evans Wood Preserving site is a former wood treatment facility, which was operated from 1954 to the late 1980s, in the community of Whitehouse, Duval County, Florida. The surrounding land use is primarily residential and light commercial/industrial, and there are approximately 1,000 local residents who rely exclusively on ground water for their drinking water supply. The site is divided into 2 areas, including a wood treatment facility on the western portion of the site, and a landfill area used for disposal of wood chips and other facility wastes on the eastern portion of the site. In addition to the treatment and storage areas there is an onsite drainage ditch that carries site runoff into nearby McGirts Creek. Prior to 1970, wastewater from the facility was precipated and discharged to the onsite drainage ditch. The precipitated sludge was deposited into two unlined pits until 1970, when the sludge was stored in tanks. The wastewater treatment process was also enhanced in 1970 with lime precipitation and chlorination. In 1980, onsite ground water contamination was detected and activated charcoal filters were added to the treatment process to remove organics. The primary contaminant in onsite soil and ground water has been identified as pentachlorophenol (PCP). The highest areas of PCP concentration were in the vicinity of onsite chemical tanks and the unlined pit areas. In 1985, EPA conducted an emergency response, which included excavating and disposing of pit material offsite and filling excavated areas with clean fill. PCP-laden fuel is thought to be floating on the water table surface; however, only limited low, level ground water contamination has been detected onsite. This Record of Decision (ROD) amends a 1986 ROD, which documented the selection of incineration for an estimated 9,000 cubic yards of contaminated soil. Since that time, additional studies during the remedial design phase indicated that there are approximately 27,000 cubic yards of contaminated soil. Based on the excessive volume of soil and the high cost of incineration, treatability studies were conducted and an alternative source control treatment was selected. The primary contaminants of concern affecting the soil, sediment, and ground water are organics including PCP and metals.

The selected amended remedial action for this site includes excavating approximately 27,000 cubic yards of soil and sediment contaminated with PCP levels greater than 25 mg/kg, and pre-treating these materials using soil washing; separating clean soil fractions from contaminated soil fines and woody wastes, followed by solidification/stabilization of any soil fines or sludge, which exceed cleanup criteria; placing a cover over the solidified mass; replacing the solidified soil and sludge onsite; treating residual soil wash water using

bioremediation, followed by a granular activated polishing unit with subsequent onsite discharge to the drainage ditch; pumping and recovering ground water to facilitate soil excavation, followed by onsite treatment using the GAC adsorption unit, if PCP levels exceed 1.0 ug/l, and using chemical precipitation for metals removal prior to discharging ground water to the onsite drainage ditch; covering the area with vegetation; and implementing institutional controls including deed restrictions, and site access restrictions including fencing. The estimated total cost for this remedial action is $8,567,304. There are no O&M costs associated with this remedy.

PERFORMANCE STANDARDS OR GOALS: Soil contaminated with PCPs greater than 25.0 mg/kg will be excavated and treated to the established cleanup level below 25 mg/kg. After bioremediation, solidified/stabilized contaminant fines will meet Toxicity Characteristic Leaching Procedure Criteria of 3.6 mg/kg. Ground water recovered during soil dewatering will be treated to below PCP 1.0 ug/l (State).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Institutional Controls; Leachability Tests; MCLs; Metals; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; ROD Amendment; Safe Drinking Water Act; Sediment; Soil; Soil Washing/Flushing; Solidification/Stabilization; State Standards/ Regulations; Treatability Studies; Treatment Technology.

DUBOSE OIL PRODUCTS, FL
First Remedial Action - Final
March 29, 1990

The 20-acre Dubose Oil Products site is an inactive waste storage, treatment, recycling, and disposal facility in Cantonment, Escambia County, Florida. Surrounding land use is primarily rural agricultural. The site overlies a deep aquifer, which serves as a drinking water source for area residents. Site operations began in 1979, and included thermal treatment of waste oil, petroleum refining wastes, oil based solvents, and wood treatment wastes; steam heating of spent iron/steel pickle liquors; and rock salt filtration of waste diesel fuel. Liquid waste was transferred from tanker trucks and drums to onsite treatment tanks for these processes. Empty drums were either sold or crushed and buried onsite. Operations ceased in 1981, and the site owner commenced closure of the site without a proper closure plan. Unauthorized closure activities included excavation of buried drums (causing some drums to be punctured), operation of an aeration system to remediate onsite drainage ponds, and movement of contaminated material with heavy equipment. A State emergency response action in 1985 included excavation and onsite vaulting of 38,000 cubic yards of contaminated soil and the offsite disposal of onsite drums. Site investigations in 1988 identified the soil containment vault as the principal contaminant source and revealed contamination above health-based levels of the shallow aquifer beneath the site, in onsite surface water, and sediment. Investigations showed that the deep aquifer contained extremely low to undetectable levels of contaminants, which were below drinking water standards. This Record of Decision (ROD) addresses final remediation of source areas and onsite shallow ground water. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including benzene, TCE, toluene, and xylenes; and other organics including PAHs and phenols.

The selected remedial action for this site includes excavating the top 20 feet of vault soil containing low-level contamination and disposing of soil in an onsite ravine area; excavating the remaining vault soil and treating by aerobic biodegradation, which includes windrowing of soil on a concrete slab, addition of microbial seed and nutrients, and aeration; disposing of treated soil onsite in the ravine area; placing a two-foot soil cover over the vault area and the ravine area; treating soil leachate from the windrowing process using filtration and either carbon adsorption or UV oxidation followed by onsite discharge to surface water; draining and filling of onsite ponds; installing surface water runoff controls; conducting ground water and soil monitoring; restoring ground water by natural attenuation; and implementing institutional controls including deed and ground water use restrictions. The estimated present worth cost

for this remedial action is $3,008,000, which includes an annual O&M cost of $115,000 for years 0 to 5 and $10,000 for years 6 to 10.

PERFORMANCE STANDARDS OR GOALS: Cleanup standards for leachate discharge are based on the more stringent of Federal or State ARARs and include benzene 1 ug/l (State), TCE 3 ug/l (State), xylenes 50 ug/l (State), and PNAs 10 ug/l (EPA detection limit). Soil cleanup goals are based on either leaching potential (LP) or health-based criteria (HBC) and include benzene 10 mg/kg (HBC), TCE 0.050 mg/kg (LP), xylenes 1.5 mg/kg (LP), and PAHs 50 mg/kg (LP).

INSTITUTIONAL CONTROLS: Deed and ground water use restrictions will be implemented at the site.

KEYWORDS: Aeration; Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Institutional Controls; Leachate Collection/Treatment; MCLGs; MCLs; O&M; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; TCE; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

HARRIS/PALM BAY FACILITY, FL
First Remedial Action
June 28, 1990

The 345-acre Harris/Palm Bay Facility site is an electronics manufacturing company in Palm Bay, Brevard County, Florida. Surrounding land use is commercial, residential, and industrial. The site overlies an unconsolidated aquifer, which is used by a public wellfield located south of and downgradient of the site. From the 1950s to 1967, the site was operated by an electronics firm when Harris Corporation purchased the facility. Current facility operations are subdivided into the Government Systems operations area and the Semiconductor Complex area. In 1981, EPA identified VOCs in ground water wells located south of the Government Systems facility. Ground water contamination was attributed to several onsite incidents at the Government Systems plant including two fires, which resulted in the dumping of chemical vats, a broken acid/solvent line, and spillage at drum storage areas. Seepage from two former treatment lagoons may also be a source of a shallow contaminant plume. In 1985, Harris constructed a treatment facility to implement an onsite ground water treatment and monitoring program which is still in operation. This Record of Decision (ROD) addresses ground water contamination at the Government Systems facility. A subsequent ROD will address the contaminated ground water at the Semiconductor Complex and all of the contaminated onsite soil. The primary contaminants of concern affecting the ground water are VOCs including TCE; metals including chromium and lead; and other inorganics including fluoride.

The selected remedial action for this site includes continued ground water pumping and treatment using air stripping to remove VOCs; using the treated ground water as industrial process water then reinjecting the treated ground water onsite into a deep aquifer; and evaluating and modifying the existing ground water monitoring program to fully characterize onsite contamination. The estimated present worth cost for this remedial action is $1,430,000, which includes a total O&M cost of $950,000 for five years.

PERFORMANCE STANDARDS OR GOALS: The goal of this remedial action is to restore the aquifer to its beneficial use. Cleanup standards were chosen as the more stringent of State or Federal SDWA standards. Chemical-specific ground water goals include TCE 5 ug/l (MCL), chromium 50 ug/l (MCL), and lead 15 ug/l (proposed MCL).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

HIPPS ROAD LANDFILL, FL

First Remedial Action (Amendment) - Final
September 21, 1990

The 7-acre Hipps Road Landfill site is an inactive landfill in Jacksonville, Duvall County, Florida. Surrounding land use is rural residential. The site overlies a sedimentary surficial aquifer system, used as a source of drinking water, which has been affected by the site. Prior to the start of landfilling operations in 1968, the site was a cypress swamp. Types of hazardous waste disposed of onsite included cans of TCE and artillery rounds from U.S. Navy facilities. After onsite operations ceased, the property was divided into lots, and five homes were constructed on the landfill. Subsequently, biota in an adjacent pond died, and area residents began to complain of deteriorating well water quality. In 1983, State investigations confirmed the presence of ground water contamination, and bottled water was supplied to the affected residents. Consequently in 1985, area homes were connected to the municipal water supply. In 1989, remedial actions stemming from a 1986 Record of Decision (ROD) commenced, and included properly closing the landfill and implementing institutional controls. In addition, the 1986 ROD documented ground water pumping and treatment at a publicly owned treatment works (POTW) as part of the overall site remedy. In 1990, the landfill was capped to control the source of the contamination. Ground water investigations after 1986 revealed that the ground water contaminantion plume was not as extensive, and the overall site quality was better than previously estimated. This ROD amends the 1986 ROD for the ground water component. The primary contaminants of concern affecting the ground water are VOCs including benzene; and metals including chromium and lead.

The 1986 selected ground water remedial action included ground water pumping, followed by offsite discharge to a POTW for treatment. This amendment provides for onsite ground water treatment using air stripping to remove VOCs, followed by onsite discharge of the treated water to a storm water retention basin, and monitoring of onsite and offsite ground water. This amendment will substantially decrease the overall cost of the remedy from that of the POTW treatment alternative. The estimated present worth cost for this amended remedial action is $1,242,000, which includes an O&M cost of $370,600 for five years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup standards were chosen as the more stringent of State standards or Federal MCLs. Chemical-specific goals for ground water include benzene 1 ug/l (State), chromium 50 ug/l (MCL), and lead 15 ug/l (Federal Recommended Cleanup Goal). Lead and chromium contamination were determined to be non-site related, but cleanup goals will be met in water discharged to the retention basin.

INSTITUTIONAL CONTROLS: Institutional controls, which were implemented as part of the 1986 ROD, include ground water and land use restrictions.

KEYWORDS: Air Stripping; Benzene; Chromium; Clean Air Act; Clean Water Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLGs; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; ROD Amendment; Safe Drinking Water Act; State Standards/Regulations; Treatability Studies; VOCs; Water Quality Criteria.

HOWE VALLEY LANDFILL, KY

First Remedial Action - Final
September 28, 1990

The 11-acre Howe Valley Landfill site is an inactive landfill in Howe Valley, Hardin County, Kentucky. A Class IIA aquifer underlies the site, but is not currently used as a drinking water source. Ground water flow is southeasterly toward Boutwell Spring and Linders Creek. From 1967 to 1976, 2.5 acres of the site were used for disposal of refuse and manufacturing by-products. In 1974, a State inspection revealed that acidic liquid wastes were being dumped directly into the landfill, in direct violation of the solid-waste disposal permit issued. Although the permit expired in 1974, the landfill continued dumping operations until 1976. In 1988, EPA required the removal of 9,150 full or partially filled drums containing metal plating sludge, caulk, flammable silicone polymers, and paint-like pigments; 1,621 empty drums; 6,000 smaller containers; and 3,000 cubic yards of loose waste from the site. State investigations in 1987 found that the potential migration of this waste posed a drinking water

hazard. Contaminant levels for the underlying ground water system cannot accurately be monitored because of the karst topography at the site. This remedial action focuses on reducing the source contamination. The primary contaminants of concern affecting the soil are VOCs including PCE; and metals including chromium.

The selected remedial action for the site includes excavating approximately 100 cubic yards of soil from the outlying areas of the site containing elevated inorganic levels, followed by disposal offsite; excavating approximately 7,400 cubic yards of soil with elevated concentrations of organics, followed by aeration; performing a treatability study to ensure that an onsite aeration process will reduce organic concentrations in soil to acceptable levels; onsite disposal of the treated soil; onsite air monitoring; installing water diversion ditches to prevent water from running onto the aerating soil; covering the area with soil and installing a vegetative cover over the entire site; monitoring ground water at Boutwell Spring and at additional springs or wells; and implementing institutional controls, such as deed restrictions, to limit the property and ground water usage. If the treatability study indicates that soil aeration will not effectively reduce contamination to protective levels, a proposed contingency remedy would include excavating, stockpiling, and transporting approximately 7,500 cubic yards of contaminated soil to an offsite RCRA-approved landfill for disposal. The estimated present worth cost of the primary remedial action is $394,524, which includes a total O&M cost of $42,625 for five years. The estimated present worth cost of the contingency remedy is $3,852,000, which includes a total O&M cost of $42,625 for five years.

PERFORMANCE STANDARDS OR GOALS: Health-based soil action levels have been calculated for the site-specific conditions, and include PCE 7.50 mg/kg and chromium (VI) 400 mg/kg.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit property and ground water usage.

KEYWORDS: Aeration; Air Monitoring; Air Stripping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingency Remedy; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Collection/Diversion; Treatability Studies; VOCs.

JADCO-HUGHES, NC

First Remedial Action - Final
September 27, 1990

The 6-acre Jadco-Hughes site is a former solvent reclamation and waste storage facility in North Belmont, Gaston County, North Carolina. The surrounding area, along with portions of the site, contains woodlands interspersed with industrial and residential developments. Two unnamed tributaries that flow through the site ultimately empty into the Catawba River, which is the predominant public drinking water supply source for the area. Ground water is not used as drinking water onsite, but offsite residents who do not yet have municipal water connections utilize this ground water for their drinking water source. From 1969 to 1975, the plant was operated to reclaim used waste paint and ink-type solvents. In addition, the plant area was used to store drummed wastes, including waste chemicals and sludge from area industries. In 1975, the State ordered the cleanup of two in-ground solvent pits and the consolidation and covering of contaminated surface soil in an onsite landfill in the southwest portion of the site. In 1983, all remaining storage tanks, a mobile tanker, and drums were removed from the site. In addition, responsible parties are currently leading the remediation of PCB-contaminated soil in a southeastern area of the site, also known as the "swale" area. This Record of Decision (ROD) addresses the remediation of remaining contaminated soil and the contaminated ground water and surface water. The primary contaminants of concern affecting the soil, ground water, and surface water are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PCBs and phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes soil venting followed by vacuum extraction and carbon adsorption to remove VOCs and other organics; flushing the treated

soil, then collecting and treating the residual water in a ground water treatment system; collecting ground water with a subsurface drain system; pumping ground water from highly contaminated areas followed by pretreatment using aeration and carbon adsorption to reduce VOC concentrations and subsequent offsite discharge to a publicly owned treatment works (POTW); conducting a treatability study to ensure compliance with POTW pretreatment standards; replacing an onsite surface water culvert; monitoring ground water and surface water; sampling soil and sediment; and implementing institutional controls, including land and ground water use restrictions. A contingency remedy has also been prepared for this site in the event that a POTW will not accept the discharge from the site within a reasonable time frame. The contingency remedy includes ground water pumping and treatment using ultraviolet oxidation followed by discharge to an onsite tributary. The estimated present worth cost for this remedial action is $4,830,900, which includes an estimated present worth O&M cost of $2,665,600 for 30 years. No costs were provided for the contingency remedy.

PERFORMANCE STANDARDS OR GOALS: The goal of this remedial action is to restore ground water to its beneficial use as a potential drinking water source. Both soil and ground water cleanup goals were developed to remediate and protect the ground water. Chemical-specific cleanup goals for soil include PCBs 10.0 mg/kg (TSCA), arsenic 48.0 mg/kg (background), chromium 140.0 mg/kg (background), and lead 1.3 mg/kg. Treatment goals for ground water include benzene 1 ug/l (State), PCE 0.7 ug/l (State), phenols 4,200 ug/l (RfD), TCE 2.8 ug/l (State), toluene 1,000 ug/l (State), xylenes 400 ug/l (State), arsenic 50 ug/l (State), chromium 50 ug/l (State), and lead 15 ug/l (Recommended Cleanup Goal for Superfund sites).

INSTITUTIONAL CONTROLS: Institutional controls including land use and ground water use restrictions will be implemented.

KEYWORDS: Aeration; Arsenic; Background Levels; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Contingent Remedy; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Onsite Treatment; Organics; PCBs; PCE; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; Solvents; State Standards/Regulations; Surface Water; Surface Water Monitoring; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Vacuum Extraction; Soil Venting; VOCs; Xylenes.

KASSOUF-KIMERLING BATTERY DISPOSAL, FL

Second Remedial Action - Final
March 30, 1990

The Kassouf-Kimerling Battery Disposal site, formerly known as the Timber Lake Battery Disposal site and the 58th Street Landfill, is in Tampa, Hillsborough County, Florida within a 100-year floodplain area. The site consists of a 42,000 square foot landfill area with an estimated landfill volume of 11,350 cubic yards. The site is bordered by small lakes and marshes to the north, east, and west. Surface water flows from the west marsh to the east marsh by way of a canal which cuts through the site, connects the marsh areas, and eventually discharges into the Palm River. In 1978, empty battery casings were deposited in previously excavated onsite areas, and contributed to the release of metals into the landfill. Storm water running eastward off of the landfill drained into the wetlands, and the dense wetland vegetation has contributed to the retention of heavy metal contamination. The first Operable Unit (OU1) Record of Decision (ROD) addressed remediation of landfill wastes and contaminated underlying soil. This ROD addresses contamination of wetlands adjacent to the landfill. The primary contaminants of concern affecting the sediment and surface water are metals including arsenic, chromium, and lead.

The selected remedial action for the site includes dredging 15,000 cubic yards of contaminated sediment in the canal that lies within 150 feet of the landfill, and marsh area sediment within 20 feet of the landfill to a depth of 2 feet; solidifying and stabilizing the sediment and disposing of the treated sediment onsite along with the treated landfill wastes from OU1; covering the area with soil; implementing engineering controls on the canal to flood the wetlands year round; wetlands

mitigation; and ground water monitoring. A waiver will be invoked for surface water because of the negative impact that further remediation would have on sediment in the wetlands area and the potential for mobilization of lead beyond the site areas. The estimated present worth cost for this remedial action is $511,700, which includes a total O&M cost of $99,500.

PERFORMANCE STANDARDS OR GOALS: Marsh sediment within 20 feet of the landfill and sediment in the canal within 150 feet of the landfill will be remediated to achieve Federal Ambient Water Quality Criteria (FAWQC) and include lead 40 mg/kg. A waiver of the FAWQC will be imposed on marsh sediment greater than 20 feet away from the landfill and sediment in the canal greater than 150 feet away from the landfill.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARAR Waiver; Arsenic; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Dredging; Excavation; Floodplain; Ground Water Monitoring; Landfill Closure; Lead; MCLs; MCLGs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Sediment; Solidification/Stabilization; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

LEWISBURG DUMP, TN

First Remedial Action - Final
September 19, 1990

The 20-acre Lewisburg Dump site includes a 4-acre abandoned landfill developed in an abandoned 6-acre limestone quarry in Lewisburg, Marshall County, Tennessee. Land in the vicinity of the site is primarily used as farm and pasture land. There are four public water wells located within one-half mile of the site. This municipally-owned and operated site began landfilling operations between 1963 and 1969, and a variety of residential and industrial wastes, including solvents and metallic wastes were landfilled onsite. Some municipal waste was burned onsite, and the resulting ash was placed in the dump. Soil samples taken from various test pits during State investigations showed elevated levels of metals and organics onsite. In addition, a 2-acre quarry pond was suspected to be contaminated when oil and other debris were seen floating on its surface and gas bubbles were observed in the absence of any aquatic life. In 1973, the State found that the old quarry was in violation of recent, more stringent State environmental laws, and concluded that landfilling operations should be discontinued. In 1975, the State approved plans for interim maintenance and final closure of the dump. In 1977, the waste was covered with soil as part of the preliminary closure activities. This Record of Decision (ROD) addresses the contaminated soil and debris present at the site in the landfill and in the quarry pond, and provides for protection of the ground water, pond water, and sediment from further contamination. The primary contaminants of concern affecting the soil and debris are organics including bis(2-ethylhexyl)phthalate (DEHP); and metals including aluminum, barium, copper, zinc, and manganese.

The selected remedial action for this site includes removing landfill surface and quarry debris and disposing of the wastes in one of the test pits at the site, an approved sanitary landfill, or a hazardous waste landfill; replacing the plastic test-pit caps with landfill cap material; regrading the landfill cap to stabilize site conditions and to meet State and Federal regulations; revegetating the landfill; conducting long-term ground water monitoring and analysis; and implementing institutional controls including deed restrictions to restrict site usage, and site access restrictions such as fencing. The estimated present worth cost for this remedial action ranges between $791,512 and $1,189,741 (depending on which of the three disposal options is implemented), which includes a total O&M cost of $270,042 for years 0 to 5.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific cleanup goals for soil or debris were provided. Source treatment and removal should indirectly reduce the level of ground water contamination. Chemical-specific ground water cleanup goals are based primarily on the proposed MCL for DEHP 4.0 ug/l. The surface water cleanup goal for copper is 12.0 ug/l, which will be less than or equal to a hazard quotient of 1.0.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit site usage.

KEYWORDS: Capping; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Ground Water Monitoring; Inorganics; Institutional Controls; MCLGs; MCLs; Metals; O&M; Onsite Containment; Organics; Safe Drinking Water Act; Soil; State Standards/Regulations.

MUNISPORT LANDFILL, FL
First Remedial Action - Final
July 26, 1990

The 291-acre Munisport Landfill site, including a 170-acre, inactive municipal landfill, is within the city of North Miami, Dade County, Florida. The site is adjacent to the State Mangrove Preserve, a wetlands area that is tidally connected to Biscayne Bay. To minimize contaminated surface water runoff from the landfill, a dike was installed through the Mangrove swamp at the southeast edge of the site. This dike has hydrologically altered the fauna and flora of the inland wetlands area. The Biscayne aquifer underlies the Munisport property and is the sole source of drinking water for Dade County; however, the ground water in the portion of the aquifer located directly under the site is non-potable due to high salt concentrations. The city of North Miami leased 291 acres to Munisport for recreational development in 1971 which begin filling low-lying areas of the site with clean fill and construction debris. In 1975, a temporary permit allowed solid waste to be used as fill above the water table However, in 1976, a State inspection found twelve 55-gallon drums that were leaking wastes onsite; a violation was issued, and these drums were removed offsite by the city. In 1977, Munisport applied for a 404 permit modification to dump additional solid wastes in the wetlands. EPA opposed the modification and in 1981, issued a CWA 404(c) veto followed by an Administrative Order (AO) that prohibited any additional filling and required removal or realignment of the diking at the Mangrove Preserve to restore the altered wetland area. In 1981, the State directed Munisport and the city to provide final closure of the landfill. Landfilling operations ceased in 1981, but closure has not yet taken place. Leachate from the landfill waste still poses a significant threat to the aquatic organisms in the Mangrove Preserve. The ground water is no longer used for potable purposes as a result of salt water intrusion. The contaminants of concern affecting the ground water include VOCs including benzene and toluene; other organics including phenols; metals including arsenic, chromium, and lead; and other inorganics.

The selected remedial action for the site includes intercepting, collecting, and treating the leachate-contaminated ground water prior to its emergence into the Mangrove Preserve, with onsite discharge of treated ground water; initiating landfill closure proceedings by the State; conducting hydrologic, water quality, and treatability studies as part of the remedial design. Based on the studies, the less favored alternative remedy may include intercepting the leachate-contaminated ground water plume by constructing a hydraulic barrier using negative pressure; treating the contaminated ground water with air stripping,adjusting the pH, and discharging the treated effluent into onsite shallow subsurface trenches or onsite surface water to enhance the treatment process; and making hydrologic improvements to the Mangrove Preserve and the altered wetlands. Alternatively, the site may be treated by using positive infiltration to provide the hydraulic barrier, biological treatment to reduce the contaminants, and discharging treated effluent to an onsite trench to maintain a hydraulic barrier. The estimated total present worth cost for the negative-pressure remedial action is $6,166,000, which includes an annual O&M cost of $430,000.

PERFORMANCE STANDARDS OR GOALS: Treated effluent will meet appropriate Clean Water Act and State standards for discharge to ground water or surface water, as appropriate; however, no chemical-specific goals were provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Arsenic; Benzene; Biodegradation/LandApplication; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Landfill Closure; Lead; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; Phenols; Plume Management;

Sole-Source Aquifer; State Standards/Regulations; Toluene; Treatability Studies; VOCs; Wetlands.

NATIONAL STARCH & CHEMICAL, NC
Second Remedial Action
September 28, 1990

The 465-acre National Starch and Chemical site is a manufacturing facility for textile finishing and custom speciality chemicals in Rowan County, North Carolina. A portion of the site is heavily wooded, and surrounding land use is mixed industrial and residential. From 1971 to 1978, approximately 350,000 gallons of reaction vessel wash water containing salt brines, sulfuric acid solutions, and solvents were disposed of onsite in unlined trenches. Liquid plant production wastes also were disposed of in the trenches after being held in an unlined pretreatment lagoon. In 1976, sampling by the site operator revealed shallow ground water contamination in the trench area. A State investigation in 1977 supported this finding, and the State requested the site operator to cease onsite liquid waste disposal in the trench area. A 1988 Record of Decision (ROD) addressed Operable Unit 1 (OU1), which called for onsite ground water pumping and treatment, further investigation of soil contamination in the trench area, continued surface water and sediment monitoring and a supplemental remedial investigation (RI). This ROD addresses OU2, and identifies no further action as the remedy for the trench area soil based on the supplemental RI. A subsequent ROD will address OU3, the remediation of onsite contaminated surface water and sediment, which are unrelated to the trench soil contamination. Results of the supplemental RI indicate that the natural leaching process of percolating rainfall will continue to reduce the soil contamination level. Because the existing ground water treatment system is designed to treat contaminants leaching into the ground water, there are no additional contaminants of concern relating to the trench area soil.

The selected remedial action for OU2 is no further action. Soil will be monitored on a quarterly basis, and institutional controls including deed restrictions will be implemented. The estimated present worth cost for this remedial action is $151,000, which includes a total O&M cost of $150,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Institutional Controls; No Action Remedy; O&M.

NORTH HOLLYWOOD DUMP, TN
First Remedial Action - Final
September 13, 1990

The 70-acre North Hollywood Dump site is an inactive, privately owned landfill in Memphis, Shelby County, Tennessee, in the Wolf River floodplain. Directly beneath the site is a contaminated aquifer from which ground water discharges directly to the Wolf River. Adjacent to the site are an abandoned dredge pond, a beaver pond, and Oxbow Lake, all of which were affected by the site. From the mid-1930s until its closure in 1967, municipal and industrial refuse were disposed of at the site, which was operated by the city of Memphis. A precise description of the materials disposed of is unknown. In addition, unauthorized dumping is thought to have occurred during the 1970s. In 1979 and 1980, EPA and State studies revealed various contaminants both onsite and offsite in soil, sediment, ground water, surface water, and fish. Commercial fishing activities in the Wolf River ceased, and EPA required removal of contaminated soil, capping of the landfill, and fencing of the site. The RI/FS process identified buried drums onsite. This Record of Decision (ROD) addresses all of the contaminated media by containing the source areas, including the landfill and onsite surface water bodies, with provisions for offsite surface and shallow ground water monitoring and treatment as necessary. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and surface water are organics including pesticides, specifically aldrin, endrin and chlordane; and metals including arsenic and lead.

The selected remedial action for this site includes excavating buried wastes and soil in easily eroded areas near the edge of the landfill and consolidating them in the landfill area; excavating and characterizing waste within the buried drums; consolidating debris in the landfill or, should contaminant levels warrant

it, properly disposing of debris as well as drummed wastes offsite; upgrading the existing landfill cover to be a total of 24 inches thick; partially dewatering the surface impoundments; excavating the contaminated sediment from the beaver pond and placing them within Oxbow Lake; covering the contaminated lake and beaver pond sediment with a 36-inch hydraulic geofabric cover, and infilling Oxbow Lake with clean fill; harvesting contaminated fish from the abandoned dredge pond; hydraulically containing the contaminated dredge pond sediment with geofabric and three feet of clean fill; refilling the pond with water and restocking with unaffected fish; monitoring the shallow ground water, with provisions for future pumping and treatment if necessary; conducting surface water (both onsite and offsite), air, and biota monitoring; and implementing institutional controls to restrict onsite land use and to prohibit well installation in the vicinity, and site access restrictions including fencing. The estimated present worth cost for this remedial action is $8,041,890, which includes a total O&M cost of $1,610,310.

PERFORMANCE STANDARDS OR GOALS: Specific goals for ground water include arsenic 0.140 ug/l (proposed State Water Quality Standard) and lead 3.8 ug/l (CWA Water Quality Criteria) at the point the ground water reaches the Wolf River.

INSTITUTIONAL CONTROLS: Construction of wells in the vicinity is not permitted, as county regulations prohibit the placement of wells within a floodplain. Onsite land use restrictions will also be implemented.

KEYWORDS: Air Monitoring; Arsenic; Capping; Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Dredging; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; Pesticides; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Monitoring; Water Quality Criteria.

PICKETTVILLE ROAD LANDFILL, FL

First Remedial Action - Final
September 28, 1990

The 52-acre Pickettville Road Landfill site is an inactive municipal landfill in Jacksonville, Duval County, Florida. The area is rural with mixed industrial and residential usage. Adjacent to the site is Little Sixmile Creek to the east, which empties into Sixmile Creek to the north of the site. Waste debris from the landfill is present within the 100-year floodplain of Sixmile Creek. The site overlies a surficial sand aquifer and a deeper limestone aquifer. From the 1940s to the 1960s, the site was used primarily as a sand borrow pit. From 1968, when landfilling operations began, to 1971, the municipal landfill accepted all types of wastes. Subsequently, the landfill accepted hazardous wastes exclusively. Types of wastes disposed of onsite included waste oil, lead-acid battery liquid waste, battery casings, terpene sludge, and PCBs. County site inspections in 1975 and 1976, revealed many improper waste disposal and maintenance practices, and the landfill was closed in 1977. These disposal practices resulted in leaching of wastes into Sixmile Creek, the ground water and soil. Several investigations from 1979 to 1990, characterized the affected media and the nature and extent of onsite and offsite contamination. This Record of Decision (ROD) addresses both source control and management of contaminant migration, and is a final remedy for the site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene, TCE, and toluene; other organics including acids, PCBs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating the waste, soil, and debris from the 100-year floodplain of Sixmile Creek to a depth of five feet, followed by onsite disposal of waste and debris within the landfill area; capping the landfill with a clay and soil cover; installing a passive landfill gas venting system; providing an alternate water supply to residents affected by the ground water contaminant plume by extending a city water main, implementing a plugging and abandonment program for the affected wells; ground water monitoring; and implementing institutional controls including ground water use and deed restrictions, and site access restrictions, such as fencing. The estimated

present worth cost for this remedial action is $9,935,000, which includes an estimated annual O&M cost of $171,100 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Surface water discharge limits are SARA Alternate Concentration Limits (ACLs), and include benzene 115 ug/l and vinyl chloride 115 ug/l. Ground water discharge, which exceeds ACLs may indicate the need for future ground water remediation.

INSTITUTIONAL CONTROLS: Ground water use and deed restrictions will be implemented at the site.

KEYWORDS: Acids; ACLs; Alternate Water Supply; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; MCLGs; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Organics; PCBs; Plume Management; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Toluene; Venting; VOCs; Water Quality Criteria.

SCHUYLKILL METAL, FL

First Remedial Action - Final
September 28, 1990

The 17-acre Schuylkill Metal site is a former battery recycling facility containing marsh areas in the southwest portion of Plant City, Hillsborough County, Florida. From 1972 to 1986, the facility was used to recycle lead from batteries; the lead was subsequently sent offsite for smelter processing. Wastes generated in the recycling process included rubber and plastic chips from battery casings and sulfuric acid solution. In 1980, the State required the removal of approximately 250 tons of sediment from a disposal pond, 3,000 tons of battery casings, and 500 tons of soil underlying the battery casings. Prior to 1981, acidic washdown wastewaters were stored in a 2.2-acre, unlined wastewater holding pond, and neutralized with lime or ammonia. In 1981, the facility upgraded the wastewater treatment system, and acidic rinse washdown wastewaters were neutralized with sodium hydroxide and discharged into the city's treatment plant. Site investigations conducted in 1981 revealed that onsite surficial aquifer monitoring wells contained elevated levels of ammonia. Analyses of soil, surface water, and sediment samples near the processing area and around the holding pond revealed elevated concentrations of metals. This Record of Decision (ROD) provides a final remedy and addresses all contaminants at the site. The contaminants of concern affecting the soil, debris, sediment, ground water, and surface water are acids and metals including lead, arsenic, and chromium.

The selected remedial action for this site includes excavation and onsite solidification of approximately 36,000 cubic yards of contaminated soil from the process area and approximately 2,000 cubic yards of contaminated sediment from the ditches; onsite disposal of treated soil and sediment; debris recycling; onsite treatment of surface water from the wastewater holding pond and pumping and treatment of ground water by chemical action and filtration, followed by offsite discharge of the treated surface and ground water to a publicly owned treatment works (POTW) or to surface water; biological monitoring of the east and west onsite marshes; installing flood control mechanisms to maintain continued surface water inundation in the east marsh; mitigating the wetlands that have been adversely impacted by the site; and implementing of site access restrictions including fencing. The estimated present worth cost for this remedial action ranges from $5,864,000 to $8,161,000, depending on O&M costs, which will be estimated during the RD/RA phase.

PERFORMANCE STANDARDS OR GOALS: All soil with lead levels of 500 mg/kg and ditch sediment to a depth of 2 feet will be treated by chemical stabilization. This cleanup level was based onsite-specific analyses to prevent excessive lead leaching to the ground water. Debris will be excavated to a depth of between 3 and 10 feet below land surface and will be recycled. Ground water cleanup level is lead 0.015 mg/l (MCLs or background levels), and treated water discharged to nearby wetlands will achieve lead levels of 0.013 mg/l (WQC). The Ambient Water Quality Criteria for the existing marsh and for surface water has been waived, due to the potential for destructive effects of the remediation on the wetlands.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented in marsh areas.

KEYWORDS: Acids; ARAR Waiver; Arsenic; Background Levels; Carcinogenic Compounds; Chromium; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Surface Water; Surface Water Treatment; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

SCRDI BLUFF ROAD, SC
First Remedial Action - Final
September 12, 1990

The 4-acre SCRDI Bluff Road site is an inactive chemical waste manufacturing, storage, recycling, and disposal facility in Richland County, South Carolina. Surrounding land use is rural residential and industrial, and part of the site has been classified as a wetlands area. The site was first used as an industrial facility, which manufactured acetylene gas. Two lagoons were constructed onsite to support this operation. Starting in 1975, the site was used as a storage, recycling, and disposal facility for chemical waste. An above-ground storage tank was installed for use in these processes. All operations at the site ceased in 1982 after State investigations identified onsite soil and ground water contamination. From 1982 to 1983, the State addressed the site contamination and required the removal of over 7,500 drums containing various chemicals, visibly contaminated soil, and above-ground structures. Additionally, in 1989, the storage tank containing approximately 100 gallons of contaminated sludge was removed. This Record of Decision (ROD) addresses remediation of both the contaminant source and ground water, and provides a final remedy for the site. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, PCE, TCE, and xylenes, other organics including PCBs, phenols, and pesticides; and metals.

The selected remedial action for this site includes pumping and onsite treatment of ground water using flocculation/precipitation as a pretreatment to remove metals, air stripping to remove VOCs, and granular activated carbon adsorption to remove semi-volatile organic compounds, if necessary, followed by reinjecting the treated water onsite; treating contaminated soil in-situ using vacuum extraction, followed by carbon adsorption or fume incineration to destroy off-gases; managing carbon residuals from ground water and soil treatments through offsite disposal or regeneration; and monitoring soil and ground water. The estimated present worth cost for this remedial action is $5,574,984, which includes an annual O&M cost of $311,287 for 16 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup standards for ground water are the more stringent of Federal or State MCLs or proposed MCLs. Chemical-specific ground water goals include benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), toluene 2 mg/l (MCL), and xylenes 10 mg/l (MCL). Soil cleanup levels were calculated using a soil leachability.

YELLOW WATER ROAD, FL
First Remedial Action
September 28, 1990

The 14-acre Yellow Water Road site is a former storage area for PCB-contaminated liquids and electrical equipment in Baldwin, Duval County, Florida. Dense woodlands are located along the perimeter of the site, and surrounding land use is commercial and residential. In 1981, onsite storage of PCB-contaminated liquids and electrical equipment began at the former operational area in anticipation of upcoming onsite incineration operations, but the proper permits for the incinerator were never obtained. Subsequently in 1982, PCB-contaminated oils were spilled at the site as a result of onsite salvage operation which included metal removal from transformers. As a result of this onsite PCB contamination, EPA conducted a removal action in 1984 that included cleaning and storing 719 electrical transformers, securing 100,000 gallons of PCB liquids in onsite holding tanks, and excavating and storing 3,000 cubic yards of PCB-contaminated soil onsite. In 1988, EPA directed a second removal action which included demolishing an onsite warehouse; disposing of warehouse debris and stockpiling contaminated soil offsite; incinerating 78,854 gallons of PCB liquids offsite; and disposing of

704 transformers and 18,690 pounds of capacitors offsite. This Record of Decision (ROD) addresses the remediation of PCB-contaminated soil and sediment. Onsite ground water contamination will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil and sediment are organics including PCBs.

The selected remedial action for this site includes excavating 3,560 cubic yards of onsite contaminated soil and sediment with PCB concentrations greater than 10 mg/kg; solidifying and stabilizing the soil and sediment, if a treatability study determines the effectiveness of using solidification for organics; placing treated soil within the old salvage operational area and covering the area with 1-foot-thick soil cover; conducting leachability studies of the treated mass; backfilling excavated areas with clean soil and revegetating the site; implementing site access restrictions including fencing; conducting ground water monitoring; and abandoning ground water wells within the excavated area, if necessary. The estimated present worth cost for this remedial action ranges from $1,119,000 to $1,448,200, (depending on the soil disposal method used), which includes a total O&M cost of $62,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Onsite soil cleanup levels are based on the TSCA PCB Spill Cleanup Policy for unrestricted sites. PCBs will be remediated to a level of 10 mg/kg with a minimum excavation depth of 10 inches, and excavated areas will be covered with clean fill to reduce levels of PCBs to less than 1 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Direct Contact; Excavation; Ground Water Monitoring; Leachability Tests; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PCBs; Sediment; Soil; Solidification/Stabilization; Toxic Substances Control Act; Treatability Studies; Treatment Technology.

ZELLWOOD GROUNDWATER CONTAMINATION, FL

First Remedial Action (Amendment)
March 1, 1990

The 57-acre Zellwood Groundwater Contamination site is approximately 1/2-mile west of the town of Zellwood in Orange County, Florida. The site is situated in a rural area, and approximately 300 homes located within one mile of the site depend on private wells for their potable water supply. The site is comprised of four active industries and an open field with marshy wetlands. Prior to 1963, the area was used by several agriculturally related businesses. In 1963, a drum recycling facility began operations at the site. During the drum recycling process, onsite wastewaters were generated by draining and cleaning procedures, and two onsite evaporation/percolation ponds (#1 and #2) were used in the treatment and disposal of the wastewaters. A new treatment system was installed in 1980 and use of the ponds was discontinued. In 1981, the site owners drained the two ponds and moved some of the contaminated sediment to an offsite landfill. The remainder of the contaminated sediment was consolidated into a temporary sludge storage area before the sediment was moved offsite in 1982 and the onsite ponds were filled in. In 1982, EPA identified an abandoned drum storage area by a 6-acre field at the northern part of the site, which was apparently used for the disposal of drums and other wastes. Site investigations by EPA from 1988 to 1990 identified contamination in the soil, sediment, and ground water at the site. This Record of Decision (ROD) addresses remediation of onsite source areas. Ground water remediation will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil and sediment are VOCs including PCE, toluene and xylenes; other organics including PAHs and pesticides; and metals including lead and chromium.

The selected remedial action for this site includes excavating approximately 3,000 cubic yards of contaminated soil and sediment from the ditch, drum, and pond areas, followed by onsite stabilization and solidification of the soil and sediment; replacing the stabilized soil and sediment into the excavation area, covering the area with top soil and reseeding the area; evaluating existing ground water wells for decommissioning; and ground water

monitoring. This ROD amends a 1987 ROD, which proposed treatment of contaminated soil and sediment by incineration with disposal of the residual ash onsite. The estimated total cost for this remedial action is $1,030,000, which includes an estimated total O&M cost of $250,000 over 10 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup criteria were calculated using site specific soil and climatic data from the EPA, State, and other sources. Chemical-specific goals for soil include lead 220 mg/kg, chromium 100 mg/kg, total PAHs 10 mg/kg, PCE 1 mg/kg, toluene 30 mg/kg, and total xylenes 5 mg/kg.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water Monitoring; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; RCRA; ROD Amendment; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; PCE; Toluene; VOCs; Wetlands; Xylenes.

RECORDS OF DECISION ABSTRACTS
REGION 5
(Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)

ALGOMA MUNICIPAL LANDFILL, WI
First Remedial Action - Final
September 29, 1990

The 13-acre Algoma Municipal Landfill site is an inactive municipal landfill in Algoma, Kewaunee County, Wisconsin. Surrounding land use is primarily agricultural/rural residential with wetlands adjacent to the site. The site overlies an aquifer that currently supplies water to private wells. From 1969 to 1983, the site was operated as a municipal landfill comprised of 3 distinct landfill areas. Solvents, thinners, lacquers, as well as municipal wastes were reportedly disposed of in the main landfill area known as the Landfill Disposal Area (LDA). Two smaller areas, the North Disposal Area (NDA) and the South Disposal Area (SDA) were reportedly used for the disposal of construction debris and asbestos-contaminated sludge. Approximately 400,000 cubic yards of municipal wastes were disposed of at the site. In 1983, the landfill was closed and the wastes were covered. However, over time, the cap has deteriorated due to weather and lack of protection from freezing and thawing. Therefore, the current cover has not been impermeable and landfill contaminants have been released into the ground water. EPA site investigations conducted in 1984 and 1989 revealed onsite ground water contamination caused by sources leaching from the LDA. This Record of Decision (ROD) addresses the remediation of contaminated source and ground water. The primary contaminants of concern affecting the ground water, soil, and debris are VOCs including benzene; other organics; and metals including arsenic and cadmium.

The selected remedial action for this site includes capping the LDA with a soil/clay cover and installing a gas venting system to remove off-gases; covering the SDA and NDA with a soil cover, if further waste characterization determines these areas to be sources of asbestos contamination; monitoring ground water onsite, offsite, and in nearby private wells to determine the effectiveness of the landfill cap in controlling the migration of contaminants into ground water; monitoring landfill gases; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $1,298,000, which includes a total O&M cost of $11,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The State has determined that contaminant migration from the landfill to ground water must not exceed State Prevention Action Limits (PALs), including benzene 0.067 ug/l (PAL).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Arsenic; Benzene; Capping; Carcinogenic Compounds; Debris; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; MCLs; Metals; O&M; Onsite Containment; Organics; Plume Management; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Venting; VOCs; Wetlands.

ANDERSON DEVELOPMENT, MI
First Remedial Action - Final
September 28, 1990

The 12.5-acre Anderson Development site is an active chemical manufacturing facility in Adrian, Madison Township, Lenawee County, Michigan. The site is in a 40-acre industrial park, and is comprised of several areas of contamination that exceed health-based levels, including a 0.5-acre former process wastewater pretreatment lagoon containing lagoon sludge, clay underlying the lagoon, and a small quantity of soil near the lagoon. From 1970 to 1979, the plant produced 4,4-methylene bis(2-chloroaniline) (MBOCA), a hardening agent for the production of polyurethane plastics. Process wastewater was discharged directly to surface water until 1973, when it was discharged to a publicly owned treatment works (POTW). In 1979, the State ordered the POTW not to accept the waste stream because of the decreased efficiency of the POTW resulting from MBOCA. In 1980 and 1981, the site owner and the State performed a cleanup action of all contaminated site areas with levels

of MBOCA above 1 ppm. This included decontaminating the plant, sweeping streets, shampooing/vacuuming residential carpet, and removing some surface soil. This Record of Decision (ROD) addresses the remediation of the pretreatment lagoon area. The primary contaminants of concern affecting soil and lagoon sludge are organics, namely MBOCA and its degradation products.

The selected remedial action for this site includes removing and treating standing water in the lagoon; excavating contaminated soil, clay, and lagoon sludge from a 100-foot by 75-foot area and placing the material in an unexcavated portion of the lagoon; treating the contaminated material by in-situ vitrification; collecting pyrolized gases, and treating the gases using a scrubber system, air filters, and carbon adsorption beds; filling the lagoon containing the vitrified material with clean fill; and conducting ground water monitoring and soil sampling. The estimated present worth cost for this remedial action is $2,364,050, which includes a total O&M cost of $38,530 over 30 years.

PERFORMANCE STANDARDS OR GOALS: A cleanup action level of MBOCA 1,684 ug/kg was calculated based upon EPA guidance documentation. The cleanup level corresponds with the excess lifetime cancer risk level of 10^{-6}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Dredging; Excavation; Ground Water Monitoring; O&M; Onsite Disposal; Onsite Treatment; Organics; RCRA; Sludge; Soil; State Standards/Regulations; Surface Water Treatment; Treatability Studies; Treatment Technology; Vitrification.

BOFORS NOBEL, MI
First Remedial Action
September 17, 1990

The 85-acre Bofors Nobel site is an active specialty chemical production plant in Edelston Township, Muskegon County, Michigan. An inactive landfill is also located in the eastern portion of the site. Onsite wetlands lie within πthe floodplain of Big Black Creek, which runs through the southern portion of the site. The site overlies a lacustrine aquifer, a potential drinking water source, which has been contaminated as a result of site activities. During the 1960s and early 1970s, sludge, wastewater, and waste liquids from plant operations were discharged into 10 onsite lagoons. Subsequent investigations by EPA have identified eight of the onsite lagoons as potential sources of ground water contamination. In 1976, the State restricted wastewater discharge from the site, and a ground water pump and treatment system was installed to treat contaminated ground water in the lacustrine aquifer. This Record of Decision (ROD) addresses remediation of the lagoons, as well as upgrading the current ground water treatment system. A subsequent final ROD will address other contaminated soil and complete restoration of the aquifer. The primary contaminants of concern affecting the soil, sludge, and ground water are VOCs including benzene.

The selected remedial action for this site includes excavating approximately 101,000 cubic yards of sludge and berm material highly contaminated with VOCs, treating the contaminated material onsite using incineration and low temperature thermal desorption, disposing of the residual ash in an onsite landfill, and treating scrubber water from the incinerator by precipitation; treating landfill leachate in the ground water treatment system; excavating approximately 372,000 cubic yards of less VOC-contaminated soil and sludge and disposing of these wastes onsite in the landfill; pumping and treatment of ground water using ozone oxidation or a comparable treatment with onsite discharge to surface water; monitoring ground water, surface water, and air; and implementing site access restrictions including fencing. The estimated present worth cost for this remedial action is $70,874,000, which includes an annual O&M cost of $313,000 for 43 years.

PERFORMANCE STANDARDS OR GOALS: Landfilled material must exhibit an excess lifetime cancer risk of less than 10^{-6}. Chemical-specific soil cleanup levels were developed based on the type and location of contaminated media within or adjacent to the lagoons including benzene 410 to 4,500 ug/kg. Ground water cleanup levels are based on proposed Best Available Technology discharge standards including benzene 5.0 ug/l.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Monitoring; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Leachability Tests; MCLs; MCLGs; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Sludge; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; Treatability Studies; Treatment Technology; VOCs; Wetlands.

CLARE WATER SUPPLY, MI
First Remedial Action
August 30, 1990

The Clare Water Supply site is the public water supply system for the city of Clare, Clare County, Michigan. The Clare Water Supply system withdraws ground water from four municipal wells (MW) in the site wellfield, each tapping an unconsolidated sand aquifer. In 1981, ground water sampling revealed contaminants including chlorinated hydrocarbons in two of the wells (MW #2 and MW #5) in the northeastern portion of the site. An industrial area containing approximately 14 manufacturing and retailing businesses operates west of the contaminated wells. Soil samples extracted from this industrial area indicate soil contaminated with TCE and DCE. In addition, a nearby settling lagoon contains solvents and heavily contaminated sediment. EPA conducted a short-term study that determined that the major source of ground water contamination resulted from contaminants leaching out of soil on the industrial properties, entering a shallow perched aquifer, and migrating to the deeper aquifer that serves the municipal wellfield. The Clare Water Supply wellfield is the sole source of drinking water for the community. Remedial actions for this site will focus on two Operable Units (OUs). This Record of Decision (ROD) provides an interim remedy, which addresses TCE contamination of the drinking water supply. A subsequent ROD will address OU2, the remaining ground water contaminants as well as soil contamination. The primary contaminants of concern affecting the ground water are VOCs including TCE.

The selected remedial action for this interim remedy includes installing and operating an air stripper to treat the ground water, modifying pipelines on the existing water supply system, monitoring treated water from the air stripper prior to its release into the water supply system, and monitoring air emissions from the air stripper. The estimated present worth cost for this interim remedial action is $1,284,059, which includes an annual O&M cost of $61,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: This ROD will remediate ground water TCE and TCE-degradation components to meet Safe Drinking Water Act MCLs including TCE 5.0 ug/l. Additional chemical-specific ground water goals will be determined in the subsequent ROD.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air Stripping; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; Municipally Owned Site; O&M; Onsite Discharge; Onsite Treatment; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Sole-Source Aquifer; State Standards/Regulations; TCE; Treatment Technology; VOCs.

FISHER CALO CHEM, IN
First Remedial Action - Final
August 7, 1990

The Fisher Calo Chem site is in LaPorte County, Indiana. The site is comprised of the 33-acre One-Line Road facility, the 340-acre Two-Line Road facility, and the 170-acre Space Leasing facility. Surrounding the site are woodlands, grasslands, wetlands, and a wildlife area. Site contamination at all three facilities is the result of the production and distribution of industrial chemicals, and reclamation of waste paint and metal finishing solvents. From 1970 to 1985, packaging and storage violations were documented by the State during investigations. In 1979 when the State excavated buried drums from the One-Line Road facility, additional onsite contamination was identified. In 1982, EPA initiated site investigations that revealed elevated levels of organic compounds in ground water, heavy metals in the soil, and evidence of additional buried drums. Sampling

and analysis continued until 1988, when EPA initiated a removal action to dispose of drums, tanks, and containers at the Two-Line Road facility. This Record of Decision (ROD) addresses the remaining contaminated areas including the soil, waste material, and structures at the site, and contaminated ground water in aquifers underlying the site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including TCE, toluene, xylenes; other organics including PAHs and PCBs; and asbestos.

The selected remedial action for this site includes excavation and incineration of semi-volatile and PCB-contaminated soil, with ash disposal location to be determined upon leaching test results; treatment of VOC-contaminated soil remaining in the excavated area using soil flushing or vapor extraction; limited asbestos removal/repair of structures and offsite disposal of any asbestos-containing materials, drums, tanks, or containers and their contents; treating ground water using an equalization/sedimentation basin, granular activated carbon, and air stripping, followed by filtration and reinjection of the treated water into the shallow aquifer to enhance soil ground water monitoring; and implementation of site access restrictions. The estimated present worth cost for this remedial action is $31,685,000, which includes an annual O&M cost of $9,379.000.

PERFORMANCE STANDARDS OR GOALS: Excavation levels for contaminated soil are based on TSCA standards and TBC criteria including PCBs 10 mg/kg. Ground water cleanup levels are derived from action levels adopted by the State from SDWA MCLs and MCLGs, including TCE 5 ug/1.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Asbestos; Carbon Adsorption (GAC); Carcinogenic Compounds; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Inorganics; Leachability Tests; MCLGs; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Xylenes.

HAGEN FARM, WI
First Remedial Action
September 17, 1990

The 10-acre Hagen Farm site is a former waste disposal facility in Dade County, Wisconsin. This site is in a rural area that is dominated by sand and gravel mining and agricultural activities. From 1950 to 1966, waste materials were disposed of in three subareas of the site's defined area of contamination. Onsite investigations indicate that subarea A, a 6-acre area in the southern portion of the site, contains industrial wastes consisting of solvents and various other organics as well as municipal waste, whereas subareas B and C, each 1.5-acre areas in the northeastern portion of the site, appear to contain only scattered municipal wastes. Site investigations have determined the need for two concurrent operable units. The source control operable unit, which is defined in this Record of Decision (ROD), addresses the waste refuse and subsurface soil at areas A, B, and C with the goal of controlling the migration of the waste refuse and sub-soil and reducing the volume of contaminants from the waste and sub-soil to the ground water. The ground water operable unit will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil and waste refuse are VOCs including benzene, toluene, xylenes; other organics including phenols and PCBs; and metals including lead.

The selected remedial action for this site includes consolidating waste materials from disposal areas B and C into disposal area A and backfilling excavated depression areas within disposal areas B and C with clean soil, followed by revegetation; capping disposal area A after consolidation; treating 67,650 cubic yards of waste and 112,000 cubic yards of contaminated sub-soil materials in disposal area A using in-situ vapor extraction (ISVE) and treating off-gas emissions using carbon adsorption, followed by regenerating the spent carbon from the off-gas treatment process; and implementing site access restrictions and institutional controls including deed restrictions to prevent installation of drinking water wells and to protect the integrity of the cap. The

estimated present worth cost for the remedial action is $3,299,000 which includes an annual O&M cost of $29,530 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The goal of the ISVE will be a 90% removal of the VOCs from the waste and contaminated sub-soil. Off-gas extracts from the ISVE will be treated to meet State emission standards.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent disturbances of the consolidated capped material.

KEYWORDS: Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Debris; Direct Contact; Excavation; Institutional Controls; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PCBs; Phenols; Soil; Solvents; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

HUNTS DISPOSAL, WI
First Remedial Action - Final
September 29, 1990

The 84-acre Hunts Disposal site is an inactive landfill in Caledonia Township, Racine County, Wisconsin. Onsite features include a 35-acre landfill surrounded by woodlands, wetlands, agricultural areas, and a lake. Part of the site that includes the landfill is within the 100-year floodplain of the Root River. The site overlies a contaminated surficial sand and gravel aquifer. Prior to 1959, when onsite landfilling operations began, the site was a sand and gravel pit. By 1961, municipal and industrial wastes were dumped and burned in an onsite open pit. Approximately 620,000 cubic yards of waste is currently landfilled onsite, with 168,000 cubic yards present below the water table. Specific wastes disposed of onsite included waste newspaper ink, spent solvents, tannery wastes, chromic acids, arsenic acid, and beryllium. Because State site inspections revealed improper landfilling practices, the State ordered the landfill to close in 1974. EPA investigations conducted in 1984 and 1988 characterized contaminated media and determined the extent of onsite contamination. The primary contaminant migration pathway is onsite ground water, which is contaminated by wastes leaching from the eroded landfill cap and from wastes below the water table. This Record of Decision (ROD) addresses both source control and management of contaminant migration. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs including benzene, TCE, and xylenes; acids; and metals including arsenic and chromium.

The selected remedial action for this site includes excavating and consolidating 5,300 cubic yards of onsite contaminated soil and sediment from outside the landfill area to within the landfill, and filling excavated areas with clean soil; constructing a levee to prevent erosion of the landfill during floods; capping the landfill with a multi-layer clay and soil cover; installing an active landfill gas collection and combustion system; constructing a slurry wall intersecting the cap and a subsurface confining layer to hydraulically contain contaminated ground water; pumping and offsite treatment of ground water, followed by offsite discharge; and implementing institutional controls including land and ground water use and deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $17,454,000, which includes an annual O&M cost of $375,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels chosen for the site are State Preventive Action Limits (PALs), which are equal to, or more stringent than Federal MCLs. Ground water chemical-specific goals include benzene 1 ug/l, TCE 0.18 ug/l, xylenes 124 ug/l, arsenic 5 ug/l, and chromium 5 ug/l. Specific cleanup standards for soil and sediment have not been set.

INSTITUTIONAL CONTROLS: Land and ground water use, and deed restrictions will be implemented at the site.

KEYWORDS: Acids; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Debris; Deferred Decision; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Levees; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Containment; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Slurry Wall; Soil; State

Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria; Wetlands; Xylenes.

JANESVILLE ASH BEDS, WI
First Remedial Action - Final
December 29, 1989

The Janesville Ash Beds site is being remediated concurrently with the Janesville Old Landfill site and two nearby, non-NPL sites, the Janesville Old Dump and the Janesville New Landfill sites. These four sites comprise the 65-acre Janesville Disposal Facility (JDF) in Janesville, Wisconsin. The Janesville Ash Beds (JAB) site, which is RCRA regulated, operated from 1974 to 1985 and consisted of five ash beds in which industrial liquids and sludge were deposited and allowed to evaporate or dry. Although the JAB site was excavated, closed and capped with clay, it is a source of ground water contamination and possibly surface water contamination in the nearby Rock River. The second NPL site, the 18-acre Janesville Old Landfill site was operated from 1963 to 1978, accepting both municipal and industrial wastes. The site was capped with silty sand and sandy clay at the time of closure in 1978, but was subsequently shown to be contributing to air and ground water contamination. Two other contingent sites are also included as part of this remedy because of their proximity to the two NPL sites. A 1986 Consent Order authorized that the four sites comprising the JDF would be addressed in one remedial investigation under the joint authority of CERCLA and RCRA. The 16-acre Janesville New Landfill site was operated from 1978 to 1985 and accepted municipal and industrial wastes. The site is also a possible source of air and ground water contamination. The second additional site is the 15-acre Janesville Old Dump site which was operated from 1950 to 1963 as a general refuse dump, accepting unknown types of waste. This site does not significantly contaminate the JDF area. The primary contaminants of concern affecting the ground water and air are VOCs including benzene, PCE, and TCE; and metals including arsenic.

Remedial activities at the JDF site will be implemented at three of the sites and include upgrading the landfill cap, and providing site drainage as needed, at the JAB site; treating the landfill gas by extraction and flaring, upgrading the landfill cap, and air monitoring at the Old Landfill site; and treating the landfill gas by extraction and flaring, upgrading the landfill cap, improving the leachate collection system, and air monitoring at the New Landfill site. No further action will be implemented at the Janesville Old Dump site. Overall, contaminated ground water at the JDF site will be pumped and treated onsite by air stripping, with discharge to Rock River, in conjunction with ground water monitoring. Ground water and land use and deed restrictions will be implemented at each site. The estimated present worth cost for the Janesville Ash Beds site is $1,020,000, which includes an annual O&M cost ranging from $33,100 to $53,100.

PERFORMANCE STANDARDS OR GOALS: Ground water will be treated to attain Federal MCLs or State standards. Surface water will meet State surface water quality standards. Chemical-specific cleanup goals were not provided.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented to assure that future use of the site does not increase the potential release of hazardous substances. Deed and ground water use restrictions for the area between the JDF site and the neighboring Rock River will also be implemented.

KEYWORDS: Air; Air Monitoring; Air Stripping; Arsenic; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

JANESVILLE OLD LANDFILL, WI
First Remedial Action - Final
December 29, 1989

The Janesville Old Landfill site is being remediated concurrently with the Janesville Ash Beds site and two nearby, non-NPL sites, the Janesville Old Dump and the Janesville New Landfill sites. These four sites comprise the 65-acre Janesville Disposal Facility (JDF) in Janesville, Wisconsin. The 18-acre Janesville Old Landfill site was operated from 1963 to

1978, accepting both municipal and industrial wastes. The site was capped with silty sand and sandy clay at the time of closure in 1978, but was subsequently shown to be contributing to air and ground water contamination. The second NPL site, Janesville Ash Beds (JAB) site, was operated from 1974 to 1985 and consisted of five ash beds in which industrial liquids and sludge were deposited and allowed to evaporate or dry. Although the JAB site was excavated, closed and capped with clay, it is a source of ground water contamination and possibly surface water contamination in the nearby Rock River. Two other contingent sites are also included as part of this remedy because of their proximity to the two NPL sites. A 1986 Consent Order authorized that the four sites comprising the JDF would be addressed in one remedial investigation under the joint authority of CERCLA and RCRA. The 16-acre Janesville New Landfill site was operated from 1978 to 1985 and accepted municipal and industrial wastes. The site is also a possible source of air and ground water contamination. The second additional site is the 15-acre Janesville Old Dump site which was operated from 1950 to 1963 as a general refuse dump, accepting unknown types of waste. This site does not significantly contaminate the JDF area. The primary contaminants of concern affecting the ground water and air are VOCs including benzene, PCE, and TCE; and metals including arsenic.

Remedial activities at the JDF site will be implemented at three of the sites and include treating the landfill gas by extraction and flaring, upgrading the landfill cap, and air monitoring at the Old Landfill site; upgrading the landfill cap, and providing site drainage as needed, at the JAB site; and treating the landfill gas by extraction and flaring, upgrading the landfill cap, improving the leachate collection system, and air monitoring at the New Landfill site. No further action will be implemented at the Janesville Old Dump site. Overall, contaminated ground water at the JDF site will be pumped and treated onsite by air stripping, with discharge to Rock River, in conjunction with ground water monitoring. Ground water, land use and deed restrictions will be implemented at each site. The estimated present worth cost for the Old Landfill site is $6,059,000, which includes an annual O&M cost ranging from $71,500 to $174,000.

PERFORMANCE STANDARDS OR GOALS: Ground water will be treated to attain Federal MCLs or State standards. Surface water will meet State surface water quality standards. Chemical-specific cleanup goals were not provided.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented to assure that future use of the site does not increase the potential release of hazardous substances. Deed and ground water use restrictions for the area between the JDF site and the neighboring Rock River will also be implemented.

KEYWORDS: Air; Air Monitoring; Air Stripping; Arsenic; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLs; Metals; No Action Remedy; O&M; Offsite Discharge; Onsite Containment; PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

K&L LANDFILL, MI
First Remedial Action - Final
September 28, 1990

The 87-acre K&L Landfill site is an inactive municipal landfill in Oshtemo Township, Kalamazoo County, Michigan. Surrounding land use is rural-residential with several nearby small lakes and ponds. The site overlies two sand and gravel aquifers (shallow and deep), which are not apparently hydraulically connected, but both are area drinking water sources. From the early 1960s to 1979, approximately 5 million cubic yards of refuse and an unknown quantity of liquid and drummed chemical wastes were accepted at the landfill. In 1972, the State notified the site owners to stop accepting chemical wastes, but the request was ignored. Residential well testing in 1976, 1978, and 1979 revealed ground water contamination. In 1979, the State ordered the landfill to cease operations, to supply an alternate water supply to affected residents, and to cover the landfill. This Record of Decision (ROD) provides a final remedy and addresses contaminated ground water in the shallow aquifer. The primary contaminants of concern present in the landfill affecting the soil, debris, and ground water are VOCs including benzene,

toluene, and xylenes; other organics including acids, PAHs, PCBs, and phenols; and metals including chromium and lead.

The selected remedial action for this site includes capping approximately 83 acres of landfill area with a RCRA multi-layer cap and installing gas vents throughout the landfill; pumping and onsite treatment of ground water using enhanced bioremediation/fixed-film bioreactor technology accompanied by aeration; conducting treatability studies or pilot tests to ensure the effectiveness of the selected technology; discharging the treated effluent by either onsite reinjection, discharge to an onsite filtration pond, or offsite discharge of ground water to a publicly owned treatment works (POTW); disposing offsite of any resulting sludge; continued ground water, surface water, and air monitoring; closure and abandonment of affected residential wells; implementing institutional controls including deed restrictions to limit ground water and land use, and site access restrictions such as fencing. The estimated present worth cost of this remedial action is $16,407,100, which includes a total O&M cost of $1,099,900 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Remedial goals are based upon reduction of excess life-time cancer risks to 10^{-4} to 10^{-6} for carcinogens. For non-carcinogens, the Hazard Index (HI) will be reduced to 1 or less. Chemical-specific goals for ground water include acetone 700 ug/l (State), benzene 1.0 ug/l (State), toluene 40 ug/l (State), vinyl chloride 0.02 ug/l (State), xylenes 20 ug/l (State), phenols 300 ug/l (State), and lead 5.0 ug/l (State).

INSTITUTIONAL CONTROLS: Deed restrictions limiting ground water and land use will be implemented.

KEYWORDS: Acids; Aeration; Air Monitoring; Benzene; Carcinogenic Compounds; Capping; Chromium; Clean Air Act; Closure Requirements; Debris; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachability Tests; Lead; MCLGs; MCLs; Metals; Municipally Owned Site; O&M; Offsite Discharge; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Monitoring; Toluene; Treatability Studies; Treatment Technology; Venting; VOCs; Xylenes.

KUMMER SANITARY LANDFILL, MN
Third Remedial Action - Final
September 29, 1990

The 35-acre Kummer Sanitary Landfill site is an inactive mixed municipal waste landfill in Northern Township, Beltrami County, Minnesota, approximately one mile west of Lake Bemidji. A large residential area lies approximately 1,000 feet east of the site, and there is a hospital directly southwest. The privately owned landfill was operated from 1971 until 1985; however, business records for the site are virtually nonexistent. Operations at the landfill caused the State to take a number of administrative and enforcement actions. Following the discovery of ground water contamination in Northern Township in 1984, the State issued a public health advisory concerning the well water and provided a temporary water supply. Two previous Records of Decision (RODs) in 1985 and 1988 documented the provision of an alternative water supply for the Northern municipal water system as Operable Unit 1 (OU1), and a source control Operable Unit (OU2), which included a cover system to control the source of contamination (OU3). This final ROD addresses ground water contamination. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, and vinyl chloride.

The selected remedial action for this site includes ground water pumping and treatment using advanced oxidation processes (e.g., ozone, hydrogen peroxide, or ultraviolet light), and lime soda softening, as necessary, to precipitate alkalinity and other inorganic compounds, followed by disposal of the precipitate sludge, polishing the effluent stream with granulated activated carbon, and discharging treated ground water to an onsite infiltration pond; and ground water monitoring. Treatability studies for bioremediation as a more cost-effective remedy are planned; however, the ROD will be amended if the treatment is changed to biotreatment. The estimated present worth cost for this remedial action is $1,800,000-$6,200,000, which includes an annual O&M cost of $240,000-$510,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Contaminants of concern in the ground water will be reduced to meet current and proposed Maximum Contaminant Levels (MCLs) including PCE 5 ug/l (proposed MCL), TCE 5 ug/l (MCL), and benzene 5 ug/l (MCL); thereby reducing cumulative residual carcinogenic risk due to ingestion to 10^{-6}.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; MCLGs; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Safe Drinking Water Act; TCE; Treatability Studies; VOCs; Water Quality Criteria.

MASTER DISPOSAL SERVICE LANDFILL, WI
First Remedial Action
September 26, 1990

The 26-acre Master Disposal Service Landfill site is an inactive industrial landfill in the Town of Brookfield, Waukesha County, Wisconsin. The site lies within the marshy floodplain of the Fox River and is partially surrounded by wetlands and drainage channels. The site overlies a surficial sand/gravel and dolomite aquifer system, which has been contaminated by onsite disposal activities. Onsite disposal of mainly industrial foundry sands and slags occurred between 1967 and 1982. Onsite disposal of hazardous wastes including inks, sludge, and solvents was also observed during this period. The site was partially closed in 1982, but controlled burning of wood waste continued until 1985, when the site was permanently closed. Investigations completed in 1990 identified negative impacts on surface water and ground water from the landfill sources. This Record of Decision (ROD) addresses source control as a final remedy and management of migration of ground water as an interim remedy. A subsequent ROD will address the final restoration of the surficial aquifer system. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene, TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes capping the landfill with a clay/soil cap and soil cover; installing an active landfill gas venting system; pumping and treatment of ground water in the surficial aquifer system using filtration and either air stripping, carbon adsorption, ion exchange or chemical treatment, based on the results of treatability studies; discharging the treated water onsite to surface water; restoring or mitigating any wetlands impacted by this remedial action; conducting long term surface water and ground water monitoring; and implementing institutional controls including deed, land use, and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action ranges from $4,632,000 to $5,016,000, which includes an annual O&M cost ranging from $142,730 to $164,130 for 30 years, depending upon the selected ground water treatment.

PERFORMANCE STANDARDS OR GOALS: Effluent discharge limitations for treated ground water were calculated from State discharge statutes, and specify weekly averages for metal contaminants and monthly averages for VOCs, as well as maximum concentration levels. Chemical-specific goals include benzene 8.5 lbs/day, TCE 22 lbs/day, toluene (daily concentration level) 17 mg/l, arsenic 0.045 lbs/day, chromium (total) 0.034 lbs/day, and lead 0.0096 lbs/day.

INSTITUTIONAL CONTROLS: Deed, land use, and ground water use restrictions will be implemented at the site.

KEYWORDS: Air Stripping; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Debris; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; Toluene; Treatability Studies; VOCs; Venting; Water Quality Criteria; Wetlands; Xylenes.

METAMORA LANDFILL, MI
Second Remedial Action
September 28, 1990

The 160-acre Metamora Landfill site is an inactive, privately owned landfill in Metamora Township, Lapeer County, Michigan. Both wetland and woodland areas are present onsite. The site is underlain by a shallow glacial deposit aquifer, a lower sand and gravel unit ("the intermediate aquifer"), and the Marshall Sandstone bedrock aquifer. Landfill operations began in 1955 as an open dump, and the facility was upgraded in 1969. Industrial and municipal wastes, including approximately 35,000 drums, were accepted until the landfill closed in 1980. In 1981, the State sampled seven drums and identified several hazardous materials. A 1986 Record of Decision (ROD) for Operable Unit 1 (OU1) called for the excavation and disposal of the waste drums offsite at a RCRA incinerator. This ROD addresses ground water contamination of the shallow aquifer, as well as the generation of leachate at the landfill (OU2). A third ROD will address onsite contaminated subsurface soil (OU3). The primary contaminants of concern in the landfill affecting debris and ground water are VOCs including benzene, PCE, TCE, and xylenes; and metals including arsenic and barium.

The selected remedial action for this site includes pumping and treatment of ground water using precipitation/flocculation to remove inorganic contaminants, followed by air stripping and carbon adsorption to remove organics, and reinjection of treated water into the shallow aquifer; offsite treatment and disposal of secondary waste streams including flocculation sludge and spent carbon; capping the landfill area using a multi-layer clay cap as required by the State, and collection and flaring of landfill gases; monitoring ground water; implementing institutional controls such as deed and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $19,354,050, which includes an annual O&M cost of $856,944 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for ground water are based on Michigan Act 307 rules as well as MCLs and include benzene 1.0 ug/l (State), PCE 0.7 ug/l (State), TCE 3.0 ug/l (State), xylenes 20 ug/l (State), and for arsenic the more stringent of 0.02 ug/l (State) or background.

INSTITUTIONAL CONTROLS: Deed and ground water use restrictions will be implemented at the site.

KEYWORDS: Air Stripping; Arsenic; Background Levels; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Closure Requirements; Debris; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachability Tests; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatability Studies; Venting; VOCs; Wetlands; Xylenes.

MOSS-AMERICAN KERR-MCGEE OIL, WI
First Remedial Action - Final
September 27, 1990

The 88-acre Moss-American Kerr-McGee Oil site, a former wood preserving facility is in Milwaukee County, Wisconsin. Part of the facility lies within the 100-year floodplain of the Little Menomonee River, which flows through the site. A section of the site is wooded, and wetlands are located near the river onsite and downstream. A 23-acre portion of the site is presently used as a railroad loading and storage facility for automobiles, and the remainder of the site is an undeveloped parkland. An unconfined shallow aquifer underlies the site. Beginning in 1921, onsite operations consisted of wood preserving of railroad ties, poles, and fence posts with a mixture of creosote, which is high in PAHs, and No. 6 fuel oil. The facility changed names and ownership several times until it ceased operations in 1976. Wastes were discharged to onsite settling ponds until 1971, when wastewater was discharged into the sanitary sewer system. In 1971, several people received chemical burns attributed to creosote while wading three miles downstream of the site. This led to a State order requiring cleanup of onsite settling ponds by the site owner and operator. In 1973, EPA dredged 5,000 feet of the river directly downstream of the site. During 1977 to 1978, 450 cubic yards

of contaminated soil were removed during the dismantling of the facility. Studies conducted before 1980 indicated that extensive creosote contamination was present in the soil and ground water onsite as well as in the sediment of the Little Menomonee River. This Record of Decision (ROD) provides a final remedy and addresses source and ground water remediation. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, toluene, and xylenes; and other organics including PAHs.

The selected remedial action for this site includes rerouting 5 miles of the river channel onsite parallel to the existing channel, followed by excavating highly contaminated sediment from the old channel; mitigating wetland areas; treating 5,200 cubic yards of river sediment and 80,000 cubic yards of contaminated onsite soil using onsite soil washing and bioslurry technologies; separation and dewatering of residues followed by redeposition onsite; covering treated material with 2 feet of clean soil and 6 inches of topsoil, followed by revegetation; recycling or treating slurry water onsite before discharge to a publicly owned treatment works (POTW) or the river; constructing a synthetic geomembrane barrier to prevent movement of contaminated ground water into the river; collecting ground water using a drain and interceptor system, followed by treatment using an oil/water separator and granular activated carbon, with discharge of treated water to a POTW or to the river; removing pure-phase liquid wastes for offsite incineration; and ground water monitoring. The estimated present worth cost for this remedial action is $26,000,000, which includes an annual O&M cost of $130,000 for 10 years.

PERFORMANCE STANDARDS OR GOALS: Goals are designed to reduce the excess lifetime cancer risk for carcinogens to 10^{-4} or less. For non-carcinogens, cleanup levels will reduce the Hazard Index (HI) to 1 or less. Chemical-specific goals for ground water include benzene 0.067 ug/l [State Preventive Action Level (PAL)], toluene 68.6 ug/l (State PAL), and xylenes 124.0 ug/l (State PAL). The chemical-specific goal for soil and sediment is PAHs (carcinogenic) 6.1 mg/kg (State).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent onsite development.

KEYWORDS: ARAR Waiver; Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; O&M; Offsite Discharge; Offsite Treatment; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; Publicly Owned Treatment Works (POTW); RCRA; Sediment; Soil; Soil Washing/Flushing; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; Wetlands; Xylenes.

NATIONAL PRESTO INDUSTRIES, WI

First Remedial Action
August 1, 1990

The 325-acre National Presto Industries site is a former munitions and metal-working facility in Eau Claire, Chippewa County, Wisconsin, adjacent to the town of Hallie. From 1942 until 1945, the site was government-owned, contractor-operated, and produced gunpowder and small arms. From 1945 to 1980, the site was owned by National Presto Industries (NPI). Initial operations were for the manufacture of cookware and consumer products, which generated waste streams consisting of metals, oils, grease, and spent solvents. Also, beginning in 1951, artillery shell fuses, aircraft parts, and metal projectiles were produced by NPI under a military contract. Early waste-handling practices included the use of dry wells and seepage pits with overflow from the pits pumped to a series of lagoons, used as settling and percolation ponds. A major waste steam generated from the defense-related activities was a spent forge compound, comprised of mineral oil, graphite, VOCs, and asphalt, which accounts for much of the sludge in the bottom of one of the settling ponds. From 1966 to 1969, the spent forge compound was also landfilled onsite. Subsequently, the spent forge compound was recycled as part of the manufacturing process. Based on their investigations, EPA required National Presto Industries to provide bottled water to an area in Hallie, where private wells are contaminated or threatened by contamination from confirmed onsite sources. This Record of Decision (ROD) provides for a permanent alternate water supply to address the principal threat posed by the ground water contamination at the site.

Future operable units will address source control and ground water remediation. The primary contaminants of concern affecting the ground water are VOCs including PCE and TCE.

The selected remedial action for this site includes constructing a well field, storage facilities and distribution system to supply water to the businesses and residences within the affected area of the Hallie Sanitary District; extending municipal water service from the City of Eau Claire to businesses and residences within the affected area that have annexed to Eau Claire; closing and abandoning all existing private wells within the affected area that draw from the contaminated aquifer; and annual monitoring of the designated private wells immediately outside the affected area that are still used as drinking water supply to ensure continued quality of drinking water. The estimated present worth cost for this remedial action is between $3,000,000 and $3,200,000, which includes an estimated annual O&M cost of between $48,200 and $120,000, depending on the size and extent of remediation required. The most likely annual O&M cost is $90,000.

PERFORMANCE STANDARDS OR GOALS: The primary goal of the EPA and the State is to provide a permanent and safe alternate drinking water supply to the affected area.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Alternate Water Supply; Carcinogenic Compounds; Direct Contact; Ground Water; Ground Water Monitoring; O&M; PCE; Safe Drinking Water Act; State Standards/Regulations; TCE; VOCs.

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT, MN
First Remedial Action
September 28, 1990

The 82.6-acre Naval Industrial Reserve Ordnance Plant (NIROP) site is a weapons system manufacturing facility in Fridley, Minnesota, which began operations in 1940. The site is a government-owned, contractor-operated plant located just north of the FMC Corp. Superfund site. NIROP is located approximately 30 feet above and 700 feet east of the Mississippi River and less than one mile upstream from the city of Minneapolis drinking water supply intake. During the 1970s, paint sludge and chlorinated solvents were disposed of onsite in pits and trenches. In 1981, State investigations identified TCE in onsite water supply wells drawing from the Prairie DuChien/Jordan aquifer, and the wells were shut down. In 1983, EPA found drummed waste in the trenches or pits at the northern portion of the site, and as a result, during 1983 and 1984, the Navy authorized an installation restoration program, during which approximately 1,200 cubic yards of contaminated soil and 42 drums were excavated and landfilled offsite. In 1987, TCE use at the site was discontinued, but the principal threat posed by the site is the continued migration of TCE via ground water to the Mississippi River. This Record of Decision (ROD) addresses remediation of a shallow ground water operable unit. The need for a second operable unit to treat potential contamination sources will be determined pending the results of additional investigations. The primary contaminants of concern affecting the ground water are VOCs including PCE, TCE, toluene, and xylenes.

The selected remedial action for the site is a two-phased approach. Phase I includes ground water pumping and pre-treatment, as necessary, before disposal to a local publicly owned treatment works (POTW) via an existing sanitary sewer system; and testing the recovered water to assist in the design of Phase II treatment facilities. Phase II includes treating the recovered ground water by either a two-stage air stripping process, followed by vapor-phase granular activated carbon (GAC) to treat air emissions, or treating ground water using aqueous-phase GAC, depending on Phase 1 test results; and discharging treated ground water into the Mississippi River. Both options include disposal of the treated effluent offsite and regenerating the spent carbon at an offsite facility. The estimated present worth cost for this remedial action is $4,100,000 for the GAC-only option. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water quality in the unconsolidated aquifer at the site will be restored to MCLs or State recommended allowable limits, if more restrictive. Because TCE was found with the greatest frequency and in the highest concentrations at the site than any other VOC, TCE 5.0 ug/l (MCL) was established as the

target cleanup goal for ground water in the aquifer. Cleanup levels for recovered ground water discharged to the local POTW must not exceed 10 mg/l, total VOCs, and individual VOC levels must be less than 3 mg/l (local POTW standards). Contaminants in any uncaptured portion of the aquifer are expected to dissipate by natural means over time.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Clean Air Act; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Offsite Discharge; PCE; Plume Management; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Xylenes.

NL INDUSTRIES/TARACORP
LEAD SMELTING, IL
First Remedial Action
March 30, 1990

The NL Industries/Taracorp Lead Smelting site is an inactive secondary lead smelting facility in a heavily industrialized section of Granite City, Madison County, Illinois. Land in the site vicinity is primarily industrial, but includes adjacent residential communities, including Eagle Park Acres and Venice Township. Prior to 1903, the site was used for metal refining, fabricating, and other associated activities. From 1903 to 1983, the site was used for secondary lead smelting activities. These operations generated an onsite pile of blast furnace slag and battery casing debris waste (the Taracorp pile). From 1981 to 1983, St. Louis Lead Recyclers, Inc. (SLLR) used equipment on an adjacent property to recycle lead-bearing materials from the Taracorp waste pile for use in the furnaces at Taracorp. Hard rubber was the end waste product of this recycling process. In 1983, both operations were discontinued and the equipment dismantled. In 1983, a State study of the Granite City lead attainment air emissions problem linked emissions from the onsite lead smelter and reclamation operations at the NL Industries/Taracorp site to the air pollution problem. Onsite contaminated areas identified during the study included the 85,000 cubic yard Taracorp pile, smaller adjacent waste piles associated with the SLLR recycling operation that total 2,450 cubic yards, and 25 to 35 drums containing solid waste from onsite smelting operations. Additionally, the adjacent property contained a 4,000 cubic yard pile of battery casing debris from the SLLR operation, and another large contaminated unpaved area was identified south and west of the site. Other contamination associated with the site included 2,700 cubic yards of battery casing material in Eagle Park Acres and an additional 670 cubic yards of similar material in Venice Township. In 1984, the State required the implementation of remedial actions to improve air quality. This Record of Decision (ROD) addresses the Taracorp pile, the SLLR piles, and residential soil, alleys, and driveways that are contaminated by airborne lead and/or hard rubber battery casing material. The primary contaminant of concern affecting the soil and debris is lead.

The selected remedial action for this site includes excavating a total of 94,820 cubic yards of lead-contaminated soil and debris from the SLLR piles, the unpaved area, and adjacent residential areas, and hard rubber battery casing material from Venice, Eagle Park Acres, and other nearby communities; consolidating the soil and debris within the Taracorp pile; covering the Taracorp pile with a RCRA multi-media cap, and lining the newly-expanded Taracorp pile with a clay liner; removing all onsite drums to an offsite secondary lead smelter facility for recovery; monitoring nearby communities to determine if additional areas need remediation or lead exposures need mitigation; performing blood lead sampling to determine potential acute site-associated health effects; monitoring air and ground water during remedial activities; developing a contingency plan to provide remedial action if any nearby soil lead levels exceed 500 mg/kg or ground water or air exceed applicable standards; and implementing institutional controls, including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $30,000,000, which includes an annual O&M cost of $35,300 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup levels for lead are based on the "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites" (1989). All contaminated soil in the unpaved area adjacent to the site will be excavated to achieve a lead

cleanup level of 1,000 mg/kg. All contaminated soil in adjacent residential areas will be excavated to achieve a cleanup level of lead 500 mg/kg.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site to prevent disturbance of the capped Taracorp pile.

KEYWORDS: Air Monitoring; Capping; Carcinogenic Compounds; Closure Requirements; Contingency Remedy; Debris; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; Offsite Disposal; Onsite Containment; RCRA; Soil; State Guidance; State Standards/Regulations.

OCONOMOWOC ELECTROPLATING, WI

First Remedial Action
September 20, 1990

The 10.5-acre Oconomowoc Electroplating site encompasses a 5-acre active electroplating facility and 5 acres of adjacent wetlands in Dodge County, Ashippun, Wisconsin. The Oconomowoc Electroplating Company's (OEC) facility includes a main building that houses process lines, a wastewater treatment building, two formerly used wastewater treatment lagoons, and various storage tank and container deposit areas. Recreational facilities, residences, and businesses that use ground water for their drinking water supply, are in proximity to the OEC facility. In addition, Davy Creek, a small creek and warm water sport fishery, flows through the wetlands 500 feet south of the site. Electroplating, finishing, and degreasing processes performed since 1957 at the OEC facility produce a multi-source effluent stream contaminated with heavy metals and VOCs. The effluent, as well as accidental spills and leaks around the property, have resulted in widespread site contamination. Prior to 1972, untreated wastewaters were discharged directly into the Davy Creek wetlands, and even after the construction of two treatment lagoons, untreated wastes and sludge overflowed the lagoons and continued to accumulate in the wetlands. Lagoon sludge removal was initiated by OEC in 1979 but was never completed, and therefore, discharge of contaminants, including RCRA-listed hazardous waste (F006), continued into the wetlands. An estimated 10,000 square yards of wetlands are contaminated with metals and cyanide. Hazardous waste was also found in between the walls and floor of the wastewater treatment building (where it was placed as a sealant), leaking from waste containers, and spilled in a north parking lot area. Due to its complexity, the site has been divided into four Operable Units (OU) for remediation: the surface water, sludge and contaminated soil associated with the two lagoons (OU1); all other contaminated soil around the OEC facility not associated with the lagoons or found beneath the manufacturing building, including a fill area, a lowlands area, the drainage ditches and the parking lot area (OU2); the associated contaminated ground water (OU3); and the highly contaminated sediment in the Davy Creek wetlands area (OU4). All remedial actions for the operable units are final except for OU4, which is an interim action. Further wetland investigation will delineate the final removal area. In addition, if after further investigation, the building foundation and underlying soil will need remediating, an appropriate remedial action will be developed to accompany the wetland remedial action. The primary contaminants of concern affecting the soil, sediment, debris, sludge, ground water and surface water are VOCs including TCE, toluene, and xylenes; and metals including chromium and lead.

The selected remedial action for this site includes clean closing the lagoon by excavating 650 cubic yards of lagoon sludge and surrounding soil, followed by stabilization and offsite disposal of the material and pumping 72,000 gallons of contaminated lagoon water (which will be hauled offsite and treated) (OU1); excavating 700 cubic yards of soil and debris with offsite treatment and disposal (OU2); onsite ground water pumping and treatment using filtration, ion exchange, air stripping, and carbon adsorption, followed by onsite discharge to surface water (a treatability study will be conducted to determine the effectiveness of the ion exchange and to determine the disposition of the resin) (OU3); excavating 6.000 cubic yards of contaminated sediment from Davy Creek and adjacent wetlands to a depth of two feet, followed by offsite stabilization, treatment, and disposal of the contaminated sediment and monitoring of the area; and performing additional bioassay and risk assessment work to determine final exposure levels (OU4). The estimated present worth cost for this remedial action is $7,576,196,

which includes an annual O&M cost of $90,569. The present worth costs associated with each of the four OUs are $490,302 (OU1); $258,667 (OU2); $1,831,805 (OU3), which includes an annual O&M cost of $90,569; and $4,995,422 (OU4).

PERFORMANCE STANDARDS OR GOALS: The lagoon soil excavation levels for the OEC site OU1 will attain background levels consistent with State and Federal (RCRA) clean closure levels; excavation of OU2 soil will attain a 10^{-6} cumulative carcinogenic risk and a cumulative HI<1 for noncarcinogens. Ground water treatment (OU3) will attain Federal and State ground water cleanup standards and are based on State preventative action limits (PALs). Chemical-specific ground water goals include chromium 5.0 ug/l (PAL); and TCE 0.18 (PAL). Cleanup levels for Davy Creek and adjacent wetlands have not been determined.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Closure; Clean Water Act; Debris; Direct Contact; Drinking Water Contamination; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Hybrid/Alternate Closure; Interim Remedy; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Solvents; State Permit; State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; TCE; Toluene; Treatability Studies; VOCs; Water Quality Criteria; Wetlands; Xylenes.

ONALASKA MUNICIPAL LANDFILL, WI

First Remedial Action - Final
August 14, 1990

The 11-acre Onalaska Municipal Landfill site includes a 7-acre landfill owned by the Township of Onalaska, which is located in central-western Wisconsin. The Black River and its associated wetlands are 400 feet west of the site and lie within a wildlife and fish refuge. The site was operated as a sand and gravel quarry until the late 1960s, when it was converted and used as a municipal landfill until 1980. Although the site was primarily used for the disposal of municipal wastes, solvent wastes were also disposed of onsite until 1976. Approximately 320,000 gallons of liquid solvent waste and approximately 1,000 drums of solvent waste were either burned with other trash onsite or poured directly into holes for burial in the southwestern portion of the landfill. The Township capped the landfill in 1982, but subsequent onsite investigations revealed ground water contamination within and around the site. Ground water flows beneath the landfill, where it comes into contact with solvents leaking from the solvent disposal area. The ground water flows in a southwesterly direction and a ground water contaminant plume has migrated from the southwestern edge of the landfill and appears to be discharging into the wetlands. This Record of Decision addresses two operable units, the ground water plume and the contaminated soil adjacent to the southwestern portion of the landfill, which is a major source of ground water contamination. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, TCE, toluene, and xylenes; other organics including PAHs; and metals including arsenic and lead.

The selected remedial action for this site includes in-situ bioremediation of the solvent-contaminated soil and, if feasible, a portion of the landfill debris; pumping and treatment of the ground water plume using aeration, clarification, and filtration, followed by discharge of the treated ground water into the Black River and onsite disposal of the sludge generated during the treatment process; reconstruction of the landfill cap and installation of a passive methane gas venting system to control the gas buildup under the cap; ground water monitoring; and implementation of institutional controls including deed restrictions limiting ground water and surface water use. The estimated present worth cost for this remedial action is $8,000,000, which includes an annual O&M cost of $164,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS; Chemical-specific soil cleanup standards were not provided but will be established once the reduction rate for bioremediation has been determined during the pilot-scale test. Currently, the estimated cleanup goal is an 80-95% reduction of the organic contaminant mass in the soil. Ground water at the landfill waste boundary will meet SDWA MCLs or

non-zero MCLGs. Chemical-specific cleanup standards for the ground water beyond the site boundary are based on State cleanup levels and include benzene 0.067 ug/1, toluene 68.6 ug/1, xylenes 124 ug/1 TCE 0.18 ug/1, arsenic 5 ug/1, and lead 5 ug/1. The reconstructed cap is projected to reduce the rate of precipitation infiltration by 80%, thereby minimizing contaminant migration toward the ground water.

INSTITUTIONAL CONTROLS: Deed restrictions limiting surface and ground water use at the site will be implemented.

KEYWORDS: Aeration; Arsenic; Benzene; Biodegradation; Capping; Carcinogenic Compounds; Clean Water Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; MCLGs; Metal; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; Plume Management; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; Venting; VOCs; Wetlands; Xylenes.

OTT/STORY/CORDOVA CHEMICAL, MI

Second Remedial Action
September 29, 1990

The Ott/Story/Cordova Chemical site is a former specialty chemical manufacturing facility in Dalton Township, Muskegon County, Michigan. The site is at the headwaters of a small, unnamed tributary of Little Bear Creek, which flows southeast of the site approximately one-half mile away to Muskegon River, three miles to the south. The site operated from 1957 to 1985 under a series of owners. Chemical products manufactured onsite included intermediate items used in manufacturing pharmaceuticals, dyestuffs, agricultural chemicals, diisocyanates, and herbicides. For at least ten years, production vessel clean-out wastes and wastewaters were discharged to onsite unlined lagoons and allowed to dissipate into soil. In subsequent years, wastes were also drummed and stored onsite. In the early 1960s, the State noted signs of water and soil contamination. Site owners attempted to manage the ground water contaminant plumes emanating from the site, but the effectiveness of these measures was uncertain. In 1977, the State negotiated with a new site owner to remove several thousand drums, thousands of cubic yards of lagoon sludge, and to destroy or to neutralize phosgene gas left onsite. In 1982, an alternate water supply was undertaken and financed in part by the State and a former owner. A Record of Decision (ROD), signed in 1989 and reaffirmed in 1990 after additional public comment, addressed Operable Unit 1 (OU1), the contamination of the nearby Little Bear Creek system. This ROD addresses aquifer restoration. A subsequent ROD will address remaining threats posed by the contaminated soil areas at the site. The primary contaminants of concern affecting the ground water are VOCs including benzene, 1,2 dichloroethane, PCE, TCE, toluene, vinyl chloride, and xylenes; other organics including pesticides; and metals including arsenic.

The selected remedial action for this site includes installing and operating extraction wells in a phased approach to restore the aquifer and prevent degradation of useable ground water downgradient of the plume; pumping and treatment of ground water in the shallow and deeper zones of the aquifer system using physical-chemical treatment including UV-oxidation, air stripping, biological treatment such as activated sludge, and/or filtration/adsorption such as granular activated carbon as determined in the design phase; discharging the treated effluent in the nearby stream; installing a ground water monitoring system to demonstrate the effectiveness of restoration; and implementing institutional controls, such as deed restrictions to limit ground water use. The estimated present worth cost for this remedial action is $26,000,000, which includes an annual O&M cost of $1,400,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals include benzene 1 ug/l (10^{-6} cancer risk level), toluene 40 ug/l (State standard), TCE 3 ug/l (10^{-6} cancer risk level), and xylenes 20 ug/l (State standard). Effluents must meet limitations for stream discharge as administered by the State.

INSTITUTIONAL CONTROLS: Deed restrictions or other controls will be implemented to limit current and future uses of ground water at and downgradient of the facility.

KEYWORDS: Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Metals; O&M; Offsite Discharge; Organics; PCE; Pesticides; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Wetlands; Xylenes.

PRISTINE, OH
First Remedial Action (Amendment) - Final
March 30, 1990

The 2-acre Pristine site is in Reading, Hamilton County, Ohio. The site is bordered by industrial and residential areas, including a trailer park three hundred feet northeast of the site. Eight municipal supply wells serving the citizens of Reading are located approximately 300 feet northwest of the site. Prior to 1974, this site was used for the manufacture of sulfuric acid. Subsequently, Pristine began liquid waste disposal operations at the site, and in 1977, obtained a permit to operate an onsite liquid waste incinerator. An onsite concrete lined pit (the magic pit) was used to store and treat hazardous materials during liquid waste disposal operations. In 1979, State investigations identified as many as 8,000 to 10,000 drums and several thousand gallons of liquid wastes onsite. Types of waste included acids, solvents, pesticides, and PCBs. Over 90 hazardous compounds were detected onsite in the soil, ground water, surface water, sediment, and debris as a result of past disposal activities. In 1981, the State ordered all onsite disposal operations to cease. From 1980 to 1983, EPA and Pristine removed onsite wastes including paint and solvent sludge, solvents, pesticides, organics, PCB-contaminated soil, and incinerator ash. During 1984, the PRPs removed contaminated soil and waste as a means to address the immediate site hazards. A 1987 Record of Decision (ROD) documents the selection of in-situ vitrification of the upper 12 feet of soil across the site. This ROD amends the soil component remedy of the 1987 ROD from in-situ vitrification to incineration and soil vapor extraction. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs including benzene, PCE, TCE, and xylenes; other organics including dioxin and pesticides such as DDT; metals including lead, chromium, and arsenic; and other inorganics.

The selected amended remedial action for this site includes excavating and incinerating the top one foot of contaminated soil from across the site (a total of 3,598 cubic yards) and 1,799 cubic yards of contaminated soil to a depth of four feet in areas that contain semi-volatile organic compounds and pesticides in excess of performance goals; incinerating 600 cubic yards of contaminated sediment and 1,125 cubic yards of contaminated soil surrounding the magic pit; testing the residual ash and placing the ash onsite if it meets standards for delisting; performing in-situ soil vapor extraction with an off-gas control system to extract VOCs from onsite soil to a depth of 12 feet; dewatering the upper aquifer, and onsite treatment of the extracted ground water using carbon adsorption; capping the soil with a RCRA multi-layer cap; pumping and treatment of ground water from the lower and upper aquifer and lower outwash lens of the upper aquifer using air stripping and carbon adsorption; decontaminating and demolishing all onsite structures and disposing of the debris offsite; monitoring ground water; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $13,500,000, which includes an O&M cost of $6,000,000.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific goals for soil/sediment were based on a cumulative 10^{-6} incremental lifetime cancer risk of eleven indicator compounds including aldrin 15 ug/kg, benzene 116 ug/kg, chloroform 2,043 mg/kg, DDT 487 ug/kg, 1,2-DCA 19 ug/kg, 1,1-DCE 285 ug/kg, dieldrin 6 ug/kg, PAHs 14 ug/kg, dioxin 0 ug/kg, PCE 3,244 ug/kg, and TCE 175 ug/kg.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Air Stripping; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Debris; Decontamination; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Inorganics;

Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; RCRA; ROD Amendment; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Xylenes.

REILLY TAR & CHEMICAL (ST. LOUIS PARK), MN
Third Remedial Action
September 28, 1990

The 80-acre Reilly Tar & Chemical (St. Louis Park) site is a former coal tar distillation and wood preserving plant in St. Louis Park, Minnesota. The site overlies a complex system of aquifers, including the St. Peter aquifer that provide drinking water to area residences. The St. Peter Aquifer contains one municipal well, which is used during periods of peak demand, however, the majority of the drinking water in St. Louis Park is obtained from deeper aquifers. Surrounding land use is primarily residential. From 1917 to 1972, wastewater containing creosote and coal tar was discharged to onsite surface water, and as a result, small wastewater spills occured into onsite soil. In 1972, the site was purchased by the city in response to complaints about wastewater contamination, and the plant was dismantled. State investigations from 1978 to 1981 identified site-related ground water contamination. Two previous Records of Decision (RODs) in 1984 and 1986 addressed remediation of specific aquifers, the filling of a small onsite wetland, and offsite soil contamination. This ROD addresses Operable Unit 4 (OU4), remediation of the St. Peter aquifer. A subsequent ROD will address any remaining site problems as OU3. The primary contaminants of concern affecting the ground water are organics including PAHs and phenols.

The selected remedial action for this site includes pumping an existing well screened within the St. Peter aquifer and initially discharging the extracted water offsite to a publicly owned treatment works (POTW); and ground water monitoring. Within 3 to 5 years, direct onsite discharge to surface water will be conducted if NPDES permit requirements can be met. If requirements are not met, onsite treatment, possibly using granular activated carbon, will be conducted prior to onsite discharge. The estimated capital cost for this remedial action is $225,000 to $250,000, depending on the need for onsite treatment. Annual O&M costs are estimated at $60,000.

PERFORMANCE STANDARDS OR GOALS: Extracted ground water must meet NPDES discharge requirements for both discharge to a POTW and to surface water. Chemical-specific levels include carcinogenic PAHs 70 ug/l, other PAHs 17 ug/l, and phenols 10 ug/l.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Wetlands.

SANGAMO/CRAB ORCHARD NWR (USDOI), IL
Second Remedial Action
August 1, 1990

The Sangamo/Crab Orchard NWR (USDOI) site, in the Crab Orchard National Wildlife Refuge, is near Carterville, Illinois. Within the refuge, lakes and adjacent wetlands support recreational activities on the western portion of the refuge, while the eastern portion is used for manufacturing purposes. The Department of Defense (DOD), the original administrator of the refuge, leased portions of the refuge to munitions and explosives manufacturers who continue to operate onsite. In 1947, DOD transferred the administration of the refuge to the Department of the Interior (DOI). DOI also leased portions of the refuge to manufacturers of PCB transformers and capacitors, automobile parts, fiberglass boats, plated metal parts, and jet engine starters. Solid wastes generated from these industrial activities were disposed of in onsite landfills while other liquid wastes may have been discharged into nearby surface waters and impoundments. EPA has divided the site into four operable units. The first operable unit, documented in a March 1990 Record of Decision (ROD), addressed the metal-contaminated areas. The second operable unit is documented in this ROD and focuses on the PCB-contaminated soil and sediment in four

sites including the Job Corps Landfill (site 17), an inactive 1-acre landfill containing 1,400 cubic yards of contaminated material; the Water Tower Landfill (site 28), an inactive 1-acre landfill containing 100 cubic yards of contaminated material; the Area 9 Landfill (site 32), an inactive 2.5-acre landfill; and the Area 9 Building Complex (site 33), where contaminated runoff from an industrial building complex discharges into two drainage ditches. The Area 9 Landfill and Building Complex together contain 36,000 cubic yards of contaminated material. Two additional operable units will be addressed in a future ROD. The primary contaminants of concern affecting soil and sediment are organics including PCBs and metals including lead.

The selected remedial action for this site includes excavation and treatment of PCB-contaminated soil and sediment using incineration or in-situ vitrification (ISV), if appropriate, and stabilization/fixation of incineration residues and non-incinerated, metal-contaminated soil and sediment, followed by onsite disposal in a RCRA-permitted landfill; backfilling, capping, and closure of excavated areas and areas where contamination is below the excavation criteria; environmental monitoring including ground water, surface water, and leachate monitoring; and implementation of institutional controls including land use and transfer restrictions. ISV, an innovative treatment technology, will substitute for incineration if a successful demonstration of the technology is made. The estimated present worth cost for this remedial action is $25,000,000, which includes an annual O&M cost of $379,701 for 30 years. If ISV is used, the estimated present worth cost of this remedial action will be $17,080,215, which includes an annual O&M cost of $201,800.

PERFORMANCE STANDARDS OR GOALS: Soil and sediment contaminated above the established remediation goals will be excavated and treated. Soil remediation goals include PCBs 1 mg/kg for the top 12 inches of surficial soil, PCBs 25 mg/kg for soil below 12 inches, and lead 450 mg/kg. Sediment remediation goals include PCBs 0.5 mg/kg. Soil and sediment remediation goals are based on the risk assessment, a 10^{-6} excess cancer risk level, and an HI=1.

INSTITUTIONAL CONTROLS: Land use and transfer restrictions will be implemented.

KEYWORDS: Capping; Carcinogenic Compounds; Clean Air Act; Clean Closure; Clean Water Act; Direct Contact; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water Monitoring; Toxic Substances Control Act; Treatment Technology; Vitrification.

SPIEGELBERG LANDFILL, MI

Second Remedial Action - Final
June 29, 1990

The 115-acre Spiegelberg Landfill site is an active sand, peat, and gravel mining site in Green Oak Township, Livingston County, Michigan. Surrounding the site are several residences and small businesses which rely on onsite non-municipal water sources for their drinking water supply. In addition, the Rasmussen Superfund site neighbors the site to the east. From 1966 to 1977, a 2.5-acre portion of the site was used to dispose of septic, domestic, and industrial wastes, including paint sludge. Site investigations revealed two areas of concern, a paint sludge disposal area, Operable Unit I (OU I) and a ground water plume (OU II), contaminated as a result of the paint sludge disposal area. The paint sludge disposal area was addressed in a 1986 Record of Decision (ROD), and all wastes associated with the paint sludge disposal area were removed, including the paint sludge and debris, the contaminated soil underlying the paint waste, liquid paint, laboratory liquid waste, and gas cylinders. This second ROD focuses on the resulting ground water plume, which is estimated to contain 3,770,000 cubic feet of contaminated ground water. Although the contaminated ground water plume has not yet migrated beyond the site boundary, continued migration of the plume poses a threat to water supply wells north and northwest of the site. The primary contaminants of concern affecting the ground water are VOCs including benzene, toluene, and xylenes; and metals including lead.

The selected remedial action for this site includes ground water pumping and treatment using chemical precipitation and pH adjustment to remove inorganics, biological treatment to remove organics, and air stripping and granular

activated carbon to remove residual organic contamination, followed by onsite discharge of treated water to the ground water; implementing institutional controls including deed restrictions; and ground and well water monitoring. The estimated present worth cost for the remedial action is $4,420,000 which includes a present worth O&M cost of $2,000,000 over at least 5 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water cleanup goals include benzene 1.2 ug/l (based on a 10^{-6} cancer risk level), toluene 40 ug/l (based on taste and odor thresholds), and lead 5.0 ug/l (based on human lifecycle safe concentrations).

INSTITUTIONAL CONTROLS: Deed restrictions and other institutional controls, as necessary, will be implemented to ensure the integrity of the remedial action.

KEYWORDS: Air Stripping; Benzene; Carbon Absorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; Metals; O&M; Onsite Discharge; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; Toluene; VOCs; Xylenes.

SPRINGFIELD TOWNSHIP DUMP, MI
First Remedial Action - Final
September 29, 1990

The 16-acre Springfield Township Dump site is in Davisburg, Springfield Township, Michigan. The site is comprised of an open field area surrounded by dense woods. Surrounding land use is mixed agricultural and residential. The site overlies both a shallow and deep aquifer, and there are several wetlands adjacent to the site. A 4-acre portion of the site was used for industrial waste disposal between 1966 and 1968. Unknown quantities of industrial waste were drained into onsite excavated pits in a central disposal area or deposited on low ground areas. Random dumping of refuse occurred onsite, and many drums containing liquid wastes were seen scattered throughout the woods. In 1978, the State identified PCBs, paint sludge, solvents, oils, and greases in 1,500 onsite drums. State studies also determined that a portion of the aquifer underlying the site was highly susceptible to contamination, due to the absence of a clay layer. In 1979 and 1980, VOC-contaminated well water was found at private residences near the site. In 1979, the State ordered the 1,500 onsite drums removed and disposed of offsite. From 1979 to 1980, 711 tons of contaminated soil were excavated and removed from several onsite areas including the centrally located disposal pits. Because of limited funding, some wastes remained onsite, but the pits were subsequently filled in and regraded. In 1980, the State identified onsite PCB- and DDT-contaminated soil and onsite VOC-contamination in ground water. This Record of Decision (ROD) addresses remediation of onsite contaminated soil and ground water and will be a final remedy for the site. The primary contaminants of concern affecting the soil and ground water are VOCs including TCE and toluene; other organics including PCBs; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating and treating onsite a total of 11,820 cubic yards of VOC- and other organic-contaminated soil by incineration, and solidifying the resulting ash; treating metal-contaminated soil using solidification and redepositing the treated soil and ash onsite or temporarily storing the treated soil onsite in a solid waste unit; treating remaining soil using in-situ vacuum extraction and performing a treatability study to determine its effectiveness; ground water pumping and treatment using carbon adsorption, followed by onsite reinjection of the treated ground water; and implementing site access restrictions, such as fencing. The estimated present worth cost for this remedial action is $9,271,290, which includes an annual O&M cost of $97,659.

PERFORMANCE STANDARDS OR GOALS: Soil remediation goals are based on a 10^{-6} cancer risk and State Michigan Act 307 Standards. Chemical-specific soil cleanup levels include PCBs 1 mg/kg, toluene 0.08 mg/kg, and TCE 0.08 mg/kg. Ground water will be remediated to meet or exceed SDWA Federal MCLs or MCLGs including toluene 0.4 mg/l (MCL) and TCE 0.003 mg/l (MCL). Lead and arsenic will be remediated to background levels for both soil and ground water.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Arsenic; Background Levels; Carcinogenic Compounds; Chromium; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLGs; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/Regulations; Temporary Storage; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

ST. LOUIS RIVER, MN
First Remedial Action
September 28, 1990

The 230-acre St. Louis River site (also known as the St. Louis River/Interlake Duluth Tar site) is on the north bank of the St. Louis River in Duluth, Minnesota, with portions of the site within the 100-year floodplain. The bank of the river consists of a series of inlets and peninsulas, including the Stryker Embayment and the boat slip inlets. This site is the former location of several pig iron and coking plants, as well as separate tar and chemical companies, which used byproducts from the plants. The chemical companies closed in the 1940s, and the pig iron coking plants closed during the 1960s. Tar seeps are present onsite in several locations, including the embayment and boat slip areas where tar producers had disposed of tars directly onto the ground. Soil and underlying ground water are contaminated with high levels of PAHs as a result of past onsite disposal activities. Chemicals released from the sediment are the source of a thick layer of tar-like material in portions of the embayment and boat slip areas. This Record of Decision (ROD) addresses Operable Unit 1 (OU1), the remediation of the onsite tar seeps, which are a potential source of ground water and surface water contamination. A future ROD will include a treatability study to address the contamination of the soil, sediment, ground water, and surface water at the site (OU2). The primary contaminants of concern affecting the soil are organics including PAHs.

The selected remedial action for this site includes excavating 300-2300 cubic yards of visible tar seeps with offsite disposal to a power plant or a similar facility for use as recyclable fuel, and landfilling the tar and ash residues offsite. This ROD provides a contingency for incineration of up to 10% of the materials at a RCRA incinerator if the power plant will not accept the contaminated soil/tar mixture. The estimated present worth cost for this remedial action ranges from $700,000 to $2,700,000, depending on the extent of excavation required. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific goals are provided; however, this remedial action will reduce the current excess lifetime cancer risk for ground water to acceptable levels and prevent migration of contaminants to surface and ground water.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Excavation; Floodplain; Incineration; Offsite Disposal; Offsite Treatment; Organics; PAHs; RCRA; Soil; State Standards/Regulations.

TRI-STATE PLATING, IN
First Remedial Action - Final
March 30, 1990

The 3,900-square foot Tri-State Plating site is an abandoned metal plating facility in Columbus, Bartholomew County, Indiana. Land use in the vicinity of the site is residential and industrial. Metal plating operations at the site began during the 1940s. Tri-State Plating operated the facility from 1981 until 1984, when operations were shut down and the site abandoned. Site features include an electroplating building and an onsite storage building. In 1983, the State identified soil contaminated with chromium, lead, and other metals, which was thought to be a result of an onsite waste spill. Tri-State Plating excavated the contaminated soil and placed it in onsite drums. Subsequently, the State identified additional onsite contaminated soil and elevated levels of chromium in offsite ground water, and determined that facility wastes had been discharged directly into the sewer line. In 1984, following additional onsite waste disposal violations, onsite spills, and the failure of Tri-State Plating to install an onsite waste treatment system, the State blocked sewers from the site and cut off the water supply. From 1987 to 1989, in two separate actions, EPA removed 27 drums of inorganic material from the storage building, excavated

contaminated onsite soil, decontaminated and demolished all onsite structures, filled and revegetated the excavated areas, and disposed of the soil and debris in offsite landfills. Subsequent site investigations revealed that ground water beneath and migrating from the site was contaminated with metals and required remediation. Previous removal actions successfully reduced metal concentration in onsite soil to background levels; therefore, onsite soil does not warrant remedial action. This ROD addresses the contaminated onsite ground water. The primary contaminants of concern affecting the ground water are metals including chromium.

The selected remedial action for this site includes pumping contaminated ground water from the underlying aquifer and discharging the water to a publicly owned treatment works (POTW); monitoring ground water and surface water; conducting a public education program; and implementing institutional controls and site access restrictions including fencing. The estimated present worth cost for this remedial action ranges from $1,110,000 to $1,115,000 for 2-10 years, depending on the ground water pumping rate. O&M costs were not provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: Pumping of ground water will continue until contaminant levels meet State and Federal standards including chromium 50 ug/l.

INSTITUTIONAL CONTROLS: Ground water usage will be restricted until remediation has been completed.

KEYWORDS: Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; Metals; Offsite Discharge; Offsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; State Standards/Regulations; Surface Water Monitoring.

UNION SCRAP IRON METAL, MN

First Remedial Action - Final
March 30, 1990

The Union Scrap Iron Metal site is a vacant industrial property in Minneapolis, Hennepin County, Minnesota. The site overlies an alluvial aquifer. Surrounding land use is primarily industrial and commercial, with adjacent residential areas. From the early 1970s until 1983, the site was used as a processing facility for used batteries and scrap metal. Batteries were crushed and recyclable materials were sorted onsite. Several piles of crushed battery casings and electrical equipment were present onsite at various times. Intermittent investigations conducted from 1980 to 1987 identified contaminated soil onsite as a result of these processing activities. In 1987, a potentially responsible party removed 773 tons of battery casing material from the site. Two subsequent EPA removal actions in 1988 included the excavation and offsite disposal of onsite contaminated soil, an underground storage tank, debris, a concrete pad, and an onsite building. A 1989 to 1990 remedial investigation determined that prior removal actions were effective in eliminating contaminated onsite soil and waste, and the low level ground water contamination does not pose any threat to public health. Therefore, there are no contaminants of concern affecting this site.

The selected remedial action for this site is no further action. Previous site removal activities have reduced onsite contaminant levels to below background or EPA health-based levels.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: No Action Remedy.

UNIVERSITY OF MINNESOTA, MN

First Remedial Action - Final
June 11, 1990

The University of Minnesota site, composed of four subsites, is in Rosemount, Dakota County, Minnesota, approximately 20 miles southeast of the Minneapolis/St. Paul metropolitan area. Surrounding land use is agricultural and rural residential. The site is underlain by a shallow

sand and gravel aquifer and a deeper fractured dolomite and sandstone aquifer, both hydraulically connected and current sources of drinking water. Three of the subsites were occupied by tenants between approximately 1968 and 1985. All three subsites were involved with the storage and/or reconditioning of electrical equipment and contain PCB-contaminated soil and debris from spills or disposal of PCB oil. One subsite was also involved with reclamation of copper wire. The fourth subsite was used by the University as a burn pit for waste chemicals. From 1968 to 1974, it is estimated that 90,000 gallons of laboratory chemicals, solvents, corrosives, salts, heavy metals, organics, and inorganics were disposed of in the burn pit, which was ultimately capped in 1980. In 1984, ground water sampling identified the burn pit as a source of contamination. In 1986, the University submitted plans for an alternate water supply for affected residents. This action has been updated and is addressed in this Record of Decision (ROD). This ROD also addresses ground water treatment in the burn pit area and treatment and consolidation of contaminated soil and debris in the remaining three subsites. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including chloroform; other organics including PCBs; and metals such as lead.

The selected remedial action for this site includes excavating 2,620 cubic yards of soil containing greater than 1,000 mg/kg of lead and transporting the soil to an offsite RCRA landfill for disposal; excavating 160 cubic yards of concrete debris and 6,309 cubic yards of soil with greater than 25 mg/kg of PCBs, followed by onsite thermal desorption and fume incineration; consolidating 14,809 cubic yards of soil with 10-25 mg/kg of PCBs and limiting access with man-made barriers; backfilling excavations with treated soil and grading and revegetating the area; pumping and treating contaminated ground water using a packed tower air stripper, followed by onsite discharge to an infiltration supply pond; and ground water monitoring. Outside of the selected remedy, the University of Minnesota is constructing two supply wells upgradient of the contaminant plume and supplying 27 affected residents with this alternate water supply. The combined estimated capital cost for both remedies is $8,308,686. There are no O&M costs associated with the soil remedy. The estimated annual O&M cost for the ground water remedy is $8,695 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for carcinogenic compounds are meant to reduce the excess lifetime cancer risk to 10^{-4} to 10^{-7}. Specific soil cleanup goals include PCBs 25 mg/kg (TSCA PCB "Spill Cleanup Policy") and lead 1,000 mg/kg (EP Toxicity Leach Testing). Specific ground water cleanup goals for VOCs were also provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Clean Air Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Leachability Tests; Lead; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology; VOCs.

WAYNE WASTE OIL, IN

First Remedial Action - Final
March 30, 1990

The 30-acre Wayne Waste Oil site is a former oil reclamation operation and municipal landfill in Columbia City, Indiana. The site lies within the Blue River floodplain, and a wetlands area is located onsite. The site overlies a contaminated unconsolidated surficial aquifer. From 1953 to 1970, part of the site was operated as a municipal landfill. From 1975 to 1982, waste oil reclamation activities, which included the storage and handling of hazardous wastes were conducted onsite. Site features include an incinerator, onsite disposal pits, buried drums, vacant office buildings, and several above-ground and underground storage tanks, which contain hazardous material. From 1979 to 1980, an estimated 250,000 gallons of hazardous waste were illegally dumped onsite and allowed to percolate into the soil. In addition the current landfill cap is not adequate to prevent exposure of buried landfill material. Removal actions by potentially responsible parties (PRPs) in 1986 and 1988 resulted in remediation of several onsite disposal pits, and the removal and offsite disposal of 340 buried drums, the contents of 23 storage tanks, over

12,900 tons of contaminated soil from the onsite pits, and implementation of site access restrictions. Site investigations by the PRP under a Consent Order from 1988 to 1989, characterized the location and extent of remaining contaminated media, and quantified the chemical contaminants at the site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes treating VOC-contaminated soil using vapor extraction; treating metals-contaminated soil using soil washing or solidification/stabilization; delineating the area of the municipal landfill; capping the landfill and constructing a landfill venting system if necessary; covering PAH-contaminated soil or consolidating the soil under the landfill cap; treating and disposing of the contents of storage tanks offsite, steam cleaning, and removing the storage tanks offsite; dismantling the incinerator and disposing of the debris offsite or within the onsite municipal landfill; pumping and treatment of ground water onsite using air stripping, or discharging the ground water offsite to a publicly owned treatment works (POTW); monitoring air, ground water, and surface water; and implementing institutional controls including deed, land use, and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $5,582,499, which includes an annual O&M cost of $291,000 for 15 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels for soil will be calculated using a contaminant leaching model. Chemical-specific cleanup levels for ground water are based on Federal MCLs and non-zero MCLGs including benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), toluene 2,000 ug/l (MCL), xylenes 10,000 ug/l (proposed MCL), and arsenic 50 ug/l (MCL).

INSTITUTIONAL CONTROLS: Deed, ground water, and land use restrictions will be implemented onsite.

KEYWORDS: Air Monitoring; Air Stripping; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachability Tests; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil Washing/Flushing; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water Monitoring; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Vacuum Extraction; Venting; VOCs; Wetlands; Xylenes.

WHEELER PIT, WI
First Remedial Action - Final
September 28, 1990

The 3.4-acre Wheeler Pit site is a former industrial waste disposal pit in LaPrairie Township, approximately 1-1/2 miles from Janesville, Wisconsin. The soil beneath the site is generally sand and gravel, and the uppermost aquifer, also composed of sand and gravel, serves as a major source of drinking water for the Janesville area. From 1900 to the 1970s, the site was used as a sand and gravel pit by a railroad company, which may also have used the pit for refuse disposal. In 1956, General Motors Corporation (GMC) leased 3.82 acres of the pit, and from 1956 to 1960, disposed of general refuse onsite. From 1960 to 1974, GMC disposed of an estimated 22.3 million gallons of industrial wastes, including paint spray booth sludge, residue from part hanger stripping systems, clarifier sludge, and powerhouse coal ash. In 1974, the State required closure of the disposal area along with ground water monitoring. Onsite elevated levels of several contaminants, including TCE and chromium, were detected in the ground water after the site was closed. This Record of Decision (ROD) addresses control of the source area, as well as monitoring of ground water. Natural attenuation will be relied upon to remediate the ground water. The primary contaminants of concern affecting the waste, soil, and/or ground water are VOCs including benzene, toluene and xylenes; other organics including PAHs; and metals including arsenic, lead, and chromium.

The selected remedial action for this site includes consolidating waste and contaminated soil from adjacent property into the original onsite disposal area; removing trees from the area to provide a regular surface for the cap; capping the landfill with a solid waste cap to comply with State requirements; installing a gas venting system in the cap, if necessary, to release gas generated during tree root decomposition; monitoring of ground water and private wells, and evaluating results to determine the need for any additional remedial action; implementing institutional controls to limit land and ground water use, and site access restrictions including fencing. The estimated present worth cost for this remedial action is $2,940,000, which includes an annual O&M cost of $137,300 per year for 30 years. Costs associated with the gas venting system are not included.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels identified for ground water are based on State Preventive Action Limits and include arsenic 5.0 ug/l and chromium 5.0 ug/l. No cleanup levels have been determined for soil or onsite wastes, as these will be permanently contained onsite.

INSTITUTIONAL CONTROLS: Institutional controls including deed restrictions, will be implemented to limit land and ground water use at the site.

KEYWORDS: Arsenic; Benzene; Capping; Chromium; Debris: Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; O&M; Onsite Containment; Organics; Sludge; Soil; State Standards/Regulations; Toluene; Venting; VOCs; Xylenes.

RECORDS OF DECISION ABSTRACTS
REGION 6
(Arkansas, Louisiana, New Mexico, Oklahoma, Texas)

ARKWOOD, AR
First Remedial Action - Final
September 28, 1990

The 15-acre Arkwood site is a former wood treatment facility in Boone County, Arkansas. Land use in the vicinity of the site is primarily agricultural and light industrial. Approximately 200 residences are located within one mile of the site, and 35 domestic water supply wells are within 1.5 miles of the site. In addition, numerous springs including New Cricket Spring, are found on, and adjacent to the site. The site is characterized as karst terrain formed by the solution of limestone and dolomite by ground water. Ground water on, or near the site is highly susceptible to contamination as a result of underground cavities, enlarged fractures and conduits which hinder monitoring and pumping. From 1962 to 1973, Arkwood operated a PCP and creosote wood treatment facility at the site. Subsequently from 1973 to 1984, Mass Merchandisers, Inc. (MMI) leased the plant and continued operations until the lease expired, and MMI removed all remaining inventory and materials offsite. In 1986, the site owner dismantled the plant. State investigations conducted during the 1980s documented PCP and creosote contamination in surface water, soil, debris, and buildings throughout the site. Contaminated surface features at the site include the wood treatment facility, a sinkhole area contaminated with oily waste, a ditch area, a wood storage area, and an ash pile. In 1987, EPA ordered the site owner to perform an immediate removal action, which included implementing site access including fencing and sign postings. This Record of Decision (ROD) addresses remediation of all affected media, and provides the final remedy for the site. The primary contaminants of concern affecting the soil, sludge, debris, ground water and surface water are organics including pentachlorophenol (PCP), PAHs, and dioxin; and oils.

The selected remedial action for this site includes excavating approximately 21,000 cubic yards of contaminated soil and sludge from the railroad ditch, wood treatment facility, storage areas and ash pile; pretreating these materials by sieving and washing the soil; incinerating approximately 7,000 cubic yards of pretreated materials exceeding cleanup levels onsite; backfilling washed coarse materials pretreated to below cleanup levels as well as any residual ash; decontaminating onsite structures and debris, followed by onsite or offsite disposal; covering the site with a soil cap and revegetating the area; onsite pumping and treatment of 3,000 gallons of oily sinkhole liquids and any wastewater from decontamination activities using filtration and granular activated carbon, followed by onsite discharge of treated liquids, and incineration of any free phase oil; disposing of any residuals offsite; implementing site access restrictions including fencing; monitoring drinking water and ground water; providing municipal water lines to affected residences; monitoring New Cricket Spring for a two-year period to measure the success of natural attenuation. If PCP levels still exceed State standards after two years, a treatment system will be implemented for the spring. The estimated present worth cost for this remedial action is $10,300,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Action levels for soil excavation and treatment include PCP 300 mg/kg (based on the leachability of PCP from site soil), carcinogenic PAHs 6.0 mg/kg (10^{-5} excess cancer risk), and dioxin 20 ug/kg (ATSDR).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Alternate Water Supply; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Debris; Decontamination; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water

Monitoring; Incineration/Thermal Destruction; O&M; Offsite Disposal; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Sludge; Soil; Soil Washing/Flushing; State Standards/Regulations; Surface Water; Surface Water Monitoring; Treatability Studies; Treatment Technology.

CIMARRON MINING, NM
First Remedial Action
September 21, 1990

The 10.6-acre Cimarron Mining site, Lincoln County, New Mexico, is an inactive milling facility used to recover iron from ores transported to the site. The land surrounding the site supports agricultural, commercial, and residential uses. A shallow aquifer, which is not a potential drinking water source, and a deeper primary drinking water aquifer lie beneath the site. The iron recovery process was conducted onsite between the late 1960s and 1979. Although cyanide was not used in the original iron-recovery milling process, operations changed in 1979, and cyanide was used until 1982 to recover precious metals. The operation of the mill resulted in the discharge of contaminated liquids onsite. The sources of environmental cyanide contamination at the site are the processed waste materials, including tailings piles and cinder block trench sediment piles, the cyanide solution and tailings spillage areas, and the cyanide solution recycling and disposal areas, including cinder block trenches and an unlined discharge pit. The major sources of ground water contamination by cyanide are the cinder block trenches and the discharge pit. These areas of prolonged contact between cyanide solution and underlying soil led to cyanide contamination in the shallow aquifer. Field investigations revealed another abandoned mill, known as Sierra Blanca, operated by the same owner nearby, which will be addressed in a second Record of Decision (ROD). This ROD addresses contaminated shallow ground water at the Cimarron Mining mill area as Operable Unit 1 (OU1). The primary contaminants of concern affecting the debris and ground water are inorganics including cyanide.

The selected remedial action for this site includes pumping and discharging contaminated shallow ground water to an offsite publicly owned treatment works (POTW); ground water monitoring; removal and offsite disposal of process chemical drums, decontaminated tanks, and associated piping; filling in the discharge pit and cinder block trenches with onsite soil and waste pile material and covering with clean soil; plugging the onsite abandoned water supply well; and inspecting and maintaining the existing fence. The estimated present worth cost for this remedial action is $105,000, which includes a total estimated O&M cost of $50,825.

PERFORMANCE STANDARDS OR GOALS: The discharge to the POTW will comply with the pretreatment standard of cyanide 5 mg/l (CWA). Ultimate cleanup goals for the shallow aquifer are based on Federal MCLs and State action levels including cyanide 200 ug/l (State and MCL). Cyanide will be remediated to a Hazard Index (HI) of less than or equal to 1.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds: Clean Water Act; Debris; Direct Contact; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; State Standards/Regulations; Water Quality Criteria.

CRYSTAL CHEMICAL, TX
First Remedial Action - Final
September 27, 1990

The 24-acre Crystal Chemical site consists of a 7-acre abandoned herbicide manufacturing facility (referred to as the onsite area) and 18 acres of affected surrounding properties (referred to as the offsite area) in Houston, Harris County, Texas. The site lies within the 100-year floodplain of an adjacent flood control channel, and is underlain by a shallow aquifer system. Surrounding land use is

commercial/industrial. From 1968 to 1981, herbicides, including arsenide compounds were manufactured at the site. During that time several structures, four evaporation ponds, and many storage tanks were utilized. Drums of raw and finished product were routinely stored in the open. Onsite soil was contaminated by herbicides spilled from drums during transfer of raw materials from rail cars. Contamination of offsite soil and sediment was a result of periodic flooding, which caused contaminated onsite materials to be relocated offsite. In 1981, the site was abandoned, and approximately 99,000 gallons of chemical liquids in a storage tank and 600,000 gallons of wastewater in the evaporation ponds were left onsite. Emergency Removal Actions conducted intermittently from 1981 to 1988, included removing chemical liquids and wastewater, temporarily capping the site, dismantling and decontaminating structures, constructing drains and fencing, and placing fill material onsite. The primary contaminant of concern affecting the soil, sediment, and ground water is arsenic.

The selected remedial action for this site includes excavating approximately 55,000 cubic yards of offsite soil and sediment with arsenic levels greater than 30 mg/kg and redepositing the materials onsite; treating approximately 16,500 cubic yards of onsite soil and sediment with levels of arsenic greater than 300 mg/kg using in-situ vitrification; covering the onsite area with a multi-layer cap; pumping and treating approximately 3 million gallons of contaminated ground water using ferric hydroxide precipitation, flocculation, clarification, filtration, and ion exchange; discharging the treated water offsite to a publicly owned treatment works (POTW), to surface water, or reinjecting the treated water onsite; disposing of residual sludge at an offsite facility; conducting long-term ground water monitoring; and implementing institutional controls including land use restrictions. The estimated present worth cost for this remedial action is $18,590,740, which includes an annual O&M cost of $140,079 for 30 years.

PERFORMANCE STANDARDS OR GOALS: The excavation level of arsenic is 30 mg/kg for offsite soil and sediment and is based on calculated health standards. Treatment of onsite soil with greater than 300 mg/kg arsenic will effectively treat 95% of the onsite contamination and will reduce the amount of leachable arsenic to 5 mg/kg. The cleanup standard for ground water is arsenic 0.05 mg/kg, which is based on the Federal MCL.

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented at the site.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachability Tests; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; Treatability Studies; Treatment Technology; Vitrification; Water Quality Criteria.

HARDAGE/CRINER, OK

First Remedial Action (Amendment)
November 22, 1989

The Hardage/Criner site is in an agricultural area near Criner, McClain County, in central Oklahoma. The site is situated in the North Criner Creek drainage basin, approximately 0.8 miles from the confluence of North Criner Creek and Criner Creek. From 1972 to 1980 the site was operated under a State permit for the disposal of industrial wastes including paint sludge and solids, ink solvents, tire manufacturing wastes, oils, other solvents, cyanides, and plating wastes sludge. Waste disposal practices have resulted in the contamination of approximately 70 acres of ground water beneath and adjacent to the site as well as several acres of surface soil. The principal source of contamination is approximately 278,000 cubic yards of sludge, waste drums, highly contaminated soil, and waste liquids contained in three main waste (source) areas near the center

of the property. Additional source areas include scattered mixing ponds, spill areas, and runoff paths in the vicinity of the main source areas. Dense non-aqueous phase liquids have pooled beneath the disposal areas and are a continuing source of contamination to the ground water. A 1986 Record of Decision addressed source control through incineration, stabilization, and onsite disposal; however, the remedial action was not implemented due to protracted litigation. The 1989 ROD Amendment provides a comprehensive site remedy addressing both source control and ground water remediation and takes into consideration recently enacted land disposal restrictions. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene, PCE, TCE and other carcinogenic compounds; other organics including PCBs and pesticides; and metals including arsenic, chromium, and lead; and oils.

The selected remedial action for the site includes source control and ground water components. Source control remediation includes installation of liquid extraction wells to pump out free liquids currently pooled in the three waste areas and any liquids released from drums buried in the mounds, followed by offsite treatment of the removed organic liquids and onsite treatment of aqueous liquids; excavation of drummed organic liquids for offsite destruction; excavation and consolidation of contaminated soil adjacent to the main source areas with placement in the main source areas, followed by temporary capping; treatment of the main source areas using in-situ soil vapor extraction with treatment of air used in soil extraction by thermal destruction; installation of a permanent RCRA-compliant cap once remedial activities are complete. Ground water components are designed to control the spread of ground water plumes and protect downgradient areas because of the technical impracticability of restoration of the bedrock aquifer. Ground water remediation includes installation of an interceptor trench downgradient of the source areas to intercept and collect contaminated ground water migrating into bedrock zones, and a second trench or equally effective system of extraction wells to intercept and collect contaminated ground water contaminating the alluvium; design and construction of an onsite ground water treatment system to treat both organic and inorganic contaminants before discharge of treated water to surface water. Contaminants already present in the alluvium will be allowed to dissipate by natural dilution, natural attentuation, and flushing; however, active restoration will be implemented if contaminant reduction goals are not met. In addition, institutional controls, surface water controls, and multimedia monitoring will be implemented, and the current provision of an alternate water supply will be continued. The estimated present worth cost of this remedial action is $62,904,655, which includes an annual O&M cost of $1,300,000.

PERFORMANCE STANDARDS OR GOALS: The goal of the soil vapor extraction is a 99% reduction of the VOC concentrations found at the beginning of treatment. Beyond reduction of the source, the goal of this action is to restore the ground water, especially the alluvial aquifer associated with North Criner Creek, to levels below MCLs, including chromium 50 ug/l. If contaminant concentrations in the alluvium increase after trench installation and pumping, or there is a decline in the mass of contaminants of less than 40% in 10 years, active restoration of the alluvium will be implemented.

INSTITUTIONAL CONTROLS: Institutional controls including deed restrictions and maintenance of the availability of an alternate water supply system will be implemented to restrict access to the site and contaminated ground water.

KEYWORDS: Air Monitoring; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; PCE; Pesticides; Plume Management; RCRA; ROD Amendment; Safe Drinking Water Act; Soil;

Solvents; State Standards/Regulations; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; TCE; Toxic Substances Control Act; Treatment Technology; Vacuum Extraction; VOCs.

JACKSONVILLE MUNICIPAL LANDFILL, AR

First Remedial Action - Final
September 27, 1990

The 80-acre Jacksonville Municipal Landfill site is an inactive landfill outside the city limits of Jacksonville, Lonoke County, Arkansas, in a floodplain area. Neighboring the site are the Rogers Road Municipal Landfill and the Vertac Chemical Superfund sites. From 1960 to 1973, approximately half the site was used to landfill unknown types or quantities of drummed or loose waste. Before 1969, waste was openly burned prior to onsite disposal in unlined trenches. During this period, trenching was used as the sole disposal method. EPA holds evidence that the onsite wastes were physically and chemically similar to the wastes at the Vertac Chemical Superfund site, and that the waste may have originated at Vertac. Dioxin was found in some of the 10-50 above-ground waste drums at the site. This Record of Decision (ROD) addresses the drummed waste, soil, and loose debris, and their offsite disposal at the Vertac facility. The primary contaminants of concern affecting the soil and debris are organics including pesticides, such as dioxin.

The selected remedial action for this site includes sampling of soil to determine the amount of contaminated soil and debris onsite; excavating, with offsite thermal treatment and disposal of soil and debris exceeding 2,3,7,8-TCDD 10 mg/kg at the Vertac Chemical Superfund site; excavating, disinfecting, and onsite disposal of debris removed from the 10 mg/kg TCDD-contaminated areas; backfilling and covering the remaining soil and debris with clean soil; revegetating excavated areas at the site; monitoring ground water; and implementing institutional controls including deed, ground water use, and land use restrictions. The estimated present worth cost for this remedial action is $1,949,940, which includes an annual O&M cost of $523,730.

PERFORMANCE STANDARDS OR GOALS: Soil action levels are based on action levels established by the Centers for Disease Control. Soil with concentrations exceeding 2,3,7,8-TCDD 10.0 mg/kg will be excavated and transported offsite for treatment. Soil with concentrations exceeding 2,3,7,8-TCDD 1.0 mg/kg but less than 10.0 mg/kg will be covered with one foot of soil.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit land use and ground water use on, and downgradient of the site.

KEYWORDS: Carcinogenic Compounds; Debris; Dioxin; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; O&M; Offsite Disposal; Offsite Treatment; Onsite Disposal; Organics; Pesticides; RCRA; Soil.

PAGANO SALVAGE, NM

First Remedial Action - Final
September 27, 1990

The 1.4-acre Pagano Salvage site is in Los Lunas, Valencia County, New Mexico, and consists of a family-run salvage business and a residence. During 1983, salvage operations at the site included purchasing "high technology" scrap material from Federal facilities such as transformers, drums containing waste fluids, and capacitors. Site inspections in 1984, 1985, and 1986 revealed several areas of soil contamination in the yard due to leaks from scrap materials, which released PCB-contaminated oil into the soil. These areas included two surface burn areas, a stained soil area, and a surface pool of oil. In 1990, EPA removed approximately 5,100 cubic yards (i.e., soil in excess of 10 mg/kg PCBs based on TSCA cleanup policy) of contaminated soil and debris for disposal in an approved RCRA facility offsite. Soil containing less than 10 mg/kg PCB was covered with a 10-12 inch soil cover. Soil sampling has confirmed that this removal has resolved the PCB contamination at the site and EPA proposes no additional

remedial action. Based on this rationale, there are no primary contaminants of concern affecting this site.

The selected remedial action for this site is a no action remedy with ground water monitoring for one year at the request of the State.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy.

ROGERS ROAD
MUNICIPAL LANDFILL, AR
First Remedial Action - Final
September 27, 1990

The 10-acre Rogers Road Municipal Landfill site is an inactive landfill in a residential and agricultural area in Pulaski County, outside the city limits of Jacksonville, Arkansas. Approximately 50 residences are located within one-half mile of the site. Furthermore, the site lies within a 100-year floodplain and has poor drainage because of slow percolation of rainwater. From 1953 until 1974, approximately one half of the site was used intermittently as a municipal waste disposal facility. Specific waste types and quantities are unknown; however, wastes appear to have been disposed of in a long excavated trench and in several surface piles. In addition, chemical waste materials probably originating from the nearby Vertac Chemical Corporation, including herbicides and associated dioxin impurities, have been disposed of at the site. Currently, as many as 50 drums of contaminated materials are estimated to be onsite, of which 30 drums are visibly corroded with their contents exposed. Investigations by EPA beginning in 1983 revealed that a 1/2-acre drum disposal area containing drums, waste piles of other types of contaminated debris, and associated soil contaminated with herbicides and dioxin, comprises the principal threat from the site. Vertac Chemical Corporation wastes were also disposed of at the Jacksonville Municipal Landfill Superfund site, which is 1/2 mile east of the site. To achieve economies of scale, the two sites will be remediated concurrently, including excavating highly contaminated wastes and soil, and transporting these to Vertac for final treatment and disposition. The primary contaminants of concern affecting the soil and debris are organics including dioxin/furan (2,3,7,8-TCDD), the pesticide dieldrin, and herbicide compounds (2,4,5-T, 2,4-D, and 2,4,5-TP).

The selected remedial action for this site includes additional soil sampling with excavation of approximately 50 cubic yards of highly contaminated soil and debris (i.e., greater than 10 ug/kg of 2,3,7,8-TCDD), followed by offsite temporary storage of the material at the Vertac Chemical Corporation Superfund site; conducting thermal treatment of all Rogers Road site material stored at the Vertac site, followed by residual analysis to evaluate treatment effectiveness, backfilling of residuals on the Vertac site, and revegetating backfilled ash areas; steam cleaning and disposing of debris removed from the Rogers Road site at the Vertac site; backfilling excavated areas and the open trench with uncontaminated native soil and decontaminated refuse; covering onsite soil, debris, and waste contaminated at low levels (i.e., below the cleanup criteria) with twelve inches of native soil; inspecting and maintaining soil caps and fences; ground water monitoring; and implementing institutional controls including ground water and land use restrictions. The estimated present worth cost for this remedial action is $1,226,000, which includes a total O&M cost of $384,000 over 30 years.

PERFORMANCE STANDARDS OR GOALS: Pre-remedial action levels have been identified and will be used to determine where soil remediation is required. Post-remedial treatment goals will be used to assure that effective treatment has been achieved. Moderately-contaminated soil and debris triggering action levels, including 2,3,7,8-TCDD between 1 and 10 ug/kg (10^{-5} excess cancer risk), dieldrin greater than 37.0 ug/kg (10^{-7} excess cancer risk), and/or a dieldrin and herbicide (2,4,5-T and 2,4,5-TP) combination resulting in a cumulative Hazard Index (HI)

exceeding 0.7, will be covered with 12 inches of clean soil. Thermal treatment will be used for approximately 50 cubic yards of soil and debris with 2,3,7,8-TCDD exceeding 10 ug/kg. Treatment goals include achieving 2,3,7,8-TCDD 1.0 ug/kg (health-based) or a 99.9999% destruction removal efficiency (40 CFR 264.343), and 2,4-D 10,000 ug/kg (40 CFR 268.43), 2,4,5-TP 7,900 ug/kg (40 CFR 268.43), and dieldrin 37 ug/kg (health-based), as well as a combined dieldrin and herbicide cumulative HI less than 0.7. The overall residual risk attained by these goals will be less than 8 x 10^{-5} and a maximum cumulative HI of 1.0.

INSTITUTIONAL CONTROLS: Institutional controls including land use controls will be implemented to limit ground water use on, and immediately downgradient of the site.

KEYWORDS: Carcinogenic Compounds; Debris; Decontamination; Dioxin; Direct Contact; Excavation; Filling; Floodplain; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Landfill Closure; Leachability Tests; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Organics; Pesticides; RCRA; Soil; Temporary Storage; Treatability Studies; Treatment Technology.

TENTH STREET DUMP/JUNKYARD, OK
First Remedial Action - Final
September 27, 1990

The 3.5-acre Tenth Street Dump/Junkyard site is an inactive landfill in Oklahoma City, Oklahoma, within the North Canadian River's 100-year floodplain. There are two residences and a salvage yard within 100 yards of the site. From 1951 to 1979, the site was used, in succession, as a municipal landfill, a privately owned and operated salvage yard, and an automobile salvage yard. Waste materials accepted by the first salvage yard included paint thinners, old transformers, and tires. Dielectric fluid that contained PCBs was drained from old transformers, stored in barrels, and sold. During this PCB recovery process, substantial quantities of PCB-contaminated oil were spilled onto the ground at the site. In 1983, EPA site inspections located 20 drums, some of which were corroded and leaking contaminated material into the soil. Soil samples, taken on and around the site, showed contamination by hazardous materials, particularly, high levels of PCBs. In 1985, EPA completed removal actions, which included disposal of drums containing hazardous waste, decontamination and relocation of junk automobiles, consolidation of contaminated soil to the center of the site, installation of a plastic liner and a clay cap, and installation of security fencing. This Record of Decision addresses soil contamination at the site. It is estimated that 8,500 cubic yards of soil are contaminated by PCBs, with 7,500 cubic yards of this total having PCBs levels above the TSCA PCB spill cleanup policy level of 25 mg/kg. The primary contaminants of concern affecting the soil are organics including PCBs.

The selected remedial action for this site includes removing the red clay cover and plastic liner; excavating an estimated 7,500 cubic yards of PCB-contaminated soil with concentrations of 25 mg/kg and higher, followed by treatment of the excavated soil by chemical dechlorination and carbon adsorption to control air emissions; and backfilling and regrading the excavated area with clean and treated soil. The estimated present worth cost for this remedial action is $4,044,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Contaminated soil with greater than 300 mg/kg PCB (an order of magnitude higher than the health-based goal) is considered the principal threat. However, the soil excavation goal is PCB 25 mg/kg (TSCA), due to the cost effectiveness of treating soil with low levels of PCBs along with the highly contaminated soil, and is based on a 10^{-6} excess cancer risk level. Soil residuals will contain less than 2 mg/kg PCBs.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Excavation; Floodplain; Onsite Disposal;

Onsite Treatment; Organics; PCBs; Soil; Toxic Substances Control Act; Treatability Studies; Treatment Technology.

TEXARKANA WOOD PRESERVING, TX
First Remedial Action
September 25, 1990

The 25-acre Texarkana Wood Preserving site is a former wood treating facility in Bowie County, Texas, within the Days Creek 100-year floodplain. Surrounding land use is industrial, residential, and agricultural. Since the early 1900s, several lumber-related businesses have operated at the site, with documented creosote-based wood treating operations starting in 1954. By 1971, Texarkana was also using creosote and pentachlorophenol for wood preserving. State investigations of the site between 1968 and 1984 showed Texarkana to be negligent or delinquent in fulfilling various permit requirements. Fund-lead removal actions from 1986 to 1988 included implementation of site access restrictions, and construction of a berm around, and pumping down the creosote-contaminated onsite processing ponds to prevent runoff and overflow. This Record of Decision (ROD) addresses onsite contaminated soil near the processing ponds and contaminated ground water in a shallow aquifer. Remediation of ground water in a deeper aquifer will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil, sediment, sludge, and ground water are organics including dioxin, PAHs, pesticides, such as dioxin, and phenols.

The selected remedial action for this site includes excavating approximately 77,000 cubic yards of contaminated soil (includes any affected sediment and sludge), followed by onsite treatment using incineration, leachability testing of residual ash, and onsite backfilling of ash with the installation of a soil cover and revegetation; pumping and treatment of approximately 16 million gallons of contaminated ground water from the shallow aquifer using carbon adsorption, with onsite or offsite regeneration or offsite disposal of the spent carbon, pretreatment using ferric hydroxide precipitation and flocculation, followed by clarification and filtration as needed, and reinjecting the treated water onsite into the shallow aquifer; and implementing institutional controls, including deed restrictions to limit land use. The estimated present worth cost for this remedial action is $47,500,000, which includes a total O&M cost of $1,060,000.

PERFORMANCE STANDARDS OR GOALS: Soil remediation will reduce the excess cancer risk to below 10^{-6}. Ground water will be restored to its beneficial use as drinking water. Chemical-specific goals for soil include carcinogenic PAHs 3 mg/kg, total PAHs 2450 mg/kg, dioxin 20 ug/kg, and pentachlorophenol 150 mg/kg. Chemical-specific goals for ground water include carcinogenic PAHs 10 ug/l (detection limit), dioxin 0.001 mg/l (Proposed MCL). CWA requirements for PAHs and dioxin in ground water are lower than the above values, but ground water will be remediated to below detection limits as indicated.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to restrict future site land use. Water use restrictions cannot be enforced in Texas, however.

KEYWORDS: Air Monitoring; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Closure; Clean Water Act; Closure Requirements; Dioxin; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Leachability Tests; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Treatability Studies; Treatment Technology.

TINKER AFB
(SOLDIER CREEK/BLDG 3001), OK
First Remedial Action
August 16, 1990

The 220-acre Tinker AFB (Soldier Creek/Building 3001) site, which includes an active military facility and the adjacent Soldier Creek is in Oklahoma City, Oklahoma. Surrounding land use is urban residential. Underlying the site is a

surficial perched aquifer and a sole-source aquifer for the region. The Building 3001 (B3001) facility is used as an aircraft overhaul and modification complex for jet engine service, repair, and upgrades. From the 1940s to the 1970s, organic solvents were used to degrease metal parts in subsurface pits. Ground water contamination has occurred onsite as a result of seepage from these pits, direct discharge of solvents to storm drains, spills, and faulty drainage system connections. A North Tank Area contains several active and abandoned underground waste oil and fuel tanks. Contamination in this area has resulted from leaking tanks and fuel spills directly onto the ground. In addition, there is onsite VOC contamination, which may be the result of leaking utility lines in the area. Investigations by the Air Force from 1982 to 1989 documented ground water contamination under the B3001 complex; the potential threat of further contamination from Pit Q-51, one of the former degreasing pits; and that underground storage tanks in the North Tank Area were leaking. In 1985 in response to the detection of onsite contamination, the Air Force removed an abandoned 13,000 gallon gasoline tank from the North Tank Area, closed three contaminated production wells, and cleaned all of the onsite degreasing pits with the exception of Pit Q-51, which contains approximately 45 gallons of contaminated liquid waste. This Record of Decision (ROD) addresses remediation of onsite ground water, along with remedial actions relating to Pit Q-51 and the North Tank Area. A subsequent ROD will address contamination associated with Soldier Creek. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including phenols; and metals including chromium and lead.

The selected remedial action for this site includes ground water pumping and onsite treatment using air stripping to remove VOCs, precipitation to remove metals, and fine filtration to remove any remaining organics and metals; using the treated water in onsite industrial processes; disposing of any residuals from the treatment processes offsite; recovering 6,000 to 12,000 gallons of hydrocarbons floating above the ground water table by using a dual fluid production system, followed by offsite disposal of the hydrocarbons; removing approximately 45 gallons of liquid waste from Pit Q-51, and placing the liquid waste into 55-gallon drums; steam cleaning, backfilling and covering the pit with a concrete slab; storing the drums temporarily onsite; disposing of waste and wash water from the steam cleaning process offsite; removing and disposing of a 750-gallon waste tank, and properly abandoning, demolishing and backfilling the onsite 235,000-gallon fuel oil tank at the North Tank Area; treating the contaminated soil from the North Tank Area using vapor extraction, with destruction of vapors in a thermal combustor; and ground water monitoring. The estimated present worth cost for this remedial action is $13,198,308. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Soil remediation goals include a 99% removal of organic contaminants at the North Tank Area. Chemical-specific ground water cleanup goals include benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), chromium 50 ug/l (MCL), and lead 50 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; PCE; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Soil; Sole-Source Aquifer; Solvents; State Standards/Regulations; TCE; Temporary Storage; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

VERTAC, AR
First Remedial Action
September 27, 1990

The Vertac site, a former herbicide and pesticide manufacturing facility in Jacksonville, Arkansas, is comprised of an onsite and offsite area. Production of herbicides and pesticides, including "Agent Orange," began in 1948 and resulted in extensive onsite contamination. The offsite contamination, which is the focus of this Record of Decision (ROD), resulted from improper discharge of wastewater generated during onsite operations. Prior to 1960, untreated wastewater was discharged directly into Rocky Branch Creek, which flows into Bayou Metro a few miles south of the site. Beginning in the 1960s, wastewater was discharged to the city's Old Sewage Treatment Plant, which had been upgraded with a pretreatment facility that included an aerated lagoon and oxidation ponds (West Wastewater Treatment Plant). A solvent treatment process was later added to remove dioxin from the product. This process, however, created contaminated liquid and solid waste residues that were drummed and buried or stored onsite until 1987, when pesticide production ceased. As part of an effort to improve onsite disposal methods, a cooling water pond and equalization basin were closed, and sediment was removed and placed in an onsite sediment vault in 1986. The burial area was capped, a french drain and leachate collection system were installed, and ground water monitoring was initiated. Since 1986, EPA has made various improvements to the onsite area and ordered the site owners to remove some offsite soil and install fencing in the Rocky Branch floodplain. Currently, the State has ordered that offsite contamination including remediation of process wastewater to Rocky Branch Creek, discharge of pretreated process wastewater to city sewer lines, and stormwater runoff from the Vertac onsite area. The primary contaminant of concern affecting the soil, sediment, and sludge is 2,3,7,8-tetra-chlordibenzo-p-dioxin.

The selected remedial action for this site includes removing contaminated sediment from the active sewage lines between the Vertac plant and the West Wastewater Treatment Plant, with onsite incineration of sediment, followed by onsite disposal of residual ash; grouting abandoned sewer lines; removing sludge from the sludge digester at the Old Sewage Treatment Plant; incinerating the sludge onsite, followed by onsite disposal of residual ash; capping the sludge drying beds with clean soil and demolishing treatment units after removing and treating the accumulated water at the Old Sewage Treatment Plant, followed by onsite discharge of treated water to Rocky Branch Creek; draining and capping the aeration basin at the West Wastewater Treatment Plant; removing soil and sediment with TCE levels greater than 1 ug/kg from Rocky Branch Creek and Bayou Metro floodplains; incinerating the contaminated soil and sediment onsite, followed by onsite disposal of residual ash; continuing to enforce a commercial fishing ban and a sport fishing advisory. The estimated present worth cost for this remedial action is $14,000,000, which includes an annual O&M cost of $57,000 for year one and $46,000 for years 2-30.

PERFORMANCE STANDARDS OR GOALS: The Agency for Toxic Substances and Disease Registry has recommended a soil/sediment action level for TCDD of 1 ug/kg for the offsite area, which will result in the reduction of carcinogenic risk from as high as 10^{-3} due to the sewer line sediment to 10^{-5} or 10^{-6}, depending on the point of exposure.

INSTITUTIONAL CONTROLS: Deed and land use restrictions will be implemented at the West Wastewater Treatment Plant and the Old Sewage Treatment Plant to maintain the commercial/industrial zoning.

KEYWORDS: Capping; Carcinogenic Compounds; Clean Closure; Clean Water Act; Dioxin; Direct Contact; Excavation; Floodplain; Incineration/Thermal Destruction; Institutional Controls; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; RCRA; Sediment; Sludge; Soil; Treatment Technology.

FAIRFIELD COAL GASIFICATION PLANT, IA

First Remedial Action - Final
September 21, 1990

The 1.3-acre Fairfield Coal Gasification Plant is a former coal gas generator plant in the town of Fairfield, Jefferson County, Iowa. Since 1917, the site has been owned by the local power company. From 1878 to 1950, gas was generated from coal as an energy source using various processes, each producing an array of by-products that were either sold or disposed of onsite. Since 1937, coal tar and ammonium liquor wastes were disposed of onsite. In 1986, site investigations by the power company found evidence of surface contamination and contamination in the underlying ground water as a result of leaching from buried coal tar wastes. The source of contamination was determined to be the sediment and soil associated with a relief gas holder, a gas holder pit area, and a tar separator. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, toluene, and xylenes; other organics including PAHs; and metals including arsenic, chromium, and lead.

The selected remedial action for the site includes excavating 3,800 cubic yards of PAH-contaminated coal tar waste, soil, and sediment from the source areas and an additional undetermined quantity of soil from these site areas after separating and decontaminating larger items, followed by offsite treatment using incineration; pumping and treatment of an estimated 1,577,000 gallons of contaminated ground water using filtration, polymer injection, and settling out of the sludge wastes, followed by treatment of the supernatant using carbon adsorption with offsite discharge to a publicly owned treatment works (POTW) or onsite use of the treated water in a nutrient addition treatment process; disposing of the settled sludge in accordance with approved disposal methods; treating the coal gas migration areas by enhanced bioremediation if a pilot study proves successful; and implementing institutional controls, including ground water and land use restrictions, and site access restrictions, such as fencing. The estimated present worth cost for this remedial action is $5,815,000, which includes an estimated O&M cost of $4,762,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water will be treated to reduce the level of contaminants to levels acceptable to the State, including benzene 1 ug/l (10^{-6} cancer risk level), toluene 2,000 ug/l (lifetime health advisory), and xylenes 10,000 ug/l (lifetime health advisory). Ground water will be treated to best available detection levels. If the ground water remediation levels can not be attained, alternate concentration levels may be established or a chemical-specific ARAR waiver may be invoked in an amended ROD. Cleanup levels for soil are based on risk assessment and include total PAHs 500 ug/kg, carcinogenic PAHs 100 ug/kg, and benzene 241 ug/kg.

INSTITUTIONAL CONTROLS: Ground water and land use restrictions will be implemented to prevent direct contact with contaminants.

KEYWORDS: Arsenic; Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Decontamination; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PAHs; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Sediment; Soil; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

HASTINGS GROUNDWATER CONTAMINATION, NE
(EAST INDUSTRIAL PARK)
First Remedial Action
September 28, 1990

The Hastings Groundwater Contamination site is a contaminated aquifer in and near the city of Hastings, Adams County, Nebraska. The site consists of seven source areas, or subsites, contaminated with industrial chemicals. This Record of Decision (ROD) addresses contaminated surface soil (1-10 feet) on approximately 14 acres of the 2,600-acre Hastings East Industrial Park subsite. The subsite is on a portion of the former Hastings Naval Ammunition Depot (NAD). Investigations have detected three major types of contaminants in onsite soil, including explosives such as trinitrotoluene (TNT), carcinogenic and noncarcinogenic polynuclear aromatic hydrocarbons (PAHs) and metals. The remedy is designed to control the migration of contaminants from surface soil to the underlying aquifer. One or more future RODs for this subsite will address contaminated ground water, and possibly vadose zone remediation. The primary contaminants of concern affecting the soil are organics including PAHs; metals including arsenic, chromium, and lead; and TNT.

The selected remedial action for this subsite includes excavating and treating approximately 125,900 cubic yards of contaminated soil. Treatment of the excavated soil includes onsite incineration of an estimated 16,400 cubic yards of soil containing high levels of organic contaminants (e.g., TNT exceeding 660 mg/kg, PAHs exceeding 1.8 mg/kg) with final residue disposition based on residual analysis results; stabilizing approximately 39,000 cubic yards of metal-contaminated soil followed by placing the soil in an onsite RCRA Subtitle C hazardous waste landfill; and stabilizing approximately 70,500 cubic yards of soil with low levels of organic and explosive contamination (less than 10^{-4} excess cancer risk), if effective, and placing the stabilized soil in the constructed onsite landfill. If stabilizing the low-level organic-contaminated soil is ineffective, the soil will be placed directly in the landfill. If soil is RCRA characteristic hazardous waste, it will be treated to the appropriate RCRA best demonstrated available technology treatment standard or to the soil and debris variance levels prior to placement in the landfill. The estimated present worth cost for this remedial action is $45,000,000, which includes an estimated annual O&M cost of $86,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil with concentrations exceeding TNT 660 mg/kg or PAHs 1.8 mg/kg (carcinogenic risk exceeding 10^{-4}) will be remediated by incineration. Cleanup goals for the surface soil contaminants include TNT 2.5 mg/kg (based on carcinogenic risk), total PAHs 50 ug/kg (based on analytical detection limits), arsenic 11 mg/kg (background levels), chromium 230 mg/kg (noncarcinogenic hazards), and lead 69 mg/kg (noncarcinogenic hazards).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Background Levels; Carcinogenic Compounds; Chromium; Direct Contact; Excavation; Incineration/Thermal Destruction; Lead; Metals; O&M; Organics; Onsite Containment; Onsite Disposal; Onsite Treatment; PAHs; RCRA; Soil; Soil Washing; Solidification/Stabilization; State Standards/Regulations; Treatability Studies; Treatment Technology.

HASTINGS GROUNDWATER CONTAMINATION, NE
(FAR-MAR-CO)
Second Remedial Action
September 28, 1990

The Hastings Groundwater Contamination site (FAR-MAR-CO) is a contaminated aquifer in and near the city of Hastings, Adams County, Nebraska. The site consists of seven source areas, or subsites, contaminated with volatile industrial chemicals. This Record of Decision (ROD) addresses the Zone 2 portion of the FAR-MAR-CO subsite, which has been divided into two general areas of contamination referred to as Zone 1 and Zone 2. Zone 1, which includes grain elevators and areas to the north of the

elevators, contains soil, soil-gas, and ground water contaminated with ethylene dibromide and carbon tetrachloride originating from the disposal of liquid grain fumigants used in grain elevator operations. Zone 1 contamination was addressed in a 1988 ROD that documented the selection of a remedy to construct a soil vapor extraction system. Zone 2, which includes the area south of the grain elevators (between the elevators and manufacturing and production buildings owned and operated by the Hastings Irrigation Pipe Company (HIPCO)) contains soil contamination primarily due to 1,1,1-trichloroethane (TCA) resulting from the disposal of cleaning solvents used in the manufacturing operations. In December 1989, HIPCO performed a removal action excavating contaminated soil in Zone 2. Subsequent testing revealed that the concentration of TCA in Zone 2 had been reduced to a protective level. Response actions for ground water contamination near the FAR-MAR-CO subsite, however, will be addressed in subsequent remedial activities.

The selected remedial action for this site is that no further action be taken at this time with regard to the TCA soil contamination. Due to the small amount of residual contamination remaining in the soil and the significant depth to the water table, the possibility of transport of TCA from this source to ground water is minimal. Ground water monitoring will continue on a semi-annual basis for two years. HIPCO will conduct the ground water monitoring and has agreed to reimburse the EPA for all oversight costs. There are no additional costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Ground Water Monitoring; No Action Remedy.

LINDSAY MANUFACTURING, NE

First Remedial Action - Final
September 28, 1990

The 42-acre Lindsay Manufacturing site is an irrigation sprinkler manufacturing facility in Lindsay, Platte County, Nebraska. The site is in a topographic low created by Shell Creek, a USDA-designated wetland. Part of the site is also within a 100-year floodplain, and a sand and gravel aquifer underlies the site. Sprinkler manufacturing operations began in 1958, and until 1982, 10,000 to 15,000 gallons of spent acid from a galvanizing process was piped monthly to an earthen unlined disposal pit. After 1982, a wastewater treatment facility was used. In addition, small quantities of solvents and degreasers were burned in two burn areas, or disposed of at the rear of the facility in a disposal pit. Test wells for the 1982 treatment facility construction showed acid contamination of ground water. In 1984, Lindsay and the State performed interim remedial measures to extract and treat ground water using precipitation and flocculation technologies. Investigations from 1987-1989 revealed soil and ground water contamination by organics and metals throughout the site. This ROD addresses both the remediation of soil source areas and the enhancement of the ground water treatment already underway as a result of the interim action. The primary contaminants of concern affecting the soil and ground water are VOCs, including PCE; and metals including chromium and lead.

The selected remedial action for the site includes vacuum extraction of volatile organic compounds from soil, followed by a carbon adsorption filter system before vapor emission, with full-scale implementation based on the results of a pilot study; onsite pumping and treatment of ground water using precipitation and flocculation, followed by sedimentation of the flocculant, with onsite discharge to surface water, and disposing of dewatered solid residuals offsite at a local landfill. The estimated present worth cost for this remedial action is $3,006,600, which includes an annual O&M cost of $636,000 for 5 years.

PERFORMANCE STANDARDS OR GOALS: Cleanup levels are based on the more stringent of either SDWA MCLs or State regulations. These levels will reduce lifetime cancer risks to between 10^{-4} and 10^{-6} for carcinogenic compounds, and the Hazard Index (HI) to less than 1 for non-carcinogens. Chemical-specific ground water cleanup goals include PCE 5 ug/l (proposed MCL), chromium 0.05 mg/l (MCL), and lead 0.05 mg/l (MCL). Specific cleanup levels for soil were not provided.

INSTITUTIONAL CONTROLS: Ground water use restrictions will be implemented to prohibit drinking water well construction within the contaminant plume.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Wetlands.

MIDWEST MANUFACTURING/ NORTH FARM, IA
First Remedial Action - Final
September 27, 1990

The 8-acre Midwest Manufacturing/North Farm site is located on a manufacturing site owned and operated by Smith-Jones, Inc. in Kellog, Iowa. Land use in the area is primarily industrial. From 1973 to 1981, Smith-Jones engaged in electroplating and painting operations of manufactured products, which involved the use of TCE to clean the product before it was coated with the metal. In 1977, the State required treatment of the wastewaters to precipitate metals. The solid residuals were stored in an above-ground tank, then transferred periodically to an unlined disposal cell onsite. Site inspections in the early 1980s, by EPA revealed elevated heavy metal concentrations in the 170 cubic yard waste disposal cell, the surrounding soil, as well as a 7,200 cubic foot waste metals pile and a borrow pit area. Ground water sampling revealed contamination of the alluvial aquifer underlying the site. This ROD addresses both source control and ground water remediation at the site. The primary contaminants of concern affecting the soil/waste and ground water are VOCs, including PCE, TCE, toluene, and xylenes; and metals, including chromium and lead.

The selected remedial action for this site includes installing a low permeability cap over the waste disposal cell in accordance with RCRA landfill closure requirements; treating ground water using air stripping, and possible treatment of vapor/air mixture using carbon adsorption, and filtering water to remove inorganics, if needed; discharging the treated water onsite to the Skunk River or offsite to a publicly owned treatment works (POTW); implementing institutional controls including deed and ground water use restrictions; and ground water monitoring for 30 years. The estimated capital cost for this remedial action is $288,419, which includes a total O&M cost of $200,425 for 25 to 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water contamination at the site will be reduced to meet Iowa Anti-Degradation Requirements.

INSTITUTIONAL CONTROLS: Deed and ground water use restrictions will be implemented until remediation is completed.

KEYWORDS: Air Stripping; Arsenic; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachability Tests; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Onsite Containment; Onsite Discharge; Onsite Treatment; PCE; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Toluene; VOCs; Xylenes.

MISSOURI ELECTRIC WORKS, MO

First Remedial Action - Final
September 28, 1990

The 6.4-acre Missouri Electric Works (MEW) site is an electrical equipment sales, service, and remanufacturing operation in Cape Girardeau, Missouri. Intermittent onsite runoff channels flow into Cape LaCroix Creek located 0.7 miles east of the site, which enters the Mississippi River, 1.1 miles to the southeast. A wetland area is located 700 feet south of the site. Since 1953, MEW has recycled materials from old electrical equipment, including the reuse of filtered transformer oil. More than 16,000 transformers have been repaired or scrapped, and approximately 28,000 gallons of transformer oil received onsite were never recycled. The MEW property, as well as adjacent properties, have been contaminated with PCBs as the result of inadequate storage and handling of transformers and PCB-contaminated transformer oils. In addition, spills and disposal of industrial spent solvents occurred onsite affecting ground water underlying the site. In 1984, preliminary State and EPA investigations found leaking drums of transformer oil onsite and PCB levels in soil of up to 21,000 mg/kg. Based on this, in 1984, the State required removal of approximately 5,000 gallons of drummed waste oil. EPA conducted investigations from 1985 to 1987 that revealed onsite PCB contamination in the soil at levels of up to 58,000 mg/kg. Offsite migration of PCBs also was detected during these investigations. In 1988, the EPA required MEW to notify the public of site contamination, limit exposure to employees and the public, and minimize movement of PCB-contaminated soil offsite from runoff and erosion. In 1989, barriers were installed across runoff channels to intercept contaminated runoff. This Record of Decision (ROD) addresses both contaminated soil and sediment removal, as well as the treatment of affected ground water. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs including benzene, PCE, and TCE; and organics including PCBs.

The selected remedial action for this site includes excavating PCB-contaminated soil and sediment and treating these by incineration onsite; placing exhaust gases through flue-gas coolers and particulate removal systems; removing acid gases in-situ; backfilling with residual materials, based on leachability test results; constructing a soil cover over the site; pumping and treatment of ground water with filtration and treatment via air stripping with subsequent carbon adsorption; discharging the treated water offsite to a surface drainage ditch between the site and the wetlands or to a publicly owned treatment works (POTW). The estimated present worth cost for this remedial action is $9,130,000, which included an estimated annual O&M cost of $64,010 for 15 years.

PERFORMANCE STANDARDS OR GOALS: Contaminant levels for soil and sediment after treatment will represent an excess upper bound lifetime cancer risk of 2×10^{-5}. Cleanup levels for ground water will be 10^{-5} and cleanup levels will meet the TSCA PCB Spill Cleanup Policy, State water quality standards and Federal MCLs for VOCs. Chemical-specific goals include TCE 5 ug/l (MCL) for ground water, PCB 10 mg/kg (TSCA) for soil to a depth of 4 feet, and PCB 100 mg/kg (TSCA) for soil below a 4-foot depth.

INSTITUTIONAL CONTROLS: Deed and/or land use restrictions will be implemented to limit the site to industrial or commercial use.

KEYWORDS: Air; Air Monitoring; Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Excavation; Ground Water; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Leachability Tests; MCLGs; MCLs; O&M; Offsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; PCE; Public Exposure; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands.

NORTHWESTERN STATES PORTLAND CEMENT, IA
First Remedial Action - Final
June 26, 1990

The Northwestern States Portland Cement site, a cement manufacturing facility, is in Mason City, Cerro Gordo County, Iowa. Calmus Creek flows between the Northwestern States Portland Cement Company (NWSPCC) facility and another cement manufacturing plant facility located just north of the site. The site includes a 150-acre area named the West Quarry where NWSPCC disposed of 2 million tons of waste cement kiln dust from 1969 to 1985. Local ground water and surface water have been impacted by elevated pH levels as a result of waste cement kiln dust disposal in the West Quarry. Two seeps emerged from the northeastern portion of the West Quarry in 1979 with high pH water from the seeps flowing overland into Calmus Creek. In 1984, the State found elevated pH levels in Calmus Creek downstream of the seep area, and in 1985 ordered NWSPCC to cease discharge from the seep area to Calmus Creek and to cease kiln dust disposal in the quarry. In 1987, NWSPCC installed an acid-neutralization system to treat the seep water and to dewater the West Quarry pond, the open area of the quarry filled with approximately 420 million gallons of water. This action has significantly decreased the contact of the water with the kiln dust and, as a result, pH levels in the quarry water have declined. This Record of Decision (ROD) addresses the contamination source, the cement kiln dust disposed of in the West Quarry, and the resulting ground water and surface water contamination. The primary contaminants of concern affecting the ground water and surface water are organics including phenols; metals including chromium and lead; and other inorganics including waste cement kiln dust.

The selected remedial action for this site includes continued acid neutralization of the water from the dewatered West Quarry, followed by discharge of the neutralized water to Calmus Creek; construction of a permanent drainage system in the dewatered West Quarry to collect precipitation runoff and ground water inflow to the West Quarry, followed by onsite treatment of contaminated water prior to discharge of the treated water to Calmus Creek; installation of bedrock dewatering wells to collect contaminated ground water beneath the West Quarry, to prevent migration of the contaminated ground water from the site, and to maintain ground water levels below the kiln dust; installation of kiln dust dewatering wells, if necessary, to facilitate kiln dust dewatering; capping of the West Quarry area containing cement kiln dust; pumping and treatment of ground water; and monitoring of ground water and treated discharge. The estimated present worth cost for this remedial action is $2,037,129, with estimated O&M costs of $210,000 for year one and $65,000 for subsequent years.

PERFORMANCE STANDARDS OR GOALS: Discharges to Calmus Creek will meet State effluent limitations including pH 6.0 to 9.0 and phenols 0.05 mg/l. Treated ground water will meet State ground water action levels and SDWA MCLs, including chromium 0.05 mg/l (MCL), lead 0.05 mg/l (MCL), and pH 6.5 to 8.5 (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Capping; Carcinogenic Compounds; Direct Contact; Chromium; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; Phenols; Safe Drinking Water Act; State Standard/Regulations; Surface Water; Treatment Technology.

SHENANDOAH STABLES, MO
Second Remedial Action - Final
September 28, 1990

The Shenandoah Stables (SS) site is located in a rural area near Moscow Mills, Lincoln County, Missouri, within the upper floodplain of Crooked Creek. The property includes an enclosed arena and horse stables building, a number of single family residences, a livestock operation, and other small businesses on approximately 5- to 10-acre land parcels around the facility. In

1971, the area inside the arena was sprayed with approximately 1,500 gallons of dioxin-contaminated waste oil for dust control purposes. Subsequently, a number of adverse effects were noted in horses, other animals, and in humans. In two separate removals during 1971 and 1972, approximately 24 to 26 inches of the contaminated materials were removed and disposed of either offsite or onsite. EPA investigations in 1982 identified contamination at the facility by dioxin levels greater than 1,750 ug/kg, with approximately 8,600 yd^2 of interior and exterior site areas affected. A 1988 Record of Decision (ROD) documented the remedial action, which involved excavating and interim onsite storage of dioxin-contaminated soil exceeding Federal and State health-based levels. This ROD addresses the final remedy for the site, the removal of 3,471 cubic yards of contaminated materials currently stored onsite in 2,660 separate containers. The primary contaminant of concern affecting the soil and debris is dioxin.

The selected remedial action for this site includes transporting of 3,471 cubic yards of contaminated materials offsite to the Times Beach Superfund site for thermal treatment, followed by land disposal of treatment residuals offsite; and restoring the Shenandoah Stables site by decontaminating and dismantling the onsite storage buildings. The estimated total cost for this remedial action is $2,800,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Thermal treatment will ensure 99.9999% destruction and removal of dioxin from the contaminated soil and debris.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Dioxin; Direct Contact; Floodplain; Incineration/Thermal Destruction; Offsite Disposal; Offsite Treatment; Organics; RCRA; Soil; State Standards/Regulations; Treatment Technology.

WAVERLY GROUNDWATER CONTAMINATION, NE

First Remedial Action - Final
September 26, 1990

The Waverly Groundwater Contamination site is in Waverly, Lancaster County, Nebraska. At this municipally owned site, the ground water aquifer provides 100% of the drinking water for the community of approximately 2,000 people through the municipal water system. Between 1952 and 1974, a Federal grain facility, located on a portion of the site, was the source of ground water contamination. From 1955 to 1965, the fumigant 80/20, composed of 80% carbon tetrachloride and 20% carbon disulfide, was used onsite on stored grain. Chloroform is a by-product of carbon tetrachloride production and may also have been present onsite. In 1982, contamination was detected in Public Water Supply Well (PWS) Numbers 1 and 3. PWS 3 was removed from service and four additional wells were installed outside the known area of contamination. In 1988, EPA began contaminant treatment at the site by installing an air stripping system, in conjunction with ground water pumping and treatment and soil vapor extraction systems. The contaminants of concern affecting the soil and ground water are VOCs including carbon tetrachloride and chloroform.

The selected remedial action for this site includes continued operation and maintenance of the ground water air stripping system and the soil vapor extraction system; ground water monitoring to delineate the magnitude and extent of contamination; evaluation of the construction of PWS 3 to explain the contamination in this well; sampling existing and new monitoring wells; development of a ground water flow and transport model to determine the correct pumping rate for the existing ground water extraction well, and investigation of the potential uses for the treated water discharged offsite. The estimated present worth cost for this remedial action is $3,550,000, which includes an annual O&M cost of $451,000 for 15 years.

PERFORMANCE STANDARDS OR GOALS: Soil gas cleanup levels for VOCs will be reduced to the performance criteria level of 6.5 ug/kg calculated for the site. Soil levels were below the calculated cleanup levels of 1.1 mg/kg and 1.7 mg/kg for carbon tetrachloride and chloroform, respectively. The treated water discharge will meet State NPDES permit levels of 5.0 ug/l for carbon tetrachloride and 3.8 mg/l for chloroform. Ground water cleanup levels will meet State MCLs including carbon tetrachloride 5.0 ug/l (MCL) and chloroform below 3.8 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; Metals; O&M; Offsite Discharge; Onsite Treatment; Pesticides; Plume Management; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Soil; Sole-Source Aquifer; State Permit; State Standards/Regulations; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria.

WELDON SPRING QUARRY/ PLANT/PITS (USDOE), MO
Second Remedial Action
September 28, 1990

The 226-acre Weldon Spring Quarry/Plant/Pits (USDOE) site is a former ordnance works and chemical plant near the city of Weldon Spring in St. Charles County, Missouri. The site is divided into two noncontiguous areas: a 217-acre chemical plant area, comprised of various buildings, ponds and four raffinate pits, and a 9-acre quarry, which forms a valley wall at the edge of the Missouri River floodplain. Since the early 1940s, the site has been used by various government agencies for chemical and ordnance processing with chemical and radioactive waste disposal in the quarry. From 1941 to 1946, the site was an Army ordnance works used for the production of trinitrotoluene (TNT) and dinitrotoluene (DNT) explosives, and the quarry was used to dispose of the chemical wastes. From 1955 to 1966 the Atomic Energy Commission (AEC), the predecessor to the Department of Energy, constructed and operated the chemical plant for processing uranium and thorium. Types of wastes disposed of onsite included uranium and thorium ore residues (drummed and uncontained), radioactively contaminated building debris, processing equipment, and residues of TNT and DNT from cleanup of the former ordnance works. Except for partially decontaminating buildings and dismantling some equipment, the site has not been used since 1967. In 1990, EPA released a remedial investigation/feasibility study and proposed plan, which documented five remedial actions for the quarry. The first remedial action involves treating contaminated surface water, followed by discharge of treated water to the Missouri River. The second remedial action, which is documented in this Record of Decision (ROD), addresses interim deposition of bulk wastes in the quarry to minimize future ground water and air contamination and to facilitate additional characterization of waste and residuals in and around the quarry. Final decisions for disposal of wastes will be made in a subsequent ROD for the chemical plant. Future remedial actions will address materials remaining in the quarry walls and floor, ground water contamination, and contaminated properties outside the quarry. The primary contaminants of concern affecting the quarry soil, sludge, and debris are organics including PCBs and PAHs; radioactive materials; and metals including arsenic and lead.

The selected interim remedial action for this site includes excavating an estimated 95,000 cubic yards of chemically and radioactively contaminated bulk wastes from the quarry and temporarily storing the wastes onsite in the chemical plant area; and implementing site access restrictions. The estimated total cost for this remedial action is $11,000,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: Not provided.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Carcinogenic Compounds; Debris; Direct Contact; Excavation; Floodplain; Interim Remedy; Lead; Metals; Organics; PAHs; PCBs; Radioactive Materials; Sludge; Soil; State Standards/Regulations; Temporary Storage; Toxic Substances Control Act.

WHEELING DISPOSAL SERVICE, MO
First Remedial Action - Final
September 27, 1990

The 200-acre Wheeling Disposal Service site is an inactive industrial and sanitary landfill in Amazonia, Missouri. Onsite disposal features include nine solid waste trenches, five liquid waste trenches, two evaporation ponds, a farm chemical area, three tannery waste areas, and a rinsed-container area. Surrounding land use is mixed residential and agricultural. From 1964 until the landfill was closed in 1986, municipal and industrial wastes, including tanning sludge, pesticides, asbestos, laboratory wastes, construction debris, paint sludge, battery and cyanide waste, and crushed drums were disposed of in the various onsite disposal units. EPA and the State conducted onsite and offsite investigations from 1980 to 1987 that identified the presence of onsite contamination with no evidence of offsite contaminant migration. The remedial investigation/feasibility study conducted in 1989 and 1990 confirmed these results. This Record of Decision (ROD) addresses both source control and management of contaminant migration, and is a final remedy. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including TCE and toluene; other organics including pesticides; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes upgrading the existing landfill cap with a revegetated clay and soil cover; monitoring onsite ground and surface water; abandoning onsite wells; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $1,205,800, which includes an annual O&M cost of $42,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Performance criteria for ground water and surface water will be developed, and may be based on Federal MCLs or Ambient Water Quality Criteria, or State water quality standards. If contaminant levels exceed these criteria, ground water treatment and/or leachate collection and treatment may be required.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent agricultural use of the disposal area.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Organics; Pesticides; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Monitoring; TCE; Toluene; VOCs; Water Quality Criteria.

WHITE FARM EQUIPMENT DUMP, IA
First Remedial Action - Final
September 28, 1990

The 20-acre White Farm Equipment Dump site is an active landfill near the north border of Charles City in Floyd County, Iowa. The site lies within the 100-year floodplain of the Cedar River in the former location of a sand and gravel quarry, and borders farmlands to the west, north and east with residential areas to the south of the site. Drainage from the site toward the northwest and south feeds into adjacent wetland areas. The Charles City municipal wells, located 700 feet east of the site, obtain water from the deep, confined Cedar Valley aquifer. Additionally, six shallow drinking water wells that draw from an uncontrolled water table are 1,000 feet downgradient from the site. Intermittently since 1971, approximately 650,000 cubic yards of wet scrubber sludge, foundry sands, baghouse dusts, and other industrial

wastes were disposed of onsite. In 1984, to assess the environmental impact of this disposal, the State required the installation of four ground water monitoring wells. Site assessments in 1985 and 1986 revealed ground water contamination and documented that elevated metal levels were present in the shallow alluvial aquifer in close proximity to the municipal wells. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including benzene and toluene; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes regrading and covering the landfill with an impermeable layer of topsoil and vegetation to prevent contaminant infiltration, leaching, run-off, and erosion; ground water pumping and treatment by air stripping followed by onsite discharge of treated water; controlling air emissions by carbon adsorption with offsite disposal of residuals; monitoring metal contaminant levels and adding a metals treatment train as needed; ground water monitoring; and implementing site access restrictions and institutional controls, including deed restrictions. The estimated present worth cost for this remedial action is $2,352,121, which includes an annual O&M cost of $89,345 for years 1-5 and $35,865 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: The concentration of benzene in ground water will be reduced and maintained below 1 ug/l (State standard).

INSTITUTIONAL CONTROLS: Well installation and property use will be limited by deed restrictions.

KEYWORDS: Air Stripping; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Debris; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Onsite Containment; Offsite Disposal; Onsite Discharge; Onsite Treatment; RCRA; Sludge; Soil; State Permit; State Standards/Regulations; Toluene; VOCs; Wetlands.

RECORDS OF DECISION ABSTRACTS
REGION 8
(Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)

EAST HELENA, MT
First Remedial Action
November 22, 1989

The 80-acre East Helena site, in East Helena, Lewis and Clark County, Montana, is a primary lead smelting facility that has been in operation since 1888. In 1927 the Anaconda Company constructed a plant adjacent to the lead smelter to recover zinc from the smelter's waste slag. Asarco, the owner and operator of the smelter facility, purchased the zinc plant in 1972 and operated the plant until 1982. Prickly Pear Creek flows near the site and has been found to contain elevated levels of arsenic and lead. Air quality and soil investigations also revealed the presence of contaminated soil in East Helena residential areas, contaminated process ponds over shallow ground water near the plant, and elevated blood-lead levels in school children. A 1984 remedial investigation identified elevated levels of metal contamination in soil, livestock, plants, and ground and surface waters with the sources of onsite contamination being primary and fugitive emissions and seepage from process ponds and process fluid circuitry. The site has been segregated into five operable units, consisting of the process ponds, the ground water, the surface water, the slag pile, and the ore storage areas. This Record of Decision (ROD) addresses four process fluid ponds which are used for process water retention and include the Lower Lake, the speiss granulating pond and pit, the acid plant water treatment facility, and the former Thornock Lake, now dry. The primary contaminants of concern affecting the soil and sediment in the process ponds are metals including arsenic and lead.

The selected remedial action for this site includes excavating and smelting 55,150 cubic yards of soil and/or sediment from all four process ponds and multi-media monitoring after individual remedial activities are implemented at three of the process pond areas. Process pond remediation activites include replacing the speiss granulating pond with a tank and a secondary containment facility and replacing the pit with a lined facility; replacing the settling system at the acid plant water treatment facility with a closed circuit filtration treatment system; in-situ co-precipitation of the process wastes from the Lower Lake, replacing the Lower Lake with two steel tanks to contain process wastes, and constructing a lined pond for emergency containment of storm runoff. If pilot-scale testing of in-situ co-precipitation proves to be impractical, a contingency plan will be implemented, which includes treatment of Thornock Lake water at an onsite water treatment facility to remove metals, followed by discharge to a publicly owned treatment works (POTW). The estimated present worth ost for this remedial action is $9,644,500 which includes an annual O&M cost of $611,200.

PERFORMANCE STANDARDS OR GOALS: Soil/sediment will be excavated to a level that will ensure that leachate will not exceed Federal drinking water standards. The prescribed standards for Lower Lake process waters include arsenic 0.02 mg/l, which is lower than EPA's MCL of 0.05 mg/l, and lead 0.05 mg/l, EPA's MCL. The State water quality standards for arsenic and lead were waived on the basis of technical impracticability.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: ARAR Waiver; Arsenic; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingency Remedy; Direct Contact; Excavation; Leachability Tests; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Treatment; Treatability Studies; Treatment Technology.

MARTIN MARIETTA, DENVER AEROSPACE, CO
First Remedial Action
September 24, 1990

The 5,200-acre Martin Marietta, Denver Aerospace site is in Waterton, Jefferson County, Colorado. The site completely surrounds 464 acres of contaminated Air Force property,

which is being addressed as a separate Superfund site. Since 1950, the Martin Marietta Aeronautics Group (MMAG) has been conducting high technology engineering, design, development, and manufacturing operations for the space industry onsite. Types of wastes generated during onsite activities include oils, metals, organic solvents, wastewater, chemical process sludge, and VOCs. From 1959 to 1980, untreated, highly concentrated waste from onsite activities was disposed of in five onsite ponds, referred to as the Inactive Site Ponds Area. An estimated 2,100 cubic yards of waste and 24,000 cubic yards of contaminated soil are contained in the Inactive Site Ponds Area. From 1957 to 1969, solid wastes and construction debris generated at the site were disposed of in an 11-acre landfill known as the Rifle Range Landfill. In addition, waste was stored in underground storage tanks in an area referred to as the Chemical Storgage Area. Previous site remediations by MMAG from 1969 to 1985 did not address contaminant sources or migration, but included backfilling and regrading of the Rifle Range Landfill; consolidation of soil and wastes from two onsite disposal ponds into one pond and covering of the ponds with soil; and operation of a ground water recovery system. EPA investigations have identified the Inactive Site Ponds and the Chemical Storage areas, both located to the north of the main facility, as the two major sources of onsite soil and ground water contamination. This Record of Decision (ROD) addresses remediation of onsite contaminated soil, waste/debris, and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including TCE; toluene, and xylenes; other organics including PCBs, pesticides, and phenols; and metals including chromium and lead.

The selected remedial action for this site has been divided into three separate areas: the Inactive Site Ponds Area, the Chemical Storage Area, and the ground water in the south central portion of the site. Remediation of the Inactive Site Ponds Area includes dewatering 1.3 million gallons of water from perched water zones; excavating and incinerating offsite 2,100 cubic yards of organic waste/soil material from in and around the ponds; thermally treating onsite 24,000 cubic yards of organic-contaminated soil; solidifying and stabilizing remaining soil contaminated with inorganics; backfilling excavated areas with the treated soil, and covering the ponds area with a RCRA-multilayer cap. Remediation of the Chemical Storage Area includes treating VOC-contaminated soil using in-situ soil vapor extraction, incinerating, and disposing of offsite any residual organic-laden sludge from the thermal extraction treatment system at the ponds area along with any spent carbon from the in-situ soil vapor extraction process. Contaminated ground water remediation includes onsite pumping and treatment using air stripping, carbon adsorption, ion exchange, UV photolysis/oxidation, chemical reduction, and precipitation, followed by onsite discharge to surface water; and ground water monitoring. The present worth cost for this remedial action is $58,240,000, which includes an annual O&M cost of $1,231,500 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Both onsite and offsite ground water will be treated to meet SDWA MCLs or MCLGs. Chemical-specific ground water cleanup standards include benzene 5 ug/l (MCL), arsenic 50 ug/l (MCL), chromium 50 ug/l (MCL), lead 5 ug/l (MCL), and TCE 5 ug/l (MCL). Chemical-specific soil cleanup levels are based on soil action levels and TCLP treatment standards including toluene 28 mg/kg (TCLP), PCB 1.0 mg/kg (TCLP), and TCE 0.09 mg/kg (TCLP).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Stripping; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Treatment; Landfill Closure; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/Regulations; TCE; Temporary Storage; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

MONTICELLO MILL TAILINGS (DOE), UT

First Remedial Action
August 22, 1990

The 300-acre Monticello Mill Tailings site is comprised of a 78-acre inactive uranium and vanadium milling operation and affected

peripheral properties in Monticello, San Juan County, Utah. Surrounding land use is rural residential and agricultural. The site overlies a shallow alluvial aquifer, and part of the site lies within the floodplain of Montezuma Creek. Approximately 18-acres of wetlands adjacent to Montezuma Creek also have been contaminated by tailings. In 1940, the site was operated as a vanadium ore-buying station. Milling of ore began in 1942, and a vanadium/uranium sludge product was produced onsite from 1943 to 1944. Onsite uranium milling processes began in the mid-forties and continued until 1959. Mill tailings from these operations were disposed of in four onsite tailings piles that are within the floodplain of the Montezuma Creek. The mill was permanently closed in 1960, and the tailings piles were covered and vegetated. From 1964 to 1965, the entire plant was dismantled and foundations were partially buried onsite along with contaminated material. Onsite and offsite soil contamination is the result of wind and surface water erosion of the contaminated tailings piles with subsequent deposition elsewhere. In 1972, 15,000 cubic yards of contaminated soil were excavated and disposed of on the onsite tailings piles. Site investigations from 1989 to 1990 identified the presence of onsite and offsite radioactively-contaminated soil and ground water, and elevated concentrations of metals within the tailings piles. This Record of Decision (ROD) addresses remediation of two Operable Units (OUs): the 78-acre Millsite area (OU1), and the 240-acres of peripheral properties (OU2). A subsequent ROD will address remediation of ground water and surface water once the source areas have been removed. The primary contaminants of concern affecting the soil and debris are metals including arsenic, chromium, and lead; and radioactive materials including radium-266 and radon.

The selected remedial action for this site includes dewatering and excavating 1.5 million cubic yards of tailings, contaminated soil, and process-related material from the contaminated tailings piles; consolidating these materials in an onsite repository that will be built one mile south of the existing millsite; diverting Montezuma Creek to allow for the relocation of mill tailings and contaminated floodplain soil, excavating 300,000 cubic yards of contaminated soil from the peripheral properties, followed by eventual consolidation of the soil within the repository; backfilling excavated areas with clean fill; treating surface runoff and construction/dewatering water collected during construction using evaporation ponds, reverse osmosis, or another technology and discharging the treated water to Montezuma Creek; disposing of any treatment residuals within the repository or at an offsite facility; covering the repository with a clay and multi-media cap; revegetating the millsite and repository site; monitoring air, ground water and surface water; and implementing institutional controls and site access restrictions. The estimated capital cost for this remedial action ranges from $64,787,500 to $70,600,000 (based on the cost of engineering controls), which includes an annual O&M cost of $40,846 for 24 years.

PERFORMANCE STANDARDS OR GOALS: Federal standards for radium-226 are 5 pCi/g above background in the surface 15 centimeters of soil, and 15 pCi/g above background level for radium-226 in the deeper 15 cm thick layer. Because the background level at the site is radium-226 1.0 ± 0.4 pCi/g, excavation levels were set at 6 pCi/g for surficial soil, and 16 pCi/g for soil greater than 15 centimeters deep. The Federal standard of 20 pCi/m^2/sec for radon emissions will also be met.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented at the site.

KEYWORDS: Air Monitoring; Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Institutional Controls; Lead; Metals; Mining Wastes; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Onsite Treatment; Radioactive Materials; Soil; State Standards/Regulations; Surface Water Collection/Diversion; Surface Water Monitoring; Water Quality Criteria; Wetlands.

MYSTERY BRIDGE AT HIGHWAY 20, WY

First Remedial Action
September 24, 1990

The Mystery Bridge at Highway 20 site is an industrial area with two onsite residential subdivisions, in Natrona County, one mile east of Evansville, Wyoming. A portion of the site lies within the 100- and 500-year floodplains of the North Platte River and Elkhorn Creek. Two plants are located at the site: the DOW/DSI facility, an oil and gas production

enhancement service facility; and the KN plant, which is a natural gas fractionation, compression, cleaning, odorizing and transmission plant. The site overlies a contaminated alluvial aquifer, which was previously used as a source of potable water. Probable sources of onsite ground water contamination include contaminant releases from a DOW/DSI truck wash water system, which is comprised of an oil/water separator, a vitreous tile drain, and a leach sump system; and an onsite toluene storage area. In 1965, an underground pipe burst, releasing 5,000 to 10,000 gallons of absorption oil from the KN facility into the soil. From 1965 to 1987, a flare pit was used by KN to collect spent materials and wastes, and an onsite catchment area was used to collect the contaminated surface runoff and steam condensate from a dehydration unit. From 1965 to 1987, several small contaminant releases occurred near the flare pit and catchment area. In 1987, site investigations revealed the presence of aromatic hydrocarbons in the soil in this area. Additionally, ground water sampling revealed the presence of two contaminated ground water plumes originating from the Dow/DSI the BETX plume and KN (VHO plume) facilities, respectively. The BETX plume consists of aromatic hydrocarbons including toluene, and xylenes, while the VHO plume consists of volatile halogenated organics and chlorinated organics. From 1988 to 1989, both DOW/DSI and KN conducted removal actions, which included remediation of approximately 440 cubic yards of contaminated onsite soil using vapor extraction; excavation and landfilling of contaminated soil and removal of the separator, a waste oil tank, and part of the vitreous tile drain at the Dow/DSI facility; and ground water treatment at the KN plant. This Record of Decision (ROD) addresses remediation of the onsite ground water emanating from the Dow/DSI and KN facilities; the VHO and BETX plumes, respectively. Further cleanup of the remaining source areas will be addressed in a subsequent ROD. The primary contaminants of concern affecting the ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes.

The selected remedial action for this site includes pumping and treatment of ground water in the VHO plume followed by air stripping of ground water in the more contaminated upgradient portion of the plume, and natural attenuation in downgradient portions of the plume; pumping and treatment of ground water in the BETX plume using air stripping; reinjecting the treated ground water from both plumes into the onsite alluvial aquifer; ground water and air monitoring; and implementing institutional controls including deed and ground water use restrictions. The estimated present worth cost for this remedial action is $601,739, which includes an annual O&M cost of $122,914 for 6 years at the VHO plume, and $50,564 for 1 year at the BETX plume.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ground water cleanup goals are based on Safe Water Drinking Act MCLs and include benzene 5 ug/l (MCL), toluene 2000 ug/l (proposed MCL), and xylenes 10,000 ug/l (proposed MCL).

INSTITUTIONAL CONTROLS: Ground water use and deed restrictions will be temporarily implemented at the site.

KEYWORDS: Air Monitoring; Air Stripping; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Oils; Onsite Discharge; Onsite Treatment; PCE; Plume Management; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Xylenes.

OGDEN DEFENSE DEPOT, UT

First Remedial Action
September 27, 1990

The 1,100-acre Ogden Defense Depot site is an active military facility in Ogden, Weber County, Utah. Land use in the surrounding area is mixed residential and commercial. The site overlies a shallow unconsolidated lacustrine and alluvial aquifer, which is a potential source of drinking water. In the past, both liquid and solid wastes have been disposed of at the site. Oily liquid materials and combustible solvents were burned in onsite pits, and solid materials were buried onsite. In fact, six different contaminated disposal areas have been identified and divided into four Operable Units (OUs) for remediation. This Record of Decision (ROD) addresses OU2, which is comprised of a french drain area, a building used for pesticide storage (B51), and a parade ground

area. From the early 1970s to 1985, the 8.5 by 20-foot french drain area, which is comprised of a 2.5 to 4-foot deep gravel-filled excavation, was used as a loading and mixing area for pesticides and herbicides, and for rinsing the empty containers. Rinsate from this activity was allowed to percolate through the french drain directly into the ground. The onsite storage building was used to mix and store pesticides, herbicides, and paint, although no contamination resulting from B51 activities has been detected to date. In addition, two onsite oil and solvent burning pits were previously utilized on or near the onsite parade ground area. Site investigations in 1979, 1981, and from 1985 to 1986, determined that improper waste disposal practices were used at the site, and discovered ground water contaminated by VOCs and pesticides near the french drain area. Subsequent investigations from 1988 to 1990, further characterized the ground water contamination, and also identified onsite soil contamination, including high pesticide levels in the french drain area. This ROD addresses soil at the french drain area and onsite ground water contamination. Subsequent RODs will address the remaining three OUs and will involve continued investigations and possible remediation of other onsite areas and media, including buried wastes, a mustard gas storage area, and the oil burning pit area. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, and TCE; and other organics including pesticides and herbicides.

The selected remedial action for this site includes excavating approximately 40 cubic yards of pesticide-contaminated soil from the french drain area, followed by offsite incineration and disposal at a hazardous waste treatment facility; backfilling the excavated area with clean soil and revegetating the area; pumping and treatment of approximately 28 million gallons of contaminated ground water using air stripping and liquid phase carbon adsorption, if contaminants are not adequately removed in the air stripping process; reinjecting or infiltrating treated ground water onsite; and ground water monitoring. The estimated present worth cost for this remedial action is $676,000, which includes an annual O&M cost of $75,000 to $103,000 for five years.

PERFORMANCE STANDARDS OR GOALS: The excavation level for soil has been set at the lowest consistently detected concentration level including pesticides/herbicides (chlordane/bromacil) 1 mg/kg. Ground water cleanup goals are Federal MCLs and include TCE 5 ug/l (MCL) and chlordane 2 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Closure Requirements; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Treatment; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PCE; Pesticides; RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; Treatment Technology; VOCs.

PORTLAND CEMENT (KILN DUST #2 & #3), UT

First Remedial Action
July 19, 1990

The 71-acre Portland Cement (Kiln Dust #2 & #3) site is in a primarily industrial/commercial area of Salt Lake City, Utah, and consists of 3 separate but adjacent properties known as Site 2, Site 3, and the West Site. Between 1965 and 1983, the Portland Cement Co., which was purchased by Lone Star Industries in 1979, deposited approximately 495,000 cubic yards of waste cement kiln dust (CKD) on each of the three properties comprising the site. Waste CKD consists primarily of heavy metals and other inorganics and is highly alkaline. Approximately 360 tons of chromium-bearing refractory bricks were disposed of with the waste CKD. Unlike Sites 2 and 3, the waste CKD at the West Site is mixed with soil and debris including demolition rubble, scrap iron, concrete slabs, asphalt, and common and the chromium bearing refractory kiln bricks. The waste CKD has also produced a contaminant plume which is present in the shallow ground water beneath the site and some adjacent properties. This Record of Decision, the first operable unit, addresses removal of the waste CKD and temporary onsite storage of the chromium bricks. A subsequent operable unit will address any remaining soil and ground

water contamination and treatment and disposal of the chromium bricks. The primary contaminants of concern affecting the waste CKD are metals including arsenic, chromium, and lead, and other inorganics.

The selected interim remedial action for this site includes excavation and offsite disposal of 495,000 cubic yards of waste CKD at a noncommercial, industrial landfill, which will be capped; removal of 360 tons of chromium-bearing refractory kiln bricks from the waste CKD prior to offsite disposal of the waste CKD, followed by temporary onsite storage; ground water monitoring; and implementation of institutional controls including well construction and deed restrictions. The estimated present worth cost for the remedial action is $12,143,000, which includes an annual O&M cost of $5,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Offsite disposal of waste CKD will eliminate fugitive dust emissions from the site thereby contributing to compliance with Federal and State air quality standards. Final soil and ground water cleanup levels will be addressed in a subsequent operable unit.

INSTITUTIONAL CONTROLS: Temporary deed restrictions will be imposed prohibiting site development that could disturb waste CKD such that fugitive dust emissions would be generated. Restrictions will also be imposed to prohibit the construction of ground water drinking wells on or adjacent to the site.

KEYWORDS: Air; Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; Interim Remedy; Lead; Metals; Offsite Disposal; O&M; RCRA; State Standards/Regulations; Temporary Storage.

ROCKY FLATS PLANT (DOE), CO
First Remedial Action
January 5, 1990

The 6,550-acre Rocky Flats Plant (DOE) site is a federal facility, which serves as a nuclear weapons research development and production complex in Jefferson County, Colorado. Surrounding land use is primarily rural residential, although there are some industrial properties nearby. The site overlies an alluvial/colluvial aquifer, and a small wetlands area is present within the facility boundaries. Since 1951, onsite operations have included the manufacture of nuclear weapons components from plutonium, uranium, beryllium, and stainless steel. There are twelve sites, designated as solid waste management units, which comprise the 881 Hillside area. In 1987, EPA identified VOC-contaminated ground water in the 881 Hillside area located in the southeast corner of the site near a surface stream. Possible sources for this contamination included chemical and oil waste pits, fuel oil tanks, and an associated drum storage area, onsite solvent/oil spills and leaks, and sanitary sewer overflow discharge. This Record of Decision (ROD) addresses management of migration and cleanup of ground water in the 881 Hillside area, and is an interim remedy. Final remediation of this site will be addressed in a subsequent ROD. The primary contaminants of concern affecting the ground water are VOCs including PCE and TCE; metals including chromium; and radioactive materials.

The selected remedial action for this site includes intercepting contaminated ground water in the alluvial/colluvial aquifer using a french drain system; treating the contaminated water in an onsite treatment plant using filtration followed by UV peroxide to remove organics, and ion exchange to remove inorganics; storing the treated water temporarily onsite during effluent quality testing prior to discharging the treated water to an onsite interceptor ditch; and ground water monitoring. The estimated present worth cost for this remedial action is $4,588,200, which includes an annual O&M cost of $258,100 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup standards will be the more stringent of Federal MCLs or MCLGs, or State water quality standards. Chemical-specific goals include PCE 5 ug/l (State), TCE 5 ug/l (State), trivalent chromium 0.05 mg/l (State), and chromium 0.05 mg/l (State).

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Carcinogenic Compounds; Chromium; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLGs; MCLs;

Metals; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Radioactive Materials; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Temporary Storage; VOCs; Wetlands.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 16), CO
Second Remedial Action
February 26, 1990

The Rocky Mountain Arsenal (RMA) (Operable Unit 16) comprises part of the 17,000-acre RMA site, which is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s until late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropyl methyl-phosphonofluoridate). From 1947 to 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, facility operations primarily have involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Interim Response Actions (IRAs) were determined necessary prior to implementing the final On-Post Record of Decision (ROD). Operable Unit 16 (M-1 Settling Basins area) is one of several areas being addressed as part of the Other Contamination Sources IRA. The M-1 Settling Basins area occupies 84,500 square feet and consists of three unlined basins used to treat waste fluids from the lewisite facility. The basins also may have received lesser amounts of waste materials including mercuric chloride from alleged spills within several onsite buildings. The basins have been backfilled and are partly covered with soil or structures. Site investigations by the Army revealed that the waste material in the basins is a source of arsenic contamination in ground water. This ROD addresses interim remediation of source areas and management of contaminant migration. The primary contaminants of concern affecting the soil, sludge, and ground water are organics including pesticides, and metals including arsenic.

The selected Interim Response Action for this interim remedy includes sampling and relocating tanks from the basin area to an adjacent area to await a final disposition in the final On-Post ROD; constructing a temporary 360-degree subsurface barrier such as a slurry wall or sheet pilings around the basins; performing an in-situ vitrification demonstration test; treating approximately 2,600 cubic yards of soil and 6,400 cubic yards of sludge using in-situ vitrification followed by carbon adsorption to treat off-gasses; treating the recovered water driven from the sludge during the vitrification process onsite at the CERCLA Wastewater Treatment System or by another method to be determined during remedial design; and conducting ground water and air monitoring. The vitrified soil will remain onsite, pending determination of a final remedial action in the final On-Post ROD. No costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: The treatment process will be constructed to provide 99.99% destruction and removal of organics. Treatment standards for effluent from the offgas control process and other liquids generated through dewatering of the area are contained in the ROD for the CERCLA Wastewater Treatment System IRA. Air emissions from the vitrification process will comply with applicable Clean Air Act emission standards.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Arsenic; Carbon Adsorption (GAC); Clean Air Act; Ground Water; Ground Water Monitoring; Interim Remedy; Metals; Onsite Treatment; Organics; Pesticides; Sludge; Slurry Wall; Soil; State Standards/Regulations; Temporary Storage; Treatability Studies; Treatment Technology; Vitrification.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 17), CO
Eighth Remedial Action
May 14, 1990

The Rocky Mountain Arsenal (RMA) (Operable Unit 17) is a part of the 17,000-acre RMA site, which is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s until late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropylmethylphosphonofluoridate). In addition, between 1947 and 1982, private industries leased major portions of the plant

facilities to manufacture various insecticides and herbicides. Since 1970, facility operations have primarily involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Interim Response Actions (IRAs) were determined necessary prior to implementing the final remedial action. Operable Unit 17 (CERCLA Wastewater Treatment System) is among those IRAs specified. This ROD addresses the interim remedy to develop and implement a program to treat contaminated wastewaters resulting from the assessment and implementation of response actions at the RMA site. The primary contaminants of concern affecting the wastewaters are VOCs including benzene, PCE, toluene, and TCE; other organics including pesticides; and metals including arsenic, chromium, and lead.

The selected Interim Response Action for this interim remedy includes constructing a centrally located wastewater treatment facility that will consist of a sequence of unit processes including chemical addition/precipitation, filtration, ultraviolet light/chemical oxidation, activated carbon adsorption, air stripping, and an activated alumina treatment process; constructing decontamination pads at both the treatment facility and satellite non-treatment wastewater facilities; constructing five storage tanks with 10,000 to 12,000 gallon capacities; and incorporating offsite discharge of the treated effluent to the sanitary sewer and offsite disposal of treatment facility sludge and residuals. No costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ARARs, based on Colorado Basic Standards for Ground Water (CBSG) and State MCLs, will be applied to the design of the treatment system and include arsenic 50 ug/l (MCL), benzene 5 ug/l (MCL), chromium 50 ug/l (MCL), lead 50 ug/l (MCL), PCE 10 ug/l (CBSG), toluene 2,420 ug/l (CBSG), and TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Decontamination; Interim Remedy; Lead; MCLs; Metals; Offsite Discharge; Offsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; Safe Drinking Water Act; Sludge; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 18), CO

Third Remedial Action
February 26, 1990

The Rocky Mountain Arsenal (RMA) (Operable Unit 18) site comprises part of the 17,000-acre RMA site, which is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s until late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropyl methylphosphonofluoridate). In addition, between 1947 and 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, facility operations primarily have involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Interim Response Actions (IRAs) were determined necessary prior to implementing the Final On-post Record of Decision (ROD). Operable Unit 18 (Motor Pool Area) is one of several areas included in the Other Contamination Sources IRA. The U.S. Army acquired the motor pool area in 1942, and used it for storing diesel fuel, gasoline, road oil, and flammable liquids in an above-ground storage tank farm. In addition, during the early 1950s, several buildings were used for pesticide and herbicide storage, and later these buildings housed an agricultural research and bioassay laboratory. The Army continues to use the area to service equipment, vehicles, and railroad cars. A diesel fuel spill and other spills related to piping from underground tanks have been recorded. In 1985, ground water monitoring identified TCE contamination near the motor pool area and in downgradient water supply wells. Records indicate that vehicle maintenance operations involved discharging water and other liquids, and rust residues through floor drains and pipes into unlined ditches. This ROD addresses interim remediation of source areas and management of migration. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene and TCE.

The selected Interim Response Action for this interim remedy includes conducting a vapor extraction pilot test; installing and operating an in-situ vapor extraction system, followed by granular activated carbon treatment of condensed water vapor with offsite thermal carbon reactivation; capping the site with a layer of asphalt to improve the efficiency of the vapor extraction system; conducting air monitoring, followed by possible stack treatment by a vapor phase carbon filter or catalytic oxidizer; and ground water pumping, treatment, and reinjection in conjunction with the Rail Classification Yard IRA. No costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: No chemical-specific goals were identified for soil contaminants. Chemical-specific goals for ground water treatment, which apply at the point of injection, are contained in the ROD for the Rail Classification Yard IRA and include benzene 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Ground Water; Ground Water Treatment; Interim Remedy; MCLs; Offsite Treatment; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; Soil; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 19), CO

Fourth Remedial Action
February 26, 1990

The Rocky Mountain Arsenal (RMA) (Operable Unit 19) site comprises part of the 17,000-acre RMA site, which is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s until late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropylmethyl-phosphonofluoridate). In addition, between 1947 and 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, facility operations primarily have involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Other Contamination Sources Interim Response Actions (IRAs) were determined necessary prior to implementing the Final Onpost Record of Decision (ROD). Operable Unit 19 (Rail Classification Yard) is one of the areas included in the IRAs. In 1980, the pesticide 1,2-dibromo-3-chloropropane (DBCP) was detected in the alluvial ground water near the Rail Classification Yard of RMA. To prevent off-post migration of DBCP in the ground water, the Irondale Control System (ICS) was installed in the Rail Classification yard in 1981. This system, which has been effective in preventing off-post migration, involves pumping and treatment of contaminated ground water followed by reinjection. Site investigations by the U.S. Army indicate DBCP contamination in unsaturated soil and sediment, possibly from leaking rail cars, to be potential sources of ground water contamination. This ROD addresses interim management of migration of the contaminated ground water plume. The primary contaminant of concern affecting the ground water is DBCP.

The selected interim remedial action for this site includes installing a ground water interception/containment system parallel to the contaminant flowpath; increasing the treatment capacity of the ICS and constructing pipelines to convey extracted ground water to the ICS; ground water pumping and treatment using carbon adsorption at the ICS followed by reinjection; and conducting ground water monitoring. This interim remedial action will be implemented jointly with the RMA motor pool area IRA. The estimated present worth cost of this interim remedial action is $2,662,000, which includes an annual O&M cost of $183,000 for 5 years.

PERFORMANCE STANDARDS OR GOALS: The chemical-specific goal for ground water treatment of DBCP is 0.2 ug/l based on the proposed MCL. Chemical-specific goals for other potential contaminants are based on MCLs and Colorado Basic Standards for Ground Water (CBSG) and include benzene 5 ug/l (MCL), toluene 2,420 ug/l (CBSG), and TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds: Ground Water; Ground-Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; O&M; Onsite Discharge; Onsite Treatment; Organics; Pesticides; Plume Management; Safe Drinking Water Act.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 20), CO
Fifth Remedial Action
March 20, 1990

The 17,000-acre Rocky Mountain Arsenal (Operable Unit 20) site is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s until late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropyl-methylphosphonofluoridate). From 1947 to 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, facility operations primarily have involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Interim Response Actions (IRAs) were determined necessary prior to implementing the final On-Post Record of Decision (ROD). Operable Unit 20 (OU20), the Lime Settling Basins area, is one of several areas being addressed as part of the Other Contaminated Sources IRA. The unlined Lime Settling Basins occupy approximately 5 acres, and were used in the 1940s and 1950s to treat chemical production wastewater using a precipitation process to remove metals and to accept wastewater from pesticide production. The wastewater discharge produced lime sludge contaminated with metals and pesticides within the basins. Sludge also was removed from the basins for drying in an adjacent area. Investigations by the Army in 1987 and 1989 have characterized the nature and extent of contamination at the Lime Settling Basins Area. The primary contaminants of concern affecting the soil, sludge, and ground water are organics including pesticides; and metals including arsenic, chromium, and lead.

The selected Interim Response Action for this site includes consolidating 26,000 cubic yards of contaminated sludge located adjacent to the basins with 80,000 cubic yards of sludge located in the basins, and containing the sludge and any excavated contaminated soil with a vegetative soil cover; hydraulically containing ground water with a slurry wall or sheet pilings constructed around the perimeter of the basin area; pumping ground water to maintain an inward hydraulic gradient across the slurry wall; treating ground water onsite, either at the CERCLA Wastewater Treatment System or at a separate onsite treatment facility to remove organic and inorganic contaminants; and ground water monitoring. No cost information was provided for this interim remedial action.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific ARARs for ground water treatment will be contained in the ROD for the CERCLA Wastewater Treatment System IRA. No chemical-specific ARARs were given for soil or sludge.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Arsenic; Carcinogenic Compounds; Chromium; Clean Air Act; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; Metals; Onsite Containment; Onsite Disposal; Onsite Treament; Organics; Pesticides; Plume Management; Sludge; Slurry Wall; Soil; State Standards/Regulations.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 22), CO
Sixth Remedial Action
May 3, 1990

The 17,000-acre Rocky Mountain Arsenal (RMA) (Operable Unit 22) site is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s to late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropylmethylphosphonofluoridate). In addition, from 1947 to 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, U.S. Army facility operations have primarily involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen interim response actions (IRAs) were determined necessary prior to implementing the final On-Post Record of Decision (ROD). Operable Unit 22 (OU22), the Complex Disposal

Trenches, is one of several areas being addressed as part of the Other Contaminated Sources Interim Remedial Action. These disposal trenches are located in the 107-acre Site 36-17N in the center of the RMA. During the 1940s and 1950s, this area was the primary disposal area for solid chemical waste, contaminated tools and equipment, rejected incendiaries, and empty munitions casings. This waste was decontaminated, placed in onsite pits, and burned using fuel oil to ensure complete decontamination. Salvageable materials such as metal were sold as scrap after burning, and nonsalvageable materials were buried in onsite pits. Investigations by RMA in 1988 and 1989, identified onsite contaminated soil and a variety of buried waste, including scrap metal, concrete rubble, wood, charcoal, drums of waste chemicals, and glass vials containing unknown liquids. Ground water under the site also was determined to be contaminated. The main source area for the contaminant plume, however, appears to be from upgradient trenches located south of Site 36-17N. Ground water contaminant sources are the subject of another ROD. The selected interim remedial action is designed to prevent taking measures that may be incompatible with final decisions. Therefore, this ROD will not address the primary contaminants of concern affecting the soil and ground water. Remediation of contaminated media will be a component of the final site remedy.

The selected interim remedial action for this site is no further action with the installation of ground water wells for further site characterization; and ground water monitoring. A reevaluation procedure will identify the need for any additional onsite remedial actions. No costs were provided for this interim remedial action.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Ground Water Monitoring; Interim Remedy; No Action Remedy.

ROCKY MOUNTAIN ARSENAL (OPERABLE UNIT 23), CO
Seventh Remedial Action
May 3, 1990

The 17,000-acre Rocky Mountain Arsenal (RMA) (Operable Unit 23) site is a former U.S. Army chemical warfare and incendiary munitions manufacturing and assembly plant in Adams County, Colorado. From the 1950s to late 1969, the U.S. Army used the RMA facility to produce the nerve agent GB (isopropyl-methylphosphonofluoridate). From 1974 to 1982, private industries leased major portions of the plant facilities to manufacture various insecticides and herbicides. Since 1970, the U.S. Army facility operations primarily have involved the destruction of chemical warfare materials. Because final remediation of the RMA site will take many years to complete, thirteen Interim Response Actions (IRAs) were determined to be necessary prior to implementing the final On-Post Record of Decision (ROD). Operable Unit 23 (OU23), the Shell Section 36 Trenches, is one of several areas being addressed as part of the Other Contaminated Sources Interim Remedial Action. Approximately 31 trenches occupy an 8-acre area of Section 36 in the central portion of the RMA. From 1952 to 1965, liquid and solid waste including bulk or drummed process intermediates, off-specification product, laboratory sample filters, and other debris from the manufacture of pesticides was disposed of and buried in the trenches. Investigations by the Army from 1987 through 1989 have identified ground water contamination in a surficial unconsolidated sand aquifer underlying the site. A plume of dense non-aqueous phase liquids (DNAPLs) was also detected, and is believed to have originated from the Shell Section 36 trenches. The primary contaminants of concern affecting the soil and ground water are VOCs; and other organics including pesticides.

The selected Interim Response Action for this Operable Unit includes constructing a subsurface barrier around the perimeter of the site, such as a grout curtain tied into an impermeable clay layer located beneath the sand aquifer to effectively contain ground water and DNAPLs; covering the trench area with a vegetative soil cover to reduce precipitation infiltration; and investigating further the DNAPL plume, which is located downgradient

of the trench area. The estimated present worth cost for this remedial action is $1,500,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

INSTITUTIONAL CONTROLS: Not provided.

KEYWORDS: Carcinogenic Compounds; Ground Water; Interim Remedy; Onsite Containment; Organics; Pesticides; Plume Management; Soil; State Standards/Regulations; VOCs.

SAND CREEK INDUSTRIAL, CO
Second Remedial Action
September 28, 1990

The Sand Creek Industrial site is chemical manufacturing facility in Commerce City, Adams County, Colorado. Land use in the area surrounding the site is primarily industrial and residential with 13 residents onsite. Production wells north and downgradient of the site supply drinking water to the county. The Sand Creek Industrial site lies in the vicinity of three other Superfund sites: Woodbury Chemical, Chemical Sales, and Rocky Mountain Arsenal. Beginning in the 1960s, the Colorado Organic Chemical Company (COC) conducted pesticide manufacturing operations onsite. Disposal and onsite storage areas include a landfill and acid pits. Onsite fires in 1968 and 1977, as well as improper pesticide storage practices, resulted in pesticide-contaminated soil, ground water, and surface water. In 1978, COC removed some contaminated soil, and in 1984, COC removed drummed wastes, excess product, additional contaminated soil, and implemented site access restrictions including fencing. The site has been divided into six Operable Units (OU) to facilitate remediation. A 1989 Record of Decision (ROD) addressed OU1, which included remediating some of the subsurface soil. This second ROD addresses OU5, and includes the final response action for the 14,000 cubic yards of contaminated soil present onsite at the COC area. Subsequent RODs will address the remaining contamination including the landfill, acid pits, and ground water. The primary contaminants of concern affecting the soil are organics including pesticides; and metals including arsenic and chromium.

The selected remedial action for this site includes excavating approximately 14,000 cubic yards of surface soil above the health-based action levels, treating the soil onsite using soil washing and subsequently backfilling the treated soil onsite; grading and revegetating the site; incinerating the soil washing wastewater offsite; and ground water monitoring. The estimated present worth cost for this selected remedial action is $4,490,734, which includes an estimated annual O&M cost of $20,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Remediation goals are based on health-based action levels or RCRA treatability variance action levels, whichever is more stringent. Health-based action levels were established for soil based on a 10^{-6} cancer risk and include dieldrin 0.155 mg/kg and heptachlor 0.553 mg/kg. Treatability variance action levels were established for arsenic (90-99% reduction), chromium 0.5-0.6 mg/l (TCLP), chlordane (90-99% reduction), 2,4-D (90-99% reduction), and 4,4-DDT 0.5-20 mg/l (Total Waste Analysis).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Arsenic; Carcinogenic Compounds; Chromium;) Closure Requirements; Direct Contact; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Soil; Soil Washing/Flushing; State Standards/Regulations; Treatability Studies; Treatment Technology.

SHARON STEEL (MIDVALE TAILINGS), UT
First Remedial Action
September 24, 1990

The Sharon Steel (Midvale Tailings) site is a former ore milling operation facility in Midvale, Utah. Land use in the area is residential, urban, agricultural, and commercial. Onsite and offsite features include a mill site, a tailings area, and an offsite residential community that relies on drinking water supply wells located within a three mile radius of the site. From 1906 to 1971, the facility was operated as a custom mill, receiving ore from many sources, then concentrating and extracting a variety of metals. Tailings from these operations were deposited into onsite

uncovered tailings piles, which have an estimated volume of 14,000,000 cubic yards. Previous investigations by the State in 1982 identified elevated levels of metals within the tailings piles. It is estimated that over 242,000 cubic yards of soil in the residential community were contaminated by wind-blown tailings from the onsite pile at the mill site area. In addition, investigations have identified that the shallow aquifer directly under the mill site also is contaminated. This Record of Decision (ROD) addresses remediation of offsite soil in the residential areas. A future ROD will address contaminant source and ground water remediation. The primary contaminants of concern affecting the soil are metals including arsenic, cadmium, and lead.

The selected remedial action for this site includes excavating 242,000 cubic yards of contaminated soil with lead levels greater than 500 mg/kg and arsenic levels greater than 70 mg/kg to a maximum depth of 2 feet, followed by temporarily disposing of the soil onsite for future treatment with the onsite tailings; filling and revegetating excavated areas; temporarily relocating residents as necessary; and indoor cleaning if required. The estimated present worth cost for this remedial action is $22,650,000, which includes an annual O&M cost of $72,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil contaminated with concentrations greater then the action levels of lead 500 ug/kg and arsenic 70 mg/kg will be excavated and disposed of onsite.

INSTITUTIONAL CONTROLS: A building permit must be obtained for future construction including removal or replacement of pavement or foundations. This requirement will be imposed to reduce the level of contaminant exposure. A "citizens repository" may be created to provide a place for residents to dispose of soil during these future activities.

KEYWORDS: Arsenic; Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Onsite Disposal; Soil; State Standards/Regulations; Temporary Storage.

SILVER BOW CREEK, MT
First Remedial Action
September 28, 1990

The Silver Bow Creek site is a mining and processing area in the Upper Clark Fork River Basin, Deer Lodge County, Southwestern Montana. This Record of Decision (ROD) documents the selected interim remedial action for one of eleven operable units for the site, the Warm Springs Ponds operable unit, which covers approximately 2,500 acres just above the beginning of the Clark Fork River. Several onsite creeks (e.g., Warm Springs, Silver Bow, Mill, Willow) and a stream bypass (Mill-Willow Bypass) serve as principal headwaters to Clark Fork River. Three settling ponds (i.e., Warm Springs Ponds), an area between the northern most pond and the Clark Fork River's beginning point, and a series of wildlife ponds are located in close proximity to the streams. Contamination at the site is the result of over 100 years of mining and process operations in the area. Mining, milling, and smelting wastes were dumped directly into Silver Bow Creek and transported downstream to the Clark Fork River with final deposition downstream as far as 130 miles. The three settling ponds, which cover over four square miles, were built to allow the wastes from mining, milling, and smelting operations that were deposited in Silver Bow Creek to settle out before discharge to the Clark Fork River. An estimated 19 million cubic yards of tailings and heavy metal-contaminated sediment and sludge have collected in the ponds. An estimated 3 million cubic yards of contaminated tailings remain upstream of the ponds, along the banks of Silver Bow Creek. Principal threats from the site include the possibility of pond berm failure due to flood and earthquake damage that could release millions of cubic yards of tailings and sediment to the river. Furthermore, the creeks are contaminated with dissolved metals, and exposed soil and tailings are contaminated with elevated levels of several metals. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are metals including arsenic, cadmium, copper, lead, and zinc.

The selected remedial action for this site includes raising and strengthening all pond berms; increasing the capacity of settling Pond 3 to receive and treat (using metals precipitation) flows up to a 100-year flood level, and constructing new inlet and hydraulic

structures to prevent debris from plugging the settling Pond 3 inlet; upgrading the treatment capability of Ponds 2 and 3 to treat all flows up to the 100-year peak discharge, and constructing spillways for routing excess flood water into the bypass channel; flooding (wet-closure) all dry portions of settling Pond 2; reconstructing the Mill-Willow Bypass channel, and removing all remaining tailings and contaminated soil from the bypass, followed by consolidating these with dry tailings and contaminated soil within the dry portion of settling Pond 1 and settling Pond 3, capping and revegetating the closure areas; dewatering wet portions of settling Pond 1, covering the area with a RCRA-type cap and revegetating; constructing interception trenches to collect contaminated ground water in and below settling Pond 1, then pumping the water to settling Pond 3 for treatment; establishing surface and ground water quality monitoring systems; and implementing institutional controls and site restrictions. Decisions concerning remediation of contaminated soil, tailings and ground water in the area below settling Pond 1 will be made within one year, pending evaluation of various wet- and dry-closure alternatives and public review. Until these decisions are made, soil cleanup levels cannot be determined. Three chemical- and location-specific ARARs pertaining to water quality standards and potential solid waste disposal requirements will be waived in this remedy. The present worth cost for this remedial action is $57,416,000 which includes an estimated annual O&M cost of $379,000 for 5 years.

PERFORMANCE STANDARDS OR GOALS: All exposed tailings and contaminated soil in the Mill-Willow Bypass have already been removed and placed in the closure area behind the settling Pond 3 berm. Final soil cleanup levels will be set within one year of this ROD. Ground water pumping and discharge for treatment in the pond system will comply with State standards, with the exception of arsenic (0.02 mg/l) and lead (0.05 mg/l). State surface water concentrations of arsenic and mercury require an ARAR waiver based on technical impracticability and the fact that this is an interim remedy. The replacement criteria are arsenic 0.02 mg/l and mercury 0.0002 mg/l at the beginning of the river.

INSTITUTIONAL CONTROLS: Restrictions will be enacted to prevent residential development, swimming, and human consumption of fish from the site.

KEYWORDS: ARAR Waiver; Arsenic; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; Lead; MCLs; Metals; Mining Wastes; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; State Permit; State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; Water Quality Criteria; Wetlands.

WHITEWOOD CREEK, SD

First Remedial Action - Final
March 30, 1990

The Whitewood Creek site is a mine tailings deposit area near the town of Whitewood in Lawrence, Mead, and Butte counties, South Dakota. Situated along 18 miles of Whitewood Creek, the 2,018-acre site consists of woodlands, farmland, and residential homes. From 1877 to 1977, arsenic-rich tailings from gold and ore mining and milling operations, conducted by the Homestake Mining Company, were discharged directly into Whitewood Creek. The tailings, which consist of finely ground rock, residual metallic and non-metallic compounds not extracted from the ore, and trace compounds used during the extraction process, were deposited downstream from the mine. The largest tailings deposits at the site are found along the floodplains of Whitewood Creek and the Belle Fouche and Cheyenne Rivers. Since 1977, however, material from the ore milling process has been treated prior to backfilling residual material into the mine, and process water also has been treated prior to discharge into Whitewood Creek. The tailings are the major source of contamination at the site affecting onsite soil in residential areas and continue to leach metals to surface and subsurface waters. A 1989 remedial investigation revealed that some residential properties contain arsenic levels that presented health risks. Soil in the residential areas contain arsenic contamination as a result of a building in the tailings area, windblown

tailings, and the use of arsenic-contaminated soil as a soil conditioner and a driveway base. Approximately 12 residences are estimated to have arsenic-contaminated soil exceeding 100 mg/kg. The total number of affected residences, however, will be determined during the remedial design phase. This Record of Decision (ROD) addresses the arsenic-contaminated soil in the residential areas. The primary contaminant of concern affecting the soil is arsenic.

The selected remedial action for this site includes removing and/or covering frequently used areas with clean surface soil (arsenic <20 mg/kg) in residential areas with arsenic levels above 100 mg/kg followed by offsite disposal of the arsenic-contaminated soil, if approved by EPA, and revegetation of the remediated area; soil sampling at all remediated areas to confirm that arsenic levels are below 100 mg/kg; implementing institutional controls including land access restrictions; conducting an annual education program to inform site residents of the potential health hazards associated with exposure to tailings, soil, and downgradient ground water; refining knowledge of the extent of the contamination and delineating the 100-year floodplain of Whitewood Creek; and surface water monitoring. EPA is invoking ARAR waivers based on the technical impracticability of remediating contaminated ground and surface waters. The estimated present worth cost for this remedial action is $882,813, which includes an annual O&M cost of $12,000 for years 1-5 and $6,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Contaminated surface soil in frequently used residential areas will be excavated if arsenic levels exceed 100 mg/kg (based on 10^{-4} target risk level).

INSTITUTIONAL CONTROLS: Land use restrictions will be implemented. Ground water well installation restrictions have already been implemented and will continue to be enforced.

KEYWORDS: ARAR Waiver; Arsenic; Background Levels; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Floodplain; Institutional Controls; MCLs; Metals; Mining Wastes; Offsite Disposal; O&M; Safe Drinking Water Act; Soil; State Standards/Regulations; Surface Water Monitoring; Water Quality Criteria.

RECORDS OF DECISION ABSTRACTS
REGION 9
(American Samoa, Arizona, California, Guam, Hawaii, Nevada, Trust Territories)

APPLIED MATERIALS, CA
First Remedial Action
September 28, 1990

The 9-acre Applied Materials site is an active equipment manufacturing facility in Santa Clara, Santa Clara County, California. The site is located within the San Tomas Aquino floodplain, and land use in the area is primarily light industrial, commercial, and residential. Shallow ground water at the site is a potential drinking water source. Onsite operations include manufacturing vapor deposition equipment for use by the semiconductor industry. In 1983, Applied Materials discovered that several leaks and/or spills from three onsite underground tanks near Building 1 had contaminated onsite soil and shallow ground water with VOCs and other organics. In 1984 and 1985, as part of interim onsite cleanup activities, Applied Materials excavated and removed underground tanks, piping, and more than 60 cubic yards of contaminated onsite soil, and installed an air stripping unit onsite to treat VOC-contaminated ground water. This Record of Decision (ROD) provides a final remedy for contaminated onsite ground water at the Building 1 area. Remediation of onsite contaminated soil will be addressed in a subsequent ROD. The primary contaminants of concern affecting the ground water are VOCs including PCE, TCE, and 1,1,1-TCA.

The selected remedial action for this site includes onsite pumping and treatment of contaminated ground water using an existing air stripping unit, followed by onsite discharge of the treated water to surface water; ground water monitoring; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $715,000. No O&M costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup levels will meet State and Federal Drinking Water MCLs and include PCE 0.005 ug/l (MCL), TCE 0.005 ug/l (MCL), and 1,1,1-TCA 0.0032 ug/l (MCL). It is estimated that the time needed to restore ground water to beneficial use will be 50 years.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to limit site activities and ground water use until safe drinking water levels are achieved.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Onsite Discharge; PCE; Plume Management; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

COALINGA ASBESTOS MINE, CA
Second Remedial Action - Final
September 21, 1990

The 557-acre Coalinga Asbestos Mine site, a former asbestos processing area and chromite mine, comprises part of the Johns Manville Coalinga Asbestos Mill site in western Fresno County, California. This rural mountainous area is used primarily for recreational purposes. From 1962 to 1974, asbestos ore from several local mines was processed and sorted onsite, and the resulting asbestos mill tailings were periodically bulldozed into an intermittent stream channel. Subsequently, from 1975 to 1977, a chromite milling operation was conducted onsite. Tailings were often washed downstream during periods of stream flow, and the resuspension of asbestos fibers from the tailings into the air produced a significant inhalation hazard. As a result of these activities, approximately 450,000 cubic yards of mill tailings and asbestos ore remain onsite within a large tailing pile. Other site features include an asbestos ore storage/loading area, an abandoned mill building, an inactive chromite mine, filled-in chromite settling ponds, and debris. In 1980 and 1987, State investigations indicated that the site was contributing a significant amount of asbestos into the surface water. This site will be remediated as two Operable Units (OU). This

Record of Decision (ROD) addresses the remedial action for OU2, the Johns Manville Coalinga Asbestos Mill Area. The primary contaminant of concern affecting the surface water is asbestos.

The selected remedial action for this site includes consolidating contaminated soil and asbestos ores within the tailing pile; grading and revegetating the tailing pile to reduce erosion and increase stability; diverting surface water away from the tailing pile; improving an existing sediment trapping dam by constructing a concrete spillway; dismantling the mill building; paving the mill access road; and implementing engineering controls, institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $1,947,000, which includes a total O&M cost of $815,000.

PERFORMANCE STANDARDS OR GOALS: A specific cleanup level for asbestos was not determined due to uncertainties in sampling parameters; however, the selected remedial action will reduce the excess lifetime cancer risk to the level of 10^{-4} to 10^{-6}.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented at the site.

KEYWORDS: Air; Asbestos; Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Inorganics; Institutional Controls; O&M; Onsite Containment; Onsite Disposal; Public Exposure; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring.

INTEL (SANTA CLARA III), CA
First Remedial Action - Final
September 20, 1990

The Intel (Santa Clara III) site includes a plant that performs quality control testing of chemicals and electrical testing of semiconductors in Santa Clara, Santa Clara County, California. The site is in a predominantly industrial area, and overlies a major ground regional source of ground water, the Santa Clara Valley ground water basin. In 1982, the State conducted a leak detection program, which identified VOC contamination in an onsite shallow aquifer. Possible sources for the contamination may include the accidental dumping of solvents into an acid neutralization tank, accidental spills near an above-ground solvent storage facility, and cleaning of solvent-contaminated pipes during plant construction. It has been determined that no onsite source is presently contributing to ground water contamination. Since 1985, Intel has been pumping and treating ground water using granular activated carbon as an Initial Remedial Measure (IRM). This Record of Decision (ROD) addresses a final solution for restoring ground water to its beneficial use. The primary contaminants of concern affecting the ground water are VOCs including TCE.

The selected remedial action for this site includes installing an additional extraction well onsite; continuing the pumping and treatment of ground water using an existing granular activated carbon adsorption system, with regeneration of carbon filters offsite; discharging treated water to onsite surface water; conducting a treatability study to evaluate the effectiveness of pulsed pumping techniques that enhance the removal of contaminants adsorbed to soil and allow for aquifer equilibration; ground water monitoring; and implementing institutional controls, including deed restrictions to limit ground water use. The estimated present worth cost for this remedial action is $594,400. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup goals will reduce the excess lifetime cancer risk for carcinogens from 10^{-4} to 10^{-6}, and will reduce the Hazard Index (HI) for non-carcinogens to a value of 1 or less. Chemical-specific goals include TCE 5 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Deed and ground water use restrictions will be implemented until safe drinking water levels are achieved.

KEYWORDS: Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Initial Remedial Measure (IRM); Institutional Controls; MCLs; O&M; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; State Standards/Regulations; TCE; Treatability Studies; VOCs.

INTERSIL, CA

First Remedial Action - Final
September 27, 1990

The 12-acre Intersil site contains two industrial properties, Intersil, Inc., and Siemens Components, Inc., in Cupertino, California. Since 1978, Siemens has manufactured semiconductor products for optoelectronic applications at the site. Former underground waste-handling facilities, which have been removed, included five unvaulted waste solvent tanks and an unvaulted acid dilution basin. Solvents are currently stored above-ground and wastewater is treated in an acid neutralization system. From 1967 to 1988, Intersil operated as a semiconductor assembly facility. Two vaulted and one unvaulted underground acid neutralization systems, now excavated, were used in the operation. Both facilities used various organic solvents and commercial mixtures. Contamination, a result of releases from the underground waste handling facilities at both plants, has been detected in soil and ground water beneath the site. A contaminant plume also has been detected, which affects offsite ground water. In 1983, Siemens began onsite soil vapor extraction, and subsequently in 1986, began pumping and treatment of onsite ground water. Intersil began onsite ground water treatment and soil vapor extraction in 1987. This Record of Decision (ROD) outlines the final remedy addressing onsite source areas, and onsite and offsite contaminated ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and toluene; and other organics including phenols.

The selected remedial action for this site includes enhancement and/or expansion of onsite and offsite ground water pumping and treatment systems, which use air stripping, and the soil vapor extraction systems, which use carbon adsorption at the Siemens and Intersil facilities; excavating 40 cubic yards of soil contaminated with greater than 10 mg/kg semi-volatile organics at the Siemens facility, followed by offsite disposal; pumping and treatment of offsite ground water using air stripping; discharging all treated ground water to onsite surface water; and monitoring soil vapor and ground water. The estimated present worth cost for this remedial action is $18,750,000. O&M costs were not provided.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup standards were chosen as the more stringent of Federal or State MCLs, or State Recommended Drinking Water Action Levels (RDWALs). Chemical-specific goals include PCE 5 ug/l (State MCL), TCE 5 ug/l (State MCL), and toluene 100 ug/l (RDWAL). Soil cleanup goals have been set at 1 mg/kg total VOCs for vapor extraction, and 10 mg/kg total semi-volatile organics (including phenols) for soil excavation and offsite disposal.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLGs; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PCE; Phenols; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs.

J.H. BAXTER, CA

First Remedial Action - Final
September 27, 1990

The J.H. Baxter site is in Weed, Siskiyou County, north-central California, and consists of the 33-acre J.H. Baxter facility and the adjacent 870-acre Roseburg Forest Products facility. These properties continue to be used for wood treatment operations and lumber product manufacturing. The site is surrounded by pasture and woodland areas with residential areas to the north and west. Man-made and natural wetlands exist within the site boundaries, and Beaughton Creek runs through the eastern portion of the site. Since 1937, wood treatment operations at the site have involved a variety of chemicals including ammonical copper-zinc-arsenate, creosote, and PCP. Numerous waste products have been generated including tank and retort sludge, process water, storage area drippings, and spilled raw preservative compounds. Prior to 1983, when the State ordered the J.H. Baxter facility to cease all waste disposal practices, onsite waste management involved onsite disposal and discharge, spray irrigation of wastewater onsite, storage in tanks and ponds, and discharge of wastewater into the bermed

area around a 500,000 gallon tank, once used for creosote storage and currently used for process water storage. These disposal practices and leakage from storage tanks led to soil and sediment contamination. Water that was collected by the lumber operations drainage system was discharged to Beaughton Creek until 1987, at which time a carbon adsorption system was installed to treat the extracted ground water. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are organics including PAHs and dioxins; and metals including arsenic.

The selected remedial action for this site includes excavation of 41,000 cubic yards of contaminated soil, followed by biological treatment for soil with organic contaminants, chemical fixation for soil with inorganic contaminants, biological treatment and chemical fixation for soil with both inorganic and organic contaminants, and onsite disposal of treated soil in lined cells; leachate collection and treatment; ground water pumping, followed by biological treatment, chemical precipitation, and polishing, prior to onsite discharge of treated ground water; implementation of institutional controls; and long-term ground water, surface water, and air monitoring. All sediment in the site drainage system with detectable levels of wood treatment chemicals will be excavated and treated with stabilized soil. No remedy for the Beaughton Creek sediment is proposed unless additional data indicate the need for further action. Surface water contamination will be controlled through soil remedial actions that will reduce contact between the contaminated soil and surface water. The estimated present worth cost for this remedial action is $37,829,100, which includes an annual O&M cost of $1,207,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for soil remediation include arsenic 8 mg/kg (background), carcinogenic PAHs 0.5 mg/kg (10^{-6} risk level and detection limit), and dioxin 1 ug/kg (detection limit). Chemical-specific goals for ground water remediation are based on MCLs or non-zero MCLGs, State MCLs, the 10^{-5} to 10^{-6} risk range, or whichever is more restrictive, and include arsenic 5 ug/1 (10^{-5} to 10^{-6} risk range), PAHs 5 ug/1 (detection limit), and dioxin 0.000025 ug/kg (10^{-5} to 10^{-6} risk range).

INSTITUTIONAL CONTROLS: Deed restrictions will be required for all areas where treated waste has been deposited.

KEYWORDS: Air Monitoring; Arsenic; Biodegradation; Carcinogenic Compounds; Dioxin; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Leachability Tests; Leachate Collection/Treatment; MCLs; MCLGs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water; Surface Water Monitoring; Treatment Technology.

LOUISIANA-PACIFIC, CA

First Remedial Action
September 28, 1990

The Louisiana-Pacific (L-P) site is comprised of an active wood processing plant and a landfill in Butte County, Oroville, California. The plant and landfill are 1/2 mile apart, separated by another Superfund site, the Koppers Company site. The plant lies within the Feather River floodplain with the river located 1/2 mile west of the site. Area land use is agricultural, residential, commercial, and industrial. The plant rests on mine tailings created by dredge mining activities conducted from 1900 until 1969. Since 1970, plant activities have included log storage, lumber production, and hardboard manufacturing. Wood wastes have been disposed of onsite at the landfill. Possible sources of contamination at the site include discharge of wastewater and plant process wastes from the site, and contaminants migrating from the adjacent Koppers site. Between 1970 and 1984, a fungicide spray containing pentachlorophenol (PCP) was used onsite to prevent fungal discoloration of cut lumber. In 1973, State investigations discovered PCP and various other contaminants in downgradient ground water and surface water, as well as, sawdust and wood waste at the plant and landfill. In addition, contamination has been detected at the adjacent Koppers Company site. This Record of Decision (ROD) documents an interim remedy and the need to collect additional data on arsenic and formaldehyde levels on and near the site. The primary contaminants of concern affecting the

soil and ground water are VOCs including toluene; organics including formaldehyde; and metals including arsenic, lead, and zinc.

The selected interim remedial action for this site includes onsite ground water monitoring; and implementing institutional controls including deed and well permit restrictions, and site access restrictions, such as fencing. The estimated present worth cost for this remedial action is $193,000. There are no significant O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS: EPA has determined that before final remedial action goals for the site can be set, additional information is necessary to determine background arsenic levels in soil, and formaldehyde and arsenic levels in ground water. Therefore, no chemical-specific goals are provided for this remedial action.

INSTITUTIONAL CONTROLS: Deed and well permit restrictions will be implemented to eliminate exposure to onsite contaminants.

KEYWORDS: Arsenic; Chromium; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; Metals; Organics; Pesticides; Toluene; VOCs; Soil; Ground Water; Zinc.

OPERATING INDUSTRIES, CA
Third Remedial Action - (Amendment)
September 28, 1990

The 190-acre Operating Industries site is an inactive municipal landfill in Monteray Park, California. Surrounding land use is primarily industrial, however, 53,000 residences are located within three miles of the site. Onsite disposal activities began in 1948, and continued until 1984. Wastes accepted at the landfill included household and organic refuse, scrap metal, non-decomposable inert solids, and liquid wastes. The landfill was capped with a soil cover after operations ceased. Two 1987 Records of Decision (RODs) addressed site control, monitoring, and leachate management. A third ROD, signed in 1988, addressed landfill gas migration control and documented the implementation of an active landfill gas collection and treatment system. Since that time, continued settling of onsite landfill wastes and the occurrence of subsurface fires have decreased the integrity of the existing landfill cap. As a result, oxygen and precipitation have intruded landfill wastes. This ROD amends the original 1988 landfill gas migration control ROD to include the addition of an upgraded landfill cap. A final comprehensive site remedy will be addressed in a subsequent ROD. The primary contaminants of concern affecting the air are VOCs including benzene, PCE, TCE, and toluene.

The amended selected remedial action includes capping the landfill to reduce surface gas emissions, to prevent oxygen intrusion and surface water infiltration, and to provide for erosion control; installing landfill gas extraction wells around the perimeter and on the top of the cap; collecting and treating landfill gas by incineration; and dewatering saturated landfill zones. The estimated present worth cost for this amended remedial action ranges from $125,300,000 to $181,300,000 (based on the range of costs for the gas control system and landfill cover), which includes an annual O&M cost of $3,700,000 to $4,100,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: A destruction and removal efficiency of 99.99% for each organic landfill gas component will be achieved in accordance with RCRA requirements.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Monitoring; Air; Benzene; Capping; Clean Water Act; Closure Requirements; Direct Contact; Incineration/Thermal Destruction; Landfill Closure; O&M; Onsite Containment; Onsite Treatment; PCE; RCRA; ROD Amendment; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs.

SOLVENT SERVICE, CA
First Remedial Action - Final
September 27, 1990

The 3-acre Solvent Service (SSI) site is an active treatment, storage and disposal facility in San Jose, California. Land use in the vicinity of the site is industrial and commercial. Since 1983, SSI has been operated as a treatment, storage, and disposal facility. Mixed and segregated solvents have been recycled by a variety of methods including distillation, separation, and blending. Approximately 99% of the

recoverable solvents are recycled and then reused and consumed by industry. After VOCs were detected in the ground water, the California Water Quality Control Board adopted Waste Discharge Requirements requiring further site investigations and implementation of interim remedial measures. In 1988 and then again in 1989, the Board adopted Revised Waste Disposal Requirements requiring completion of the pollution investigation, final installation of soil cleanup measures, and submittal of an RI/FS and RAP. Interim remedial actions conducted during the 1980s included the removal of underground storage tanks, paving storage, unloading, and spill containment areas, placing berms in the treatment and storage areas; and changing operational procedures to minimize the risk of additional contamination. SSI is currently operating a containment/extraction system for the ground water plume. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes.

The selected remedial action for this site includes capping the entire site with asphalt; operating a steam injection and vacuum extraction (SIVE) system for the removal of VOCs from soil; extracting ground water via three excavation trenches and five ground water extraction wells, and treating the ground water using bio-treatment, carbon adsorption, and air stripping; soil and ground water monitoring; and implementing deed restrictions. The estimated capital cost for this remedial action is $948,000 with an annual O&M cost of $1,172,000.

PERFORMANCE STANDARDS OR GOALS: A soil remediation goal of 1 ppm total VOCs has been set to protect the ground water from future VOC leaching. Inorganic soil cleanup goals have not been established due to uncertainty surrounding the natural occurrence of metals in soil in the South Bay area. Ground water remediation goals include benzene 1 ug/l (State MCL), PCE 5 ug/l (State MCL), TCE 5 ug/l (State MCL), toluene 1000 ug/l (Federal MCL), and xylenes 1750 ug/l (State MCL).

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to control residential development of the property until cleanup standards for soil and ground water are achieved.

KEYWORDS: Air Stripping; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; O&M; Onsite Treatment; PCE; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

STRINGFELLOW, CA

Fourth Remedial Action
September 30, 1990

The Stringfellow site is an inactive hazardous waste disposal facility in Riverside County, California, approximately 50 miles east of Los Angeles. The site is divided into four zones: the onsite/upper mid-canyon area, which includes a 17-acre, inactive industrial disposal area in the southern portion of the Jurupa Mountains (Zone 1); the mid-canyon area (Zone 2); the lower canyon area (Zone 3); and the community of Glen Avon (Zone 4). From 1956 to 1972, approximately 34 million gallons of industrial waste from metal finishing, electroplating, and DDT production activities were disposed of in unlined evaporation ponds located throughout Zone 1. Some of the wastes from these ponds migrated into the ground water system and were transported 2 miles downgradient (under Zones 2 and 3) to form a ground water plume beneath the Glen Avon community (Zone 4). Between 1975 and 1980, the State removed approximately 6.5 million gallons of unspecified liquid waste and DDT-contaminated material from the site. In 1980, EPA removed approximately 10 million gallons of contaminated water, reinforced containment barriers, and improved a truck loading area. Further removal actions included installing french drain system fences; removal of all remaining surface liquids; partially neutralizing and capping the wastes; installing a gravel drain network, monitoring wells, and surface channels; and constructing a surface barrier and leachate collection system downgradient from the original evaporation ponds. In 1983, the first Record of Decision (ROD) provided an interim remedial measure and addressed additional fencing of the site and implemented erosion control and offsite disposal of the extracted leachate. In 1984, a second ROD addressed construction of an onsite pretreatment plant for contaminated

ground water, and the third ROD in 1987, specified installation of a ground water extraction system in the lower canyon area (Zone 3), as well as surface channels to direct surface water runoff. This fourth ROD addresses the contaminated ground water in Zone 1 (an interim measure) and in Zone 4, and proposes treatability studies to remediate the source material in Zone 1. A future ROD will specify the source treatment methods as well as a remedy for any remaining ground water contamination in Zone 1. The primary contaminants of concern affecting the ground water include VOCs such as TCE.

The selected remedial action for this site includes dewatering the bedrock in the original disposal area (Zone 1), followed by ground water treatment at the existing pretreatment plant, and offsite discharge to a publicly owned treatment works (POTW) facility; ground water pumping and treatment using air stripping or granular activated carbon, and reverse osmosis in Zone 4, followed by onsite reinjection or disposal in an industrial sewer; conducting field tests on reinjection of treated ground water into Zones 2 and 3; and performing treatability tests on soil vapor extraction at Zone 1. The estimated present worth cost of this remedial action is $115,000,000, which includes unspecified O&M costs.

PERFORMANCE STANDARDS OR GOALS: No remediation goals have been determined in this ROD for Zone 1 ground water contamination, because this is an interim measure. Chemical-specific goals for ground water in Zone 4 include TCE 5.0 ug/l (SDWA MCLs).

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Air Stripping; Carbon Adsorption (GAC); Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Treatment; MCLs; O&M; Offsite Discharge; Onsite Discharge; Onsite Treatment; Plume Management; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; VOCs.

WATKINS-JOHNSON (STEWART DIVISION), CA

First Remedial Action - Final
June 29, 1990

The Watkins-Johnson site is an active research and development, manufacturing, and industrial complex in Santa Cruz County, five miles north of Santa Cruz, California. The Watkins-Johnson Company has owned and operated the complex since 1963, conducting such activities as: metal machining, degreasing, metal plating, and photo laboratory activities. During these activities, a variety of organics, inorganics, and metals were used. In 1984, Regional authorities found TCE and TCA in the Watkins-Johnson wastewater disposal system. Further investigations revealed soil contamination at the site and ground water contamination in the Santa Margarita aquifer underlying the site. The aquifer has been designated a sole-source aquifer used for drinking water, and is comprised of a perched zone and a regional zone. In addition, the aquifer is easily accessible for drinking water supplies and for contamination from the ground surface. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE and TCE; and metals including silver.
The selected remedial action for this site includes soil vapor (vacuum) extraction with pretreatment of extracted vapors using granular activated carbon (GAC) prior to ambient discharge; capping and grading contaminated soil areas to minimize the potential for mobilization of soil contaminants to the ground water; installing infiltration leachfields to prevent offsite migration of ground water contaminants in the perched zone; installing gravity drains to transfer the contaminated ground water from the perched zone to the regional aquifer zone for subsequent extraction; ground water pumping and onsite treatment to remove contamination from both the perched and regional zones using GAC adsorption with offsite regeneration of spent carbon; discharging the treated water onsite for industrial and consumptive use and to recharge the perched zone or offsite to surface water; and ground water monitoring. The estimated present worth cost for this remedial action is $2,156,243, which includes an estimated annual O&M cost of $167,820.

PERFORMANCE STANDARDS OR GOALS: Ground water treatment standards for both the perched and regional zones were based on chemical-specific SDWA MCLGs or the more stringent of SDWA MCLs or MCLGs and State MCLs, thereby achieving a residual risk of 10^{-4} to 10^{-6}. Chemical-specific goals for ground water include PCE 0.005 mg/l (PMCL) and TCE 0.005 mg/l (MCL). Soil remediation will ensure that soil no longer poses a threat to the ground water; however, no chemical-specific goals have been set for the soil.

INSTITUTIONAL CONTROLS: Institutional controls will be developed and implemented during the remedial design/remedial action.

KEYWORDS: Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Inorganics; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Onsite Containment; Onsite Discharge; Onsite Treatment; PCE; Plume Management; Safe Drinking Water Act; Soil; Sole-Source Aquifer; Solvents; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

FMC YAKIMA PIT, WA

First Remedial Action
September 14, 1990

The FMC Yakima Pit site is a former pesticide formulation facility in central Yakima County, Washington. The site consists of a 58,000 square foot fenced area on the northeastern portion of a 10-acre property. Pesticide dusts and liquids were manufactured onsite from 1951 to 1986, and between 1952 and 1969 wastes containing pesticides were disposed of in an onsite pit. Raw material containers, soil contaminated by leaks or spills from process equipment, broken bags, and off-specification materials were disposed of in the excavated pit and covered with dirt. After 1969, waste materials were disposed of offsite. Beginning in the 1970s, liquid products were formulated onsite, a process that used solvents, emulsifiers and stabilizers. Spills, leaks, and other accidental releases of these liquid formulation materials are believed to be sources of soil and concrete contamination. A 1988 remedial investigation confirmed hot spots of DDT and other pesticide contamination in the former disposal pit. Investigation results led to two removal actions in 1988 and 1989, which included excavating, removing, and disposing of 850 tons of contaminated soil from the waste pit. This Record of Decision addresses the contamination that remains in the formulation areas and some contaminated soil in the former disposal pit, including 900 cubic yards of pesticide- and metal-contaminated soil and portions of buildings and other concrete structures that contain high levels of pesticide contamination including 1,460 square feet of concrete structures. The primary contaminants of concern affecting the soil and debris are organics including pesticides and metals including chromium.

The selected remedial action for this site includes excavation and onsite incineration of contaminated soil; dismantling of the contaminated portions of the buildings and, if necessary, repairing those buildings where the removal of portions of the buildings affect their safety or structural integrity; onsite incineration of contaminated concrete building structures or offsite disposal at a RCRA Subtitle C-permitted hazardous waste facility, depending on volume; analysis of the ash from the incinerated soil and debris prior to onsite disposal if the ash meets cleanup goals or offsite disposal if the ash remains contaminated; and ground water monitoring to confirm source removal. The estimated present worth cost for the remedial action is $1,755,000, which includes an annual O&M cost of $33,000.

PERFORMANCE STANDARDS OR GOALS: Health-based levels and cleanup goals for contaminated concrete structures were determined based on a 10^{-6} cancer risk and a Hazard Index of 1.0, and include chromium 1.0 mg/kg.

INSTITUTIONAL CONTROLS: Not applicable.

KEYWORDS: Chromium; Clean Closure; Debris; Direct Contact; Excavation; Ground Water Monitoring; Incineration/Thermal Destruction;Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Soil; Treatment Technology.

FORT LEWIS LOGISTICS CENTER, WA

First Remedial Action - Final
September 25, 1990

The 650-acre Fort Lewis Logistics Center site is a military storage and maintenance facility in Pierce County, Washington. Surrounding land use is mixed residential and commercial. The site overlies a surficial aquifer, and a deeper bedrock aquifer that is used as a water supply to over 85,000 people in the area. The Logistics Center is an industrial complex, which includes warehouses, motor pools, maintenance facilities, and an equipment disposal yard. From the 1940s to the mid 1970s, solvents including TCE and PCE were used as degreasers during maintenance activities. The solvents were frequently combined with waste oil and disposed of at several locations within the Logistics Center. Site investigations from 1985 to 1988 detected VOC contamination in onsite monitoring wells and offsite private wells. As a result of these findings, affected residents were connected to a public water supply. This Record of Decision (ROD)

addresses restoration of the contaminated surficial ground water aquifer, and provides a final remedy for the site. Confirmation soil sampling and further characterization of the deep aquifer contamination will be evaluated as part of this remedial action. The primary contaminants of concern affecting the ground water are VOCs including PCE, TCE, and DCE.

The selected remedial action for this site includes pumping and onsite treatment of ground water using air stripping to remove VOCs; discharging the treated water onsite to infiltration trenches, including one trench located upgradient to facilitate flushing of secondary contaminant sources; long-term monitoring of ground water; conducting confirmation soil sampling; investigating the deep aquifer contamination for possible remediation; and implementing institutional controls. The estimated present worth cost for this remedial action is $9,068,000, which includes an annual O&M cost (exclusive of maintenance) of $517,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup standards are based on Federal MCLs and include PCE 5 ug/l TCE 5 ug/l, and DCE 70 ug/l.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented onsite and in downgradient offsite areas affected by the contaminant plume.

KEYWORDS: Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Treatability Studies; VOCs.

SILVER MOUNTAIN MINE, WA

First Remedial Action - Final
March 27, 1990

The five-acre Silver Mountain Mine site is an abandoned mine dump in Okanogan County, north-central Washington. Land in the site vicinity is used primarily for cattle grazing, and the nearest well, two miles away, is used for cattle watering and irrigation. The nearest residence is three miles south of the site. Operations at the mine were initiated in 1902 to extract silver, gold, and copper from soil and ore. From 1980 to 1981, a cyanide leach heap of previously mined material was constructed in an attempt to extract (leach out) silver and gold. The heap consisted of 5,300 tons of ore on top of a 20 ml plastic liner. About 4,400 pounds of sodium cyanide were mixed with water and sprayed on the top of the heap. The cyanide-laden effluent was then collected in a leachate pond at the base of the heap. The heap leaching operation was abandoned in late 1981 without cleanup of contaminated material. In addition, approximately 5,200 tons of unprocessed mixed material (mine dump) lie to the west of the leach heap. In 1982, the State took action to treat the cyanide at the site using sodium hypochlorite to partially neutralize the leachate pond and heap. In 1985, the State conducted a site stabilization effort, which included removal of liquids from the leachate pond and installation of a 33 ml plastic cover over the heap and pond. Empty cyanide drums were also removed, and a fence was installed. The primary contaminants of concern affecting the soil and mined material in the leach heap, mine dump, mine drainage area, and bedrock are metals including arsenic (naturally occurring) and other inorganics including cyanide. Ground water beneath the site contains relatively high levels of dissolved anions and cations as well as metals and cyanide associated with the mine dump material, however, low ground water quality and quantity make it an unlikely drinking water source and will not be addressed by this remedial action.

The selected remedial action for this site includes consolidating all contaminated soil and mine dump material with the leach heap, followed by grading and contouring the consolidated 5,740 cubic yards of contaminated materials; capping the heap and consolidated materials with a soil/clay cap; plugging the mine entrance and removing a mine drainage pipe that supplies the animal water supply tank and installing a new well for an alternate animal water supply; implementing institutional controls including deed restrictions; and ground water monitoring. The estimated present worth cost for the remedial action is $635,600, which includes an annual O&M cost of $39,650 for 30 years.

PERFORMANCE STANDARDS OR GOALS: All material contaminated with concentrations of arsenic greater than 200 mg/kg (based on an HI=1 and a cancer risk level of 10^{-4}) or cyanide greater than 95 mg/kg (based on an HI=1) will be consolidated and covered. Ground water treatment will not be implemented unless monitoring detects concentrations exceeding standards set for six contaminants including cyanide 154 ug/l (based on a health advisory), and arsenic 6 ug/l (based on 10^{-4} cancer risk level) at the point of compliance, which has been established 100-200 feet downgradient from the edge of the leach heap.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prevent disturbance of the consolidated, capped material.

KEYWORDS: Arsenic; Capping; Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; MCLs; Metals; Mining Wastes; O&M; Onsite Containment; Onsite Disposal; Safe Drinking Water Act; Soil; State Standards/Regulations.

TELEDYNE WAH CHANG ALBANY (TWCA), OR
First Remedial Action
December 28, 1989

The Teledyne Wah Chang Albany (TWCA) site, in Millersburg, Oregon, is an active plant used to produce nonferrous metals and products. The site consists of a 110-acre plant site, which contains the plant's former sludge ponds, and a 115-acre farm site, which contains four active wastewater sludge ponds. Portions of the TWCA site are within the Willamette River's 100- and 500-year floodplain. The Wah Chang Corporation began operating a U.S. Bureau of Mines zirconium metal sponge pilot plant under contract with the U.S. Atomic Energy Commission in 1956. Additional facilities were subsequently built near the plant beginning in 1957 to produce nonferrous metals and products. The Lower River Solids Pond (LRSP) and Schmidt Lake sludge pond, which stored wastewater generated from the plant operations, are being addressed by this remedial action. The 3-acre LRSP received sludge from TWC's onsite wastewater treatment plant from 1967 to 1979 and currently holds approximately 75,000 cubic yards of sludge. Schmidt Lake covers 0.6 acres and accepted approximately 10,000 cubic yards of sludge from 1974 to 1979. The sludge in both the LRSP and Schmidt Lake contains heavy metals, organic compounds, and trace levels of radionuclides. Because the ponds contain radioactive materials and are a potential source of ground water contamination, TWCA decided to cleanup the ponds without waiting for the full site remedial investigation to be completed. This interim action addresses the contaminated sludge in the LRSP and Schmidt Lake. Contaminated soil in the sludge ponds will be addressed as part of an overall site remedy. The primary contaminants of concern from the sludge in the ponds are organics; metals including chromium, zirconium, and lead; and radioactive materials.

The selected remedial action for this interim remedy includes excavation of 85,000 cubic yards of sludge with partial solidification of the sludge, followed by offsite disposal in a permitted solid waste landfill. The estimated present worth cost for this remedial action is $10,716,000, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: The selected remedy will attain Federal and State ARARs. Individual contaminant goals were not specified for this interim remedial action.

INSTITUTIONAL CONTROLS: The offsite disposal facility will comply with solid waste disposal permit requirements to ensure that the sludge mixture is isolated from the surrounding environment.

KEYWORDS: Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Floodplain; Interim Remedy; Lead; Metals; Offsite Disposal; Onsite Treatment; Organics; Radioactive Materials; Sludge; Solidification/Stabilization; State Standards/Regulations; Treatment Technology.

SECTION III

RECORDS OF DECISION SUMMARY TABLE

FY 1990

The FY 1990 Record of Decision (ROD) Summary Table provides an overview of site problems, selected remedies, cleanup criteria, and estimated costs provided in the RODs signed during FY 1990. The table is presented by Region, in alphabetical order according to the site name.

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Baird & McGuire, MA Former Chemical Manufacturing Facility 09/27/90 3rd - Final	None	Not specified	Obtaining Federal and local permits for future reactivation of the Donna Road aquifer; constructing a new well; GW pumping and treatment by filtration, and piping the water to the current distribution system	Not applicable	$1,188,000 (present worth) $23,000 (O&M)
1	Beacon Heights Landfill, CT Dumping and Incineration Area 09/28/90 1st - Final (Supplemental)	Soil, GW, SW, and air contaminated with VOCs including benzene, toluene, and xylenes	Not specified	Offsite leachate treatment at a wastewater treatment facility prior to offsite discharge of treated effluent to offsite SW; offsite incineration of the sludge generated during leachate treatment; monitoring of landfill gases; and providing the criteria for excavation of the contaminated soil deemed impracticable to cap	Soil excavation levels include benzene 0.08 mg/kg, TCE 0.01 mg/kg, toluene 100 mg/kg, and xylenes 500 mg/kg. These goals are based on a 10^{-6} excess cancer-risk level for carcinogens or a HI=1. Cleanup levels for leachate were not set because all leachate will be removed and treated offsite.	$2,241,000 (present worth) $951,000 (O&M)
1	Coakley Landfill, NH Landfill 06/28/90 1st	Soil, sediment, and GW contaminated with VOCs including benzene and PCE; other organics including phenols; and metals including arsenic and chromium	2,000 yd^3 (sediment) 30,000 yd^3 (solid waste)	Excavating and consolidating sediment and solid waste and depositing the material into the landfill prior to capping; collecting and treating landfill gases using a thermal destruction process; GW pumping and treatment using chemical precipitation, air stripping, and biological treatment, prior to recharge into the aquifer or discharge to onsite SW; treating air from the air stripper using incineration or activated carbon filtration; implementing site access restrictions; and air and GW monitoring	Soil cleanup goals are based on the Organic Leachating Model and incorporate SDWA MCLs/ MCLGs and include benzene 0.055 mg/kg, PCE 0.13 mg/kg, and phenols 2.3 mg/kg. GW cleanup goals will meet SDWA MCLs/MCLGs, State standards, and health advisories including benzene 5 ug/l (MCL), PCE 3.5 ug/l (State), arsenic 50 ug/l (MCL), phenols 280 ug/l (health advisory), and chromium 50 ug/l (MCL)	$20,200,000 (present worth) $245,000 (O&M)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Kearsarge Metallurgical, NH Abandoned Foundry 09/28/90 1st - Final	Soil, debris, and GW contaminated with VOCs including TCE; and metals including chromium	250 yd^3 (leach field soil) 4,650 yd^3 (waste pile material)	Removing the septic tank and contents, followed by offsite incineration and ash disposal in a RCRA hazardous waste landfill; excavating and dewatering leach field soil, followed by offsite treatment and disposal; excavating waste pile materials with offsite disposal in a RCRA solid waste landfill and offsite treatment and disposal in a hazardous waste landfill; GW pumping and treatment using precipitation and air stripping with a carbon column to control air emissions from the air stripper, and discharging treated GW to a publicly owned treatment works (POTW); and long-term environmental monitoring	Chemical-specific GW cleanup levels include TCE 5 ug/l (MCL) and chromium 50 ug/l (National Interim Primary Drinking Water Regulation). Chemical-specific debris cleanup levels include chromium 1,400 ug/kg (based on a HI=1). Soil cleanup levels were also provided	$7,276,000 (total present worth) $4,020,000 (present worth) (migration management) $170,000 (O&M) (migration management) $3,256,000 (total cost) (source control)
1	New Bedford, MA Harbor Area 04/06/90 1st	Sediment contaminated with organics including PCBs and metals including lead	10,000 yd^3 (sediment)	Dredging and dewatering the sediment, followed by onsite incineration, and solidifying/stabilizing the residual ash if a leaching test indicates it is necessary; using the best available control technology to treat the effluent prior to discharge to the harbor; and passing exhaust gases through air pollution control devices	Sediment areas where PCB concentrations exceed 4,000 mg/kg will be dredged and incinerated (based on a cancer-risk level of 10^{-6})	$14,379,000 (present worth) $0 (O&M)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Old Springfield Landfill, VT Municipal/ Industrial Landfill 09/29/90 2nd - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; and other organics including PAHs and PCBs	120,000 yd^3 (soil)	Capping areas where soil cleanup levels are exceeded; pumping and treating GW and SW; implementing engineering controls; collecting and venting landfill gases, followed by vapor phase carbon adsorption; GW and air monitoring; and implementing institutional controls including deed restrictions	Chemical-specific soil cleanup goals include PCBs 6,000 ug/kg (risk-based) and PAHs 3,000 ug/kg (risk-based). Chemical-specific GW treatment goals include benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), xylenes 400 ug/l (State standard), and PCE 5 ug/l (proposed MCLs/ practical quantitative limit). EPA is invoking a waiver from compliance with the State standard for PCE because of technical impracticability	$8,692,800 (present worth) $123,000 (O&M)
1	Stamina Mills, RI Former Textile Mill 09/28/90 1st - Final	Soil, debris, sediment, and GW contaminated with VOCs including PCE and TCE; other organics including pesticides; and metals including chromium	550 yd^3 (landfill waste)	Treating VOC-contaminated soil using vacuum extraction, followed by treatment of the extracted gases using an activated carbon filter; excavating landfill waste and sediment, and placing these wastes within the landfill area, followed by capping and installing a leachate collection system; testing, removing, and disposing of septic tanks and their contents offsite; demolishing and removing onsite structures with onsite disposal of all earthen debris and offsite disposal of solid waste; GW pumping and treatment using pressure filtration, UV/hydrogen peroxide; discharging treated GW to SW onsite or to an existing sewer line; GW and SW monitoring; and implementing institutional controls including deed restrictions	Chemical-specific soil cleanup levels that will ensure attainment of MCLs in GW include TCE 195 ug/kg and PCE 66 ug/kg. Soil levels for chromium were not established since it was only detected in the area to be capped. GW cleanup goals include TCE 5 ug/l (MCL); PCE 5 ug/l (PMCL), and chromium 50 ug/l (National Interim Primary Drinking Water Regulation)	$4,316,485 (present worth) $164,400 (O&M)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	American Thermostat, NY Surface Dump Site 06/29/90 2nd - Final	Soil, sediment, sludge, debris, GW, and SW contaminated with VOCs including PCE and TCE; other organics; and metals including arsenic chromium, and lead	6,500 yd^3 (soil) 300 yd^3 (sediment) 5 yd^3 (sludge)	Excavating and treating soil and sediment using low temperature enhanced volatilization; backfilling treated soil and sediment and covering with clean soil; pumping and treatment of GW using filtration, air stripping and carbon adsorption followed by reinjection onsite; decontaminating buildings; removing drums, debris, and sludge for offsite treatment and disposal; disposing of all treatment residuals offsite; and conducting GW and air monitoring	Chemical-specific goals for soil include PCE 1 mg/kg and TCE 0.4 mg/kg. GW goals include PCE 5 ug/l, TCE 5 ug/l, arsenic 25 ug/l, chromium 50 ug/l and lead 25 ug/l, all of which are State MCLs	$26,102,200 (present worth) $1,304,300 (annual O&M)
2	Chemical Leaman Tank Lines, NJ Former Liquid Tanker Truck Terminal and Cleaning Operation 09/28/90 1st	GW contaminated with VOCs including benzene, PCE, and TCE; other organics; and metals including arsenic, chromium, and lead	Not specified	Pumping and treatment of GW using chemical precipitation, air stripping, and granular activated carbon; incinerating fumes from the air stripper onsite; discharging treated water to onsite SW; GW monitoring; and conducting further studies concerning contaminant characterization and design and operation of the treatment system	Aquifer cleanup levels will utilize both Federal and State Safe Drinking Water Act MCLs including benzene 1 ug/l (State MCL), PCE 1 ug/l (State MCL), TCE 1 ug/l (State MCL), arsenic 50 ug/l (MCL), chromium 50 ug/l (State MCL), and lead 15 ug/l (proposed MCL)	$5,420,000 (present worth) $320,000 (O&M)
2	Cinnaminson Groundwater Contamination, NJ Landfill 09/28/90 1st	GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including arsenic, chromium and lead	Not specified	Pumping and treatment of GW from shallow and deep aquifers using chemical precipitation and biological/granular activated carbon; reinjecting the treated water onsite into the deep aquifer; GW monitoring; and implementing engineering and institutional controls	Chemical-specific GW cleanup goals are based on the more stringent of SDWA MCLs or State standards, and include benzene 1 ug/l (State), xylenes 44 ug/l (State), and arsenic 50 ug/l (State)	$20,500,000 (present worth) $751,000 (O&M)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Claremont Polychemical, NY Industrial Facility 09/28/90 2nd - Final	Soil, debris, and GW contaminated with VOCs including PCE, TCE, toluene, and xylenes; other organics; metals including arsenic, chromium and lead; and inorganics including asbestos	1,600 yd^3 (soil)	Excavating and treating onsite soil using low temperature enhanced volatilization; redepositing the treated soil onsite; decontaminating an onsite building, which includes removal, offsite disposal and treatment of asbestos insulation; excavating and treating underground storage tanks and their contents, liquid wastes, and associated contaminated soil with offsite disposal, followed by backfilling of the area with clean soil; and GW pumping and treatment using air stripping, followed by carbon adsorption and reinjecting the treated GW onsite	Not specified	$16,800,00 (present worth) $1,100,400 (O&M) years 0-10 $701,900 (O&M) years (11-17)
2	FAA Technical Center, NJ Federal Facility 09/28/90 1st - Final	Soil and GW contaminated with VOCs including TCE and toluene; other organics including PCBs; and metals including chromium	930 yd^3 (soil)	Excavating soil, temporarily storing the soil onsite before transporting the soil offsite for rotary kiln incineration, followed by offsite disposal of residual ash; pumping and onsite treatment of GW using air stripping and emissions controls, if necessary; reinjecting onsite the treated GW from the upper aquifer upgradient of the contaminated area; discharging the treated GW from the intermediate aquifer to an existing borrow pit area; and continuing site access restrictions	Chemical-specific GW cleanup goals include 1,1,1-TCA 26 ug/l (State MCL), PCBs 0.5 ug/l (State MCL), toluene 2,000 ug/l, (MCL) and chromium 50 ug/l (MCL). Soil cleanup levels are based on State action levels including PCBs 5 mg/kg for the 0 to 0.5 ft interval and 25 mg/kg for soil at greater depths	$6,300,000 (present worth) $86,000 (O&M)
2	Forest Glen Subdivision, NY Residential Properties and Undeveloped Land 12/29/89 1st	Soil and discarded drums contaminated with organics including PAHs; metals including lead; and other inorganics	Not specified	Permanently relocating all residents; sampling and, if necessary, decontaminating, salvaging, or disposing of mobile homes remaining onsite after completion of permanent resident relocation; and implementing site access restrictions	Selected remedy addresses resident relocation only; therefore, no chemical-specific goals are applicable	$4,710,000 - $6,020,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Glen Ridge Radium, NJ Residential Community 06/01/90 2nd - Final	Soil contaminated with radium[226]	323,000 yd^3 (soil)	Excavating and disposing soil (including Montclair/West Orange Radium site soil) and other radium-contaminated materials from residential and public properties, followed by offsite disposal; filling excavated areas; environmental monitoring; and continued treatment technology studies to reduce the volume of materials disposed of offsite	Soil contaminated with radon >5.0 pCi/g of soil to a depth of 6 inches and radon 15 pCi/g in subsurface soil will be excavated and disposed of offsite	$252,700,000 - $348,700,000 (estimated present worth, based on selected transportation method) $0 (O&M)
2	Higgins Farm, NJ Cattle Farm 09/24/90 1st	GW contaminated with VOCs including benzene, PCE, TCE, and xylenes; other organics; and metals including lead	Not specified	Developing, designing, and constructing a water main extension and distribution system; installing new carbon adsorption units, as necessary; operating and maintaining existing carbon adsorption units until construction is completed; conducting environmental sampling of residential wells; removing carbon units and private well connections once the permanent water supply is installed; and implementing institutional controls including GW use restrictions. Since the proposed remedy would not restore GW to beneficial use levels, an interim ARAR waiver will be invoked as part of this remedial action	Chemical-specific ARARs for drinking water include benzene 1.0 ug/l (State MCL), PCE 1.0 ug/l (State MCL), and TCE 1.0 ug/l (State MCL)	$1,716,000 (present worth) $28,200 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Hooker - 102nd Street, NY Former Industrial Landfill 09/26/90 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, TCE, and toluene; other organics including PCBs and phenols; and metals including arsenic	Not specified	Consolidating offsite soil and lesser contaminated sediment within the landfill area, then capping the landfill and its perimeter; constructing a slurry wall around the site perimeter to contain the NAPL plume; extracting NAPLs from the landfill and dredging "hot spot" river sediment, transporting sediment and leachate offsite for incineration; dredging and dewatering remaining sediment and consolidating them within the landfill area; recovering GW with an interception drain, followed by onsite discharge or offsite treatment; cleaning the storm sewer and placing a plastic slip liner within the sewer; extracting and incinerating offsite NAPLs; GW monitoring; and implementing institutional controls including deed and land use restrictions, and site access restrictions including fencing	Chemical-specific GW goals include benzene to detection limits (State), TCE 5.0 ug/l (State), PCBs 0.1 ug/l (State), phenols 1 ug/l (State), and arsenic 25.0 ug/l (State). Sediment remedial levels will be the solid phase concentrations necessary to potentially exceed State Ambient Water Quality Standards in the liquid phase. Chemical-specific cleanup goals for sediment include benzene 40 ug/kg, TCE 111 ug/kg, and PCBs 42.4 ug/kg	$30,080,000 (present worth) $7,209,600 (O&M)
2	Hooker Chemical/Ruco Polymer, NY Active Polymer Production Facility 09/28/90 1st	Soil and debris contaminated with PCBs	1,136 yd^3 (soil)	Excavating soil contaminated with >10 mg/kg PCBs from the direct spill and transport areas, and soil from the recharge basin to depth of 10 ft; disposing of soil contaminated with 10 to 500 mg/kg PCBs at an offsite landfill along with the soil from the earlier excavation; treating soil contaminated with PCB levels >500 mg/kg offsite using incineration, followed by offsite disposal of residual ash; and backfilling and paving all excavated areas, except for the recharge basin	The excavation level, PCBs >10 mg/kg, and treatment level, PCBs >500 mg/kg, are based on the TSCA Spill Cleanup Policy and EPA's "Guidance on Selecting Remedies for Superfund Sites with PCB Contamination"	$995,650 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Imperial Oil/Champion Chemicals, NJ Oil Blending Facility 09/26/90 1st	Soil contaminated with VOCs including benzene, toluene, and xylenes; other organics including PAHs, and PCBs; and metals including arsenic, chromium, and lead	3,700 yd^3 (soil)	Excavating soil from offsite wetlands contaminated with >1 mg/kg PCBs; temporarily storing excavated material onsite in dewatering and staging area before disposing of the material offsite in hazardous waste landfill; air monitoring and soil sampling; restoring wetlands after completion of excavation; and site access restrictions including fencing. A contingency for soil treatment has been included if leachability studies determine treatment is necessary	Cleanup levels for soil are based on State soil cleanup objectives and include lead 250-1,000 mg/kg, PAHs 10 mg/kg, and PCBs 5 mg/kg. Excavation volume based on a PCB level of 1 mg/kg, which is designed to account for all soil contaminated above soil cleanup objectives for any contaminant of concern	$6,889,985 (present worth) $1,700 (O&M)
2	Kentucky Ave. Wellfield, NY Inactive Municipal Water Supply 09/28/90 2nd	GW contaminated with VOCs including TCE and xylenes; and metals including arsenic, chromium, and lead	Not specified	Restoring the Kentucky Avenue wellfield as public drinking water supply by constructing two treatment plants; pumping and treatment of GW using filtration to remove inorganics and air stripping/carbon adsorption or UV-oxidation to remove organics; disposing of any treatment residuals offsite; discharging treated water to public water supply, to SW, or reinjecting onsite; GW monitoring; and investigating an additional possible source of onsite contamination	Goals for discharge of treated GW were chosen as the most stringent of Federal or State MCLs or MCLGs, or other State GW standards. Chemical-specific goals for GW include TCE 5 ug/l (MCL), arsenic 25 ug/l (State), chromium 50 ug/l (MCL), and lead 25 ug/l (State)	$14,963,900 (present worth) $905,300 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	King of Prussia, NJ Abandoned Waste Disposal/ Recycling Facility 09/28/90 1st	Soil, sediment, sludge, debris, and GW contaminated with VOCs including benzene, PCE, and TCE; and metals including chromium and lead	Not specified	Excavating lagoon sludge, soil adjacent to the lagoons, and sediment in the swale, treating these materials using soil washing for metals removal and redepositing the residual materials in their original location onsite; excavating and disposing of buried drums, their contents, and associated visibly contaminated soil onsite; removing tankers for offsite disposal; GW pumping and treatment using air stripping, followed by reinjecting of GW and offsite disposal of treatment of residuals; conducting additional sampling and analysis of SW, soil, and sediment; and implementing institutional controls including GW use restrictions	Soil cleanup objectives are based on a 10^{-6} cancer risk to human health, a HI <1, or State Action Levels and include chromium 483 mg/kg (health-based level), copper 3,571 mg/kg (health-based level), lead 500 mg/kg (State), and nickel 1,935 mg/kg (health-based level). GW cleanup levels include PCE 1 ug/l (State), TCE 1 ug/l (State MCL), chromium 50 ug/l (State MCL), copper 1,000 ug/l (State MCL), and nickel 210 ug/l (State MCL)	$14,889,000 (present worth) $285,000 (O&M)
2	Lone Pine Landfill, NJ Waste Disposal Facility 09/28/90 2nd - Final	GW contaminated with VOCs including benzene, PCE, phenols, TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead	Not specified	Pumping and treating GW after installing an interceptor drain that is keyed into the water table aquifer to capture contaminated GW; supplementing the drain with extraction wells screened within the Red Bank aquifer; constructing an onsite wastewater treatment plant consisting of air stripping, precipitation/filtration and carbon adsorption to dewatering and testing of residual solids for offsite disposal; reinjecting treated GW or discharging into a recharge trench onsite; GW and SW monitoring; and implementing institutional controls	Chemical-specific GW cleanup goals include benzene 1 ug/l (State MCL), PCE 1 ug/l (State MCL), phenols 0.0035 ug/l (State), TCE 1 ug/l (State MCL), toluene 50 ug/l (State MCL), xylenes 44 ug/l (State MCL), arsenic 50 ug/l (State MCL), chromium 50 ug/l (State MCL), and lead 50 ug/l (State MCL)	$10,267,661 (present worth) $482,600 (O&M)
2	M&T DeLisa Landfill, NJ Landfill 09/20/90 1st - Final	None	Not applicable	No action remedy	Not applicable	None

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Mannheim Avenue Dump, NJ Former Landfill 09/27/90 1st - Final	GW contaminated with VOCs including benzene and TCE	Not specified	GW pumping and treatment using air stripping, with pretreatment for removal of iron, if necessary; reinjecting the GW onsite with an evaluation of the feasibility of using infiltration basins as an alternate means of discharge; covering the disposal area with clean fill; developing a contingency plan for the installation of individual carbon adsorption units on residential wells, which may become affected by migration of the contaminant plume; monitoring GW and SW; sampling the sediment; performing a treatability study to investigate the need for further treatments to remove toluene, lead, and chromium from GW; and determining the need for off-gas controls on air stripper units	Chemical-specific goals for GW include TCE 1 ug/l (State MCL) and benzene 1 ug/l (State MCL)	$4,217,100 (present worth) $18,600 - $394,100 (O&M, based on differences in treatment and monitoring systems)
2	Mattiace Petrochemical, NY Inactive Liquid Storage and Redistribution Facility 09/27/90 1st	Soil, sludge, and debris contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including phenols; and metals including arsenic, chromium, and lead	Not specified	Excavating drums, containers, and highly contaminated soil; consolidating the waste and overpacking drums as necessary; containing contaminated soil, and transporting the material offsite for treatment (possibly incineration) and disposal	Not specified	$322,300 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Metaltec/ Aerosystems, NJ Former Metal Manufacturing Plant 09/27/90 2nd - Final	GW contaminated with VOCs including PCE, TCE, toluene, and xylenes; and metals including chromium and lead	Not specified	Onsite GW pumping and treatment using precipitation, air stripping, and carbon adsorption, followed by discharge of treated GW to onsite SW; disposing of precipitated sludge from the GW treatment process offsite; regenerating spent carbon and disposing of residuals offsite; and GW monitoring	Chemical-specific GW goals are based on Federal or State MCLs and include PCE 1 ug/l (State MCL), TCE 1 ug/l (State MCL), toluene 2,000 ug/l (MCL), and xylenes 44 ug/l (State MCL)	$4,348,900 (present worth) $466,300 (O&M)
2	Montclair/West Orange Radium, NJ Residential Community 06/01/90 2nd	Soil contaminated with radioactive materials, especially radium^{226}; and metals including lead	323,000 yd^3 (soil)	Excavating soil (including Glen Ridge Radium site soil) and disposing offsite; conducting environmental monitoring	All material contaminated with concentrations of radon >5 pCi/g of soil in the first 6 inches and 15 pCi/g in subsurface soil will be excavated and removed offsite	$252,700,000 - $348,700,000 (present worth) $0 (O&M)
2	Myers Property, NJ Chemical Manufacturing Facility 09/28/90 1st	Soil, sediment, debris, and GW contaminated with VOCs including benzene; other organics including PCBs, PAHs, dioxin, and pesticides such as DDT; and metals including arsenic and lead	48,700 yd^3 (soil)	Excavating and treating soil and sediment using chemical dechlorination, followed by soil washing; onsite backfilling of treated soil; restoring designated wetlands; pumping and treatment of GW using ion exchange and granular activated carbon, followed by reinjection to the aquifer or offsite discharge; performing GW and other environmental monitoring; conducting a deep bedrock GW study; and decontaminating onsite buildings with offsite disposal of contaminated debris	Chemical-specific cleanup goals for soil and sediment are based on State soil action levels and include total DDT 10 mg/kg, total VOCs 1 mg/kg, total carcinogenic and noncarcinogenic PAHs 10 mg/kg, arsenic 20 mg/kg, cadmium 3 mg/kg, copper 170 mg/kg, and lead 250-1,000 mg/kg. Chemical-specific GW cleanup goals for discharge include benzene 1 ug/l (State MCL), DDT 0.001 (State GWQC), arsenic 50 ug/l (Federal and State MCL), and lead 50 mg/l (Federal and State MCL)	$45,918,000 (present worth) $3,053,000 (O&M) (years 0-5) $441,000 (O&M) (years 6-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Pomona Oaks Well Contamination, NJ Residential Subdivision 09/26/90 1st - Final	None	Not applicable	No action remedy with continued GW monitoring	Not applicable	Not applicable
2	Radium Chemical, NY Industrial/ Residential Site 06/21/90 1st - Final	Soil and debris contaminated with radioactive materials including radium^{226} and its decay products including radon gas	Not specified	Partial decontamination and complete dismantling of the contaminated building, followed by offsite disposal of debris; excavation and offsite disposal of contaminated soil and subsurface piping, followed by replacement of piping and backfilling with clean soil; and treatment of some radium-contaminated hazardous waste, followed by offsite disposal of treated and untreated radium-contaminated waste in approved facilities	All soil that exceeds radium^{226} 5 pCi/g above background at the surface (first 6 inches) and 15 pCi/g above background at subsurface (subsequent 6-inch layers) will be excavated and disposed of offsite. Building masonry with <5 pCi/g will be disposed of in a sanitary landfill, masonry exceeding this level will be disposed of at a radioactive waste disposal facility. Chemical-specific goals for radium-contaminated hazardous waste were not specified	$18,699,000 (total cost including O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Roebling Steel, NJ Former Steel Wire and Cable Manufacturing Facility 03/29/90 1st	Soil, drums, transformers, tanks, baghouse dust, and chemical piles contaminated with organics including acids and PCBs; metals including arsenic, chromium, and lead; and oils	67,000 gals (PCB oil in trans-formers) 194,000 gals (liquid and sludge waste) 570 yd^3 (solid material con-taminated with heavy metals)	Offsite incineration and disposal of drums and PCB-contaminated oil found in transformers at a RCRA-permitted facility; dismantling, decontaminating, and disposing of transformer housings at a RCRA-permitted facility; disposing of tanked material, stabilized bayhouse dust, and surface soil at a RCRA permitted facility; and offsite treatment of metal contaminated metals with offsite disposal at RCRA-permitted facility along with 10,000 tires	Surface soil under the water tower will be excavated if lead levels exceed 250 mg/kg	$5,003,400 (total cost) $0 (O&M)
2	Sarney Farm, NY Former Landfill 09/27/90 1st - Final	Soil, debris, and GW contaminated with VOCs including toluene; other organics including pesticides; and metals including lead	2,365 yd^3 (soil)	Removing waste drums from trench areas 2 and 4 and disposing of these offsite; treating onsite contaminated soil using low temperature thermal treatment, or if soil contamination is at highly elevated levels, the surrounding soil may be disposed of with the drums offsite; backfilling the excavated areas with any onsite-treated soil; allowing for natural attenuation of GW; conducting hydrogeologic studies onsite to define hydrologic condition of the site; GW and SW monitoring; and implementing institutional controls including deed restrictions	Chemical-specific cleanup levels for soil are based on risk-based levels (10^{-5}) and include TCE 0.2 ug/l and toluene 3.3 ug/l. These levels are based on the maximum soil concentrations needed to reach a 99.9% treatment efficiency. GW contamination levels are expected to decrease once source contamination is eliminated. The estimated timeframe for GW attenuation to acceptable levels is 30 years	$907,500 (present worth) $15,300 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Sayreville Landfill, NJ Inactive Municipal and Industrial Landfill 09/28/90 1st	Soil and debris contaminated with VOCs including benzene, toluene, and xylenes; other organics including pesticides and phenols; acids; and metals including arsenic, chromium, and lead	50-150 drums	Excavating remaining drums buried onsite and thermally treating the drummed waste offsite; disposing of the residual ash offsite; installing a multi-media cap over the landfill; constructing passive gas collection and surface runoff control systems at the landfill; monitoring GW, SW, stream sediment, and air; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing	Soil cleanup levels will be based on State Interim Soil Action Levels (ISALs) including arsenic 20 mg/kg (ISAL), chromium 100 mg/kg (ISAL), and lead 250-1,000 mg/kg (ISAL)	$16,516,600 (present worth) $746,400 (O&M) (year 1) $431,800 (O&M) (years 2-5) $354,600 (O&M) (years 6-30)
2	Scientific Chemical Processing, NJ Former Chemical Handling, Treatment, and Disposal Facility 09/14/90 1st	Soil and GW contaminated with VOCs including benzene, PCE, phenols, TCE, toluene, and xylenes; other organics including PAHs, PCBs, and pesticides; metals including arsenic, chromium, and lead; and other inorganics	Not specified	Installing a slurry wall around site perimeter to a depth of 15 to 20 ft (corresponding to the top of a confining clay layer); installing a temporary infiltration barrier over the site surface to minimize entry of precipitation; extracting GW from within the slurry wall boundary for the purpose of dewatering onsite soil and controlling movement of contaminated GW away from the site; transporting extracted GW offsite for pretreatment, treatment, and disposal; GW and SW monitoring; and maintaining a fence around the site	Cleanup levels for contaminants of concern have not been set due to the interim nature of this remedy. Chemical-specific ARARs will be met for final remedies and will be presented in subsequent RODs	$2,933,000 (present worth) $42,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Sealand Restoration, NY Former Liquid Waste Disposal and Storage Facility 09/28/90 1st	Soil and debris contaminated with VOCs including benzene, TCE, toluene, and xylenes; other organics including PCBs and pesticides; and metals including chromium and lead	1,445 drums 4,762 yd^3 (soil) 375,000 gals (liquid waste)	Excavating drums and contaminated soil, removing liquid waste from cell disposal area, incinerating these wastes offsite, and disposing of residuals at a RCRA hazardous waste facility; capping the cell disposal area with a multi-layer cap; installing a leachate monitoring system; removing drums and waste from an above-ground storage tank and tanker trailer, excavating and removing contaminated soil from the drum storage area; treating and disposing of these wastes offsite in a RCRA-permitted Subtitle C facility; and backfilling the area with clean soil	Not specified	$20,000,000 (capital cost)
2	Solvent Savers, NY Former Chemical Waste Recovery Facility 09/28/90 1st - Final	Soil, debris and GW contaminated with VOCs including PCE and TCE; other organics including carcinogenic and noncarcinogenic PAHs, PCBs, and phenols; and metals including arsenic, chromium, and lead	300 drums 59,000 yd^3 (soil)	Excavating drums followed by treating and disposing drums and associated wastes at an offsite RCRA facility; excavating VOC-contaminated soil followed by treating onsite using low temperature thermal extraction; treating PCB-contaminated soil by same method or by incinerating the soil offsite; treating soil contaminated with low levels of VOCs using soil flushing and/or vapor extraction; treating organic vapors from the soil treatment using an unspecified method; backfilling excavated areas with treatment residuals and clean fill; onsite GW pumping and treatment using chemical precipitation, air stripping, and carbon adsorption, followed by reinjection and/or discharge to SW; offsite disposal of residuals; monitoring air and GW	Soil cleanup levels are based on an average of model-derived cleanup levels to prevent further GW contamination and include PCE 2.2 mg/kg, TCE 0.8 mg/kg, toluene 1.5 mg/kg, and xylenes 3.1 mg/kg. PCB-contaminated soil will be treated to attain the level of 1 mg/kg (TSCA PCB policy). GW cleanup goals include PCE 5 ug/l (CLP Quantification Limit), TCE 5 ug/l (MCL), arsenic 25 ug/l (State), noncarcinogenic PAHs 32,340 ug/l (health-based), and phenols 48,500 ug/l (health-based)	$29,350,000 (present worth) $523,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Syosset Landfill, NY Closed Municipal Landfill 09/27/90 1st	Soil contaminated with VOCs including benzene, PCE, TCE, and toluene; other organics; and metals including arsenic	Not specified	Placing a geosynthetic membrane cap over the landfill; installing a passive gas venting system in addition to the venting system installed during the 1975 landfill closure; maintaining the cap and venting system; conducting air and GW monitoring; and implementing institutional controls including land use restrictions, and site access restrictions including fencing	Not applicable	$26,200,000 (present worth) $222,000 (O&M)
2	Vestal Water Supply 1-1, NY Production Well 09/27/90 2nd - Final	Soil contaminated with VOCs including TCE and PCE; other organics including PAHs; and metals including chromium and lead	Not specified	Treating the soil by in-situ vacuum extraction to remove VOCs in two of the four sources within the State Road Industrial Park, followed by carbon adsorption to control air emissions; disposing of the residual carbon offsite; GW monitoring; and a contingency remedy to remove heavy metals as necessary	Chemical-specific cleanup goals for soil include TCE 140 ug/kg, 1,1,1-TCA 170 ug/kg, and 1,2-DCE 188 ug/kg	$17,900,000 (present worth) $925,000 (O&M)
2	Woodland Township Route 72, NJ Abandoned Hazardous Waste Dump 05/16/90 1st	Soil, sediment, sludge, debris, and GW contaminated with VOCs including benzene, toluene, TCE, and xylenes; organics including PAHs, pesticides, and phenols; radionuclides; and metals including chromium and lead	28,000 yd^3 (soil, sediment, sludge, and debris) 19 yd^3 (radio-logically con-taminated materials)	Excavation and offsite disposal of surface soil, sediment, sludge, and debris at a permitted facility; GW pumping and treatment (treatment to be determined during design), followed by reinjection of treated GW; and GW and SW monitoring	Soil cleanup objectives have been based on State standards and background levels and include total VOCs 1 mg/kg, total chromium 100 mg/kg, pesticides 10 mg/kg, and lead 250-1,000 mg/kg (based on State risk assessment). GW goals are based on natural background level for the Pine Barrens area and include benzene 0.88 ug/l, pesticides 0.001 ug/l, toluene 1.2 ug/l, TCE 0.38 ug/l, total xylenes 1.0 ug/l, and phenols 0.15 ug/l	$142,000,000 (present worth includes costs for Woodland Route 532 site remedy) $114,000,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Woodland Township Route 532, NJ Abandoned Hazardous Waste Dump 05/16/90 1st	Soil, sediment, sludge, debris, and GW contaminated with VOCs including benzene, toluene, TCE, and xylenes; organics including PAHs, pesticides, and phenols; radionuclides; and metals including chromium and lead	26,000 yd^3 (soil, sediment, sludge, and debris) 19 yd^3 (radio-logically con-taminated materials)	Excavation and offsite disposal at a permitted facility of surface soil, sediment,sludge and debris; GW pumping and treatment (treatment to be determined during design), with reinjection of treated GW; and GW and SW monitoring	Soil cleanup objectives have been based on State standards and background levels and include total VOCs 1 mg/kg, total chromium 100 mg/kg, pesticides 10 mg/kg, and lead 250-1000 mg/kg (based on State risk assessment). GW goals are based on natural background level for the Pine Barrens area and include benzene 0.88 ug/l, pesticides 0.001 ug/l, toluene 1.2 ug/l, TCE 0.38 ug/l, total xylenes 1.0 ug/l, and phenols 0.15 ug/l	$142,200,000 (present worth includes costs for Woodland Route 72 site remedy) $114,000,000 (O&M)
3	Army Creek Landfill, DE Former Sand and Gravel Quarry 06/29/90 2nd - Final	SW contaminated with iron	Not specified	GW pumping using the recovery well network and treatment using a modified conventional precipitation water treatment plant, which involves treatment by aeration, precipitation, sedimentation, and filtration followed by onsite discharge; sampling and offsite disposal of sludge generated during the treatment process; and monitoring of the sediment, recovered GW, SW, and wetlands	Chemical-specific goals include iron 1,000 ug/l, which will meet State water quality criteria	$4,900,000 (present worth) $294,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Avtex Fibers, VA Former Synthetic Fibers Manufacturing Facility 09/28/90 2nd	Soil and debris contaminated with organics including PCBs	5,000 yd^3 (soil)	Excavating and disposing of soil contaminated with PCB levels exceeding 10 mg/kg offsite, followed by restoring excavated areas; identifying drum contents, treating, followed by offsite disposal of any contents that are RCRA wastes; decontaminating and recycling of crushing empty drums, followed by incinerating or disposing of these offsite in a RCRA landfill; drums containing non-hazardous substances will remain onsite and available for liquidation by the corporate trustee upon EPA's approval; dismantling of the unstable acid reclamation facility with decontamination, as necessary; disposing of unusable rubble and machinery onsite; and implementing site security and safety measures	Cleanup levels for PCB-contaminated soil are based on EPA published guidance on "Remedial Actions for Superfund Sites with PCB Contamination." The recommended action level for industrial land use soil is PCB 10-25 mg/kg. For this site, all soil in excess of PCB 10 mg/kg will be removed	$8,708,400 (capital) $0 (O&M)
3	Brown's Battery Breaking, PA Inactive Lead-Acid Battery Processing Facility 09/28/90 1st	Soil and sediment contaminated with lead	Not specified	Permanently relocating all onsite residents and businesses to compatible offsite locations; decontaminating personal belongings; and implementing institutional controls including deed restrictions, and site access restrictions including fencing	There are no chemical-specific ARARs for this operable unit. The initial remedy will eliminate human contact with the soil and sediment	$342,900 (present worth) $0 (O&M)
3	Butz Landfill, PA Inactive Landfill 09/28/90 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Constructing new water service lines and providing connections to a new drinking water supply for approximately 49 residences	Chemical-specific goals were not provided because this remedial action does not address GW contamination but rather will mitigate and/or prevent human exposure by providing a new water supply system that will meet SDWA MCLs	$5,910,000 (total cost) $23,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	C&R Battery, VA Former Battery Sawing and Shredding Facility 03/30/90 1st - Final	Soil, sediment, debris, and SW contaminated with metals including arsenic and lead	36,800 yd^3 (soil, sediment, and debris)	Removing any SW from the drainage ditch, followed by offsite treatment; excavating 36,800 yd^3 of soil, sediment, and debris with subsequent stabilization, followed by disposal in a RCRA-permitted hazardous waste landfill; backfilling excavated areas; placing a soil cover over areas with lead contamination above background; treating and disposing of 350 batteries offsite; GW and SW monitoring; and implementing institutional controls including site use restrictions	Soil contaminant goals include lead 1,000 mg/kg, and arsenic 10 mg/kg, cadmium 84 mg/kg, (based on a 10^{-6} risk level). Sediment contaminant goals were derived from Puget Sound Estuary Program Study and include lead 450 mg/kg and arsenic 57 mg/kg	$15,572,000 (present worth) $14,550 (annual O&M)
3	Coker's Sanitation Service Landfills, DE Two Inactive Landfills 09/28/90 1st - Final	Soil and sludge contaminated with VOCs including benzene and metals	Not specified	Covering seeps at Landfill #1, backfilling depressed areas of Landfill #2, and sealing the leachate collection system of Landfill #2; monitoring GW and SW; and implementing site access restrictions, and institutional controls including deed and land use restrictions	Since no treatment was selected, chemical-specific goals are not applicable. The selected remedy will reduce the cancer-risk level to $<10^{-6}$ with a HI <1	$653,000 (total cost) $527,257 (total O&M)
3	Croydon TCE, PA Contaminated GW Plume 06/29/90 2nd - Final	GW contaminated with VOCs including TCE and 1,1-DCE	Not specified	GW pumping and onsite treatment using air stripping and carbon adsorption, followed by onsite discharge; vapor-phased carbon adsorption of air stripper exhaust, followed by offsite disposal or treatment of spent carbon; implementing institutional controls including GW use restrictions; and GW monitoring	Chemical-specific GW cleanup goals include TCE 1 ug/l and 1,1-DCE 1 ug/l (State and background levels)	$1,345,000 (present worth) $46,709 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Cryo-Chem, PA Metal Fabricating Facility 09/28/90 2nd	GW contaminated with VOCs including PCE TCE, DCA, DCE, and TCA	Not specified	Pumping and treatment of GW using air stripping, followed by carbon adsorption, if emissions are above Clean Air Act levels, with onsite discharge of treated water to SW; and GW and SW monitoring	GW will be remediated to meet SDWA MCLs, or to an excess cancer-risk level of 10^{-6} or less, if no current MCL exists for a particular contaminant. Chemical-specific goals for GW include PCE 5 ug/l (proposed MCL), DCE 0.007 mg/l (MCL), TCA 0.2 mg/l, and TCE 5 ug/l (MCL). SW must meet Clean Water Act Federal Water Quality Criteria (FWQC) including PCE 0.8 ug/l (FWQC) and TCE 2.7 ug/l (FWQC) for both water and fish ingestion	$2,065,000 (present worth) $75,200 (O&M)
3	Dover Air Force Base, DE Active Military Base 09/28/90 1st	Soil, sludge and debris contaminated with VOCs including benzene, toluene and xylenes; and metals including lead; and oils	Not specified	Removing residual liquids, sludges, and solids from the underground tank, oil/water separator, and piping, and transporting these materials offsite for disposal; excavating the underground tank, oil/water separator, dumpsters, and piping, and decontaminating them using high-temperature steam cleaning equipment; disposing of the contaminated steam cleaning solution and excavated debris and structures offsite; and placing a soil cover over the FT-3 area backfilling and grading excavated areas	Not specified	$100,000 (present worth) $5,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	East Mt. Zion, PA Inactive Landfill 06/29/90 1st - Final	GW contaminated with VOCs including benzene and vinyl chloride	Not specified	Capping the landfill with an impermeable multi-layer cap; constructing a passive venting system to control methane offgasses; installing SW control systems for the cap; allowing natural attenuation to reduce GW contamination to background levels; conducting GW monitoring; and implementing institutional controls including deed restrictions, and site access restrictions including fencing	Based on GW velocity and elimination of the source, GW concentrations are expected to meet background levels within 5 years through natural attenuation. Chemical-specific goals for GW include benzene 5 ug/l (MCL) and vinyl chloride 2 ug/l (MCL)	$2,230,000 (present worth) O&M (not specified)
3	Fike Chemical, WV Abandoned Chemical Manufacturing Facility 09/28/90 2nd - Final	Waste/debris contaminated with organics and asbestos	5.5 tons (asbestos material) 400 onsite storage tanks 130 pieces of equipment 39 buildings	Removing asbestos material from various site areas; dismantling and decontaminating onsite storage tanks, equipment and buildings, and disposing of debris offsite; treating and discharging the decontamination fluids; and implementing site access restrictions including fencing	Any tanks, equipment, and structures identified as a safety hazard and health risk will be decontaminated and removed to an offsite facility. Any waste that cannot be treated onsite will be removed to an offsite facility	$2,830,000 (present worth) $5,200 (O&M)
3	Greenwood Chemical, VA Former Chemical Plant 12/29/89 1st	Soil contaminated with VOCs including benzene, PCE, and TCE; other organics including PAHs; metals including arsenic; and other inorganics and including cyanide	4,500 yd^3 (soil)	Excavating contaminated soil, followed by offsite incineration and disposal and backfilling the excavated areas with clean soil; and removing chemicals stored in onsite buildings; and SW collection/diversion during remedy implementation	Soil cleanup goals are based on leachability modeling and include benzene 0.83 mg/kg, TCE 0.13 mg/kg, PCE 0.07 mg/kg, PAH 5,000 mg/kg, and arsenic 25 mg/kg (non-lethal excess lifetime cancer risk of 10^{-5})	$8,787,900 (present worth) $0 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Hranica Landfill, PA Inactive Landfill 06/29/90 1st	Soil contaminated with lead	Not specified	Repairing the 29,000 ft^2 ash pile cover, capping, monitoring GW and SW; implementing site access restrictions and institutional controls including land, GW use, and deed restrictions; and performing a GW verification study to determine whether any GW remediation is necessary	All areas where lead exceeds 300 mg/kg will be capped in order to reduce the HI to <1	$1,037,000 (present worth) $81,450 (O&M) (years 0-1) $30,550 (O&M) (years 2-30)
3	Keystone Sanitation Landfill, PA Inactive Landfill 09/30/90 1st	Soil and GW contaminated with VOCs including benzene, PCE, TCE, and vinyl chloride; other organics including acids and phenols; and metals including chromium and lead	4,150 yd^3 (soil)	Excavating and consolidating surface soil in the landfill; capping the landfill; installing an active gas extraction system to collect gases emitted from the landfill; pumping and treatment of GW using equalization, flocculation/precipitation, filtration, ion exchange, air stripping, and filter press technologies, followed by offsite disposal of any sludge produced by these processes; discharging the treated water onsite to a surface stream; GW, SW, and sediment monitoring; installing an in-home water treatment system for the onsite resident; and implementing site access restrictions and institutional controls including deed, land use, and GW use restrictions	No chemical-specific cleanup goals were stated in the ROD. For carcinogenic compounds, cleanup goals were established to reduce the excess lifetime cancer risk to 10^{-4} to 10^{-6}. For noncarcinogenic compounds, the goal is a HI ≤ 1. Individual GW remediation standards are based on the more stringent of SDWA MCLs or non-zero MCLGs, or State background levels	$9,156,950 (present worth) $217,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Lord Shope Landfill, PA Inactive Hazardous Waste Landfill 06/29/90 1st - Final	Landfill material, soil, and GW contaminated with VOCs including benzene, PCE, and TCE; and metals including arsenic, chromium, and lead	Not specified	In-situ vapor stripping of landfill material and soil using vacuum wells; collection and treatment of gas emissions generated by the vapor stripping process using carbon adsorption; GW pumping and treatment, followed by air stripping, with final discharge of treated GW into the nearby surface tributaries; implementation of site access restrictions, and institutional controls including GW use restrictions	Chemical-specific goals for soil will be determined during the remedial design. Chemical-specific GW cleanup goals will include PCE 5 ug/l (PMCL), TCE 5 ug/l (MCL), benzene 5 ug/l (MCL), arsenic 20 ug/l (based on an excess cancer risk of 10^{-4}), chromium 50 ug/l (MCL), and lead 15 ug/l (risk-based calculation)	$5,760,000 (present worth) $420,000 (O&M) (years 0-2) $310,000 (O&M) (years 3-50)
3	M.W. Manufacturing, PA Former Copper Recovery Facility 06/29/90 2nd	Soil, debris, and lagoon water contaminated with VOCs including PCE and TCE; other organics including PCBs; and metals including lead	32,000 yd^3 (fluff waste) 13,000 yd^3 (soil) 40 yd^3 (drummed waste) 86,000 gals (lagoon water)	Excavation and onsite incineration of fluff waste, followed by onsite stabilization of lead-contaminated ash and offsite disposal of residual ash; excavation and onsite incineration of contaminated soil; followed by onsite stabilization, as necessary, prior to offsite disposal; backfilling and capping the soil under the fluff waste piles; covering the soil not under the fluff piles using hybrid closure; onsite treatment of lagoon water using carbon adsorption and metal removal, followed by onsite discharge to SW; onsite incineration of drummed waste, followed by stabilization of the ash and offsite disposal; and GW monitoring	Soil/waste levels are based on a 10^{-6} cancer risk and a HI=1. Chemical-specific cleanup levels for soil, fluff waste, and drummed and tanked wastes were provided for 8 indicator contaminants including PCE, TCE, PCBs, and lead	$35,950,000 (present worth) $39,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Osborne Landfill, PA Inactive Abandoned Coal Strip Mine 09/28/90 1st	Sediment and GW contaminated with VOCs including benzene and TCE; other organics including PCBs and PAHs; and metals including arsenic, chromium, and lead	Not specified	OU1 includes constructing a slurry wall; constructing a clay cap over the fill material; GW pumping and treatment using equalization, pH adjustment, chemical precipitation, clarification, sand filtration, and carbon adsorption, followed by injection into the onsite mine pit; offsite disposal of GW treatment residues; GW monitoring; and implementing institutional controls including deed restrictions. A contingency remedy for OU1 includes placing solid waste in a RCRA Subtitle-C onsite landfill; long-term GW monitoring, and institutional controls. If the primary remedy for OU1 is implemented, no additional actions other than the primary OU3 remedy of GW monitoring is necessary. If the contingency remedy for OU1 is implemented, the contingency remedy for OU3 also must be implemented. The contingency remedy for OU3 includes dewatering the site during excavation; isolating the fill area from the onsite mine pools; treating the GW using equalization, clarification, sand filtration, and carbon adsorption, followed by onsite discharge; and GW monitoring. The selected remedy for OU4 including pumping and treatment of GW in the Clarion Formation using air stripping, onsite air emissions treatment, onsite injection of treated GW; and GW monitoring	The selected source remedy will not reduce the current level of contamination in the fill area, but will maintain an average PCB concentration level of 23 mg/kg, which meets EPA's PCB Spill Cleanup Policy for a reduced access area. GW contaminants will be remediated to the following background levels: TCE 0.2 ug/l, benzene 0.2 ug/l, PCBs 1 ug/l, chromium 50 ug/l, lead 15 ug/l, and arsenic 22 ug/l. If any GW contaminants exceed SWDA MCLs or MCLGs, the remedy will continue until those goals are met	$18,681,000 (present worth) (primary remedy) $904,000 (O&M) (primary remedy) $17,811,000 (present worth) (contingency remedy) $940,000 (O&M) (contingency remedy)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Raymark, PA Active Metal Manufacturing and Electroplating Plant 09/28/90 1st	GW contaminated with VOCs including TCE and PCE	Not specified	Continuing operation and maintenance of the Hatboro public supply and the existing air stripping towers at the wells as well as installation of new vapor phase carbon adsorption units; completing a GW remedial design study; onsite pumping and treatment of GW with air stripping and vapor phase carbon adsorption units with offsite disposal to Pennypack Creek; and implementing institutional controls	GW will meet SDWA MCLs, non-zero MCLGs, or background levels, whichever are more restrictive. The residual excess cancer risk resulting from site-related contamination will be reduced to a 10^{-6} level and noncarcinogenic levels will be reduced to a HI=1. Chemical-specific levels for GW include TCE 5 ug/l (MCL) and PCE 5 ug/l (proposed MCL)	$2,700,000 (present worth) $125,000 (O&M)
3	Sand Gravel & Stone, MD Former Sand and Gravel Quarry 09/28/90 2nd	GW contaminated with VOCs including benzene, toluene, and vinyl chloride; and metals	Not specified	Monitoring of onsite and offsite GW; if data from this monitoring reveal a need for remediation, GW may be treated either onsite or offsite at point of use and bottled water will be supplied to affected residences and businesses. In the interim, if offsite contamination is detected, the previously installed onsite treatment system would be expanded and modified to treat the GW in the lower aquifers. Treatment may include granular activated carbon, air stripping, ion exchange, or any combination of these techniques	Action levels that will trigger the implementation of onsite GW treatment include concentrations of chemicals of concern in excess of MCLs, a cumulative carcinogenic risk in excess of 10^{-5}, or a noncarcinogenic HI >1	$702,000 - $7,125,000 (present worth) $102,000 - $625,900 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Tyson Dump #1, PA Abandoned Septic and Chemical Waste Disposal Area 09/28/90 3rd	GW contaminated with VOCs including toluene and xylenes	Not specified	Installing additional recovery wells on the south bank of the Schuykill River and on Barbados Island, followed by treatment of GW at the existing treatment facility; expanding of the existing treatment facility; investigating hydrogeologic conditions on the north side of the river; and implementing institutional controls to restrict GW use	Discharge limits for treated GW were calculated by the State based on risk factors, dilution within the river, and State and Federal standards. These limits include toluene 1.52 mg/l (based on chronic WQC of 0.33 mg/l) and xylenes 0.97 mg/l (based on an MCL of 10.0 mg/l)	$10,100,000 (present worth) $834,000 (O&M)
3	U.S. Titanium, VA Former Titanium Dioxide Manufacturing Plant 11/21/89 1st - Final	Soil, GW, and SW contaminated by metals including arsenic and chromium; and other inorganics including acids	16,000 yd^3 (copperas)	In-situ dissolution of copperas waste, followed by treatment of the resulting leachate using physical chemical processes; diversion of SW flow using drainage controls; excavation and neutralization of acidified soil, followed by onsite disposal. GW will be collected and treated in an oxidation/settling pond to remove iron and sulfur	Leaching of contaminants to GW and SW will not exceed State water quality standards, which include arsenic 0.19 mg/l and chromium 0.011 mg/l. Discharge from the GW treatment system into SW may not exceed iron 97,583 mg/l and pH 6.0 and 9.0	$5,895,000 (present worth) O&M (not specified)
3	Walsh Landfill, PA Landfill 06/29/90 1st	Soil, sediment, and GW contaminated with VOCs including benzene, PCE, and TCE; other organics including PAHs, and metals including arsenic and lead	Not specified	Removal of debris from the landfill surface for resource recovery, followed by construction of an approximately 5.2-acre landfill cap; provision of an alternate water supply to approximately 50 residences; GW monitoring; and implementation of institutional controls including land use, GW use, and deed restrictions	Provision of an alternate water supply will ensure availability of water meeting SDWA MCLs	$3,768,000 (present worth) $63,090 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Westline, PA Tar Pit 03/30/90 1st (Amendment)	None	Not applicable	No further action will be taken, except to monitor the site for excess levels of waste tar, and a 5-year review	Not applicable	None
4	62nd Street Dump, FL Inactive Industrial Waste Disposal Area 06/27/90 1st - Final	Soil, debris, and GW contaminated with organics including PCBs; and metals including arsenic, chromium and lead	48,000 yd^3 (soil and debris)	Dewatering and excavating soil and debris, followed by onsite treatment using solidification/stabilization and placing the treated material onsite; capping the site with an impermeable membrane and vegetative soil cover; pumping and onsite treatment of contaminated GW using chromium reduction, flocculation, sedimentation, and filtration followed by offsite discharge to a publicly owned treatment works (POTW) or onsite discharge to SW; disposing of residual sludges onsite; monitoring of GW; and implementing institutional controls including land use restrictions	Federal MCLs were chosen as GW cleanup goals. Chemical-specific goals include chromium 50 ug/l (MCL) and lead 15 ug/l (proposed MCL). Soil cleanup criteria were chosen as the more stringent of health-based criteria or values calculated from a leachate model. Chemical-specific goals for soil include PCBs 0.33 mg/kg, arsenic 3.5 mg/kg, chromium 8.8 mg/kg, and lead 17.4 mg/kg	$16,460,000 (total present worth) $690,000 (O&M)
4	Bypass 601 Groundwater Contamination, NC Industrial Area 08/31/90 1st	Soil and debris contaminated with organics; and metals including chromium and lead	57,000 yd^3 (soil)	Demolishing and disposing of debris from onsite buildings; excavating and consolidating contaminated surface soil; regrading the site, covering area with 6 inches of clean fill; covering the soil with a HPDE liner with 18 inches of drainage soil and 6 additional inches of clean topsoil; backfilling and revegetating the excavated areas; maintaining the soil cover; realigning an adjacent stream to minimize cap erosion; enacting public awareness programs; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing	Soil contaminated with lead will be remediated to 500 mg/kg (EPA Interim Guidance)	$738,821 (present worth) $9,700 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Cabot/Koppers, FL Pine Tar and Charcoal Generation Facility 09/27/90 1st - Final	Soil and GW contaminated with VOCs including benzene; other organics including oils, phenols, and PAHs; and metals including arsenic and chromium	6,400 yd^3 (soil)	Excavating soil from north and south Koppers lagoon areas, treating soil using soil washing and bioremediation if necessary, followed by solidifying/ stabilizing residual material and disposing onsite; treating soil from the cooling pond and drip track areas by in-situ bioremediation; lining the North Main Street ditch to prevent further discharge or leachate (if the ditch is to remain intact); pumping and treatment of GW followed by offsite discharge to a publicly owned treatment works (POTW); operating and maintaining North Main Street lift station as needed; monitoring GW and SW; and implementing institutional controls including land use restrictions	Chemical-specific soil cleanup goals were developed based on GW protection and include carcinogenic PAHs 0.59 mg/kg, phenols 4.28 mg/kg, arsenic 27 mg/kg, and chromium 92.7 mg/kg. Chemical-specific GW cleanup goals include carcinogenic PAHs 0.003 ug/l (health-based), phenols 2,630 ug/l, arsenic 50 ug/l, chromium 50 ug/l (MCL), and benzene 1 ug/l (State). Total noncarcinogenic risk will result in a HI of <1	$4,192,000 (present worth) $388,000 (O&M)
4	City Industries, FL Former Hazardous Waste Recycling and Transfer Facility 03/29/90 1st - Final	GW contaminated with VOCs including benzene, PCE, TCE, and toluene	Not specified	Pumping and treatment of GW using air stripping, followed by offsite discharge to a publicly owned treatment works (POTW), if treatability studies show the discharged water meets pretreatment standards; and GW monitoring. If a local POTW will not accept the treated effluent, a contingency remedy will be instituted, which includes GW pumping and treatment using air stripping followed by precipitation, filtration, carbon adsorption, and possibly biological oxidation; compliance with SW discharge criteria; and offsite discharge of treated effluent to a nearby drainage canal	Chemical-specific goals for GW include benzene 1.0 ug/l (State drinking water standard), PCE 3 ug/l (State drinking water standard), TCE 3.0 ug/l (State drinking water standard), and toluene 2,000 ug/l (proposed MCLG)	$4,575,632 (present worth) $292,500 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Coleman-Evans Wood Preserving, FL Former Wood Treatment Site 09/26/90 1st - Final (amendment)	Soil, sediment, and GW contaminated with organics including pentachlorophenol (PCP); and metals	27,000 yd^3 (soil)	Excavating soil and sediment contaminated with PCP levels >25 mg/kg, and pretreating these materials using soil washing; separating clean soil fractions from contaminated soil fines with solidification/stabilization of soil fines or sludge exceeding cleanup criteria; covering the solidified mass, and replacing solidified materials onsite; treating residual soil wash water using bioremediation, followed by a granular activated polishing unit with subsequent onsite discharge; pumping and treatment of GW following by onsite discharge; and implementing institutional controls including deed restrictions	Soil contaminated with PCPs >25 mg/kg will be excavated and treated to the established cleanup level below 25 mg/kg. Solidified/ stabilized contaminant fines after bioremediation will meet Toxicity Characteristic Leaching Procedure (TCLP) criteria of 3.6 mg/kg	$8,567,304 (present worth) $0 (O&M)
4	Dubose Oil Products, FL Inactive Waste Storage, Treatment, and Disposal Facility 03/29/90 1st - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene, TCE, toluene, and xylenes; other organics including PAHs and phenols	Not specified	Excavating the top 20 ft of vault soil containing low-level contamination and disposing of soil in an onsite ravine area; excavating remaining vault soil and treating by aerobic biodegradation, which includes windrowing of soil on a concrete slab, addition of microbial seed and nutrients, and aeration; disposing of treated soil onsite in the ravine area; placing a 2 ft soil cover over the vault and ravine areas; treating soil leachate from the windrowing process using filtration and either carbon adsorption or UV oxidation, followed by onsite discharge to SW; draining and filling of onsite ponds; installing SW runoff controls; conducting GW and soil monitoring; restoring GW by natural attenuation; and implementing institutional controls including deed and GW use restrictions	Cleanup standards for leachate discharge are based on the more stringent of Federal or State ARARs and include benzene 1 ug/l (State), TCE 3 ug/l (State), xylenes 50 ug/l (State), and PNAs 10 ug/l (EPA detection limit). Soil cleanup goals are based on either leaching potential (LP) or health-based criteria (HBC) and include benzene 10 mg/kg (HBC), TCE 0.050 mg/kg (LP), xylenes 1.5 mg/kg (LP), and PAHs 50 mg/kg (LP)	$3,008,000 (present worth) $115,000 (O&M) (years 0-5) $10,000 (O&M) (years 6-10)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Harris/Palm Bay Facility, FL Electronics Manufacturing Company 06/28/90 1st	GW contaminated with VOCs including TCE; metals including chromium and lead; and other inorganics including fluoride	Not specified	Pumping and treatment of GW using air stripping to remove VOCs; reinjecting the treated GW onsite into a deep aquifer; evaluating and modifying the existing GW monitoring program to fully characterize onsite contamination	Cleanup standards were chosen as the more stringent of State or Federal SDWA Standards. Chemical-specific GW goals include TCE 5 ug/l (MCL), chromium 50 ug/l (MCL), and lead 15 ug/l (proposed MCL)	$1,430,000 (present worth) $950,000 (O&M)
4	Hipps Road Landfill, FL Inactive Landfill 09/21/90 1st - Final (Amendment)	GW contaminated with VOCs including benzene; and metals including chromium and lead	Not specified	Onsite GW treatment using air stripping to remove VOCs, followed by onsite discharge of the treated water to a storm water retention basin; and monitoring of onsite and offsite GW. This amendment will substantially decrease the overall cost of the remedy from that of the POTW treatment alternative	Chemical-specific cleanup goals for GW include benzene 1 ug/l (State), chromium 50 ug/l (MCL), and lead 15 ug/l (Federal Recommended Cleanup Goal). Lead and chromium contamination was determined to be nonsite-related, but cleanup goals will be met in water discharged to the retention basin	$1,242,000 (present worth) $370,600 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Howe Valley Landfill, KY Inactive Landfill 09/28/90 1st - Final	Soil contaminated with VOCs including PCE; and metals including chromium	100 yd^3 (soil contaminated with inorganics) 7,400 yd^3 (soil contaminated with organics)	Excavating 100 yd^3 of soil with elevated levels of inorganics followed by offsite disposal; excavating 7400 yd^3 of soil with elevated levels of organics, followed by aeration; performing a treatability study to ensure acceptable levels of organics in soil; onsite disposal of treated soil; onsite air monitoring; installing water diversion ditches to prevent water from running onto aerating soil; covering the area with soil; monitoring GW; and implementing institutional controls including deed restrictions. A contingency remedy, including excavating, stockpiling, and transporting soil to an offsite RCRA-approved landfill for disposal will be invoked if treatability study demonstrates that aeration will not be effective	Health-based soil action levels have been calculated for the site-specific conditions and include PCE 7.50 mg/kg and chromium (IV) 400 mg/kg	$394,524 (present worth) $42,625 (O&M) $3,852,000 (present worth) (contingency remedy) $42,625 (O&M) (contingency remedy)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Jadco-Hughes, NC Former Sovent Reclamation and Waste Storage Facility 09/27/90 1st - Final	Soil, GW, and SW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PCBs and phenols; and metals including arsenic, chromium, and lead	Not specified	Soil venting followed by vacuum extraction and carbon adsorption to remove VOCs and other organics; flushing the treated soil, then collecting and treating the residual water in a GW treatment system; collecting GW with a subsurface drain system; pumping GW from highly contaminated areas followed by pretreatment using aeration and carbon adsorption to reduce VOCs and subsequent offsite discharge to a publicly owned treatment works (POTW); conducting a treatability study to ensure compliance with POTW pretreatment standards; replacing an onsite SW culvert; monitoring GW and SW; sampling soil and sediment; and implementing institutional controls including land and GW use restrictions. The contingency remedy includes GW pumping and treatment using ultraviolet oxidation with discharge to an onsite tributary	Both soil and GW cleanup goals were developed to remediate and protect the GW. Chemical-specific cleanup goals for soil include PCBs 10.0 mg/kg (TSCA), arsenic 48.0 mg/kg (background), chromium 140.0 mg/kg (background), and lead 1.3 mg/kg. Treatment goals for GW include benzene 1 ug/l (State), PCE 0.7 ug/l (State), phenols 4,200 ug/l (RfD), TCE 2.8 ug/l (State), toluene 1,000 ug/l (State), xylenes 400 ug/l (State), arsenic 50 ug/l (State), chromium 50 ug/l (State), and lead 15 ug/l (Recommended Cleanup Goal for Superfund Sites)	$4,830,900 (present worth) (includes estimated present worth) $2,665,600 (O&M) (no costs were provided for the contingency remedy)
4	Kassouf-Kimerling Battery Disposal, FL Landfill 03/30/90 2nd - Final	Sediment and SW contaminated with metals including arsenic, chromium, and lead	15,000 yd^3 (sediment)	Dredging sediment in the canal that lies within 150 feet of the landfill, and marsh area sediment within 20 feet of the landfill to a depth of 2 ft; solidifying and stabilizing the sediment and disposing of the treated sediment onsite along with the treated landfill wastes from OU1; covering the area with soil; implementing engineering controls on the canal; wetlands mitigation; and GW monitoring	Marsh sediment within 20 ft of the landfill and sediment in the canal within 150 ft of the landfill will be remediated to achieve Federal Ambient Water Quality Criteria (FAWQC) and include lead 40 mg/kg. A waiver of the FAWQC will be imposed on marsh sediment >20 ft away from the landfill and sediment in the canal >150 ft away from the landfill	$511,700 (present worth) $99,500 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Lewisburg Dump, TN Abandoned Landfill 09/19/90 1st - Final	Soil and debris contaminated with organics including bis(2-ethylhexyl)phthalate (DEHP); and metals including aluminum, barium, copper, manganese, and zinc	Not specified	Removing landfill surface and quarry debris and disposing of the wastes in one of the test pits at the site, an approved sanitary landfill, or a hazardous waste landfill; replacing the plastic test-pit caps with landfill cap material; regrading the landfill cap to stabilize site conditions; long-term GW monitoring and analysis; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing	No chemical-specific cleanup goals for soil or debris were provided. Source treatment and removal should indirectly reduce the level of GW contamination. Chemical-specific GW cleanup goals are based primarily on the proposed MCL for DEHP at 4 ug/l. The SW cleanup goal for copper is 12.0 ug/l which will be equal to or less than a Hazard Quotient of 1	$791,512 - $1,189,741 (present worth) $270,042 (O&M)
4	Munisport Landfill, FL Inactive Municipal Landfill 07/26/90 1st - Final	GW contaminated with VOCs including benzene and toluene; other organics including phenols; metals including arsenic, chromium, and lead; and other inorganics	Not specified	Collecting and treating leachate-contaminated GW prior to its emergence into the Mangrove Preserve, discharging treated GW onsite; initiating landfill closure proceedings by the State; and conducting hydrologic, water quality, and treatability studies. Based on study results, an alternative remedy may include constructing a hydraulic barrier using negative pressure; treating contaminated GW with air stripping, adjusting pH level, and discharging the treated effluent into onsite shallow subsurface trenches or onsite SW; or a third alternate remedy may include positive infiltration, biological treatment, and discharge to an onsite trench	Treated effluent will meet appropriate Clean Water Act and State standards for discharge to GW or SW, as appropriate; however, no chemical-specific goals were provided	$6,166,000 (present worth) $430,000 (O&M)
4	National Starch & Chemical, NC Manufacturing Facility 09/28/90 2nd	None	Not specified	No further action with quarterly soil monitoring and implementing institutional controls including deed restrictions	Not applicable	$151,000 (present worth) $150,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	North Hollywood Dump, TN Inactive Landfill 09/13/90 1st - Final	Soil, sediment, debris, GW, and SW contaminated with organics including pesticides, specifically chlordane, aldrin, and endrin; and metals including arsenic and lead	Not specified	Excavating buried waste and soil and consolidating them in the landfill area; excavating and characterizing waste within buried drums; consolidating debris in landfill or disposing of debris and drummed wastes offsite; upgrading the existing landfill cover; partially dewatering surface impoundments; excavating contaminated sediment from beaver pond and placing them in Oxbow Lake; covering the lake and beaver pond sediment with geofabric cover and infilling Oxbow Lake with clean fill; containing the dredge pond sediment; restocking fish; monitoring of shallow GW and SW; and implementing institutional controls including land and GW use restrictions, and site access restrictions including fencing	Chemical-specific goals for GW include arsenic 0.140 ug/l (proposed State Water Quality Standard) and lead 3.8 ug/l (CWA Water Quality Criteria) at the point the GW reaches the Wolf River	$8,041,890 (present worth) $1,610,310 (O&M)
4	Pickettville Road Landfill, FL Inactive Municipal Landfill 09/28/90 1st - Final	Soil, debris, and GW contaminated with VOCs including benzene, TCE, and toluene; other organics including acids, PCBs; and metals including arsenic, chromium, and lead	Not specified	Excavating the waste, soil, and debris from the 100-year floodplain of Sixmile Creek to a depth of 5 ft, followed by onsite disposal of waste and debris within the landfill area; capping the landfill with a clay and soil cover; installing a passive landfill gas venting system; providing an alternate water supply to residents affected by the GW contaminant plume by extending a city water main; implementing a plugging and abandonment program for the affected wells; GW monitoring; and implementing institutional controls including GW use and deed restrictions, and site access restrictions such as fencing	SW discharge limits are SARA Alternate Concentration Limits (ACLs), and include benzene 115 ug/l and vinyl chloride 115 ug/l. GW discharge which exceeds ACLs may indicate the need for future GW remediation	$9,935,000 (present worth) $171,100 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Schuylkill Metal, FL Former Battery Recycling Facility 09/28/90 1st - Final	Soil, debris, sediment, GW, and SW contaminated with acids and metals including lead, arsenic, and chromium	36,000 yd^3 (soil) 2,000 yd^3 (sediment)	Excavation and onsite solidification of contaminated soil from the process area and contaminated sediment from the ditches; onsite disposal of treated soil and sediment; debris recycling; onsite treatment of SW from wastewater holding pond and pumping and treatment of GW by chemical action and filtration, followed by offsite discharge of treated SW and GW to a publicly owned treatment works (POTW); biological monitoring; installing flood controls; replacing contaminated wetlands; and implementing site access restrictions including fencing	All soil with lead levels of 500 mg/kg and ditch sediment to a depth of 2 ft will be treated by chemical stabilization. This cleanup level was based on site-specific analyses to prevent excessive lead leaching to the GW. Debris will be excavated to a depth between 3 and 10 ft below land surface and will be recycled. GW cleanup level is lead 0.015 mg/l (MCL) or background, and treated water discharged to nearby wetlands will achieve land levels of 0.013 mg/l (WQC)	$5,864,000 - $8,161,000 (present worth) O&M (will be determined during the RD/RA phase)
4	SCRDI Bluff Road, SC Inactive Chemical Waste Manufacturing, Storage, Recycling, and Disposal Facility 09/12/90 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, TCE, and xylenes; other organics including PCBs, phenols, and pesticides; and metals	Not specified	Pumping and onsite treatment of GW using flocculation/precipitation as a pretreatment to remove metals, air stripping to remove VOCs, and granular activated carbon adsorption to remove semi-volatile organic compounds, if necessary, followed by reinjecting the treated water onsite; treating contaminated soil in-situ using vacuum extraction, followed by carbon adsorption or fume incineration to destroy off-gasses; managing carbon residuals from GW and soil treatments through offsite disposal or regeneration; and monitoring soil and GW	Chemical-specific GW cleanup goals include benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), toluene 2 mg/l (MCL) and xylenes 10 mg/l (MCL). Chemical-specific goals for soil include benzene 12 ug/kg (SL), PCE 53 ug/kg (SL), TCE 18 ug/kg (SL), toluene 3.95 mg/kg (SL)	$5,574,984 (present worth) $311,287 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Yellow Water Road, FL Former Storage Area 09/28/90 1st	Soil and sediment contaminated with organics including PCBs	3,560 yd^3 (soil and sediment)	Excavating contaminated soil and sediment with PCB concentrations >10 mg/kg; solidifying and stabilizing the soil and sediment, if a treatability study determines the effectiveness of using solidification for organics; placing treated soil within the old salvage operational area and covering the area with 1 ft thick soil cover; conducting leachability studies of treated mass; backfilling excavated areas; and monitoring GW	Onsite soil cleanup levels are based on the TSCA PCB spill cleanup policy for unrestricted sites. PCBs will be remediated to a level of 10 mg/kg with a minimum excavation depth of 10 inches, and excavated areas will be covered with clean fill to reduce levels of PCBs to <1 mg/kg	$1,119,000 - $1,448,200 (present worth) $62,600 (O&M)
4	Zellwood Groundwater Contamination, FL Industrial Area 03/01/90 1st (Amendment)	Soil and sediment contaminated with VOCs, including toluene and xylenes; other organics including PAHs and pesticides; and metals including lead and chromium	3,000 yd^3 (soil and sediment)	Excavating contaminated soil and sediment from the drum and pond areas followed by onsite stabilization and solidification; evaluating existing water wells for decommissioning; GW monitoring. This ROD amends a 1987 ROD, which proposed treatment of soil and sediment by incineration with disposal of the residual ash onsite	Soil cleanup goals were calculated using site-specific soil and climatic data from the EPA, State, and other sources. Chemical-specific goals for soil include lead 220 mg/kg, chromium 100 mg/kg, total PAHs 10 mg/kg, PCE 1 mg/kg, toluene 30 mg/kg, and total xylenes 5 mg/kg	$1,030,000 (present worth) $250,000 (O&M)
5	Algoma Municipal Landfill, WI Inactive Municipal Landfill 09/29/90 1st - Final	Soil, debris, and GW contaminated with VOCs including benzene; other organics; and metals including arsenic and cadmium	Not specified	Capping the landfill disposal area with a soil/clay cover and installing a gas venting system to remove off-gasses; covering the north and south disposal areas with a soil cover; offsite and onsite GW monitoring; monitoring landfill gases; and implementing institutional controls including deed restrictions, and site access restriction including fencing	The State has determined that contaminant migration from the landfill to GW must not exceed State Prevention Action Limits (PALs), which include benzene 0.067 ug/l (PAL)	$1,298,000 (present worth) $11,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Anderson Development, MI Active Chemical Manufacturing Facility 09/28/90 1st - Final	Soil and lagoon sludge contaminated with organics, namely MBOCA and its degradation products	Not specified	Removing and treating standing water in the lagoon; excavating contaminated soil, clay, and lagoon sludge from a 100-ft by 75-ft area and placing the material in an unexcavated portion of the lagoon; treating the contaminated material by in-situ vitrification; collecting pyrolized gases and treating the gases using a scrubber system, air filters, and carbon adsorption beds; filling the lagoon containing the vitrified material with clean fill; and conducting GW monitoring and soil sampling	A cleanup action level of MBOCA 1,684 ug/kg was calculated based on EPA guidance documentation. The cleanup level corresponds with the excess lifetime cancer-risk level of 10^{-6}	$2,364,050 (present worth) $38,530 (O&M)
5	Bofors Nobel, MI Chemical Manufacturing Facility and Inactive Landfill 09/17/90 1st	Soil, sludge, and GW contaminated with VOCs including benzene	473,000 yd^3	Excavating sludge and berm material highly contaminated with VOCs, treating material onsite using incineration and low temperature thermal desorption; disposing of residual ash in onsite landfill; treating scrubber water from the incinerator by precipitation; treating landfill leachate in the GW treatment system; excavating less VOC-contaminated soil and sludge and disposing of these onsite in the landfill; pumping and treatment of GW using ozone oxidation or comparable treatment with onsite discharge to SW; monitoring GW, SW, and air; and implementing site access restrictions including fencing	Landfilled material must exhibit an excess lifetime cancer risk of $<10^{-6}$. Chemical-specific soil cleanup levels were developed based on type and location of contaminated media, and include benzene 410-4,500 ug/kg. GW cleanup levels are based on proposed Best Available Technology discharge standards including benzene 5 ug/l	$70,874,000 (present worth) $313,000 (O&M)
5	Clare Water Supply, MI Municipal Wellfield 08/30/90 1st	GW contaminated with VOCs including TCE	Not specified	Installing and operating an air stripper to treat GW, modifying pipelines on the existing water supply system, and monitoring air emissions from the air stripping process	This ROD will remediate GW TCE and TCE-degradation components to meet Safe Drinking Water Act MCLs including TCE 5 ug/l. Additional chemical-specific GW goals will be determined in the subsequent ROD	$1,284,059 (present worth) $61,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Fisher Calo Chem, IN Chemical Manufacturing 08/07/90 1st - Final	Soil, debris, and GW contaminated with VOCs including TCE, toluene, xylenes; other organics including PAHs and PCBs; and asbestos	Not specified	Excavating and incinerating of semi-volatile and PCB-contaminated soil, with ash disposal location to be determined upon leaching test results; treatment of VOC-contaminated soil remaining in the excavated area using soil flushing or vapor extraction; limited asbestos removal/repair of structures and offsite disposal of any asbestos-containing materials, drums, tanks, or containers and their contents; pumping and treatment of GW using an equalization/sedimentation basin, granular activated carbon, and air stripping, followed by filtration and reinjection of the treated water into the shallow aquifer; construction of GW production well; GW monitoring; and implementation of site access restrictions	Excavation levels for contaminated soil are based on TSCA standards and TBC criteria, including PCBs 10 mg/kg. GW cleanup levels are derived from action levels adopted by the State from SDWA MCLs and MCLGs, including TCE 5 ug/l	$31,685,000 (present worth) $9,379,000 (annual O&M)
5	Hagen Farm, WI Waste Disposal Facility 09/17/90 1st	Soil and waste refuse contaminated with VOCs including benzene, toluene, xylenes; other organics including phenols and PCBs; and metals including lead	67,650 yd^3 (waste) 112,000 yd^3 (sub-soil material)	Consolidating waste materials from disposal areas B and C into disposal area A and backfilling areas B and C with clean soil, followed by revegetation; capping disposal area A; treatment of waste and sub-soil materials using in-situ vapor extraction (ISVE) and treating off-gas emissions using carbon adsorption, followed by regenerating the spent carbon from the off-gas treatment process; and implementing site access restrictions and institutional controls including deed restrictions	A 90% removal of VOCs from the waste and contaminated sub-soil is the goal for this remedial action. Off-gas extracts from ISVE will be treated to meet State emission standards	$3,299,000 (present worth) $29,530 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Hunts Disposal, WI Inactive Landfill 09/29/90 1st - Final	Soil, sediment, debris, and GW contaminated with VOCs including benzene, TCE, and xylenes; acids; and metals including arsenic and chromium	5,300 yd^3 (soil and sediment)	Excavating and consolidating onsite contaminated soil and sediment from outside the landfill area to within the landfill; filling excavated areas with clean soil; constructing a levee; capping the landfill; installing an active landfill gas collection and combustion system; constructing a slurry wall; pumping and offsite treatment of GW, followed by offsite discharge; and implementing institutional controls including land and GW use restrictions, and site access restrictions including fencing	GW cleanup levels chosen for the site are State Preventative Action Limits (PALs), which are equal to or more stringent than Federal MCLs. Chemical-specific goals for GW include benzene 1 ug/l, TCE 0.18 ug/l, xylenes 124 ug/l, arsenic 5 ug/l, and chromium 5 ug/l. Specific cleanup standards for soil and sediment have not been set	$17,454,000 (present worth) $375,000 (annual O&M)
5	Janesville Ash Beds, WI Waste Diposal Facility 12/29/89 1st - Final	Sediment, GW, SW, and air contaminated with VOCs including PCE, vinyl chloride, TCE, acetone, benzene, dichloroethane, and methylene chloride; other organics including bis(2-ethylhexyl) phthalate; and metals including arsenic	Not specified	Upgrading and landfill capping at the JAB site; contaminated GW at the site will receive onsite treatment by air stripping, with offsite discharge; GW monitoring; and implementing institutional controls including GW, land use, and deed restrictions	GW will be treated to meet Federal MCLs or State standards. SW will meet State SW quality standards. Cleanup goals must comply with AAQS, NPDES, and RCRA standards	$1,020,000 (present worth) $33,100 - $53,100 (annual O&M)
5	Janesville Old Landfill, WI Waste Disposal Facility 12/29/89 1st - Final	GW and air contaminated with VOCs including benzene, PCE, and TCE; and metals including arsenic	Not specified	Treating landfill gas using extraction and flaring; upgrading the landfill cap, and air monitoring; GW pumping and treatment onsite by air stripping, with discharge to Rock River, in conjunction with GW monitoring; and implementing institutional controls including GW, land use, and deed restrictions	Chemical-specific cleanup goals were not provided. GW will be treated to attain Federal MCLs or State standards. SW will meet State SW quality standards	$6,059,000 (present worth) $71,500 - $174,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	K&L Landfill, MI Inactive Municipal Landfill 09/28/90 1st - Final	Soil, debris, and GW contaminated with VOCs including benzene, toluene, and xylenes; other organics including acids, PAHs, PCBs, and phenols; and metals including chromium and lead	Not specified	Capping the landfill area with a RCRA multi-layer cap and installing gas vents throughout the landfill; pumping and treatment of GW using enhanced bioremediation/fixed-film bioreactor technology accompanied by aeration; conducting treatability studies or pilot tests to ensure remedy effectiveness; discharge of treated effluent with onsite reinjection, discharge to an onsite filtration pond, or offsite discharge to a publicly owned treatment works (POTW), with offsite disposal of any resulting sludges; continued GW, SW, and air monitoring; closure of affected residential wells; and implementing institutional controls including deed restrictions	Chemical-specific goals for GW include acetone 700 ug/l (State), benzene 1.0 ug/l (State), toluene 40 ug/l (State), vinyl chloride 0.02 ug/l (State), xylenes 20 ug/l (State), phenols 300 ug/l (State), and lead 5 ug/l (State)	$16,407,100 (present worth) $1,099,900 (O&M)
5	Kummer Sanitary Landfill, MN Inactive Municipal Landfill 09/29/90 3rd - Final	GW contaminated with VOCs including benzene, PCE, TCE, and vinyl chloride	Not specified	Pumping and treatment of GW using advanced oxidation processes (e.g., ozone, hydrogen peroxide, or ultraviolet light), and lime soda softening as necessary, to precipitate inorganic compounds, followed by disposal of the precipitant sludge, polishing the effluent stream with granulated activated carbon, and discharging treated GW to an onsite infiltration pond; and GW monitoring	Contaminants of concern in the GW will be reduced to meet current and proposed Maximum Contaminant Levels (MCLs), including PCE 5 ug/l (proposed MCL), TCE 5 ug/l (MCL), and benzene 5 ug/l (MCL); thereby reducing cumulative residual carcinogenic risk due to ingestion to 10^{-6}	$1,800,000 - $6,200,000 (present worth) $240,000 - $510,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Master Disposal Service Landfill, WI Inactive Industrial Landfill 09/26/90 1st	Soil, debris, and GW contaminated with VOCs including benzene, TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead	Not specified	Capping the landfill with a clay/soil cap and soil cover; installing an active landfill gas venting system; pumping and treatment of GW using filtration and either air stripping, carbon adsorption, ion exchange or chemical treatment, based on treatability studies; discharging treated water onsite to SW; SW and GW monitoring; and implementing institutional controls including deed, land use, and GW use restrictions; and site access restrictions including fencing	Effluent discharge limitations for treated GW were calculated from State discharge statutes, and specify weekly averages for metal contaminants and monthly averages for VOCs, as well as MCLs. Chemical-specific goals include benzene 8.5 lbs/day, TCE 22 lbs/day, toluene 17 mg/l daily concentration level, arsenic 0.045 lbs/day, chromium (total) 0.034 lbs/day, and lead 0.0096 lbs/day	$4,632,000 - $5,016,000 (present worth) $142,730 - $164,130 (annual O&M)
5	Metamora Landfill, MI Inactive Landfill 09/28/90 2nd	Debris and GW contaminated with VOCs including benzene, PCE, TCE, and xylenes; and metals including arsenic and barium	Not specified	Pumping and treatment of GW using precipitation/flocculation with air stripping and carbon adsorption, and reinjection of treated water into the shallow aquifer; offsite treatment and disposal of secondary waste streams including flocculation sludge and spent carbon; capping the landfill area using a multi-layer clay cap, and collection and flaring of landfill gases; monitoring GW; and implementing institutional controls such as deed and GW use restrictions; and site access restrictive such as fencing	Chemical specific cleanup goals for GW are based on Michigan Act 307 rules as well as MCLs including benzene 1 ug/l (State), PCE 0.7 ug/l (State), TCE 3.0 ug/l (State), xylenes 20 ug/l (State), and arsenic 0.02 ug/l (State) or background	$19,354,050 (present worth) $856,944 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Moss-American Kerr-McGee Oil, WI Former Wood Preserving Facility 09/27/90 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and xylenes; and other organics including PAHs	5,200 yd^3 (river sediment) 80,000 yd^3 (soil)	Re-routing the river channel onsite parallel to the existing channel, followed by excavating highly contaminated sediment from the old channel; treating river sediment and soil onsite using soil washing and bioslurry technologies; separation and dewatering of residues followed by redeposition onsite; covering treated material with clean soil; recycling or treating slurry water onsite before discharge to a publicly owned treatment works (POTW) or the river; constructing a synthetic geomembrane barrier to prevent GW movement into the river; collecting GW followed by treatment using an oil/water separator and granular activated carbon with discharge to a POTW or to the river; removing pure phase liquids for offsite incineration; and GW monitoring	Goals are designed to reduce the excess lifetime cancer risk for carcinogens to 10^{-4} or less. For noncarcinogens, cleanup levels will reduce HI to ≤ 1. Chemical-specific goals for GW include benzene 0.067 ug/l (State Preventive Action Level (PAL)), toluene 68.6 ug/l (State PAL), and xylenes 124.0 ug/l (State PAL). The chemical-specific goal for soil and sediment is PAHs (carcinogenic) 6.1 mg/kg (State)	$26,000,000 (present worth) $130,000 (annual O&M)
5	National Presto Industries, WI Former Munitions and Metal-Working Facility 08/01/90 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Constructing a well field, storage facilities, and distribution system to supply drinking water within the affected area of the Hallie Sanitary District; extending municipal water service from the City of Eau Claire to businesses and residences within the affected area; closing and abandoning all existing private wells within the affected area that draw from the contaminated GW; monitoring of designated private wells that are outside of the affected area that are still using the affected area for water supply	To provide a permanent and safe alternate drinking water supply to the affected area	$3,000,000 - $3,200,000 (present worth) $48,200 - $120,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Naval Industrial Reserve Ordnance Plant, MN Federal Facility 09/28/90 1st	GW contaminated with VOCs including PCE, TCE, toluene, and xylenes	Not specified	Pumping and pretreatment of GW, as necessary, prior to disposal to a local publicly owned treatment works (POTW) via an existing sanitary sewer system; and testing the recovered water to assist in the design of GW treatment facilities; treating recovered GW by either a two-stage air stripping process, followed by vapor-phase granular activated carbon (GAC) to treat air emissions, or treating GW using aqueous-phase GAC, depending on testing results; and discharging treated GW. Both options include disposal of the effluent offsite and regenerating spent carbon at an offsite facility	GW quality in the unconsolidated aquifer will be restored to MCLs or State recommended allowable limits, if more restrictive. The target GW cleanup goal for TCE is 5.0 ug/l (MCL). Cleanup levels for VOCs in recovered GW discharged to the local POTW must not exceed 10 mg/l and individual VOC levels must be <3 mg/l (local POTW standards). Contaminants in any uncaptured portion of the aquifer are expected to dissipate through natural means	$4,100,000 (present worth) O&M (not specified)
5	NL Industries/ Taracorp Lead Smelt, IL Inactive Lead Smelting Facility 03/30/90 1st	Soil and debris contaminated with lead	94,820 yd^3 (soil and debris)	Excavating soil and debris from onsite waste piles, the unpaved area, and adjacent residential area; consolidating the soil and debris with existing Taracorp pile; covering the Taracorp pile with RCRA compliant multi-media cap; and lining the newly expanded pile with a clay liner; removing all onsite drums to offsite secondary lead smelter; monitoring nearby communities; performing blood lead sampling; monitoring air and GW; developing contingency to provide further remedial action, if necessary; implementing institutional controls, including deed restrictions and site access restrictions such as fencing	Contaminated soil in unpaved area adjacent to site will be excavated to achieve lead cleanup level of 1,000 mg/kg. Contaminated soil in adjacent communities will be excavated to achieve lead cleanup level of 500 mg/kg	$30,000,000 (present worth) $35,300 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Oconomowoc Electroplating, WI 09/20/90 1st	Soil, sediment, debris, sludge, GW, and SW contaminated with VOCs including TCE, toluene, and xylenes; and metals including chromium and lead	650 yd^3 (lagoon sludge) 72,000 gals (lagoon water) 700 yd^3 (soil and debris) 6,000 yd^3 (sediment)	Excavating lagoon sludge and surrounding soil, followed by stabilization and offsite disposal; pumping and offsite treatment of lagoon water; excavating soil and debris with offsite treatment and disposal; onsite GW pumping and treatment using filtration ion exchange, air stripping, and carbon adsorption, followed by onsite discharge to SW; excavating sediment from Davy Creek and adjacent wetlands to a depth of 2 ft, followed by offsite stabilization, treatment, and disposal; and monitoring of the area	OU1 lagoon soil excavation levels will meet background levels consistent with State and Federal (RCRA) clean closure levels; excavation of OU2 soil will attain a 10^{-6} cumulative carcinogenic risk and a cumulative HI of <1 for noncarcinogens. GW treatment (OU3) will meet Federal and State cleanup standards based on State Preventative Action Limits (PALs); chemical-specific GW goals include chromium 5 ug/l (PAL) and TCE 0.18 (PAL)	$7,576,196 (present worth) $90,569 (annual O&M)
5	Onalaska Municipal Landfill, WI Inactive Municipal Landfill 08/14/90 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, xylenes, and TCE; other organics including PAHs; and metals including arsenic and lead	Not specified	In-situ bioremediation of the solvent-contaminated soil and, if feasible, a portion of the landfill debris; pumping and treatment of the GW plume using aeration, clarification, and filtration, followed by discharge of the treated GW into the Black River and onsite disposal of the sludge generated during the treatment process; reconstruction of the landfill cap and installation of a passive methane gas venting system to control the gas buildup under the cap; GW monitoring; and implementing institutional controls including deed and GW use restrictions	Chemical-specific soil cleanup standards will be established once the reduction rate for bioremediation has been determined during the pilot-scale test. The estimated cleanup goal is an 80-95% reduction of the organic contaminant mass in the soil. GW at the landfill waste boundary will meet SDWA, MCLs, or MCLGs. Chemical-specific cleanup standards for GW beyond the site boundary are based on State cleanup levels and include benzene 0.067 ug/l, toluene 68.6 ug/l, xylenes 124 ug/l, TCE 0.18 ug/l, arsenic 5 ug/l, and lead 5 ug/l. The reconstructed cap is projected to reduce the rate of precipitation infiltration by 80%	$8,000,000 (present worth) $164,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Ott/Story/Cordova Chemical, WI Chemical Manufacturing Facility 09/29/90 2nd	GW contaminated with VOCs including benzene, PCE, TCE, toluene, vinyl chloride, 1,2-dichloroethane, and xylenes; other organics including pesticides; and metals including arsenic	Not specified	Pumping and treatment of GW in the shallow and deeper zones of the aquifer system using physical-chemical treatment including UV-oxidation, air stripping, biological treatment such as activated sludge, and/or filtration/adsorption such as granular activated carbon; discharging the treated effluent into the nearby stream; installing a GW monitoring system, and implementing institutional controls to limit GW use	Chemical-specific GW cleanup goals include benzene 1 ug/l (10^{-6} cancer-risk level), toluene 40 ug/l (State standard), TCE 3ug/l (10^{-6} cancer-risk level), and xylenes 20 ug/l (State standard). Effluents must meet limitations for stream discharge as administered by the State	$26,000,000 (present worth) $1,400,000 (annual O&M)
5	Pristine, OH 03/30/90 1st (Amendment)	Soil, sediment, debris, GW, and SW contaminated with VOCs including benzene, PCE, TCE, and xylenes; other organics including dioxin and pesticides such as DDT; metals including arsenic, chromium, and lead; and other inorganics	7,122 yd^3 (soil and sediment)	The amended action includes excavating and incinerating the top 1 ft of soil from across the site (3,598 yd^3) and soil to a depth of 4 ft in areas that contain semi-volatile organic compounds and pesticides in excess of performance goals (1,799 yd^3); incinerating 600 yd^3 of sediment and 1,125 yd^3 of soil surrounding the inground pit; testing the residual ash and placing the ash onsite if it meets standards for delisting; performing in-situ soil vapor extraction with an off-gas control system to extract VOCs from onsite soil to a depth of 12 ft; dewatering the upper aquifer; capping the soil with a RCRA multi-layer cap; and onsite treatment of the extracted GW using carbon adsorption; pumping and treatment of GW from the lower and upper aquifer and a lower outwash lens of the upper aquifer using air stripping and carbon adsorption; decontaminating and demolishing all onsite structures and disposing of the debris offsite; monitoring GW; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing	Chemical-specific goals for soil/sediment were based on a cumulative 10^{-6} incremental lifetime cancer risk of 11 indicator compounds, and include aldrin 15 ug/kg, benzene 116 ug/kg, chloroform 2,043 mg/kg, dieldrin 6 ug/kg, PAHs 14 ug/kg, dioxin 0 ug/kg, PCE 3,244 ug/kg, TCE 175 ug/kg, DDT 487 ug/kg, 1,2- DCA 19 ug/kg, and 1,1- DCE 285 ug/kg	$13,500,000 (present worth) $6,000,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Reilly Tar & Chemical (St. Louis Park), MN Former Coal Tar Distillation and Wood Preserving Facility 09/28/90 3rd	GW contaminated with organics including PAHs and phenols	Not specified	Pumping an existing well screened within the St. Peter aquifer and discharging extracted water offsite to a publicly owned treatment works (POTW); and GW monitoring. Within 3 to 5 years, onsite discharge to SW will be conducted if NPDES permit requirements are met. If requirements are not met, onsite treatment, possibly using granular activated carbon will be conducted prior to onsite discharge	Chemical-specific GW cleanup goals include carcinogenic PAHs 70 ug/l, other PAHs 17 ug/l, and phenols 10 ug/l. Extracted GW must meet NPDES discharge requirements for both discharge to a POTW and SW	$225,000 - $250,000 (capital) $60,000 (annual O&M)
5	Sangamo/Crab Orchard NWR (USDOI), IL Manufacturing Facility 08/01/90 2nd	Soil and sediment contaminated with organics including PCBs; and metals including lead	37,500 yd^3 (soil and sediment)	Excavating and treating PCB-contaminated soil and sediment using incineration or in-situ vitrification (ISV), stabilization/fixation of incineration residues and non-incinerated, metal-contaminated soil and sediment, followed by onsite disposal in a RCRA-permitted landfill; backfilling, capping, and closure of excavated areas and areas where contamination is below the excavation criteria; GW, SW, and leachate monitoring; and implementing institutional controls including land use and transfer restrictions	Soil remediation goals include PCBs 1 mg/kg for the top 1 ft of surficial soil; PCBs 25 mg/kg for soil below 1 ft; and lead 450 mg/kg. Sediment remediation goals include PCBs 0.5 mg/kg. Soil and sediment remediation goals are based on the risk assessment, a 10^{-6} excess cancer-risk level, and an HI=1	$25,000,000 (present worth) $379,701 (annual O&M)
5	Spiegelberg Landfill, MI Active Sand, Peat, and Gravel Mining 06/29/90 2nd - Final	GW contaminated by VOCs including benzene, toluene, and xylenes; and metals including lead	3,770,000 ft^3 (GW)	Pumping and treatment using chemical precipitation and pH adjustment to remove inorganics, biological treatment to remove organics, and air stripping and granular activated carbon to remove residual organic contamination, followed by onsite discharge of treated water to the GW; implementing institutional controls including deed restrictions; and GW and well water monitoring	Chemical-specific GW cleanup goals include benzene 1.2 ug/l (based on a 10^{-6} cancer-risk level), toluene 40 ug/l (based on taste and odor thresholds), and lead 5.0 ug/l (based on human lifecycle-safe concentrations)	$4,420,000 (present worth) $2,000,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Springfield Township Dump, MI Industrial Waste Disposal Area 09/29/90	Soil and GW contaminated by VOCs including TCE and toluene; other organics including PCBs; and metals including arsenic, chromium, and lead	11,820 yd^3 (soil)	Excavating and treating VOC- and other organic-contaminated soil onsite by incineration, and solidifying the resulting ash; treating metal-contaminated soil using solidification and redepositing the treated soil onsite, or temporarily storing the treated soil onsite in a solid waste unit; treating remaining contaminated soil and ash onsite, or temporarily storing the treated soil using in-situ vacuum extraction with treatability studies to determine its effectiveness; GW pumping and treatment using carbon adsorption, followed by onsite reinjection of treated water; and implementing site access restrictions such as fencing	Soil remediation goals are based on a 10^{-6} cancer risk and State Michigan Act 307 Standards. Chemical-specific soil cleanup levels include PCBs 1 mg/kg, toluene 0.08 mg/kg, and TCE 0.08 mg/kg. Ground water will be remediated to meet or exceed SDWA MCLs or MCLGs, including toluene 0.4 mg/l (MCL) and TCE 0.003 mg/l (MCL). Lead and arsenic will be remediated to background levels for both soil and ground water	$9,271,290 (present worth) $97,659 (annual (O&M)
5	St. Louis River, MN Former Manufacturing Facilities 09/28/90 1st	Soil contaminated with organics including PAHs	300-2,300 yd^3 (tar seeps)	Excavating tar seeps with offsite disposal to a power plant or similar facility for use as a recyclable fuel and landfilling the tar and ash residues offsite. ROD provides a contingency for incineration of up to 10% of the materials at a RCRA-incinerator if the power plant will not accept the contaminated soil/tar mixture	No chemical-specific goals are provided; however, this remedial action will reduce the current excess lifetime cancer risk for GW to acceptable levels and prevent migration of contaminants to SW and GW	$700,000 - $2,700,000 (present worth) $0 (O&M)
5	Tri-State Plating, IN Abandoned Metal Plating Facility 03/30/90 1st - Final	GW contaminated with chromium	Not specified	Pumping GW from the underlying aquifer and discharging the treated water to a publicly owned treatment works (POTW); GW monitoring; conducting a public education program; and implementing institutional controls and site access restrictions including fencing	Pumping of GW will continue until contaminant levels meet State and Federal standards including chromium 50 ug/l	$1,110,000 - $1,115,000 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Union Scrap Iron Metal, MN Vacant Industrial Property 03/30/90 1st - Final	Not applicable	Not applicable	No further action	Not applicable	Not applicable
5	University of Minnesota, MN Electrical Equipment Storage and Reconditioning Facility 06/11/90 1st - Final	Soil, debris, and GW contaminated with VOCs including chloroform; other organics including PCBs; and metals such as lead	23,738 yd^3 (soil) 160 yd^3 (debris)	Excavating 2,620 yd^3 soil with >1,000 mg/kg lead and transporting it to an offsite RCRA landfill for disposal; excavating concrete (160 yd^3), debris, and 6,309 yd^3 of soil with >25 mg/kg PCBs, with onsite thermal desorption and fume incineration; consolidating 14,809 yd^3 of soil with 10-25 mg/kg PCBs and limiting access with man-made barriers, backfilling excavations with treated soil and grading the area; pumping and treatment of contaminated GW using a packed tower air stripper with onsite discharge to an infiltration pond; and GW monitoring. Outside of the selected remedy, the University of Minnesota is constructing two supply wells upgradient of the contaminant plume and supplying 27 affected residents	Cleanup levels for carcinogenic compounds are meant to reduce the excess lifetime cancer risk to 10^{-4} to 10^{-7}. Specific soil cleanup goals include PCBs 25 mg/kg (TSCA PCB "Spill Cleanup Policy") and lead 1,000 mg/kg (EP Toxicity Leach Testing and State Interim Standards for Lead). Specific GW cleanup goals for VOCs also were provided	$8,308,686 (capital cost) $8,695 (annual O&M cost for GW remedy)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Wayne Waste Oil, IN Former Oil Reclamation Facility and Landfill 03/30/90 1st - Final	Soil, debris, and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including arsenic, chromium, and lead	Not specified	Treating VOC-contaminated soil using vapor extraction; treating metals-contaminated soil using soil washing or solidification/ stabilization; delineating the area of the municipal landfill; capping the landfill and constructing a landfill venting system if necessary; covering PAH-contaminated soil or consolidating the soil under the landfill cap; treating and disposing of the contents of storage tanks offsite and steam cleaning and removing the storage tanks offsite; dismantling the incinerator and disposing of the debris offsite or within the onsite municipal landfill; pumping and treatment of GW onsite using air stripping, or discharging the GW offsite to a publicly owned treatment works (POTW); monitoring air, GW, and SW; and implementing institutional controls including deed, land use, and GW use restrictions, and site access restrictions such as fencing	Soil cleanup levels will be calculated using a contaminant leaching model. Chemical-specific cleanup levels for GW include benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), toluene 2,000 ug/l (MCL), xylenes 10,000 ug/l (proposed MCL), and arsenic 50 ug/l (MCL)	$5,582,499 (present worth) $291,000 (annual O&M)
5	Wheeler Pit, WI Former Industrial Waste Disposal Pit 09/28/90 1st - Final	Waste, soil, and GW contaminated with VOCs including toluene, benzene, and xylenes; other organics including PAHs; and metals including arsenic, lead, and chromium	Not specified	Consolidating waste and contaminated soil from adjacent property into original onsite disposal area; capping the landfill with a RCRA-approved solid waste cap; installing a gas venting system in the cap, if necessary; monitoring of GW and private wells, and evaluating results to determine the need for additional remedial action; and implementing site access restrictions, and institutional controls to limit land and GW use	Chemical-specific cleanup goals for GW are based on State Preventative Action Limits and include arsenic 5 ug/l and chromium 5 ug/l. No cleanup levels have been determined for soil or onsite wastes, as these will be permanently contained onsite	$2,940,000 (present worth) $137,300 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Arkwood, AR Former Wood Treatment Facility 09/28/90 1st - Final	Soil, sludge, debris, GW, and SW contaminated with organics including pentachlorophenol, PAHs, and dioxin	21,000 yd^3 (soil and sludge) 7,000 yd^3 (debris) 3,000 gals (oily liquids and wastewater)	Excavating soil and sludge from the railroad ditch, wood treatment facility, storage areas and ash pile; pretreating these materials by sieving and washing the soil; incinerating pretreated materials exceeding cleanup levels onsite; backfilling washed coarse materials pretreated to below cleanup levels as well as any residual ash; decontaminating onsite structures and debris, followed by onsite or offsite disposal; covering the site with a soil cap and revegetating the area; onsite pumping and treatment of oily sinkhole liquids and any wastewater from decontamination activities using filtration and granular activated carbon with onsite discharge of treated liquids, and incineration of any free phase oil; disposing of any residuals offsite; implementing site access restrictions including fencing; monitoring drinking water GW and SW; providing municipal water lines to affected residences; and monitoring New Cricket Spring for a 2-year period to measure the success of natural attenuation. If PCP levels still exceed State standards after 2 years, a treatment system will be implemented for the spring	Action levels for soil excavation and treatment include PCP 300 mg/kg (based on the leachability of PCP from site soil), carcinogenic PAHs 6 mg/kg (10^{-5} excess cancer risk) and dioxin 20 ug/kg (ATSDR)	$10,300,000 (present worth) O&M (not specified)
6	Cimarron Mining, NM Inactive Iron Ore Milling Facility 09/21/90 1st	Debris and GW contaminated with inorganics including cyanide	Not specified	Removing and offsite disposal of process chemical drums, decontaminated tanks, and associated piping; filling in the discharge pit and cinder block trenches with onsite soil and waste pile material; and plugging the onsite abandoned water supply well; pumping and discharging GW offsite toa publicly owned treatment works (POTW); and GW monitoring	The discharge to the POTW will comply with the pretreatment standard of cyanide 5 mg/l (CWA). Ultimate cleanup goals for the shallow aquifer are based on Federal MCLs and State action levels, and include cyanide 200 ug/l (State and MCL). Cyanide will be remediated to HI ≤ 1	$105,000 (present worth) $50,825 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Crystal Chemical, TX Abandoned Herbicide Manufacturing Facility and Surrounding Properties 09/27/90 1st - Final	Soil, sediment, and GW contaminated with arsenic	55,000 yd^3 (soil and sediment) 16,500 yd^3 (soil and sediment) 3,000,000 gals (GW)	Excavating offsite soil and sediment with arsenic >30 mg/kg, and redepositing the materials onsite; treating onsite soil and sediment with arsenic >300 mg/kg using in-situ vitrification; covering onsite area with a multi-layer cap; pumping and treating contaminated GW using ferric hydroxide precipitation, flocculation, clarification, filtration, and ion exchange; discharging the treated water offsite to a publicly-owned treatment works (POTW), to SW, or reinjecting the treated water onsite; disposing of residual sludge at an offsite facility; long-term GW monitoring; and implementing institutional controls including land use restrictions	The excavation level of arsenic is 30 mg/kg for offsite soil and sediment and is based on calculated health standards. Treatment of onsite soil with >300 mg/kg arsenic will effectively treat 95% of the onsite contamination, and will reduce the amount of leachable arsenic to 5 mg/kg. The cleanup standard for GW is arsenic 0.05 mg/kg based on Federal MCLs	$18,590,740 (present worth) $140,079 (annual O&M)
6	Hardage/Criner, OK Industrial Waste Site 11/22/89 1st (Amendment)	Soil, debris, and GW contaminated with VOCs including benzene, PCE, TCE, and other carcinogenic compounds; other organics including PCBs and pesticides; metals including arsenic, chromium, and lead; and oils	278,000 yd^3 (sludge, waste drums, soil, and waste liquids)	Source control includes installing liquid extraction wells, followed by offsite treatment for organic liquids and onsite treatment of aqueous liquids; excavating drummed organic liquids for offsite destruction; excavating and consolidating contaminated soil in onsite disposal area and placing a temporary cap over the soil; in-situ soil vapor extraction for main source area; and installing a RCRA-compliant cap. GW remediation includes installing interceptor trenches and collecting GW for onsite treatment, followed by discharge to SW	Restoration of GW contaminant levels to below MCLs including chromium 50 ug/l, and reducing VOC concentrations in soil by 99% through soil vapor extraction	$62,904,655 (present worth) $1,300,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Jacksonville Municipal Landfill, AR Inactive Municipal Landfill 09/27/90 1st - Final	Soil and debris contaminated with organics including pesticides such as dioxin	10-50 (above-ground waste drums)	Sampling of soil to determine the amount of contaminated soil and debris onsite; excavating with offsite thermal treatment and disposal of soil and debris; excavating, disinfecting, and onsite disposal of debris removed from TCDD-contaminated areas; backfilling; monitoring GW; and implementing institutional controls including deed, GW use, and land use restrictions	Soil action levels are based on action levels established by the Centers for Disease Control. Soil with concentrations of 2,3,7,8-TCDD > 10 mg/kg will be excavated and transported offsite for treatment. Soil with concentrations of 2,3,7,8-TCDD > 1.0 mg/kg but <10.0 mg/kg will remain onsite and will be covered with 1 ft of soil	$1,949,940 (present worth) $523,730 (annual O&M)
6	Pagano Salvage, NM Metal Salvage Facility 09/27/90 1st - Final	None	Not applicable	No action with GW monitoring for 1 year as requested by the State	Not applicable	Not applicable

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Rogers Road Municipal Landfill, AR Inactive Municipal Landfill 09/27/90 1st - Final	Soil and debris contaminated with organics including dioxin/furan (2,3,7,8-TCDD), the pesticide dieldrin, and herbicide compounds (2,4,5-T, 2,4-D, and 2,4,5-TP)	50 yd^3 (soil and debris)	Soil sampling with excavation of highly contaminated soil and debris, followed by offsite temporary storage of the material; conducting thermal treatment of all Rogers Road site material stored offsite at the Vertac facility, followed by residual analysis to evaluate treatment effectiveness; backfilling of residuals on the Vertac site, and revegetating backfilled ash areas; steam cleaning and disposing of debris from the Rogers Road site at the Vertac site; backfilling excavated areas and covering low-level contaminated waste with 1 ft of soil; GW monitoring; and implementing institutional controls limiting GW and land use	Moderately-contaminated soil and debris triggering action levels, including 2,3,7,8-TCDD between 1 and 10 ug/l (10^{-5} excess cancer risk), dieldrin 37.0 ug/kg (10^{-7} excess cancer risk), and/or a dieldrin and herbicide (2,4,5-T and 2,4,5-TP) combination resulting in a cumulative HI >0.7, will be covered with clean soil. Soil and debris treatment goals for 2,3,7,8-TCDD exceeding 10 ug/kg include 2,3,7,8-TCDD 1.0 ug/kg (health-based) or a 99.9999% destruction removal efficiency, and 2,4-D 10,000 ug/kg, 2,4,5-TP 7,900 ug/kg, and dieldrin 37 ug/kg (health-based), as well as a combined dieldrin and herbicide cumulative HI of <0.7	$1,226,000 (present worth) $384,000 (O&M)
6	Tenth Street Dump/Junkyard, OK Inactive Landfill 09/27/90 1st - Final	Soil contaminated with organics including PCBs	1,600 yd^3 (soil)	Removing red clay cover and plastic liner; excavating PCB-contaminated soil, followed by treatment of the excavated soil using chemical dechlorination and carbon adsorption to control air emissions; and backfilling and regrading the excavated areas	Contaminated soil with levels >300 mg/kg PCB is considered the principal threat. However, the soil excavation goal is PCB 25 mg/kg (TSCA), based on the cost-effectiveness of treating soil with low levels of PCBs along with the highly contaminated soil. Soil residuals will contain <2 mg/kg PCBs	$4,044,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Texarkana Wood Preserving, TX Former Wood Treatment Facility 09/25/90 1st	Soil, sediment, sludge, and GW contaminated with organics including dioxin, PAHs, pesticides, and phenols	77,000 yd^3 (soil, sediment, sludge) 16,000,000 gals (GW)	Excavating and treating soil using incineration; conducting leachability testing of the residual ash, and onsite backfilling of the ash; pumping and treatment of GW using carbon adsorption, with onsite or offsite regeneration, or offsite disposal of the spent carbon; GW pretreatment using ferric hydroxide precipitation and flocculation, followed by clarification and filtration as needed; onsite reinjection; and implementing institutional controls including deed restrictions to limit land use	Soil remediation will reduce the excess cancer risk to below 10^{-6}. GW will be restored to its beneficial use as drinking water. Chemical-specific goals for soil include carcinogenic PAHs 3 mg/kg, total PAHs 2,450 mg/kg, dioxin 20 ug/kg, and pentachlorophenol 150 mg/kg. Chemical-specific goals for GW include carcinogenic PAHs 10 ug/l (detection limit) and dioxin 0.001 mg/l (proposed MCL)	$47,500,000 (present worth) $1,060,000 (O&M)
6	Tinker AFB (Soldier Creek/Bldg 3001), OK Federal Facility 08/16/90 1st	Soil, debris, and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including phenols; and metals including chromium and lead	6,000 - 12,000 gals (hydro-carbons) 45 gals (liquid waste)	Pumping and onsite treatment of GW using air stripping, precipitation, and fine filtration; using the treated water in onsite industrial processes; disposing of any residuals from the treatment processes offsite; recovering hydrocarbons by using a dual fluid production system followed by offsite disposal; removing liquid waste from pit Q-51; placing liquid waste into 55-gallon drums; steam cleaning, backfilling, and covering the pit; storing drums temporarily onsite; disposing of waste from steam cleaning offsite; removing and disposing of a 750-gallon waste tank and properly abandoning, demolishing, and backfilling the onsite fuel oil tank at the North Tank Area; treating soil from the North Tank Area using vapor extraction with destruction of vapors in a thermal combustor; and GW monitoring	Soil remediation goals include a 99% removal of organic contaminants at the North Tank Area. Chemical-specific GW cleanup goals include benzene 5 ug/l (MCL), PCE 5 ug/l (MCL), TCE 5 ug/l (MCL), chromium 50 ug/l (MCL), and lead 50 ug/l (MCL)	$13,198,308 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Vertac, AR 09/27/90 1st	Soil, sediment, and sludge contaminated with 2,3,7,8-tetra-chlorodibenzo-p-dioxin (TCDD)	Not specified	Removing sediment from the active sewage lines between the Vertac plant and the West Wastewater Treatment Plant, and incinerating the sediment onsite, followed by onsite disposal of residual ash; grouting abandoned sewer lines; removing sludge from the sludge digester at the Old Sewage Treatment Plant with onsite incineration of sludge, followed by onsite disposal of residual ash; capping the sludge drying beds with clean soil; demolishing treatment units after removing and treating the accumulated water at the Old Sewage Treatment Plant, followed by onsite discharge of treated water to Rocky Branch Creek; draining and capping the aeration basin at the West Wastewater Treatment Plant; removing soil and sediment with TCE levels >1 ug/kg from Rock Branch Creek and Bayou Meto Floodplains and incinerating these onsite; disposing of the residual ash onsite; continuing to monitor fish in the streams for dioxin; and continuing to enforce a commercial fishing ban and a sport fishing advisory	The Agency for Toxic Substances and Disease Registry has recommended a soil/sediment action level for TCDD of 1 ug/kg for the offsite area, which will result in the reduction of carcinogenic risk from as high as 10^{-3} due to the sewer line sediment to 10^{-5} or 10^{-6}, depending on the point of exposure	$14,000,000 (present worth) $57,000 (annual O&M) (year 1) $46,000 (annual O&M) (years 2-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Fairfield Coal Gasification Plant, IA Former Coal Gas Generator Plant 09/21/90 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and xylenes; other organics including PAHs; and metals including arsenic, chromium, and lead	3,800 yd^3 (tar, waste, soil, and sediment) 1,577,000 gals (GW)	Excavating both PAH-contaminated coal tar, waste, soil, and sediment from the source areas and an undetermined quantity of soil from these site areas after separating and decontaminating larger items, followed by offsite treatment using incineration; GW pumping and treatment using filtration, polymer injection, and settling out of the sludge wastes, followed by treatment of the supernate using carbon adsorption with offsite discharge to a publicly owned treatment works (POTW) or onsite use of the treated water in a nutrient addition treatment process; disposing of the settled sludge in accordance with approved disposal methods; treating coal gas migration areas by enhanced bioremediation if a pilot study proves successful; and implementing institutional controls, including GW and land use restrictions, and site access restrictions	GW will be treated to reduce the level of contaminants to State levels, including benzene 1 ug/l (10^{-6} cancer risk level), and toluene 2,000 ug/l (lifetime health advisory). GW will be treated to Best Available Detection levels. If the GW remediation levels cannot be attained, alternate concentration levels may be established or a chemical-specific ARAR waiver may be invoked. Cleanup levels for soil are based on the risk assessment and include total PAHs 500 ug/kg, carcinogenic PAHs 100 ug/kg, and benzene 241 kg/l	$5,815,000 (present worth) $4,762,000 (O&M)
7	Hastings Groundwater Contamination (East Industrial Park), NE Contaminated Aquifer 09/28/90 1st	Soil contaminated with organics including PAHs; metals including arsenic, chromium, and lead; and TNT	125,900 yd^3 (soil)	Excavating and treating 16,400 yd^3 of organic-contaminated soil using onsite incineration with final residue deposition based on residual analysis; stabilizing 39,000 yd^3 of metal-contaminated soil, followed by placing the soil in an onsite RCRA Subtitle-C hazardous waste landfill, and stabilizing 70,500 yd^3 soil with low levels of organic and explosive contamination, if effective, and placing stabilized soil in the constructed onsite landfill. If stabilizing low level contaminated soil is ineffective, the soil will be placed directly into the landfill, unless they are RCRA characteristic hazardous waste, which will be treated then landfilled	Soil with concentrations exceeding TNT 660 mg/kg or PAHs 1.8 mg/kg (carcinogenic risk exceeding 10^{-4}) will be remediated by incineration. Cleanup goals for surface soil contaminants include TNT 2.5 mg/kg (based on carcinogenic risk), total PAHs 50 ug/kg (based on analytical detection limits), arsenic 11 mg/kg (background levels), cadmium 25 mg/kg (toxic risk level), chromium 230 mg/kg (toxic risk level), and lead 69 mg/kg (toxic risk level)	$45,000,000 (present worth) $86,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Hastings Groundwater Contamination (FAR-MAR-CO), NE Contaminated Aquifer 09/28/90 2nd	None	Not applicable	No further action remedy with continued GW monitoring on a semi-annual basis	Not applicable	$0 (present worth) $0 (O&M)
7	Lindsay Manufacturing, NE Irrigation Sprinkler Manufacturing Facility 09/28/90 1st - Final	Soil and GW contaminated with VOCs including PCE; and metals including chromium and lead	Not specified	Treating soil using vacuum extraction (SVE), followed by a carbon adsorption filter system before vapor emission with full-scale implementation based on the results of a pilot study; onsite pumping and treatment of GW using precipitation and flocculation, followed by sedimentation of the flocculant with onsite discharge to SW; and disposing of dewatered solid residuals offsite at a local landfill	Cleanup levels are based on the more stringent of either SDWA MCLs or State regulations. Specific GW cleanup goals include PCE 5 ug/l (proposed MCL), chromium 0.05 mg/l (MCL), and lead 0.05 mg/l (MCL). Specific cleanup levels for soil were not provided	$3,006,600 (present worth) $636,000 (O&M)
7	Midwest Manufacturing/ North Farm, IA Former Electroplating and Painting Operation 09/27/90 1st - Final	Soil, waste, and GW contaminated with VOCs including PCE, TCE, toluene, and xylenes; and metals including chromium and lead	Not specified	Capping the waste disposal cell with a low permeability cap in accordance with RCRA landfill closure requirements; treating GW using air stripping, with possible treatment of the vapor/air mixture using carbon adsorption, and filtering water, if needed; discharging the treated water onsite to the Skunk River or offsite to a publicly owned treatment works (POTW); GW monitoring; and implementing institutional controls including deed and GW use restrictions	Site-specific cleanup goals are based on State anti-degradation requirements	$288,419 (capital) $200,425 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Missouri Electric Works, MO Electrical Equipment Sales, Service, and Remanufacturing Operation 09/28/90 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, PCE, and TCE; and other organics including PCBs	Not specified	Excavating and treating PCB-contaminated soil and sediment onsite using incineration; placing exhaust gases through flue-gas coolers and particulate removal systems; removing acid gases in-situ; backfilling with residual materials based on leachability test results; constructing a soil cover over the site; pumping and treatment of GW with filtration and treatment using air stripping with subsequent carbon adsorption; and discharging the treated water offsite to a surface drainage ditch between the site and the wetlands or to a publicly owned treatment works (POTW)	Contaminant levels for soil and sediment after treatment will represent an excess upper bound lifetime cancer risk of $2x10^{-5}$. Cleanup levels for GW will be 10^{-5} and cleanup levels meet the TSCA PCB Spill Cleanup Policy, State water quality standards, and Federal MCLs for VOCs. Specific goals include TCE 5 ug/l (MCL) for GW, PCB 10 mg/kg (TSCA) for soil to a depth of 4 ft, and PCB 10 mg/kg (TSCA) for soil below a 4-ft depth	$9,130,000 (present worth) $64,010 (O&M)
7	Northwestern States Portland Cement, IA Cement Manufacturing Facility 06/26/90 1st - Final	GW and SW contaminated with organics including phenols; metals including chromium and lead; and other inorganics including waste kiln cement dust	Not specified	Continued acid neutralization of the water from the dewatered West Quarry, followed by discharge of the treated wate to Calmus Creek; construction of a permanent drainage system in the dewatered West Quarry; treating GW onsite prior to discharge to Calmus Creek; installation of dewatering wells; and monitoring GW and treated discharge	Discharge to Calmus Creek will meet State effluent limitations including pH 6.0 to 9.0 and phenol 0.05 mg/l. Treated GW will meet State GW action levels and SDWA MCLs, including chromium 0.5 mg/l (SDWA), lead 0.05 mg/l (SDWA), and pH 6.5 to 8.5 (SDWA)	$2,037,129 (present worth) $210,000 (O&M) (year 0-1) $65,000 (O&M) (subsequent years)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Shenandoah Stables, MO Arena and Horse Stables 09/28/90 2nd - Final	Soil and debris contaminated with dioxin	3,471 yd^3 (contaminated material)	Transporting soil and debris material offsite to the Times Beach Superfund site for thermal treatment, followed by land disposal of treatment residuals; and restoring the Shenandoah Stables site by decontaminating and dismantling the onsite storage buildings	Thermal treatment will ensure 99.9999% destruction and removal of dioxin from contaminated soil and debris	$2,800,000 (present worth) $0 (O&M)
7	Waverly Groundwater Contamination, NE Ground Water Aquifer 09/26/90 1st - Final	Soil and GW contaminated with VOCs including carbon tetrachloride and chloroform	Not specified	Continued operation and maintenance of the GW air stripping system and soil vapor extraction system; GW monitoring; evaluation of the construction of PWS 3 to explain contamination in the well; sampling existing and new wells; development of a GW transport model; and investigation of potential uses for treated water discharged offsite	Soil gas cleanup levels for VOCs will be reduced to the performance criteria level of 6.5 ug/l for the site. Soil levels were below the calculated cleanup levels of 1.1 mg/kg and 1.7 mg/kg for carbon tetrachloride and chloroform, respectively. The treated water discharge will meet State NPDES permit levels of 5 ug/l for carbon tetrachloride and 3.8 ug/l for chloroform. GW cleanup levels will meet MCLs including carbon tetrachloride 5 ug/l (MCL) and chloroform below 3.8 ug/l (MCL)	$3,550,000 (present worth) $451,000 (O&M)
7	Weldon Spring Quarry/Plant/Pits (USDOE), MO Federal Facility 09/28/90 2nd	Soil, sludge, and debris contaminated with organics including PCBs, and PAHs; metals including arsenic and lead; and radioactive materials	95,000 yd^3 (bulk waste)	Excavating chemically- and radioactively-contaminated bulk wastes from the quarry and disposing of the wastes onsite at the temporary storage facility in the chemical plant area; and implementing site access restrictions	Not specified	$11,000,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Wheeling Disposal Service, MO Inactive Industrial and Sanitary Landfill 09/27/90 1st	Soil, sediment, GW, and SW contaminated with VOCs including TCE and toluene; other organics including pesticides; and metals including arsenic, chromium, and lead	Not specified	Upgrading the existing landfill cap with a revegetated clay and soil cover; monitoring onsite GW and SW; abandoning onsite wells; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing	Performance criteria for GW and SW will be developed, and may be based on Federal MCLs, Ambient Water Quality Criteria, or State water quality standards. If contaminated levels exceed these criteria, GW treatment and/or leachate collection and treatment may be required	$1,205,800 (present worth) $42,000 (O&M)
7	White Farm Equipment Dump, IA Active Landfill 09/28/90 1st - Final	Soil, debris, and GW contaminated with VOCs including benzene and toluene; and metals including arsenic, chromium, and lead	650,000 yd^3 (wet scrubber sludges, foundry sands, baghouse dusts, and other industrial wastes)	Regrading and covering the landfill with an impermeable layer of topsoil and vegetation to prevent contaminant infiltration, leaching, runoff, and erosion; pumping and treatment of GW using air stripping, followed by onsite discharge of treated water; controlling air emissions by carbon adsorption with offsite disposal of residuals; monitoring metal contaminant levels and adding a metals treatment train as necessary; GW monitoring; and implementing site access restrictions and institutional controls including deed restrictions	The concentration of benzene in GW will be reduced and maintained below 1 ug/l (State standard)	$2,352,121 (present worth) $89,345 (O&M) (years 0-5) $35,865 (O&M) (years 6-30)
8	East Helena, MT Active Lead Smelting Facility 11/22/89 1st	Soil, sediment, and SW contaminated with metals including arsenic and lead	6,250 yd^3 (soil) 48,900 yd^3 (sediment)	Excavating and treating soil and sediment from process ponds with onsite smelting; treating Lower Lake water by metal co-precipitation; replacing the ponds with a tank and a secondary containment facility; and installing closed-circuit filtration treatment system	Soil and sediment with leachate concentrations exceeding MCLs will be excavated; Lower Lake process water will be treated to 0.02 mg/l arsenic, which is below the Federal MCL; process waters will be treated for lead to 0.05 mg/l (MCL); State water quality standards for lead and arsenic were waived due to technical impracticability	$9,644,500 (present worth) $611,200 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Martin Marietta, Denver Aerospace, CO Technology Engineering, Design, Development, and Manufacturing facility 09/24/90 1st	Soil, debris, and GW contaminated with VOCs including TCE, toluene, xylenes; other organics including PCBs pesticides and phenols; and metals including chromium and lead	24,000 yd^3 (soil) 2,100 yd^3 (debris)	Remediation of the Inactive Site Ponds Area includes dewatering perched water zones; excavating and incinerating offsite 2,100 yd^3 of organic waste/soil from in and around the ponds; thermally treating 24,000 yd^3 of organic-contaminated soil; solidifying and stabilizing remaining soil contaminated with inorganics; backfilling excavated areas with treated soil; and capping the ponds area. Remediation of the Chemical Storage Area includes in-situ soil vapor extraction and incineration of VOC-contaminated soil, followed by offsite disposal of residuals and spent carbon. Onsite pumping and treatment of GW using air stripping, carbon adsorption, ion exchange, UV photolysis/oxidation, chemical reduction, and precipitation, followed by onsite discharge to SW; and GW monitoring.	Both onsite and offsite GW will be treated to meet SDWA MCLs or MCLGs, including benzene 5 ug/l (MCL), arsenic 50 ug/l (MCL), chromium 50 ug/l (MCL), lead 5 ug/l (MCL), and TCE 5 ug/l (MCL). Chemical-specific soil cleanup levels are based on soil action levels and TCLP treatment standards including toluene 28 mg/kg (TCLP), PCB 1.0 mg/kg (TCLP), and TCE 0.09 mg/kg (TCLP)	$58,240,000 (present worth) $1,231,500 (annual O&M)
8	Monticello Mill Tailings (DOE), UT Inactive Uranium and Vanadium Milling Operation Facility and Adjacent Properties 08/22/90 1st	Soil and debris contaminated with metals including arsenic, chromium, and lead; and radioactive materials including $radium^{226}$ and radon	300,000 yd^3 (soil) 1,500,000 yd^3 (debris)	Dewatering and excavating tailings, soil, and process-related material from the tailings piles; followed by onsite disposal; diverting Montezuma Creek to allow for the relocation of mill tailings and contaminated floodplain soil; excavating soil from the peripheral properties, followed by onsite consolidation and disposal; treating surface runoff and construction/dewatering water collected during construction using evaporation ponds, reverse osmosis, or another technology and discharging treated water onsite to Montezuma Creek; disposing of any treated residuals onsite or offsite; covering the onsite disposal repository with a clay and multi-media cap; GW and air monitoring; and implementing institutional controls and site access restrictions	Federal standards for $radium^{-226}$ are 5 pCi/g above background in the surface 15 cm of soil, and 15 pCi/g above background level for $radium^{226}$ in the deeper 15 cm-thick layer. Because the background level at the site is radium226 1.0$\pm$ 0.4 pCi/g, excavation levels were set at 6 pCi/g for surficial soil, and 16 pCi/g for soil >15 cm deep. The Federal standard of 20 $pCi/m^2/sec$ for radon emissions also will be met	$64,787,500 - $70,600,000 (present worth) $40,846 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Mystery Bridge at Highway 20, WY Industrial Area with Residential Subdivisions 09/24/90 1st	GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes	Not specified	Pumping and treatment of GW in the VHO plume followed by air stripping in the more contaminated upgradient portion of the plume; pumping and treatment of GW in the BETX plume using air stripping; reinjecting the treated GW from both plumes into the onsite alluvial aquifer; GW and air monitoring; and implementing institutional controls including deed and GW use restrictions	Chemical-specific GW cleanup goals are based on Safe Drinking Water Act MCLs including benzene 5 ug/l (MCL), toluene 2,000 ug/l (proposed MCL), and xylenes 10,000 ug/l (proposed MCL)	$601,739 (present worth) $122,914 (O&M) (for 6 years at the VHO plume) $50,564 (O&M) (for 1 year at the BETX plume)
8	Ogden Defense Depot, UT Federal Facility 09/27/90 1st	Soil and GW contaminated with VOCs including benzene, PCE, and TCE; and other organics including pesticides and herbicides	40 yd^3 (soil) 28,000,000 gals (GW)	Excavating soil from the french drain area, followed by offsite incineration and disposal at a hazardous waste treatment facility; pumping and treatment of GW using air stripping and possibly liquid phase carbon adsorption; reinjecting or infiltrating treated GW onsite; and GW monitoring	The excavation level for soil has been set at the lowest consistently detected concentration level including pesticides/herbicides (chlordane/bromacide) 1 mg/kg. GW cleanup goals are Federal MCLs and include TCE 5 ug/l (MCL) and chlordane 2 ug/l (MCL)	$676,000 (present worth) $75,000 - $103,000 (O&M)
8	Portland Cement (Kiln Dust #2 & #3), UT Industrial Commercial Site 07/19/90 1st	Waste Cement Kiln Dust (CKD) contaminated with metals including arsenic, chromium, and lead; and other inorganics	495,000 yd^3 (waste CKD) 360 tons (chromium-bearing refractory brick)	Excavation and offsite disposal of waste CKD at a noncommercial, industrial landfill, which will be capped; removal of 360 tons of chromium-bearing refractory kiln bricks from waste CKD prior to offsite disposal of the waste CKD, followed by temporary onsite storage; GW monitoring; and implementing institutional controls including well construction and deed restrictions	Offsite disposal of waste CKD will eliminate fugitive dust emissions from the site, thereby complying with Federal and State air quality standards. Final soil and GW cleanup levels will be addressed in a subsequent operable unit	$12,143,000 (present worth) $5,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Rocky Flats Plant (DOE), CO Federal Facility 01/05/90 1st	GW contaminated with VOCs including PCE and TCE; metals including chromium; and radioactive materials	Not specified	Intercepting GW in alluvial/colluvial aquifer using french drain system with treatment in an onsite plant using filtration, followed by UV-peroxide to remove organics, and ion exchange to remove inorganics; storing treated water temporarily onsite during effluent quality testing prior to discharging the treated water to an onsite interceptor ditch; and GW monitoring	GW cleanup standards have been chosen as the more stringent of Federal MCLs or MCLGs, or State water quality standards and include PCE 5 ug/l (State), TCE 5 ug/l (State), trivalent chromium 0.05 mg/l (State), and chromium 0.05 mg/l (State)	$4,588,200 (present worth) $258,100 (O&M)
8	Rocky Mountain Arsenal (OU16), CO Federal Facility 02/26/90 2nd	Soil, sludge, and GW contaminated with organics including pesticides, and metals including arsenic	9,000 yd^3 (soil and sludge)	Sampling and relocating tanks from the basin area to an adjacent area to await final disposition; constructing a temporary 360-degree subsurface barrier such as a slurry wall or sheet pilings around the basin; performing an in-situ vitrification demonstration test; treating soil and sludge using in-situ vitrification followed by carbon adsorption to treat off-gasses; treating recovered water driven from the sludge during the vitrification process onsite at the CERCLA Wastewater Treatment System or by another to be determined method; and GW and air monitoring. The vitrified soil will remain onsite, pending determination of a final remediation action	The treatment process will be constructed to provide 99.99% destruction and removal of organics. Treatment standards for effluent from the off-gas control process and other liquids generated through dewatering of the area are contained in the ROD for the CERCLA Wastewater Treatment System. Air emissions from the vitrification process will comply with applicable Clean Air Act emissions standards	Not specified

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Rocky Mountain Arsenal (OU17), CO Federal Facility 05/14/90 8th	Wastewater contaminated with VOCs including benzene, PCE, TCE, and toluene; other organics including pesticides; and metals including arsenic, chromium, and lead	Not specified	Constructing a centrally-located wastewater treatment facility that will consist of chemical addition/precipitation, filtration, ultraviolet light/chemical oxidation, activated carbon adsorption, air stripping and an activated alumina treatment process; constructing decontamination pads at both the treatment facility and satellite nontreatment wastewater facilities; constructing 5 storage tanks onsite; incorporating offsite discharge of the treated effluent to the sanitary sewer; and offsite disposal of treatment facility sludge and residuals	Chemical-specific ARARs, based on State standards and MCLs will be applied to the design of the treatment system and include arsenic 50 ug/l (MCL), benzene 5 ug/l (MCL), chromium 50 ug/l (MCL), lead 50 ug/l (MCL), PCE 10 ug/l (State), toluene 2,420 ug/l (State), and TCE 5 ug/l (MCL)	Not specified
8	Rocky Mountain Arsenal (OU18), CO Federal Facility 02/26/90 3rd	Soil and GW contaminated with VOCs including benzene and TCE	Not specified	Conducting a vapor extraction pilot test; installing and operating an in-situ vapor extraction system followed by granular activated carbon treatment of condensed water vapor with offsite thermal carbon reactivation; capping the site with a layer of asphalt to improve the efficiency of the vapor extraction system; conducting air monitoring followed by possible stack treatment by a vapor phase carbon filter or catalytic oxidizer; pumping and treatment of GW and reinjection in conjunction with the Rail Classification Yard IRA	No chemical-specific goals were identified for soil contaminants. Chemical-specific goals for GW treatment, which apply at the point of injection, are contained in the ROD for the Rail Classification Yard IRA and include benzene 5 ug/l (MCL)	Not specified
8	Rocky Mountain Arsenal (OU19), CO Federal Facility 02/26/90 4th	GW contaminated with pesticides including DBCP	Not specified	Installing a GW interception/containment system parallel to the contaminant flowpath; increasing the treatment capacity, of the Irondale Control System (ICS) and constructing pipelines to convey extracted GW to the ICS; pumping and treatment of GW using carbon adsoprtion at the ICS followed by reinjection; and GW monitoring	The chemical-specific goal for GW treatment of DBCP is 0.2 ug/l based on a proposed MCL. Chemical-specific goals for other potential contaminants are based on MCLs and Colorado Basic Standards for GW (CBSG), and include benzene 5 ug/l (MCL), toluene 2,420 ug/l (CBSG), and TCE 5 ug/l (MCL)	$2,662,000 (present worth) $183,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Rocky Mountain Arsenal (OU20), CO Federal Facility 03/20/90 5th	Soil, sludge, and GW contaminated with organics including pesticides; and metals including arsenic, chromium, and lead	106,000 yd^3 (sludge)	Consolidating sludge adjacent to the basins with sludge in the basins and containing the sludge and any excavated contaminated soil with a vegetative soil cover; hydraulically containing GW with a slurry wall or sheet pilings constructed around the perimeter of basin area; pumping GW to maintain an inward hydraulic gradient across the slurry wall; treating GW onsite, either at the CERCLA Wastewater Treatment System or at a separate onsite treatment facility to remove organic and inorganic contaminants; and GW monitoring	Chemical-specific ARARs for GW treatment will be contained in the ROD for the CERCLA Wastewater Treatment System IRA. No chemical-specific ARARs were provided for soil or sludge	Not specified
8	Rocky Mountain Arsenal (OU22), CO Federal Facility 05/03/90 6th	None	Not specified	No further action with GW monitoring. A re-evaluation procedure will be determined to identify the need for any additional remedial actions	Not applicable	Not specified
8	Rocky Mountain Arsenal (OU23), CO Federal Facility 05/03/90 7th	Soil and GW contaminated with VOCs; and other organics including pesticides	Not specified	Constructing a subsurface barrier around the perimeter of the site, such as a slurry wall tied into a impermeable clay layer located beneath the sand aquifer to effectively contain GW and DNAPLs; covering the trench area with a vegetative soil cover to reduce precipitation infiltration; and investigating further the DNAPL plume, which is located downgradient to the trench area	Not specified	$1,500,000 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Sand Creek Industrial, CO Active Chemical Manufacturing Facility 09/28/90 2nd	Soil contaminated with organics including pesticides; and metals including arsenic and chromium	14,000 yd^3 (soil)	Excavating and treating surface soil above the health-based action levels onsite using soil washing, and subsequently backfilling the treated soil onsite; grading and revegetating the site; incinerating the soil washing wastewater offsite; and GW monitoring	Remediation goals are based on health-based action levels or RCRA treatability variance action levels, whichever is more stringent. Health-based action levels were established for soil based on a 10^{-6} cancer risk and include dieldrin 0.155 mg/kg and heptachlor 0.553 mg/kg. Treatability variance action levels were established for arsenic (90-99% reduction), chromium 0.5-0.6 mg/l (TCLP), chlordane (90-99% reduction), 2,4-D (90-99% reduction) and 4,4-DDT 0.5-20 mg/l (Total Waste Analysis)	$4,490,734 (present worth) $20,000 (O&M)
8	Sharon Steel (Midvale Tailings), UT Former Ore Milling Operation Facility 09/24/90 1st	Offsite soil contaminated with metals including arsenic, cadmium, and lead	242,000 yd^3 (soil)	Excavating contaminated soil with lead levels >500 mg/kg and arsenic levels >70 mg/kg to a maximum depth of 2 ft; temporarily disposing of soil onsite, for future treatment with onsite tailings; temporarily relocating offsite residents as necessary; and indoor cleaning, if required	Soil contaminated with concentrations greater than the action levels of lead 500 mg/kg and arsenic 70 mg/kg will be excavated and disposed of onsite	$22,650,000 (present worth) $72,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Silver Bow Creek, MT Mining and Processing Area 09/28/90 1st	Soil, sediment, GW, and SW contaminated with metals including arsenic, cadmium, copper, lead, and zinc	3,000,000 yd^3 (tailings)	Raising and strengthening all pond berms; increasing the capacity of Pond 3 to receive and treat (using metals precipitation) flows up to a 100-year flood level, and constructing new inlet and hydraulic structures; constructing spillways for routing excess flood water into the bypass channel; flooding (wet-closure) the dry portions of Pond 2; reconstructing the Mill-Willow Bypass channel, and removing all remaining tailings and contaminated soil from the bypass, followed by consolidation of the tailings and soil within the dry portions of Ponds 1 and 3; capping the closure areas, dewatering Pond 1 and covering the area with a RCRA-type cap; collecting contaminated water from below Pond 1 and transporting it to Pond 3 for treatment; GW monitoring; and implementing institutional controls and site access restrictions	Final soil cleanup levels will be set within 1 year of this ROD. GW pumping and discharge for treatment in the pond system will comply with State standards, with the exception of arsenic (0.02 mg/l) and lead (0.05 mg/l). State SW concentrations of arsenic and mercury require an ARAR waiver based on technical impracticability and the fact that this is an interim remedy. The replacement criteria are arsenic 0.02 mg/l and mercury 0.0002 mg/l at the beginning of the river	$57,416,000 (present worth) $379,000 (O&M)
8	Whitewood Creek, SD Mining Site 03/30/90 1st - Final	Soil contaminated with arsenic	Not specified	Removing and/or covering frequently used residential areas with clean surface soil (arsenic <20 mg/kg), followed by offsite disposal (contingent on EPA approval) of the removed arsenic-contaminated soil, and revegetation; SW monitoring; and implementing institutional controls including land and access restrictions	Arsenic levels may not exceed 100 mg/kg (based on 10^{-4} target-risk level)	$882,813 (present worth) $12,000 (O&M) (years 0-5) $6,000 (O&M) (years 6-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Applied Materials, CA Active Equipment Manufacturing Facility 09/28/90 1st	GW contaminated with VOCs including PCE, TCE, and 1,1,1-TCA	Not specified	Pumping and treatment of GW onsite using an existing air stripping unit, followed by onsite discharge to surface water; GW monitoring; and implementing institutional controls including deed restrictions	GW cleanup levels will meet State and Federal Drinking Water MCLs including PCE 0.005 ug/l (MCL), TCE 0.005 ug/l (MCL), and 1,1,1-TCA 0.0032 ug/l (MCL)	$715,000 (present worth) O&M (not specified)
9	Coalinga Asbestos Mine, CA Asbestos Handling and Shipment Area 09/21/90 2nd - Final	SW contaminated with asbestos	Not specified	Consolidating soil and asbestos ores within the tailing pile; grading and revegetating tailing pile; diverting SW away from the tailing pile; improving an existing sediment trapping dam by constructing a concrete spillway; dismantling the mill building; paving the mill access road; and implementing engineering controls, institutional controls including deed restrictions, and site access restrictions including fencing	A specific cleanup goal for asbestos was not determined due to uncertainties in sampling parameters; however, the selected remedy will reduce the excess lifetime cancer risk to the level of 10^{-4} to 10^{-6}	$1,947,000 (present worth) $815,000 (O&M)
9	Intel (Santa Clara III), CA Industrial Facilities Area 09/20/90 1st - Final	GW contaminated with VOCs including TCE	Not specified	Installing an additional extraction well onsite; continued pumping and treatment of GW using an existing granular activated carbon adsorption system, with regeneration of carbon filters offsite; discharging treated GW to onsite SW; conducting a treatability study to evaluate the effectiveness of pulse pumping; GW monitoring; and implementing institutional controls including deed restrictions to limit GW use	GW cleanup goals will reduce the excess lifetime cancer risk for carcinogens from 10^{-4} to 10^{-6} and will reduce the HI to ≤ 1. Chemical-specific goals include TCE 5 ug/l (State MCL)	$594,400 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Intersil, CA Industrial Facilities Area 09/27/90 1st - Final	Soil and GW contaminated with VOCs including PCE, TCE, and toluene; and other organics including phenols	40 yd^3 (soil)	Enhancement and/or expansion of onsite and offsite GW pumping and treatment systems, which use air stripping, and the onsite soil vapor extraction systems, which use carbon adsorption at the Siemens and Intersil facilities; excavating soil at the Siemens facility, followed by offsite disposal; discharging treated GW to onsite SW; and monitoring soil vapor and GW	Soil cleanup goals have been set at total VOCs 1 mg/kg for vapor extraction and 10 mg/kg for semi-VOCs, which are excavated and disposed of offsite. GW cleanup standards were chosen as the more stringent of Federal or State MCLs, or State Recommended Drinking Water Action Levels (RDWALs). Chemical-specific goals include PCE 5 ug/l (State MCL), TCE 5 ug/l (State MCL), and toluene 100 ug/l (RDWAL)	$18,750,000 (present worth) O&M (not specified)
9	J.H. Baxter Active Wood Treatment and Lumber Product Manufacturing Facility 09/27/90 1st - Final	Soil, sediment, GW, and SW contaminated with organics including PAHs and dioxins; and metals including arsenic	41,000 yd^3 (soil)	Excavation of soil, followed by biological treatment for soil with organic contaminants, chemical fixation for soil with inorganic contaminants, biological treatment and chemical fixation for soil with both organic and inorganic contaminants, and onsite disposal of treated soil in lined cells; leachate collection and treatment; pumping and treatment of GW using biological treatment, chemical precipitation, and polishing, prior to onsite discharge of treated GW; long-term GW, SW, and air monitoring; and implementing institutional controls. All sediment in the site drainage system with detectable levels of wood treatment chemicals will be excavated and treated with stabilized soil	Chemical-specific cleanup goals for soil include arsenic 8 mg/kg (background), carcinogenic PAHs 0.5 mg/kg (10^{-6} risk level and detection limit), and dioxin 1 ug/kg (detection limit). Chemical-specific goals for GW are based on MCLs or non-zero MCLGs, State MCLs, the 10^{-5} to 10^{-6} risk range, or whichever is more restrictive, and include arsenic 5 ug/l (10^{-5} to 10^{-6} risk range), PAHs 5 ug/l (detection limit), and dioxin 0.000025 ug/kg (10^{-5} to 10^{-6} risk range)	$37,829,100 (present worth) $1,207,600 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Louisiana-Pacific, CA Active Wood Processing Plant and Landfill 09/28/90 1st	Soil and GW contaminated with VOCs including toluene; organics including formaldehyde; and metals including arsenic	Not specified	Onsite GW monitoring; and implementing institutional controls including deed and well permit restrictions, and site access restrictions, such as fencing	EPA has determined that before final remedial action goals can be set, additional information is necessary to determine background arsenic levels in soil, and formaldehyde and arsenic levels in GW. Therefore, no chemical-specific goals are provided	$193,000 (present worth) No significant O&M costs associated with this action
9	Operating Industries Landfill, CA Inactive Municipal Landfill 09/28/90 3rd (Amendment)	Air contaminated with VOCs including benzene, PCE, TCE, and toluene	Not specified	Capping the landfill to reduce surface gas emissions, prevent oxygen intrusion and SW infiltration, and provide erosion control; installing landfill gas extraction wells around the perimeter and on top of the cap; collecting and treating landfill gas by incineration; and dewatering saturated landfill zones	Destruction and removal efficiency of 99.99% for each organic landfill gas component, will meet RCRA requirements	$125,300,000 - $181,300,000 (present worth) $3,700,000 - $4,100,000 (O&M)
9	Solvent Service, CA Active Treatment, Storage, and Disposal Facility 09/27/90 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes	Not specified	Capping the entire site with asphalt; operating a steam injection and vacuum extraction (SIVE) system for the removal of VOCs from soil; pumping and treatment of GW using bio-treatment, carbon adsorption, and air stripping; soil and GW monitoring; and implementing institutional controls including deed restrictions	A soil remediation goal of 1 ug/l total VOCs has been set to protect the GW from future VOC leaching. Inorganic soil cleanup goals have not been established due to uncertainty surrounding the natural occurrence of metals in soil in the South Bay area. GW remediation goals include benzene 1 ug/l (State MCL), PCE 5 ug/l (State MCL), TCE 5 ug/l (State MCL), toluene 1,000 ug/l (Federal MCl), and xylenes 1,750 ug/l (State MCL)	$948,000 (capital) $1,172,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Stringfellow, CA Inactive Hazardous Waste Disposal Facility 09/30/90 4th	GW contaminated with VOCs including TCE	Not specified	Dewatering bedrock in original disposal area (Zone 1), followed by GW treatment at the existing onsite pretreatment plant, and offsite discharge to a POTW facility; GW pumping and treatment using air stripping or granular activated carbon, and reverse osmosis in Zone 4, followed by onsite reinjection or disposal in an industrial sewer; conducting field tests on reinjection of treated GW in Zones 2 and 3; and performing treatability tests on soil vapor extraction at Zone 1	No remediation goals have been determined in this ROD for Zone 1 GW contamination because this is an interim measure. Chemical-specific goals for GW in Zone 4 include TCE 5 ug/l (SDWA MCLs)	$115,000,000 (present worth) O&M (not specified)
9	Watkins-Johnson (Stewart Division), CA Active Industrial Complex 06/29/90 1st - Final	Soil and GW contaminated with VOCs including PCE and TCE, and metals including silver	Not specified	Soil vapor (vacuum) extraction with pretreatment of extracted vapors using GAC prior to ambient discharge; capping and grading contaminated soil areas to minimize the potential for mobilization of soil contaminants to GW; installing infiltration leachfields to prevent offsite migration of GW contaminants in the perched zone; installing gravity drains to transfer contaminated GW from the perched zone to the regional aquifer zone for subsequent extraction; GW pumping and onsite treatment using GAC adsorption with offsite regeneration of spent carbon; onsite discharge of treated water for reuse or offsite discharge to SW; and GW monitoring	GW treatment standards for both the perched and regional zones were based on chemical-specific SDWA MCLGs or the more stringent of SDWA MCLs or PMCLs and State MCLs. Chemical-specific goals include PCE 0.005 mg/l (PMCL) and TCE 0.005 mg/l (MCL). No chemical-specific goals have been set for soil	$2,156,243 (present worth) $167,820 (O&M)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	FMC Yakima Pit, WA Former Pesticide Formulation Facility 09/14/90 1st	Soil and debris contaminated with organics including pesticides; and metals including chromium	900 yd^3 (soil) 1,460 ft^2 (concrete structures)	Excavation and onsite incineration of soil; dismantling of contaminated portions of buildings and, if necessary, repairing those buildings where the removal activities may affect their structural integrity; onsite incineration of contaminated concrete building structures or offsite disposal at a RCRA Subtitle C-permitted hazardous waste facility, depending on volume; analysis of ash from the incinerated materials prior to onsite disposal if ash meets cleanup goals or offsite disposal if ash remains contaminated; and GW monitoring	Soil will be excavated to health-based levels, which are based on a 10^{-6} cancer risk and a HI=1. Health-based surface concentrations were determined for concrete building structures based on a 10^{-6} cancer risk and a HI=1. Health-based excavation and cleanup goals were provided for pesticides and metals, including chromium 1 mg/kg	$1,755,000 (present worth) $33,000 (O&M)
10	Fort Lewis Logistics Center, WA Federal Facility 09/25/90 1st	GW contaminated with VOCs including PCE, TCE, and DCE	Not specified	Pumping and onsite treatment of GW using air stripping to remove VOCs; discharging the treated water onsite to infiltration trenches, including one trench located upgradient to facilitate flushing of secondary contaminant sources; confirmation soil sampling; investigating deep aquifer contamination for possible remediation; and implementing institutional controls	GW cleanup standards are based on Federal MCLs and include PCE 5 ug/l, TCE 5 ug/l, and DCE 70 mg/l	$9,068,000 (present worth) $517,000 (O&M exclusive of maintenance)

FY90 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Silver Mountain Mine, WA 5-Acre Abandoned Mine Dump 03/27/90 1st - Final	Soil and mined material contaminated with metals including arsenic (naturally occurring) and other inorganics including cyanide	5,740 yd^3 (soil and mine dump material)	Consolidating all soil and mine dump material with the leach heap, followed by grading and contouring the consolidated materials; capping the heap and consolidated materials with a soil/clay cap; plugging the mine entrance and removing a mine drainage pipe that supplies the animal water supply tank, and installing a new well for an alternate animal water supply; GW monitoring; and implementing institutional controls including deed restrictions	All material with concentrations of arsenic >200 mg/kg (based on a HI=1 and a cancer-risk level of 10^{-4}) or cyanide >95 mg/kg (based on a HI=1) will be consolidated and covered. GW will not be treated unless monitoring detects concentrations exceeding standards set for cyanide 154 ug/l (based on a health advisory) and arsenic 6 ug/l (based on 10^{-4} cancer-risk level) at the point of compliance, which is 100-200 ft downgradient from the edge of the leach heap	$635,600 (present worth) $39,650 (annual O&M) (years 1-30)
10	Teledyne Wah Chang Albany (TWCA), OR Active Metal Production Plant 12/28/89 1st	Sludge ponds contaminated with organics; and metals including chromium, lead, and zirconium; and radioactive materials	85,000 yd^3 (sludge)	Excavation and partial onsite solidification of sludge, followed by offsite disposal in a permitted solid waste landfill	Individual contaminant goals were not specified for this interim remedial action; the selected remedy will attain Federal and State ARARs	$10,716,000 (present worth) $0 (O&M)

SECTION IV

RECORDS OF DECISION SUMMARY TABLE

FY 1982-1989

The FY 1982-1989 Record of Decision Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed between FY 1982-1989. The table is presented by Region, in alphabetical order according to the site name.

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Auburn Road, NH 09/17/86 1st	GW contaminated with VOCs including TCE, organics, and inorganics	Not specified	Extension of existing municipal water supply	Not specified	$2,372,000 (present worth) $57,000 (annual O&M)
1	Auburn Road Landfill, NH 14-Acre Landfill Area 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including benzene, toluene, TCE, and PCE; and metals including arsenic and lead	Not specified	Downgradient GW pumping and treatment using chemical coagulation and precipitation to remove metal contaminants and air stripping to remove VOCs, which will be collected in a vapor phase carbon adsorption system, followed by onsite discharge to recharge trenches; GW monitoring; and capping	Target GW cleanup goals are based on SDWA MCLs or PMCLs and include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), PCE 5 ug/l (PMCL), TCE 5 ug/l (MCL), arsenic 50 ug/l (MCL), and lead 50 ug/l (MCL)	$24,100,000 (present worth) $1,460,000 (annual present worth O&M)
1	Baird & McGuire, MA 09/30/86 1st	GW, soil, and sediment contaminated with VOCs, organics, pesticides, dioxin, PAHs, and metals	191,000 yd^3	Excavation and onsite thermal destruction of contaminated soil; GW pump and treatment with onsite discharge to the aquifer; restoration of wetlands; and relocation of river	Excavation will remove approximately 95% of contamination by mass. Action levels for GW remediation will be developed during design	$44,386,000 (capital) $4,132,000 (present worth O&M)
1	Baird & McGuire, MA Former Chemical Manufacturing Facility 09/14/89 3rd	Sediment contaminated with organics including PAHs and pesticides; and metals including arsenic	1,500 yd^3 (sediment)	Sediment excavation and onsite incineration; backfilling excavated areas with clean fill and onsite placement of treated sediment; long-term SW and sediment monitoring; wetland restoration; and placement of silt curtains downstream of site	Cleanup goals for sediment are based on a 10^{-5} to 10^{-6} excess cancer risk. Chemical-specific goals include DDT 19 mg/kg, arsenic 250 mg/kg, chlordane 5 mg/kg, and PAHs 22 mg/kg	$1,656,000 (present worth) $22,000 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Beacon Heights, CT 09/23/85 1st - Final	GW, SW, and soil contaminated with VOCs and organics	Not specified	Excavation of contaminated soil with onsite consolidation; RCRA capping of consolidated wastes, gas venting and stormwater management; leachate collection with offsite disposal at a licensed wastewater treatment facility or onsite treatment with discharge to Hockanum Brook; extension of public water supply to the next municipal supply; fencing; and installation of a more extensive GW monitoring system	Excavation of soil to background levels, which will be developed during design	$17,397,000 (capital) $235,000 (annual O&M)
1	Cannon Engineering/ Plymouth, MA 09/30/85 1st	GW, SW, soil, and sediment contaminated with PAHs, pesticides, and metals including lead	Not specified	Removal and offsite disposal of tanks, associated pipework, and foundation to a RCRA approved facility	Not specified	$350,000 or $433,000 (capital) $0 (O&M)
1	Cannon Engineering Corporation, MA Industrial Facility 03/31/88 1st - Final	Soil, GW, and debris contaminated with VOCs including benzene, PCE and TCE, and organics including PAHs and PCBs	Not specified	Excavation and onsite treatment of soil contaminated with VOCs using thermal aeration, and excavation and offsite treatment of soil contaminated with PCBs; implementation of a wetland restoration program; decontamination and removal of buildings, tanks, and structures; additional soil sampling; access restrictions; GW monitoring with implementation of a water quality monitoring program; and institutional controls	Soil cleanup levels were based on leaching potential into GW as determined using the Organic leaching Model and include benzene 550 ug/kg and TCE 71 ug/kg. The soil cleanup level for PCBs 9 mg/kg is based on risk levels. GW cleanup levels are the MCLs for benzene 5 ug/l, TCE 5 ug/l, and vinyl chloride 2 ug/l	$3,411,000 - 4,505,000 (present worth) $700,000 (present worth O&M)
1	Charles George, MA 12/29/83 1st	GW contaminated with VOCs	Not specified	Extension of existing water supply system	Not specified	$2,453,000 (present worth)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Charles George, MA 07/11/85 2nd	Air, GW, SW, and sludge contaminated with VOCs including toluene, organics, and metals	Not specified	Capping; SW diversion and collection system; venting off-gas collection system to the atmosphere; and a full peripheral leachate collection system	Not specified	$13,613,725 (capital) $1,252,901 (annual O&M)
1	Charles George Reclamation Landfill, MA 70-Acre Landfill 09/29/88 3rd and 4th Final	Sediment, GW, and air contaminated with VOCs including benzene, TCE, and PCE, organics including PAHs, and metals including arsenic	500 yd^3	GW pump and treatment along with collected leachate using biological treatment, metals precipitation, and carbon adsorption, followed by onsite discharge to GW; GW and residential well monitoring; collection and incineration of landfill vent gas emissions; excavation and solidification of sediment with onsite disposal in landfill	GW cleanup will meet individual target levels based on MCLs including benzene 5 ug/l, arsenic 50 ug/l, and TCE 5 ug/l. Discharge concentration levels were provided for 18 contaminants. Sediment will meet the target cleanup level for PAHs of 1.0 mg/kg based on a risk level of $4x10^{-6}$. Vent emissions will be treated to a cumulative risk level of $1x10^{-6}$. Individual target levels for vent emissions were provided for 12 contaminants including benzene 568 ug/m^3, TCE 3,210 ug/m^3, and PCE 8,690 ug/m^3	$11,320,000 (present worth) $773,000 (annual O&M)
1	Davis Liquid Waste, RI 09/29/87 1st	Soil and GW contaminated with VOCs, inorganics, and organics	25,000 yd^3	Excavation and onsite incineration of raw wastes and contaminated soil with backfilling of treated soil not EP toxic; onsite disposal of EP toxic treated soil in RCRA landfill; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply for nearby residences	Soil will be treated to attain 10^{-5} cancer risk level with concentrations of total VOCs reduced to <2 mg/kg. GW will be treated to attain the 10^{-5} cancer risk level which includes reducing concentrations of benzene and TCE to 5.0 ug/l (MCLs) each	$27,392,000 (present worth)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Groveland Wells, MA Industrial Facility 09/30/88 1st	Soil, sediment, GW, and SW contaminated with VOCs including PCE and TCE, and metals including arsenic and lead	20,000 yd^3 (soil)	In-situ vacuum extraction followed by carbon adsorption of contaminated soil; GW pump and treatment using air stripping and carbon adsorption with reinjection to the aquifer; GW monitoring; and sealing or disconnecting all drains and lines to the subsurface disposal system	GW cleanup levels for VOCs are based on MCLs or a 10^{-6} cancer risk level, and cleanup levels for metals are based on State Ground Water Quality Standards and permit requirements. Individual goals include PCE 5.0 ug/l, TCE 5.0 ug/l (MCL), arsenic 50 ug/l, and lead 50 ug/l. Soil cleanup goals for VOCs were based on achieving the target GW levels and include PCE 18.2 ug/kg and TCE 6.3 ug/kg	$4,165,000 (present worth) $2,677,000 (present worth O&M)
1	Hocomonco Pond, MA 09/30/85 1st - Final	GW, SW, soil, and sediment contaminated with organics, inorganics, and metals	Not specified	Former Lagoon: capping with site grading; and relocation of storm drain pipe Kettle Pond Area: pond dewatering and lowering area GW levels; soil and waste excavation; dewatering sediment with onsite landfilling; air quality monitoring; if necessary, treatment with discharge of effluent water; construction of onsite landfill; and restoration of wetland areas Hocomonco Pond and Discharge Stream: mechanical dredging and onsite disposal of sediment; and treatment of pond water in system constructed for Kettle Pond area Otis Street: seal storm drain Isolated Areas: removal of contaminated materials and onsite disposal	Not specified	$2,213,000 (capital) $56,000 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Industriplex, MA 09/30/86 1st	GW, soil, sludge, and air contaminated with metals, and VOCs including toluene and benzene	1,000 yd^3	Capping with soil grading; GW pump and treatment using air stripping with discharge to the aquifer; development of a multi-service GW response plan; institutional controls; stabilization of side slopes; and treatment of gaseous emissions	Eliminate direct contact threat of soil with arsenic >300 mg/kg, lead >600 mg/kg, and chromium >1000 mg/kg. GW treatment will meet MCLs. Air remedy will achieve NAAQS and unit cancer risks	$12,302,300 or $12,612,000 (depending on air treatment) (present worth) $285,500 or $311,000 (depending on air treatment) (annual O&M)
1	Iron Horse Park, MA Industrial Facility 09/15/88 1st	Soil, sludge, and debris contaminated with VOCs, organics including PAHs, and metals including arsenic and lead	28,000 yd^3 (soil and sludge)	Excavation and biodegradation of contaminated soil and sludge with residual disposal to the lagoon area, followed by construction of a clean soil cover and revegetation; and decontamination of the lagoon system's piping and pumps	Treatment of soil and sludge will attain a 10^{-6} excess cancer risk for industrial use of the area, and 10^{-5} excess cancer risk for residential use of the area. Treatment should reduce contaminant concentration in wastes 70-80%, and will meet the state pathogen reduction requirements for sludge. Individual cleanup goals were not specified	$2,273,000 (capital) $47,000 (present worth O&M)
1	Keefe Environmental, NH 11/15/83 1st	SW and soil contaminated with VOCs including TCE and PCE, organics, and metals	Not specified	Removal and offsite disposal of lagoon contents, liner, and highly contaminated soil	Not specified	$500,000 (capital) $0 (O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Keefe Environmental Services, NH Waste Disposal Facility 03/21/88 2nd - Final	Soil and GW contaminated with VOCs including PCE and TCE	150,000 ft^2 (soil)	In-situ treatment of soil using vacuum extraction with discharge to the atmosphere; and GW pump and treatment using air stripping, filtration, and carbon adsorption with discharge to a GW recharge area along site border (adjacent to wetland)	Cumulative soil cleanup goals will attain a $5.7x10^{-5}$ cancer-risk level. Individual goals include benzene 20.8 ug/kg, PCE 91 ug/kg, TCE 31.5 ug/kg, 1,2-dichloroethane 3.5 ug/kg, and 1,1-dichloroethylene 22.8 ug/kg. GW will meet MCL values which include benzene 5 ug/l, PCE 5 ug/l, TCE 5 ug/l, 1,2-dichloroethane 5 ug/l, and 1,1-dichloroethylene 7 ug/l	$1,937,300 (capital) $4,157,700 (present worth O&M)
1	Kellogg-Deering Well Field, CT 09/25/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	Initiation of existing air stripping facilities with discharge to existing treatment plant and distribution system	GW treatment will achieve a 99% TCE removal efficiency, which corresponds to the 10^{-6} excess cancer risk	$69,751 (capital) $0 (O&M)
1	Kellogg-Deering Well Field, CT 10-Acre Municipal Well Field 09/29/89	Soil and GW contaminated with VOCs including benzene, toluene, PCE, TCE, and xylenes	44,000 yd^3 (soil)	Onsite in-situ vacuum extraction of soil followed by carbon adsorption; GW pumping and treatment using air stripping followed by offsite discharge; periodic GW, soil vapor, and indoor air sampling; and implementation of soil excavation and well installation restrictions	Chemical-specific cleanup goals for GW are based on SDWA MCLs or PMCLs and include benzene 0.005 mg/l, toluene 2 mg/l, TCE 0.005 mg/l, and PCE 0.005 mg/l. Chemical-specific cleanup goals for soil are based on a soil leachability model, vary depending on soil type, and include benzene 0.0012-0.0367 mg/kg, toluene 5.5-169 mg/kg, TCE 0.012-0.358 mg/kg, and PCE 0.033-1.036 mg/kg	$9,100,000 (present worth) $3,034,000 (present worth O&M) (years 1-30)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Landfill and Resource Recovery, RI 28-Acre Industrial/ Municipal Landfill 09/29/88 1st - Final	Air contaminated with VOCs including benzene, toluene, PCE, and TCE	Not specified	Upgrading the landfill by slope stabilization, installation of a RCRA cap, and revegetation; collection and thermal destruction (method to be determined in design) of landfill gases; excavation of eroded landfill sand from wetlands, with replacement onsite, and vegetation of excavated wetland areas; access restrictions; and GW and air monitoring	Target cleanup levels for the gaseous emissions are the State Air toxic Regulations. Individual goals were not specified	$5,674,000 - $6,790,000 (present worth)
1	Laurel Park, CT 19-Acre Industrial Landfill 06/30/88 1st - Final	Soil sediment, GW, and SW contaminated with VOCs, organics, and metals	1,300,000 yd^3	Installation of a RCRA cap over all waste disposal areas; rehabilitation of existing leachate collection system supplemented by a shallow GW extraction system consisting of a french drain and/or GW extraction wells with discharge and offsite treatment at NWPCF; and monitoring of all media	GW and leachate will be extracted to meet the RCRA Ground Water Protection Standard (GWPS) at the point of compliance, which is the vertical surface at the hydraulically downgradient limit of the waste management area. Currently, the GWPS are set at MCLs, ACLs, or background. Individual cleanup levels were not specified	$21,706,300 (present worth) or $23,078,200 (including pretreatment, if necessary) (present worth)
1	McKin Site, ME 07/15/83 IRM	GW, SW, soil, and air contaminated with VOCs including TCE and PCE	Not specified	Onsite cleaning and salvage of tanks; and offsite disposal of liquids and sludges	Not specified	$47,000 (capital) $0 (O&M)
1	McKin Site, ME 07/22/85 2nd - Final	GW, SW, and soil contaminated with VOCs including TCE and PCE	Not specified	Onsite soil aeration; offsite disposal of drums; soil testing of petroleum contaminated areas; GW pump and treatment; SW discharge system; reevaluation of GW performance standards; offsite GW and SW monitoring program; and site removal and closure activities	GW treatment will meet 10^{-5} cancer risk level criteria including 1,1,1-TCA 92 ug/l and TCE 28 ug/l. Soil will be treated to TCE 0.1 mg/kg	$3,919,000 (capital) $38,900 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Norwood PCBs, MA Former Electrical Equipment Disposal Area 09/29/89 1st - Final	Soil, sediment, debris, and GW contaminated with VOCs including PCE and TCE; other organics including PAHs, PCBs, and phenols; and metals	31,000 yd^3 (soil) 3,000 yd^3 (sediment)	Excavation, solvent extraction and onsite disposal of soil and sediment followed by installation of soil cover over treated soil; offsite incineration and disposal of extracted PCB-contaminated oils; flushing and cleansing portions of drainage system; cleaning and sealing roof surfaces, and decontaminating debris which exceed TSCA cleanup levels; GW collection in a barrier drain trench with onsite treatment by carbon adsorption, air stripping and precipitation/filtration; wetlands restoration; GW, soil, sediment and debris monitoring; and implementation of institutional controls to restrict GW use and to prevent soil and sediment disturbance	EPA divided the site into 3 sections and established cleanup levels for each section. Chemical-specific soil target cleanup levels range depending on location of soil, and include PCBs 1-10 mg/kg (based on a cancer-risk level no greater than $7x10^{-6}$), PAHs 2-6 mg/kg (based on a cancer-risk level no greater than $7x10^{-6}$). TCE 24 ug/kg and PCE 60 ug/kg (both based on preventing contamination to GW above MCLs). Sediment cleanup levels include PCBs 1 mg/kg (based on $1.5x10^{-7}$ excess cancer-risk level) and PCBs 0.5 ug/kg for discharge to SW. GW cleanup goals are based on Federal and State MCLs and include TCE 5 ug/l and PCE 5 ug/l	$16,100,000 (present worth; included O&M) (years 1-10)
I	Nyanza Chemical, MA 09/04/85 1st	GW, SW, soil, and sediment contaminated with organics, inorganics, and metals	Not specified	Excavation and consolidation of sludge deposits and sediment with backfilling to original grade and revegetation of wetlands; RCRA capping over entire Hill area; construction of upgradient surface and GW diversion system; and downgradient GW monitoring	All outlying sludge deposits and contaminated soil and sediment associated with these deposits will be excavated to background levels for chromium, lead, and mercury	$5,600,000 - $9,800,000 (capital) $92,000 (O&M) (year 1) $70,000 (annual O&M) (years 2-30)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	O'Connor, ME 9-Acre Transformer Recycling Facility 09/27/89 1st - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene; other organics including PCBs and PAHs; and metals including lead	23,500 yd^3 (soil and sediment)	Pumping and offsite treatment of lagoon and upland marsh SW; excavation and onsite solvent extraction of soil and sediment, followed by onsite disposal of residuals; onsite treatment of gases from solvent extraction process; extraction and offsite incineration of solvent residues; onsite solidification of soil and sediment that do not achieve target cleanup levels, followed by offsite disposal; backfilling and upgrading excavated areas; GW pumping and treatment using activated carbon adsorption followed by onsite reinjection; sediment and GW monitoring; and implementation of deed and land use restriction to prohibit GW use	Target cleanup goals are based on a 10^{-5} excess cancer risk. Individual goals for soil and sediment include PCBs 1 mg/kg, PAHs 1 mg/kg, and lead 248 mg/kg; for GW: PCBs 0.5 ug/l and benzene 5 ug/l; for SW: PCBs 0.065 ug/l and lead 1.94 ug/l	$14,221,000 (total cost) $56,000 (O&M) (year 1) $54,000 (O&M)(years 2-4) $92,000 (O&M) (year 5) $65,000 (O&M) (years 6-30)
1	Old Springfield Landfill, VT 27-Acre Industrial/ Municipal Landfill 09/22/88 1st	GW contaminated with VOCs including benzene, TCE, DCE, and vinyl chloride, and other organics including PCBs and PAHs	Not specified	GW extraction and leachate collection with combined treatment onsite or discharge to a POTW; institutional controls; multimedia monitoring; and additional site studies	GW and leachate cleanup goals will attain MCLs and include benzene 5 ug/l, TCE 5 ug/l, DCE 7 ug/l, and vinyl chloride 2 ug/l	$5,374,000 (present worth) $173,000 (annual O&M)
1	Ottati & Goss, NH 01/16/87 1st - Final	Soil, sediment, and GW contaminated with VOCs including TCE, organics including PCBs, and VOCs	19,000 yd^3	Onsite incineration of 5,000 yd^3 soil and sediment with >20 mg/kg PCBs; aeration of 14,000 yd^3 of soil <20 mg/kg PCBs and >1 mg/kg total VOCs; GW pump and treatment using air stripping, biological treatment, and ion-exchange with reinjection; and onsite backfilling of all residuals with grading and covering	Soil, sediment, and GW will attain the health-based cleanup level of 10^{-5}. Specific GW goals include 1,2-DCE 3.8 ug/l, TCE 26.0 ug/l, PCE 6.7 ug/l, and benzene 13.0 ug/l. Specific soil and sediment goals include PCBs 20.0 mg/kg and total VOCs 1.0 mg/kg	$8,592,500 (capital) $1,735,000 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Picillo Farm, RI 09/30/85 1st	GW and soil contaminated with PCBs, and VOCs including TCE	3,500 yd^3	Onsite disposal of primarily PCB and phenol contaminated soil in a RCRA/TSCA landfill; and site closure activities	Not specified	$841,000 (capital) $12,120 (O&M) (year 1) $25,648 (annual O&M) (years 2-4) $19,048 (annual O&M) (years 5-30)
1	Pinette's Salvage Yard, ME PCB Spill Area 05/30/89 1st - Final	Soil and GW contaminated with VOCs including benzene; other organics including PCBs; and metals including lead	2,200 yd^3 (soil)	Excavation and offsite incineration of soil with PCB concentrations >50 mg/kg; excavation and onsite solvent extraction of soil with PCB concentrations between 5-50 mg/kg with offsite incineration of treatment process effluent and onsite treatment of air emissions; excavation and onsite disposal of surface soil with PCB concentrations between 1-5 mg/kg, followed by additional soil covering and revegetation; GW pumping and treatment using filtration and carbon adsorption, followed by discharge into aquifer; sediment, GW, and SW monitoring; and implementation of access restrictions and institutional controls	Target soil cleanup goals include PCBs 5 mg/kg (State) and benzene 260 ug/kg. Target GW cleanup goals include PCBs 0.5 ug/l (State), benzene 5 ug/l (MCL), and lead 5 ug/l (MCL). EPA is invoking a waiver from the PCB target cleanup goal due to technical impracticability	$4,367,000 (present worth) $135,000 (annual O&M) (years 1-2) $42,000 (annual O&M) (years 3-5) $20,000 (annual O&M) (years 6-30)
1	Re-Solve, MA 07/01/83 1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not specified	Excavation and offsite disposal of lagoon contents and highly contaminated soil; and clay capping of entire site	Not specified	$3,050,000 (capital) $36,000 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Re-Solve, MA 09/24/87 2nd-Final	Soil, sediment, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation with KPEG dechlorination and onsite place of 22,500 yd^3 of soil and 3,000 yd^3 of sediment; GW pump and treatment using air stripping and carbon adsorption with reinjection; and institutional controls restricting GW usage	Soil will be treated to PCBs 25.0 mg/kg based on the 10^{-5} cancer risk level. Sediment will be treated to PCBs 1.0 mg/kg. GW will be treated to the 10^{-5} cancer risk which includes MCL values for TCE, PCE, and methylene chloride of 5.0 ug/l each	$7,332,900 (capital) $1,097,000 (present worth O&M)
1	Rose Disposal Pit, MA Waste Disposal Area 09/23/88 1st - Final	Soil, sediment, GW and SW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes, and PCBs	60,000 yd^3 (soil)	Excavation and onsite incineration of 15,000 yd^3 of soil and sediment with residual disposal onsite; GW pump and treatment along with SW using air stripping and carbon adsorption with discharge to the aquifer; and institutional controls	Soil with PCBs in excess of 13 mg/kg (based on a 10^{-5} risk level) will be incinerated to a concentration less than 2 mg/kg for PCBs. GW cleanup goals are set at or below MCLs, if available, MCLGs, Lifetime Health Advisory (LHA) or a 10^{-6} cancer risk level. Individual GW goals include TCE (MCL), benzene (MCL), and PCE 1 ug/l (10^{-6} risk level)	$6,450,000 (present worth) $5,790,000 (present worth O&M)
1	Saco Tannery Waste Pits, ME Process Waste Disposal Area 09/27/89 1st - Final	Sediment, sludge, GW, and SW contaminated with metals including arsenic, chromium, and lead	Not specified	The selected remedial action is contingent upon the State designating the site a permanent conservation area and includes pumping, offsite treatment and discharge of water from waste pits and lagoons followed by covering and revegetating waste pits, lagoons, and wet areas; compensating for lost wetlands; GW and SW monitoring; implementing institutional controls; and implementing a contingency plan, if legislation is not passed which includes excavating and solidifying soil and sludge with onsite disposal in a RCRA-permitted landfill; and GW and SW monitoring	Target cleanup goals were developed for sediment and sludge contaminants which exceed a carcinogenic risk of 10^{-7} or a noncarcinogenic risk greater than an HI=1. Specific goals include total chromium 2,000 mg/kg (based on ecological risk assessment), lead 125 mg/kg (State), and arsenic 60 mg/kg. If GW contaminants exceed ACLs, further site evaluation will be necessary	$9,211,600 - $10,551,400 (present worth) $2,500,000 - $3,800,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	South Municipal Water Supply Well, NH Manufacturing Facility 09/27/89 1st - Final	Soil, sediment, and GW contaminated with VOCs including PCE, TCE, and toluene; other organics including PCBs and PAHs; and metals	7,500 yd^3 (soil) 1,170 yd^3 (sediment)	GW pumping and treatment using a phase separation settlement tank/pretreatment system, air stripping, carbon columns for air emission control, and onsite discharge; GW pumping from dilute plume and treatment using air stripping and carbon columns and onsite discharge; in-situ vacuum extraction of soil; excavation and/or dredging with dewatering of wetlands sediment and offsite disposal; wetlands restoration; surface contouring and revegetation; long-term GW monitoring; and implementation of institutional controls including GW use and well installation restrictions	Target cleanup levels for GW are based on SWDA MCLs or PMCLs and include PCE 5 ug/l, TCE 5 ug/l, and toluene 2,000 ug/l. Target cleanup levels for soil were established to reduce contaminant migration to GW and include PCE 4.5 ug/kg, TCE 1.5 ug/kg, and toluene 1,500 ug/kg. Soil target levels will attain $3x10^{-10}$ excess cancer-risk level. Target cleanup levels for sediment include PAHs 1.1 ug/kg, which will attain an excess cancer risk of $2.9x10^{-7}$ for PCBs and $1.3x10^{-6}$ for PAHs for a total risk of $1.3x10^{-6}$	$7,387,769 (present worth) $3,992,105 (O&M)
1	Sullivan's Ledge, MA 12-Acre Waste Disposal Area 06/29/89 1st	Soil, sediment, GW, and SW contaminated with VOCs, including benzene and TCE; other organics including PCBs and PAHs; and metals including lead	24,200 yd^3 (soil) 1,900 yd^3	Excavation/dredging of soil/sediment with onsite solidification, followed by onsite disposal and capping; air monitoring; diversion and lining of the stream adjacent to site; GW pumping and passive underdrain collection and treatment using oxidation/filtration and UV/ozonation with offsite disposal of contaminated residues; wetlands restoration/enhancement; sediment, GW, and SW monitoring; and implementation of GW use and land access restrictions	Onsite soil cleanup standards for PCBs and PAHs are health based using a 10^{-5} cancer-risk level and include remediation of soil contaminated with total PCBs >50 mg/kg and/or total cPAHs >30 mg/kg. Offsite soil with PCBs >10 mg/kg (based on a 10^{-5} cancer-risk level) will be excavated and disposed of onsite, and soil with PCBs >50 mg/kg will be solidified onsite. Sediment cleanup standard for PCBs is the interim sediment quality criteria value of PCBs 20 ug/gC. Where TOC <10 gC/kg, target treatment for sediment will be PCB 0.2 mg/kg. GW standards include VOCs 1-10 mg/l and/or until there is no significant contaminant reduction	$10,100,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Sylvester, NH 07/29/82 IRM	GW, SW, and air contaminated with VOCs, inorganics and heavy metals	Not specified	Capping with installation of a slurry wall	Not specified	$8,822,000 (capital) $750,000 (annual O&M)
1	Sylvester, NH 09/22/83 1st	GW, SW, and air contaminated with VOCs, inorganics, and metals	Not specified	GW pump and treatment system	GW treatment will attain ACLs	$4,696,400 (capital) $1,380,000 (annual O&M)
1	Tinkhams Garage, NH 09/30/86 1st - Final	GW, SW, and soil contaminated with VOCs including TCE and PCE, organics, and metals	10,800 yd^3	Excavation and onsite treatment of soil via aeration, soil washing, or composting followed by onsite disposal; GW pump and treatment at POTW; and restoration of wetlands	At a minimum, soil will be treated to TVO 1 mg/kg. GW will be treated to 5 ug/l for PCE and TCE	$2,058,000 (capital) $874,000 (annual O&M)
1	Tinkhams Garage, NH Surface Dump 03/10/89 1st - Final (Amendment)	Soil and GW contaminated with VOCs including TCE and PCE	9,000 yd^3 (soil)	Contaminated soil will be treated onsite using a dual vacuum extraction method; the soil pile and leachfield soil will be in-situ or excavated, followed by consolidation and treatment; GW will be extracted via extraction wells and treated onsite, followed by offsite disposal; wetland water levels will be monitored	Contaminated soil will be treated to a total mass VOC concentration of 1 mg/kg, GW will meet the following cleanup levels: PCE 5 ug/l (based on a 10^{-6} excess cancer-risk level) and TCE 5 ug/l (MCL)	Present worth (not specified) $0 (O&M)
1	W.R. Grace, MA (Acton Plant) 200-Acre Waste Disposal Area 09/29/89 1st	Sediment, soil, and sludge contaminated with VOCs including benzene and toluene; other organics; and metals including arsenic	Not specified	Excavating and incinerating offsite highly contaminated soil and sludge; solidifying onsite less contaminated soil, sludge, and sediment, followed by onsite disposal in the landfill and capping the landfill; covering and monitoring other waste areas; modifying the aquifer restoration system; and environmental monitoring	Soil cleanup goals will ensure that any further contaminant migration to GW will not result in GW levels exceeding drinking water standards. Chemical-specific goals were provided but specific goals for each contaminant varied depending on the location of the waste area onsite. The overall cumulative risk associated with the soil cleanup level is 8.34×10^{-7}	$7,058,000 (total cost) $2,468,000 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Wells G&H, MA Municipal Well Field 09/14/89 1st	Soil, sludge, debris, and GW contaminated with VOCs including TCE and PCE; other organics including cPAHs, PCBs, and pesticides; and metals including lead	10,500 yd^3 (soil) 410 yd^3 (sludge and debris)	In-situ volatilization using carbon adsorption for treatment of the extracted vapor of VOC-contaminated soil; excavation and onsite incineration of the remaining contaminated soil and backfilling of the excavated areas; GW pumping and treatment using pretreatment for metals, followed by air stripping and vapor phase carbon filtering with either onsite discharge or reinjection, or both; removing and disposing sludge and debris; GW monitoring; and implementation of deed and land use restrictions	GW cleanup goals include TCE 5.0 ug/l (MCL) and PCE 5.0 ug/l (PMCL). Soil cleanup goals and include PCE 36.7 ug/kg and TCE 12.7 ug/kg (based on protecting GW from VOC contamination from the soil); cPAHs 0.694 mg/kg, PCB 1.04 mg/kg, and 4-4[1] DDT 23.5 mg/kg (based on a 10^{-6} cancer-risk level); and lead 640 mg/kg (based on target blood level of 10 ug/dl)	$68,400,000 (present worth) $0 (O&M)
1	Western Sand & Gravel, RI 09/28/84 1st	GW contaminated with VOCs including TCE, and organics	Not specified	Installation of carbon canister filters as a temporary measure; and installation of a permanent alternate water supply	Not specified	$1,493,513 (present worth) $156,800 (annual O&M) (year 1) $100,800 (annual O&M) (years 2-30)
1	Winthrop Landfill, ME 11/22/85 1st - Final	GW contaminated with organics	Not specified	RCRA capping; alternate water supply; and institutional controls	ACLs for each GW contaminant will be established based on RCRA criteria. If ACL not established, protection will be to background levels	$6,000,000 (capital) $42,000 (annual O&M if ACL not exceeded) $360,000 - $1,480,000 (annual O&M if ACL exceeded)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
1	Yaworski Lagoon, CT Waste Disposal Area 09/29/88 1st - Final	Soil, sediment, GW and debris contaminated with VOCs including benzene, toluene, and xylenes, organics including PAHs, and metals including chromium and lead	65,000 yd^3 (sludge) 60,000 yd^3 (debris)	Installation of a RCRA cap over lagoon area; reconstruction of lagoon dike to improve flood control; GW monitoring; and GW treatment with method to be established as part of corrective action program, if necessary	GW cleanup levels will meet ACLs established as part of the selected remedy. Individual ACLs were not specified	$1,673,000 (capital) $716,000 (present worth O&M)
2	American Thermostat, NY Industrial Facility 01/07/88 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Extension of the existing Catskill Water District pipeline to affected and potentially affected areas; the contaminated GW and surrounding areas will be cleaned up by the owner of the property	GW cleanup goals will meet MCLs for TCE 0.005 mg/l, 1,1-dichloroethylene 0.007 mg/l, and 1,1-trichloroethane 0.200 mg/l, and the Water Quality Criteria chronic level for PCE 0.800 mg/l	$2,270,000 - $2,380,000 (capital) $100,000 - $110,000 (annual O&M)
2	Asbestos Dump, NJ Industrial Facility 09/30/88 1st	Soil and GW contaminated with asbestos	90,000 yd^3 (asbestos waste)	Installation of a soil cover; construction of slope protection/stabilization measures along asbestos mound embankment, and surface runoff diversion channels; GW monitoring; institutional controls restricting GW usage and land development; access restrictions; and treatability studies to evaluate technologies that may permanently remediate asbestos	Remedy addresses containment of asbestos, thus individual cleanup goals are not applicable	$1,145,000 (present worth) $56,000 - $161,000 (annual O&M)
2	Beachwood/ Berkeley Wells, NJ Residential Plumbing System 06/30/88 1st - Final	Drinking water contaminated with lead	Not specified	No man-made or industrial contaminant source is causing the elevated lead levels in drinking water. Remediation under the Superfund program is precluded by law. The State of New Jersey is proceeding independently to address the problem	Not applicable	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	BEC Trucking, NY Former Truck Maintenance Facility 09/28/89 1st - Final	None	Not applicable	No further action with GW and SW monitoring	Not applicable	$0 (capital) O&M to be determined
2	Bog Creek Farm, NJ 09/30/85 1st	GW, soil, and sediment contaminated with VOCs, organics, and metals	Not specified	Removal of wastewater and sediment from pond and bog with regrading and covering of both areas and treatment of wastewater with discharge to stream; excavation of VOC contaminated soil with onsite or offsite incineration; evaluation of soil washing, segregation, and other technologies to reduce the volume of soil to be incinerated; compacted soil capping; fencing around site and work areas; and evaluation of monitoring program effectiveness	Excavation of soil with >10,000 mg/kg TVOs	$9,200,000 (capital) $54,400 (annual O&M)
2	Bog Creek Farm, NJ Waste Disposal Site 06/28/89 2nd - Final	Sediment and GW contaminated with VOCs including benzene, toluene, and xylenes; other organics including phenols; and metals including lead	90 yd^3 (sediment)	GW pumping and treatment using air stripping, H_2O_2-UV photolysis oxidation, and carbon adsorption and reinjection; brook sediment excavation followed by onsite incineration and onsite disposal; and steambed restoration	GW cleanup goals are derived from discharge limits allowed under a State permit. Specific goals include benzene, 5 ug/l; toluene 74 ug/l; phenols 47 ug/l; and lead 56 ug/l	$6,927,000 (present worth) $663,000 (annual O&M) (years 1-10)
2	Brewster Well Field, NY 09/30/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using existing air stripping facilities with reinjection to the aquifer	Existing air stripping system exceeds State and Federal ARARs for GW which include TCE 10 ug/l (State) and 5 ug/l (Federal)	$163,912 (capital) $27,468 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Brewster Well Field, NY Municipal Well Field 09/29/88 2nd - Final	Soil, sediment, sludge, and debris contaminated with VOCs including PCE and TCE	100 yd^3	Excavation and offsite incineration of drywell sediment, sludge and soil with greater than 4 mg/kg PCE, followed by offsite disposal; and removal, decontamination and offsite disposal of the concrete drywell structure and debris	Remediation of all soil, sediment, sludge and debris containing greater than 4 mg/kg PCE will reduce health risks due to direct contact with contaminated site soil to $1x10^{-6}$	$241,940 (capital)
2	Bridgeport, NJ 12/31/84 1st - Final	GW, SW, soil, and sediment contaminated with VOCs and PCBs	Not specified	Disposal of oily waste, sediment, and sludge via onsite incineration; removal and disposal of contaminated water using onsite treatment; drum excavation with offsite removal; maintenance pumping; removal and offsite disposal of tanks and waste; and installation of an alternate water supply pipeline	GW must meet TOC limit of 50 mg/l on a 30 day average	$57,672,000 (capital) $20,000 (annual O&M)
2	Burnt Fly Bog, NJ 11/16/83 1st	GW, SW, and soil contaminated with PCBs, VOCs, and metals	Not specified	Excavation and offsite disposal of liquids, sludges, asphalt piles, drums, and contaminated soil from lagoons and northern wetlands; restoration of original site contours and vegetation; and implementation of a 5-year GW monitoring program	Not specified	$2,200,000 (capital) (Phase I) $5,110,000 (capital) (Phase II) $60,000 (annual O&M)
2	Burnt Fly Bog, NJ Industrial Waste Disposal Area/Municipal Landfill 09/29/88 2nd	Soil, sediment, and SW contaminated with PCBs and lead	82,000 yd^3 (soil and sediment)	Excavation and offsite disposal of approximately 5,600 yd^3 of contaminated downstream sediment; containment through a sedimentation basin and diversion controls of remaining contaminated soil and sediment; access restrictions; and performance of treatability studies to determine final treatment for contained contaminated soil and sediment	Remedy is an interim action designed to control contaminant migration pending treatability study results. Cleanup goals for the downstream sediment will meet the State soil cleanup criteria of PCBs 5 mg/kg and lead 250 mg/kg	$3,000,000 (present worth for three-year life) or $6,100,000 (present worth for 20-year life) $320,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Byron Barrel & Drum, NY Former Salvage Yard 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; other organics including PAHs and phenols; and metals including chromium and lead	4,100 yd^3 (soil)	GW pumping and treatment using precipitation, sedimentation, and filtration to remove inorganics and air stripping and carbon adsorption to remove organics, followed by reinjection into aquifer and, if necessary, offsite discharge of excess treated water; offsite disposal of GW residues; in-situ soil flushing; dismantling and decontaminating debris, followed by offsite disposal; and air and GW monitoring	GW will meet State and Federal ARARs. Specific GW cleanup levels include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), xylenes 440 ug/l (MCL), PCE 5 ug/l (based on TCE MCL), and TCE 5 ug/l (MCL). Soil will meet site-specific action levels including toluene 45,000 ug/kg, xylenes 8,200 ug/kg, PCE 140 ug/kg, and TCE 47 ug/kg	$5,572,000 (present worth) $259,700 (annual O&M)
2	Caldwell Trucking, NJ 09/25/86 1st	GW and soil contaminated with PAHs, PCBs, VOCs including TCE, inorganics, and metals including lead	28,000 yd^3	Excavation and heat addition treatment of soil and waste materials with onsite disposal; GW treatment using air stripping; and provision of an alternate water supply	Not specified	$5,490,000 (capital) $48,000 (annual O&M)
2	Caldwell Trucking, NJ Former Septic Waste Disposal Area 09/28/89 2nd	GW contaminated with VOCs including TCE	Not specified	GW pumping and treatment using air stripping with offsite discharge to SW; installation of a drainage system; sealing GW wells; and GW monitoring	ARAR waiver invoked based on technical impracticability. Remedy will achieve interim cleanup levels which will allow for potable use of GW	$11,540,000 (present worth) $315,000 (annual O&M) (years 1-30)
2	Chemical Control, NJ 09/19/83 1st	GW and soil contaminated with VOCs, organics including PCBs, pesticides, and inorganics	Not specified	Removal of gas cylinders; reconstruction of storm sewer catch basins and grates; cleaning of the storm sewer system with construction of curbing; and decontamination of box trailer and vacuum truck	Not specified	$732,500 (capital) $0 (O&M)

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2	Chemical Control, NJ 09/23/87 2nd	Soil contaminated with VOCs, organics, inorganics, and pesticides	18,000 yd^3	In-situ fixation of 18,000 yd^3 of soil; repairing berm to prevent surface runoff into adjacent river; removal of debris; and sealing of a sanitary sewer	Cleanup goals for contaminants in the soil were not specified	$7,208,000 (capital) $57,400 (annual O&M) (years 1-5) $22,400 (annual O&M) (years 6-30)
2	Chemical Insecticide, NJ Pesticide Production Facility 09/29/89 1st	Soil and SW contaminated with organics including pesticides and metals including arsenic	Not specified	Clearing, grading and capping site; constructing a SW run-off diversion system; controlling the release of uncontaminated SW run-off; and SW monitoring	SW discharge standards provided for arsenic 50 ug/l and for five pesticides based on State standards	$1,420,211 (present worth) $37,184 (annual O&M)
2	Ciba-Geigy, NJ Industrial Facility 04/24/89 1st	GW contaminated with VOCs including benzene, PCE, TCE, and toluene; and metals including arsenic and chromium	Not specified	Sealing contaminated residential irrigation wells; on- and offsite GW pumping with onsite treatment using filtration, reverse osmosis, and GAC followed by temporarily retaining GW in monitoring basins and subsequent discharge to SW; and implementation of a river and GW monitoring program	Treated GW will meet the proposed State Surface Water Quality Standards including benzene 1 ug/l, PCE 1 ug/l, TCE 1 ug/l, toluene 26 ug/l, total chromium 50 ug/l, and arsenic 50 ug/l. State MCLs will be attained for the aquifer including benzene 1 mg/l, PCE 1 mg/l, TCE 8 mg/l, arsenic 0.05 ug/l, and chromium 0.05 mg/l. For unregulated VOCs in the aquifer, single contaminant levels for carcinogens are not to exceed 5 ug/l and 50 ug/l for possible carcinogens or non-carcinogens	$164,500,000 (present worth) $12,539,000 (annual O&M)

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2	Claremont Polychemical, NY Industrial Facility 09/22/89 2nd - Final	Sludge and debris contaminated with VOCs including benzene, toluene, TCE, and PCE; other organics; and metals including arsenic, chromium, and lead	100,000 lbs (solids) 25,000 (sludge) 10,000 lbs (liquids)	Compatibility testing and consolidation of compatible wastes and pumping contents of tanks, basins and sump into storage tanks; analytical testing of samples to determine appropriate treatment or disposal methods; and transporting wastes for offsite treatment or disposal, as appropriate	RCRA wastes will be treated to BDAT or treated to attain specific treatment levels, as appropriate, to comply with RCRA LDRs. Chemical-specific goals were not specified	$1,339,000 (present worth) $0 (O&M)
2	Clothier Disposal, NY 6-Acre Non-Permitted Disposal Area 12/28/88 1st - Final	Soil contaminated with VOCs including toluene, xylenes, and PCE; other organics including PAHs, PCBs, and phenols; and metals	Not specified	Placing a soil cover over the contaminated areas, regrading, and revegetating site; installing rip-rap, as needed; construction and post-construction air monitoring; long-term soil, sediment, GW, and SW monitoring; and implementing land use and GW use restrictions	Because the remedy addresses containment, chemical-specific goals are not applicable	$500,000 (present worth) $27,000 (annual O&M)
2	Combe Fill North, NJ 09/29/86 1st - Final	GW and soil contaminated with organics and low levels of VOCs	Not specified	Capping with grading and compacting of disposal areas; installation of drainage and venting systems; and site fencing	Not specified	$10,500,000 (capital) $168,000 (annual O&M)
2	Combe Fill South, NJ 09/29/86 1st - Final	GW and soil contaminated with VOCs including TCE and PCE	Not specified	RCRA capping; active gas collection and treatment system; GW and leachate pump and treatment with discharge to brook; alternate water supply; SW controls; and fencing	Not specified	$46,060,700 (capital) $673,000 (annual O&M)
2	Cooper Road, NJ 09/30/87 1st - Final	None	Not applicable	No further action	Not specified	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	De Rewal Chemical, NJ Former Dumping Area 09/29/89 1st	Soil and GW contaminated with VOCs including PCE, TCE and toluene; other organics including PAHs; and metals including chromium and lead	8,000 yd^3 (soil)	Excavation and onsite thermal treatment of organic-contaminated soil and solidification of inorganic-contaminated soil and ash residues followed by onsite disposal monitoring and controlling air emissions generated during thermal treatment; GW pumping and offsite treatment at an industrial wastewater treatment facility; GW monitoring; provision of a treatment system for onsite residential well; temporary relocation of onsite residents; preparation of cultural resources survey; and implementation of land use restrictions	Contaminated soil which exceeds State action levels will be excavated and treated to meet State action levels which include VOCs 1 mg/kg, chromium 100 mg/kg, and lead 250 mg/kg. GW will also be treated to meet State SDWA MCLs which include TCE 1 ug/l, PCE 1 ug/l, chromium 50 ug/l, and lead 50 ug/l	$5,097,000 (present worth) $865,400 (O&M)
2	Diamond Alkali, NJ 09/30/87 1st	Soil, debris, GW, and air contaminated with pesticides including TCDD and DDT	Not specified	Construction of site slurry wall and flood wall; disassembly and decontamination of structures and materials for offsite reuse, recycling, or disposal; offsite transportation of all drums containing hazardous substances >1 ug/kg TCDD for treatment or disposal; securing of all material with >1 ug/kg TCDD onsite; stabilization of remaining drums with dioxin-contaminated materials; GW pump and treatment; plugging or rerouting underground conduits; and onsite placement and capping of sludge	Cleanup levels will attain 10^{-6} cancer-risk level. GW will be treated to include dioxin $1.4x10^{-5}$ ug/l, DDT $2.4x10^{-2}$ ug/l, and hexachlorobenzene $7.4x10^{-1}$ ug/l. Soil and structures will be treated to dioxin 1.0 ug/l	$8,068,000 (capital) $261,000 (annual O&M)
2	D'Imperio Property, NJ 03/27/85 1st - Final	GW and soil contaminated with VOCs	3,900 yd^3	Excavation and offsite disposal of contaminated waste, soil, and surface drums; RCRA capping; and GW pump and treatment	Cleanup will be monitored and assessed in accordance with Drinking Water Standards to determine need for additional remediation	$4,251,551 (capital) $1,169,449 (present worth O&M)

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2	Endicott Village Well Field, NY 09/25/87 1st	GW contaminated with VOCs	3,700 gpm (to be treated)	GW treatment with air stripping and chlorination; and continued operation of an existing purge well to intercept contamination on its way to the supply well	GW treatment will attain MCL values which include vinyl chloride 2 ug/l, 1,2-dichloroethane 5 ug/l, and trichloroethane 5 ug/l. Tetrachloroethene 0.88 ug/l and 1,1,2-trichloroethane 0.6 ug/l will meet levels established by the FWQC, and will meet the 10^{-6} cancer risk level. Vinyl chloride air emission will meet the National Emission Standard for Clean Air of 10 ppm	$1,200,000 (capital) $147,000 (annual O&M)
2	Ewan Property, NJ Illegal Waste Disposal/Dumping Area 09/29/88 1st	Soil contaminated with VOCs including benzene, TCE, PCE, and xylenes, and metals including chromium and lead	500-8,000 drums 4,500 yd^3 (heavily contaminated soil and drum contents) 29,500 yd^3 (moderately contaminated soil and drum contents)	Excavation and offsite incineration of approximately 4,500 yd^3 of contaminated soil/waste; additional assessment of non-incinerable waste to determine the appropriate remediation; and GW and air monitoring	Final cleanup goals will be determined during a subsequent operable unit	$21,153,000 (present worth) $22,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Ewan Property, NJ 43-Acre Industrial Waste Disposal Area 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including benzene, TCE, PCE, toluene, and xylenes; and metals including chromium and lead	22,000 yd^3 (soil)	Excavating and treating soil using solvent extraction and soil washing, followed by redepositing treated soil onsite as clean fill; treating and disposing of spent solvent offsite; treating spent wash water onsite using GW treatment system; regrading and revegetating disposal areas; GW pumping and treatment, followed by reinjection into aquifer; and environmental monitoring	Treated soil will meet State Solid Waste Regulations. Treated GW will meet State water quality criteria (SWQC) and MCLs. Specific GW treatment levels include benzene 1 ug/l (SWQC), TCE 26 ug/l (SWQC), toluene 2,000 ug/l (PMCL), xylenes 44 ug/l (SWQC), lead 50 ug/l (MCL), and chromium 50 ug/l (SWQC)	$35,152,447 (present worth) $1,903,980 (annual O&M)
2	FAA Technical Center, NJ Federal Facility 09/26/89 1st	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes; and other organics including PAHs and phenols	33,000 yd^3 (soil) 360,000 gals (free product) 13,300,000 gals (GW)	In-situ soil vacuum extraction (soil venting) and off-gas treatment using either incineration or activated carbon adsorption; extraction of the free product floating on the plume followed by offsite incineration; GW extraction and addition of nutrients for subsequent reinjection and in-situ biodegradation of residual GW contamination; and GW monitoring	GW cleanup goals are based on Federal and State MCLs and include benzene 1 ug/l (MCL), xylenes (total) 44 ug/l (State MCL), toluene 2,000 ug/l (Federal PMCL), and phenols 300 ug/l (State GWQS). Soil cleanup levels are based on State Soil cleanup action levels and include 1 mg/kg for total priority pollutant VOCs and 100 mg/kg for total petroleum hydrocarbons	$583,000 (present worth) $200,000 (total present worth O&M)
2	Florence Landfill, NJ 06/27/86 1st - Final	GW and soil contaminated with VOCs and metals	Not specified	Capping with slurry wall containment system; removal and onsite disposal of lagoon liquids and surface debris; leachate collection, treatment, and offsite disposal; gas collection and treatment; and partial fencing	Not specified	$8,021,000 (capital) $170,000 (annual O&M)
2	Friedman Property, NJ 04/30/85 1st - Final	No threat	None	No action with five-year onsite well monitoring; and deed restrictions	Not specified	$0 (capital) $12,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Fulton Terminals, NY Hazardous Waste Staging and Storage Area 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene, TCE and xylenes; other organics including PAHs; and metals including arsenic	4,000 yd^3 (soil)	Excavation and low temperature thermal treatment of soil followed by backfilling; capping site with clean top soil; GW pumping and treatment using air stripping and carbon adsorption followed by reinjection or other type of recharge into the aquifer; disposal of soil and GW treatment residues waste at a RCRA-approved facility; air and GW monitoring; and implementation of institutional controls including GW use restrictions	Soil treatment levels are designed to prevent leaching to GW that will result in levels above MCLs. Chemical-specific soil goals include TCE 2 mg/kg, benzene 1.4 mg/kg, and xylenes 8 mg/kg. GW cleanup goals will meet the more stringent of Federal or State drinking water standards including TCE 5 ug/l (MCL) and arsenic 1,000 ug/l (MCL)	$4,031,000 (present worth) $732,000 (annual O&M) (years 1-3)
2	GE Moreau, NY 07/13/87 1st	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PCBs	8,600 yd^3	Excavation of soil with disposal under cap; slurry wall installation (completed); SW and GW treatment with air stripping; and extension of municipal water supply to affected residents	Soil cleanup goals were not specified. GW and SW treatment will attain the MCL for TCE 5.0 ug/l and the State guidance value for 1,2-DCE 50.0 ug/l	$16,382,000 (capital) $78,000 (annual O&M)
2	GEMS Landfill, NJ 09/27/85 1st - Final	GW, SW, soil, and air contaminated with VOCs, inorganics, and organics	Not specified	Capping with regrading of existing landfill slopes; gas collection and treatment system; GW pump and treatment with discharge to POTW or SW; remediation of Holly run and Briar Lake; SW controls; fencing; and extension of existing water supply system	Discharge criteria will be established by the State and are dependent on the point of discharge (to be determined)	$27,365,000 (capital) $601,000 (annual O&M)
2	GE Wiring Devices, PR Industrial Facility 09/30/88 1st - Final	Soil, perched GW, and debris contaminated with mercury	1,500 yd^3 (soil) 500,000 gals (perched GW) 4,000 yd^3 (debris)	Onsite hydrometallurgical treatment of the soil, perched GW, and waste-fill materials with residue disposed of in the former waste-fill area, followed by covering with a clean soil cover and onsite treatment of the leaching agent with residual discharge to POTW; additional investigation of the GW to determine extent of contamination; and limited GW monitoring, if GW remediation is not required	Soil, perched GW, and waste-fill material will be treated to either 16 ppm, if further air sampling verifies levels exceeding the EPA National Emission Standard for a Hazardous material (NESHAP), or 21 ppm based on risk due to ingestion, if there are no levels exceeding NESHAP	$1,912,870 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Glen Ridge Radium Site, NJ Former Radium Processing or Utilization Area 06/30/89 1st	Soil and structures contaminated with radium[226]	41,000 yd^3 (soil)	Excavation and offsite disposal of soil and debris; installation and maintenance of indoor engineering controls; environmental monitoring; and continuation of treatment technology study	Surface soil (top 6") will be removed until concentration is 5 pCi/g above background and subsurface soil is 15 pCi/g above background	$53,000,000 (present worth) $0 (O&M)
2	Goose Farm, NJ 09/27/85 1st	GW, SW, and soil contaminated with VOCs including TCE, and organics including PCBs	Not specified	GW and soil flushing with GW treatment and reinjection into soil; and conduction of testing programs to evaluate capping and extent of drum pit PCB contamination	GW treatment system will be designed to meet NPDES permit limits	$3,014,000 (capital) $0 (O&M)
2	Haviland Complex, NY 09/30/87 1st - Final	Sediment and GW contaminated with VOCs and metals	Not specified	GW pump and treatment with air stripping; provision of an alternate water supply; and excavation of contaminated sediment from local septic disposal systems	Specific treatment goals will be determined during pilot studies	$1,257,500 (capital) $105,500 (annual O&M)
2	Helen Kramer, NJ 09/27/85 1st - Final	GW and SW contaminated with VOCs including TCE, organics, and inorganics	Not specified	Clay capping with slurry wall containment system; gas collection and treatment system; dewatering, excavation, and filling of leachate ponds and lagoons; fencing of site and work areas; SW controls; and GW and leachate collection and treatment with disposal at POTW or to SW	Not specified	$36,478,000 or $38,089,000 (capital) (Pending onsite treatment) $1,047,900 (annual O&M) (year 1 pretreatment) $792,100 (annual O&M) (complete onsite treatment)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Hudson River, NY 09/25/84 1st - Final	Soil and river sediment contaminated with PCBs	Not specified	In-situ containment of remnant shoreline deposits; and evaluation of Waterford water treatment facility	Not specified	Not specified
2	Hyde Park, NY 11/26/85 1st - Final	GW and soil contaminated with VOCs, and organics including PCBs and dioxin	80,000 tons	Extraction and incineration of non-aqueous phase liquids; GW pump and treatment using activated carbon; and construction of plume contaminant systems	The 10^{-6} cancer-risk level will be achieved	$17,000 (present worth) (O&M not provided)
2	Katonah Municipal Well, NY 09/25/87 1st - Final	GW contaminated with VOCs including PCE	Not specified	Installation of a new GW production well and onsite treatment with air stripping prior to discharge to POTW	The cleanup goal for PCE is less than 1.0 ug/l or nondetectable and is based on 10^{-6} cancer-risk level	$1,365,000 (capital) $296,000 (annual O&M)
2	Kentucky Avenue Well Field, NY 09/30/86 1st	GW contaminated with VOCs including TCE	Not specified	Extension of public water supply to private well users; and GW monitoring	Remedy will attain the MCL for TCE 5 ug/l	$303,800 (capital) $19,00 (annual O&M)
2	Kin-Buc Landfill, NJ 220-Acre Municipal/ Industrial Landfill 09/30/88 1st	Sediment, GW, SW, and air contaminated with VOCs including benzene and toluene, organics including PAHs, and PCBs, and metals including arsenic and lead	3,000,000 gals (oily-phase leachate) 1,000 tons (solid waste)	Installation of a slurry wall surrounding the site, RCRA capping over Kin-Buc II, portions of the low-lying area between Kin-Buc I and the Edison Landfill, and Pool C, as well as maintenance, and upgrading if necessary, of Kin-Buc I cap; collection of oily-phase leachate with offsite incineration and residual disposal; collection and onsite treatment of aqueous-phase leachate and contaminated GW with discharge either to SW or POTW; and GW monitoring	Incineration of oily-phase leachate will meet six nines (99.9999%) destruction and removal efficiency. Aqueous-phase leachate and contaminated GW discharge criteria will be established by NJDEP following treatability studies, but will meet NJAC water quality criteria and State wastewater discharge requirements. Individual cleanup goals were not specified	$16,635,000 - $16,290,000 (present worth) Annual O&M varies from $848,000 (year 1) to $405,000 (years 12-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Krysowaty Farm, NJ 06/20/84 1st - Final	GW and soil contaminated with VOCs, organics, and pesticides	Not specified	Excavation and offsite disposal of contaminated soil and waste; and provision for a permanent alternate water supply	Not specified	$2,164,014 (capital) $145,698 (annual O&M)
2	Lang Property, NJ 09/29/86 1st - Final	GW, SW, soil, and sediment contaminated with VOCs and metals	6,500 yd^3	Excavation and offsite disposal of soil and waste material with filling and grading; GW pump and treatment with reinjection into aquifer; and fencing	GW treatment effluent will attain SDWA criteria	$2,322,000 (capital) $612,000 (annual O&M)
2	Lipari Landfill, NJ 08/03/82 1st	GW, SW, and soil contaminated with VOCs and organics	Not specified	Capping with slurry wall containment system; and GW collection and onsite treatment at POTW	Not specified	$1,769,150 (capital) $91,250 (annual O&M)
2	Lipari Landfill, NJ 09/30/85 2nd	GW and soil contaminated with VOCs including toluene, organics, and metals	Not specified	GW and leachate extraction with injection wells within containment system for flushing and dewatering with onsite pretreatment and discharge to POTW; and flushing of containment system for cleansing	Marginal successive flushing cycle benefits and effects of leachate release into GW will be evaluated within 5 years	$3,464,000 (capital) $715,000 (annual O&M)
2	Lipari Landfill, NJ 6-Acre Industrial/ Municipal Landfill 07/11/88 3rd - Final	Soil, sediment, GW, SW and air contaminated with VOCs including benzene, toluene, and xylenes, and metals including arsenic, chromium, and lead	Not specified	GW/leachate pump and onsite treatment with discharge to POTW; marsh soil excavation and thermal treatment with offsite disposal; sediment dredging, dewatering and thermal treatment with offsite disposal; temporary measures, if necessary, to reduce volatile emissions; and integration of offsite sampling with onsite monitoring plan	Soil cleanup will attain New Jersey soil cleanup objectives and health or real-based criteria. SW cleanup will meet Federal Water Quality Criteria and State surface water standards. Individual goals were not provided	$21,000,000 (present worth)
2	Lone Pine Landfill, NJ 09/28/84 1st - Final	GW, SW, and soil contaminated with VOCs, pesticides, and metals	Not specified	Multi-layer surface sealing with slurry wall containment system; and GW collection and treatment at POTW or onsite plant	Not specified	$10,642,050 (capital) $324,734 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Love Canal, NY 05/06/85 1st	SW, sediment, and air contaminated with VOCs, organics, pesticides including dioxin, and metals	Not specified	Removal and dewatering of contaminated creek sediment; inspection of sewer reaches for defects, repairing of damaged flood gate, and hydraulic leaning of designated sewers; dredging and cleaning of culverts; berm construction; interim onsite storage of sediment; and installation of an administration building	CDC recommends soil treatment to TCDD 1 ug/kg	$8,929,000 - $12,000,000 (capital) O&M (not provided)
2	Love Canal, NY Waste Disposal Facility 10/26/87 2nd	Sediment and debris contaminated with dioxin	30,000 - 40,000 yd^3	Construction of an onsite dewatering/ containment facility (DCF) and a separate construction/demolition debris facility (CDF); onsite containment of sewer and creek sediment in the DCF prior to thermal destruction in a transportable thermal destruction unit; onsite storage in the DCF of leachate treatment residuals and other "associated" material generated as a result of remediation; and onsite storage of uncontaminated debris in the CDF	The CDC level of 1 ug/kg for dioxin in residential soil is not implementable and would lead to unacceptable project delays. Additionally, the community is opposed to anything less than complete thermal destruction. As a result, all materials (excluding 5,500 yd^3 of house debris) will be thermally destroyed. Six nines (99.9999%) destruction and removal efficiency will be the goal. Excavation to approximately 18 inches will ensure elimination or reduction of risk	$26,400,000 - $31,400,000 (present worth)
2	Love Canal/93rd Street School, NY Waste Disposal Area 09/26/88 3rd	Soil contaminated with VOCs including toluene and xylenes, organics including dioxins, PAHs, and pesticides, and metals including arsenic and lead	7,500 yd^3	Excavation and solidification or stabilization of contaminated soil; replacement of solidified soil into excavation; installation of a RCRA cap; and sampling, analysis, and monitoring of GW	Soil cleanup will meet the Land Disposal Restrictions requirements for dioxin of less than 1 ug/l using the TCLP test	$2,295,000 - $3,675,000 (capital) $121,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Ludlow Sand and Gravel, NY Landfill 09/30/88 1st - Final	Soil, sediment, and GW contaminated with VOCs and organics including PCBs and phenols	10,000 yd^3 (soil and sediment)	Consolidation and disposal in the onsite landfill of contaminated soil and sediment, followed by RCRA capping; leachate/GW collection and dewatering of the landfill with onsite treatment and offsite residual discharge; hydraulic containment of the landfill through implementation of upgradient GW controls; deed and access restrictions; and long-term water quality monitoring including GW, SW, and potable water supply wells	Leachate/GW cleanup will attain substantive requirements of State Pollution Discharge Elimination System, Technical Operations Guidance Series, Ambient Water Quality Standards and Guidance Values, all GW and SW standards, and State Freshwater Wetlands Standards. Soil cleanup will attain 10 mg/kg for PCBs based on TSCA policy	$3,727,200 - $14,548,900 (present worth) $58,900 - $364,900 (annual O&M)
2	Marathon Battery, NY 09/30/86 1st	SW, sediment, and biota contaminated with metals including cadmium, nickel, and cobalt	30,083 yd^3	Hydraulic dredging of sediment with chemical fixation and offsite disposal; dredging, water treatment, and disposal; marsh restoration; and site access restrictions	Sediment will be treated to a 100 mg/kg established background concentration. Standards for total cadmium water concentrations include $6.6x10^{-4}$ mg/l and $2.0x10^{-3}$ mg/l for water hardness levels of 50 mg/l and 200 mg/l, respectively	$16,640,000 (capital) $3,530,000 (annual O&M) (year 1) $180,000 (annual O&M) (years 2-5) $127,000 (annual O&M) (years 6-30)
2	Marathon Battery Company, NJ Industrial Facility 09/30/88 2nd	Soil, sediment, GW, and debris contaminated with VOCs including PCE and TCE, and metals including cadmium and nickel	6,100 yd^3 (soil) 5,000 yd^3 (sediment) 110 yd^3 (dust)	Decontamination of the inside surfaces and contents of the former battery facility, and excavation of cadmium-contaminated soil and the dredge spoils vault, followed by onsite fixation of the excavated soil, dust and vault sediment with offsite disposal, and backfilling excavated areas; excavating the VOC-contaminated soil hot spots, followed by enhanced volatilization and replacement of the clean residuals onsite; GW monitoring; institutional controls; and evaluation and performance of repairs, if needed, to the inoperable sprinkler and heating systems inside the former battery facility	ACLs are provided as GW cleanup goals for indicator compounds. The ACLs are below Federal and State MCLs, if available, and include PCE 0 ug/l and TCE 3 ug/l. These goals will be attained in 3-10 years by natural attenuation. Excavation of cadmium-contaminated soil will attain an ATSDR-recommended level of 20 mg/kg	$10,010,000 (present worth) $775,000 (annual O&M) (year 1) $17,000 (annual O&M) (years 2-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Marathon Battery, NY Former Battery Manufacturing Facility 09/29/89 3rd - Final	Sediment contaminated with metals including cadmium and nickel	55,000 yd^3 (sediment)	Dredging cadmium-contaminated sediment followed by onsite chemical fixation and offsite disposal; sediment sampling with dredging and onsite treatment; and sediment monitoring	Acceptable sediment concentration of cadmium is 220 mg/kg. Expectations are that by dredging the upper layer of contaminated sediment, 95% of the cadmium contamination will be removed. Following remediation, cadmium concentrations are not expected to exceed 10 mg/kg	$48,499,500 (present worth) $21,303,330 (O&M) (year 1) $132,700 (O&M) (years 2-30)
2	Metaltec/Aero-Systems, NJ 06/30/86 1st	Soil and GW contaminated VOCs including TCE and PCE, and metals including copper, chromium, and lead	10,000 yd^3	Excavation with heat treatment and offsite disposal of soil; and alternate water supply	MCLs and State guidelines set action levels for GW of TCE 5 ug/l and PCE 5 ug/l. Soil action levels include copper 170 mg/kg, chromium (total) 100 mg/kg, and lead 100 mg/kg	$7,005,000 (sanitary landfill) or $11,735,000 (RCRA landfill) (capital)
2	Montclair/West Orange Radium Site, NJ Former Radium Processing or Utilization Area 06/30/89 1st	Soil and structures contaminated with radium[226]	41,000 yd^3 (soil)	Excavation and offsite disposal of soil and debris; installation and maintenance of indoor engineering controls; environmental monitoring; and continuation of treatment technology study	Surface soil (top 6") will be removed until concentration is 5 pCi/g above background and subsurface soil is 15 pCi/g above background	$53,000,000 (present worth) $0 (O&M)
2	Montgomery Township, NJ 09/29/87 1st	GW contaminated with VOCs including TCE	Not specified	Extension of Elizabethtown water supply system to affected residences	Water supply will be monitored regularly for compliance with MCLs	$319,00 (capital) $0 (O&M)

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2	Montgomery Township Housing Development, NJ Residential Area 06/30/88 2nd - Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment onsite using air stripping with reinjection into the aquifer; connecting remaining affected residences to public water supply, and sealing remaining private water supply and monitoring wells within plume; and GW monitoring	GW cleanup will meet the State MCL for TCE of 1.0 ug/l	$2,548,000 (present worth) $94,000 (annual O&M)
2	Nascolite, NJ Industrial Facility 03/31/88 1st	Soil, GW, and debris contaminated with VOCs and organics	Not specified	GW pump and treatment using a method to be determined after pilot testing, followed by reinjection; performance of additional soil and onsite building studies to determine future measures; and provision of an alternate water supply for potentially affected residents	ROD did not specify chemical-specific goals but indicated attainment of CWA, SDWA, SWDA, NJSDWA, and NJWQC. Additionally, carcinogenic compounds without cleanup standards will attain the 10^{-6} health-based risk level. Any other contaminants will attain the goal of 5 ug/l total noncarcinogenic and "non-a-280" compounds	$609,000 (capital) $266,000 (annual O&M)
2	North Sea Municipal Landfill, NY 131-Acre Municipal Landfill 09/29/89 1st	Soil and sludge contaminated with VOCs; other organics including PAHs; metals including arsenic and lead; and other inorganics	Not specified	Capping landfill cell #1; implementing site security and deed restrictions; sampling sludge/soil in former sludge lagoons; and long-term air, SW, and GW quality monitoring	Capping the landfill reduces emissions of methane and VOCs, and reduces precipitation percolation through the landfill and thus migration of hazardous substances into GW. Individual contaminant goals were not specified	$7,700,000 - $8,300,000 (present worth) $190,000 - $200,000 (annual O&M)

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2	Old Bethpage, NY 65-Acre Municipal/ Industrial Landfill 03/17/88 1st - Final	GW contaminated with benzene, and toluene, and metals including chromium and lead; air contaminated with methane gas and VOCs	Not specified	GW pump and treatment using air stripping and, if necessary, carbon filtration with discharge into an upgradient injection well system; hydraulic control of the plume through installation of GW recovery wells; GW monitoring; completion of the landfill capping (29 acres previously capped); continuation and expansion, or enhancement, of the leachate control and gas collection systems; and gas monitoring	The plume will be treated to State standards or to a zero-slope condition if one exists following 5 or more years of pumping. Individual goals include chromium 0.05 mg/l, lead 0.025 mg/l, TCE 5.0 mg/l (MCL), benzene non-detectable, and toluene 50 mg/l. Air discharge requirements also will meet State standards. Individual goals include methylene chloride $1.17x10^3$ ug/m^3, TCE $9.0x10^2$ ug/m^3, and toluene $7.5x10^3$ ug/m^3	$23,045,000 (present worth)
2	Olean Well Field, NY 09/24/85 1st	GW contaminated with VOCs including TCE	Not specified	Reactivation of municipal wells; construction of two air stripping systems for GW treatment with discharge to public water supply system; extension of existing clean water lines; inspection of McGraw Edison industrial sewer and analysis of repair and replacement options; and recommendation of institutional controls to restrict GW usage	GW will be treated to TCE 5 mg/kg	$1,996,780 (capital) $799,040 (annual O&M)
2	PAS Oswego, NY 06/06/84 1st - Final	Soil contaminated with organics, VOCs, and metals	Not specified	Limited excavation and offsite removal of contaminated soil, subsurface tanks, and drums; RCRA capping with slurry wall containment system and site grading; and GW and leachate recovery and treatment	Not specified	$1,363,700 (capital) $117,000 (annual O&M)
2	Pijak Farm, NJ 09/30/84 1st - Final	GW and soil contaminated with VOCs, PCBs, organics, pesticides, and metals	Not specified	Removal and offsite disposal of drums and lab packs; and excavation and offsite disposal of visibly contaminated soil with GW pumping and removal	Not specified	$1,962,750 (capital) $53,600 (annual O&M)

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2	Pepe Field, NJ Processing Wastes Disposal Area 09/29/89 1st - Final	Soil found in landfill contaminated with hydrogen sulfide and methane gases	Not specified	Installing and maintaining landfill gas collection and treatment system using carbon adsorption; disposing carbon offsite; upgrading and maintaining existing leachate collection and treatment system; GW monitoring; and implementing deed restrictions	GW and soil already meet State drinking water standards and State action levels. Leachate quality will comply with State requirements. Emissions from gas treatment system will comply with State air pollution regulations. Chemical-specific cleanup goals were not specified	$1,293,700 (present worth) $108,000 (O&M) (years 1-2) $93,000 (O&M) (years 3-30)
2	Picatinny Arsenal, NJ Federal Facility Weapons and Munitions Research and Development Installation 09/28/89 1st	GW contaminated with VOCs including TCE and metals	Not specified	GW pumping and treatment using pretreatment for metals and solids removal and air stripping for VOCs removal; discharge of treated GW to SW; and air and effluent monitoring	ARARs for GW cleanup will apply to final remedial action, not to this interim action	$2,100,000 (capital) $1,100,000 (annual O&M)
2	Port Washington Landfill, NY 53-Acre Inactive Landfill 09/30/89 1st - Final	Soil and GW contaminated with VOCs including PCE, TCE, and benzene; and other organics including methane gas	Not specified	Capping landfill; rehabilitating existing gas collection system and installing additional vacuum extraction vents; GW pumping and treatment using air stripping followed by discharge to an aquifer recharge basin; and environmental monitoring	GW cleanup goals are based on SDWA MCLs and State standards for drinking water. Chemical-specific goals were not specified	$42,580,000 (present worth) $16,247,000 (present worth O&M) (years 1-30)

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2	Preferred Plating, NY Plating Facility 09/22/89 1st	GW contaminated with VOCs including TCE and PCE; and metals including chromium and lead	Not specified	GW pumping and treatment using precipitation, carbon adsorption, and ion exchange followed by GW reinjection, and offsite disposal of treatment residues	GW cleanup goals are based on SDWA MCLs and State water quality regulations and will be attained provided upgradient source areas are removed	$9,327,400 (present worth) $920,900 (annual O&M) (years 1-12)
2	Price Landfill, NJ 09/20/83 1st	GW and soil contaminated with VOCs and organics	Not specified	Replacement and relocation of the water supply well field and transmission facilities; and analysis of plume management, source control and GW treatment remedies	Not specified	$5,070,000 (capital) O&M (not provided)
2	Price Landfill, NJ 09/29/86 2nd - Final	GW contaminated with VOCs including TCE, organics, and inorganics	Not specified	GW pump and onsite pretreatment with discharge to a POTW; site capping; and fencing	Extraction and treatment will continue until TVO concentration reaches 10 ug/l or less in GW	$9,050,000 (capital) $1,010,000 (annual O&M) (years 1-5) $255,000 (annual O&M) (years 6-25)
2	Reich Farm, NJ Illegal Waste Disposal Area 09/30/88 1st - Final	Soil and GW contaminated with VOCs including PCE, toluene, TCE and xylenes, and organics	2,010 yd^3	Soil excavation and onsite treatment through enhanced volatilization and onsite disposal and/or offsite incineration and disposal; GW pump and treatment onsite using air stripping and carbon adsorption with reinjection to the aquifer; and additional GW and soil sampling	GW will be treated to attain State MCLs for TCE 26 ug/l, TCE 1 ug/l, and PCE 1 ug/l. Soil cleanup levels will meet State Soil Action Levels of total VOCs 1 mg/kg and total semi-volatile organics 10 mg/kg	$5,832,000 (present worth) $419,550 (annual O&M)

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2	Renora, Inc., NJ 09/29/87 1st	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and pesticides	5,500 yd^3	Biodegradation of 4,400 yd^3 of PAH contaminated soil; excavation of 1,100 yd^3 of PCB contaminated soil with offsite disposal (landfilling or incineration); and backfilling, Grading, and revegetation	Soil will be treated to total VOCs 1.0 mg/kg, total PAHs 10.0 mg/kg, total petroleum hydrocarbons 100.0 mg/kg, Cadmium 3.0 mg/kg, zinc 350.0 mg/kg, and PCBs 5.0 mg/kg. GW will be treated to total VOCs 50.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$1,401,000 (landfilling) (present worth) or $6,021,000 (incineration) (present worth)
2	Ringwood Mines/ Landfill, NJ Waste Disposal Area/Landfill 09/29/88 1st - Final	Soil and GW contaminated with metals including arsenic and lead, and petroleum hydrocarbons	Not specified	Soil sampling and excavation, if necessary, with offsite disposal, backfilling, regrading, and revegetation; and GW and SW monitoring	Soil cleanup will attain the non-promulgated New Jersey Cleanup Objectives for lead 250 mg/kg and total petroleum hydrocarbons 100 mg/kg. GW will attain MCLs, including arsenic 50 ug/l and lead 50 ug/l, by natural attenuation	$225,000 (capital) $50,000 (annual O&M)
2	Rockaway Borough Well Field, NJ 09/29/86 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW treatment using existing system	Municipal treatment system will be designed in accordance with SDWA standards to remove TCE and PCE to 5 ug/l each	$0 (capital) $74,800 (annual O&M)
2	Rocky Hill, NJ Municipal Well Field 06/30/88 1st - Final	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping with reinjection; alternate water supply; sealing remaining wells; and GW monitoring	Remediation will meet a $0.12x\ 10^{-6}$ excess cancer-risk level. The TCE cleanup goal of 1 ug/l corresponds to the proposed NJ MCL. PCE and 1,1-dichloroethane will be reduced to below 1 ug/l and 2 ug/l, respectively	$1,618,000 (capital) $84,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Sharkey Landfill, NJ 09/29/86 1st - Final	GW and soil contaminated with VOCs including TCE, inorganics, and metals	Not specified	Capping; and GW pump and treatment	Not specified	$23,173,000 (capital) $330,000 (annual O&M)
2	Sinclair Refinery, NY 09/30/85 1st	Soil contaminated with VOCs and metals	Not specified	Removal and offsite disposal of 300 drums; backfilling with clean fill; onsite consolidation of waste from South Landfill area with RCRA capping; site fencing; and partial river channelization	GW and SW will be treated to total organics 100 ug/l, toluene 10 ug/l, 1,1,1-trichloroethane 50 ug/l, arsenic 5 ug/l, zinc 30 ug/l and PCBs 0.0095 ug/l. Soil will be treated to toluene 72 ug/l, trans-1,2-dichloroethylene 325 ug/kg, arsenic 15,000 ug/kg, zinc 53,000 ug/kg, and PCBs 12.1 ug/kg	$8,759,000 (capital) $30,000 (annual O&M)
2	SMS Instruments (Deer Park), NY Active Industrial Facility 09/29/89 1st	Soil and GW contaminated with VOCs including PCE, TCE, and xylenes; and metals including chromium and lead	1,250 yd^3 (soil)	In-situ steam stripping of soil, and GW pumping and treatment using air stripping followed by reinjection. A contingency plan may be implemented if in-situ steam stripping cannot be utilized effectively; contingency plan includes offsite incineration of contaminated soil	Treated GW will meet State and Federal drinking water standards prior to reinjection. Specified GW cleanup goals include TCE 5 ug/l (MCL), PCE 0.7 ug/l (State), xylenes 5 ug/l (State), chromium 50 ug/l (MCL), and lead 25 ug/l (State). Soil will be treated until all contaminants of concern attain a level less than 10 ug/kg	$1,195,800 (present worth) $437,576 (annual present worth O&M)
2	South Brunswick Landfill, NJ 09/30/87 1st - Final	GW and SW contaminated with VOCs and metals	Not specified	Remediation completed in 1985 (capping, slurry wall, and leachate collection system). Post-remediation monitoring will continue for 30 years	Chemical-specific levels will be addressed in the post remedial monitoring program	$0 (no additional funding necessary)
2	Spence Farm, NJ 09/30/84 1st	GW and soil contaminated with organics, metals, and inorganics	Not specified	Excavation and offsite disposal of all drums, lab packs, and visibly contaminated soil; and site grading and surface restoration	Not specified	$845,500 (capital) $95,300 (annual O&M)

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2	Suffern Village Well Field, NY 09/25/87 1st - Final	Potential contamination of GW with VOCs	Not applicable	No further action with GW monitoring	GW levels for 1,1,1-TCA comply with the NYSDEC guideline of 50.0 ug/l	$0 (capital) $311,000 (present worth O&M)
2	Swope Oil, NJ 09/27/85 1st	GW and soil contaminated with VOCs, and organics including PCBs	Not specified	Capping; removal of tanks and building debris with offsite incineration; treatment or disposal of tank contents with offsite disposal of tanks and building debris; excavation and offsite disposal of buried sludge waste area; and excavation and offsite disposal of PCB contaminated soil	In accordance with State policy, soil will be excavated up to 1.5 feet, which contain PCBs >5 mg/kg	$5,590,356 (capital) $33,000 (annual O&M)
2	Syncon Resins, NJ 09/29/86 1st	GW, soil, and sediment contaminated with VOCs, PCBs, organics, pesticides, and metals	700 yd^3 2,000 yd^3	Excavation of lagoon sediment and highly contaminated subsurface soil with offsite disposal. Excavation and offsite disposal of surface soil; and GW pump and treatment	Soil removal to achieve PCBs 5 mg/kg, base-neutrals 100 mg/kg, TVOs 1 mg/kg, and numerous levels for metals. No standards have been set for GW treatment	$5,600,000 (capital) $209,000 (annual O&M)
2	Tabernacle, NJ Waste Disposal Area 06/30/88 1st - Final	GW contaminated with VOCs including 1,1,1-TCA and DCE	Not specified	Installation of GW monitoring wells with implementation of a monitoring program to delineate extent of plume; GW treatment using air stripping followed by reinjection; exhaust gas analysis; and soil sampling of former drum dumping and storage area	The proposed MCLs established by NJDEP are more stringent than Federal standards and include 1,1,1-TCA 26 ug/l and DCE 2 ug/l. The remedial action will comply with the NJDEP levels in anticipation that they will become State ARARs	$772,600 (capital) $215,600 (present worth O&M)
2	Upjohn Manufacturing Company, PR Industrial Facility 09/30/88 1st - Final	GW contaminated with carbon tetrachloride	Not specified	GW pump and treatment using air stripping with discharge to either a GW recharge area or a public water supply system; installation of chloride monitoring wells near the coastline; and GW monitoring	GW cleanup levels will meet the MCL for carbon tetrachloride 5 ug/l	$2,200,000 - $6,200,000 (capital) $400, 000 - $700,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Vega Alta, PR 09/29/87 1st	GW contaminated with VOCs including TCE and PCE	3,800,000 gpd (supply)	GW pump and treatment using scaling pretreatment, air stripping, and possibly activated carbon with discharge to creek or public distribution system; and the shutting down of two wells with connection to the public distribution system	GW pump and treatment will attain the 10^{-6} health-based risk level which includes MCL values for PCE 0.7 ug/l, 1,1,1-dichloroethene 0.23 ug/l, benzene 0.7 ug/l, and trichloroethene 2.8 ug/l. The ultimate attainment of MCLs will require identification and control of source(s)	$4,106,000 (capital) $581,000 (annual O&M)
2	Vestal Water Supply Well 1-1, NY 06/27/86 1st	GW contaminated with VOCs inlcuding TCE	Not Specified	GW pump and treatment using air stripping; alternate water supply; and cessation of untreated discharge to river	Not specified	$389,400 (captial) $119,750 (annual O&M)
2	Vineland Chemical, NJ Disposal Area 09/28/89 1st	Soil, sediment, and GW contaminated with metals including arsenic	126,000 yd^3 (soil) 62,600 yd^3 (sediment)	Site remediation has been divided into 4 OUs. OU 1 includes in-situ flushing of soil with onsite treatment along with GW from OU 2; decontaminating onsite storage buildings; and closing two impoundments after offsite treatment and disposal of recovered wastewater and sludge. OU 2 includes GW pumping and onsite treatment followed either by reinjection, offsite discharge to SW, or reuse for soil flushing. OU 3 includes excavating, dredging, and treating sediment using water wash extraction followed by onsite redeposition of treated sediment, and implementing natural river flushing. OU 4 is an interim remedy for lake sediment and includes dredging, excavating, and treating sediment using water wash extraction followed by redeposition and sediment and SW monitoring; treating and disposing of sludge residue offsite will follow all treatments	Soil, sediment, and GW cleanup goals for arsenic are based on 10^{-6} health-based levels and MCLs. Specific goals include 20 mg/kg (soil and surface sediment), 120 mg/kg (submerged sediment), and 50 ug/l (GW)	$66,384,636 (present worth) $3,463,463 (short-term source control O&M) $38,010 (long-term source control O&M) $5,155,053 (GW O&M)

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2	Vineland State School, NJ 195-Acre Residential Treatment Facility 09/30/89 1st - Final	None	Not applicable	Investigation results indicated very low levels of contamination. Because risks fall within the acceptable range, as determined by the State and EPA, no further remedial action is considered necessary	Not applicable	Not specified
2	Volney Landfill, NY 07/31/87 1st	GW contaminated with VOCs and metals	4,000,000 yd^3	Supplemental capping of landfill side slopes covering approximately 35 acres; installation of a leachate collection system to include a slurry wall, collection wells, and force mains; and offsite or onsite treatment of contaminated leachate, which will be determined during design (flow equalization, batch biological treatment, and carbon absorption considered)	Cleanup goals will meet the MCL values for vinyl chloride 1.0 ug/l, benzene 5.0 ug/l, and arsenic 50.0 ug/l. Additionally, chloroform 0.0 ug/l, nickel 15.4 ug/l, and arsenic 0.0 ug/l will meet WQC values. Total phenols 1.0 ug/l will meet the NY State value	$12,754,000 (offsite treatment) (capital) $12,876,000 (onsite leachate treatment) (capital) $882,000 (offsite leachate treatment) (present worth O&M) $691,000 (onsite leachate treatment) (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
2	Waldick Aerospace, NJ 09/29/87 1st	Soil contaminated with VOCs including TCE, and inorganics	10,500 yd^3	In-situ air stripping of 8,000 yd^3 from the saturated zone; excavation and offsite disposal of 2,500 yd^3 residuals with contamination above action levels; institutional controls to include site access and well restrictions; and fencing	Soil will be excavated to New Jersey Department of Environmental Protection levels which include cadmium 3.0 mg/kg, chromium 100.0 mg/kg, zinc 350.0 mg/kg, nickel 100.0 mg/kg, total VOCs 1.0 mg/kg, and total PHCs 100.0 mg/kg	$2,602,118 (capital) $55,000 (annual O&M)
2	Wide Beach, NY 09/30/85 1st - Final	GW and soil contaminated with PCBs	Not specified	Excavation and chemical treatment of PCB contaminated soil with backfilling of treatment residuals; offsite disposal of contaminated asphaltic material, and repavement of roadways and driveways; perched water treatment in sewer trench; construction of hydraulic barrier at end of sewer trench; conduction of treatability study to determine effective PCB and soil treatment; and sewage and sediment sampling	Based on 10^{-6} lifetime cancer risk, media cleanup goals include soil 10 mg/kg, air 1.67 ug/m^3, GW 100 ug/l, and SW $7.9x10^{-5}$ ug/l	$9,295,000 (capital) $0 (O&M)
2	Williams Property, NJ 09/29/87 1st - Final	Soil and GW contaminated with VOCs including PCE, organics, and metals	700 yd^3	Excavation of soil with removal to an offsite disposal facility for incineration; regrading, revegetation, and site restoration; GW pump and treatment using air stripping and carbon adsorption with reinjection; and provision of an alternate water supply to affected residences	Soil will be excavated to the New Jersey Environmental Cleanup Responsibility Act (ECRA) target level of 1.0 mg/kg total VOCs. GW will be treated to MCLs which include TCE 5.0 ug/l, chloroform 100.0 ug/l, barium 1,000.0 ug/l, arsenic 50.0 ug/l, cadmium 10.0 ug/l, chromium 50.0 ug/l, and lead 50.0 ug/l	$513,750 (capital) $64,600 (annual O&M)
2	York Oil, NY Waste Oil Recycling Facility 02/09/88 1st	Soil, sediment, GW, and SW contaminated with VOCs, metals, and organics including PCBs	30,000 yd^3 (soil) 8,000 yd^3 (sediment) 25,000 gals (tank contents)	Excavation and onsite solidification of soil and sediment followed by onsite disposal of treatment residuals; installation of draw down wells to collect sinking plume and oil followed by onsite oil skimmer and oil/water separator treatment with subsequent offsite discharge; offsite thermal treatment of tank oils in addition to other soil collected at the site; cleaning and demolition of empty storage tanks; and surface grading	GW cleanup will attain the State GW ARAR for any single phenolic compound 50 ug/l and for total phenolics 100 ug/l	$6,500,000 (capital) $500,000 (present worth O&M)

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3	Aladdin Plating, PA Industrial Facility 09/27/88 1st	Soil contaminated with metals including chromium	12,000 yd^3	Excavation and offsite stabilization of contaminated soil, followed by offsite disposal in a landfill; and replacement of the excavated soil with clean fill	Soil cleanup will attain a level of chromium 50 mg/kg	$4,461,000 (present worth)
3	Ambler Asbestos Piles, PA Industrial Facility 09/30/88 1st	Sediment, SW, and debris contaminated with asbestos	4,500 yd^3 (sediment) 1,900,000 gals (SW) 1,255,000 yd^3 (debris)	Installation of a geotextile and soil cover over exposed areas of waste piles; erosion control/repair; vegetative/soil cover over both waste piles; runoff collection and treatment; pump and filter lagoon and basins water, followed by onsite discharge, backfilling lagoon and basins, and onsite disposal of collected sediment and asbestos onto the waste piles; slope stability control measure,s if necessary after testing; further alternative evaluations; and access restrictions	Remedy addresses containment of asbestos-contaminated debris, therefore, no cleanup level is provided for the debris. SW treatment will meet requirements of State NPDES. Individual cleanup goal not specified	$5,135,000 (capital) $46,000 - $63,000 (years 2-6) $33,000 (years 7-30)
3	Ambler Asbestos Piles, PA 3.5-Acre Asbestos Pile 09/29/89 2nd - Final	Soil, sediment, debris, and SW contaminated with asbestos	110,000 yd^3 (debris)	Regrading waste pile and placing a soil cover over portions of the site; preforming a verification study to determine the source of inorganics in SW; installing and implementing erosion and sedimentation controls; SW and air monitoring; and implementing institutional controls including land use restrictions	Remedy addresses containment of asbestos-contaminated debris; therefore, no cleanup level is provided for the debris	$753,000 (present worth) $21,700 (O&M) (years 1-5) $10,200 (O&M) (years 6-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Army Creek Landfill, DE 09/30/86 1st	GW, SW, soil, and sediment contaminated with VOCs, inorganics, and metals	1,900,000 yd^3	Capping; downgradient GW pumping with monitoring; and possible upgradient controls	Not specified	$12,030,000 or $12,340,000 (upgradient controls) (capital) $306,000 or $388,000 (upgradient controls) (annual O&M)
3	Avtex Fibers, VA Industrial Facility 09/30/88 1st	GW is contaminated with organics including phenols and metals including arsenic and lead	Not specified	GW pump and treatment and basin liquid treatment after upgrading the existing onsite activated sludge treatment plant; GW, SW, and basin fluids monitoring; and deed restrictions	GW will be treated to meet MCLs, EPA Reference dose-based water limits, AWQC, State drinking water standards, NPDES requirements and Federal and State WQC. Individual cleanup goals include phenol 0.3 mg/l (AWQC), lead 0.05 mg/l (MCL/VAGWS), and arsenic 0.05 mg/l (MCL/VAGWS)	$9,122,000 (present worth)
3	Bally Ground Water Contamination, PA Municipal Well Field 06/30/89 1st	GW contaminated with VOCs including TCE	Not specified	Abandoning appropriate wells; GW pumping and treatment by air stripping with either vapor phase carbon, regenerable vapor phase carbon, or vapor phase catalytic oxidation, followed by discharging treated water to an adjacent stream or municipal potable water system; GW and SW monitoring; and implementing institutional controls restricting GW use and the construction of new wells	GW will be treated to meet MCLs or PMCLs when final MCLs are unavailable. Chemical-specific goals include TCE 0.005 mg/l (MCL)	$2,950,000 - $3,640,000 (present worth) $105,000 - $189,000 (O&M)
3	Bendix, PA Industrial Facility 09/30/88 1st - Final	Soil and GW contaminated with VOCs including TCE	Not specified	Soil vacuum extraction and soil aeration; and GW pump and treatment onsite with offsite GW treated at each residential wellhead	GW cleanup will attain a TCE concentration level of less than 1 ug/l both on- and offsite. Soil cleanup will meet a concentration limit of VOCs 100 ug/kg based on GW cleanup goal	$4,487,000 (present worth) $394,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Berks Sand Pit, PA Waste Disposal Area 09/29/88 1st - Final	Sediment, SW and GW contaminated with VOCs including PCE, 1,1-DCE and 1,1,1-TCA	Not specified	Excavation of contaminated sediment with offsite incineration and disposal; GW pump and treatment using air stripping and vapor phase carbon adsorption, followed by reinjection to the aquifer; provision of an alternate water supply system; GW and SW monitoring; and deed restrictions	GW cleanup levels will meet MCLs for 1,1-DCE 7 ug/l and 1,1,1-TCA 200 ug/l. Secondary target levels of 1,1-DCE 1 ug/l and PCE 1 ug/l are based on Unit Cancer Risk. GW cleanup will also meet the Underground Injection Control Regulations	$10,773,100 (present worth) $459,200 (annual O&M)
3	Blosenski Landfill, PA 09/29/86 1st	GW, SW, and soil contaminated with PCBs, VOCs including benzene and TCE, inorganics, and pesticides	Not specified	Excavation and removal of buried drums and other materials with RCRA offsite disposal; alternate water supply; GW pumping with onsite treatment; capping with SW diversion and gas venting; and source reduction program	Removal of contaminated media will attain a 10^{-6} excess cancer risk. GW will initially be treated to ACLs, then to levels established by NPDES	$11,000,000 - $15,000,000 $13,000,000 (estimated baseline cost) (capital) $534,300 (annual O&M) (years 1-2)
3	Bruin Lagoon, PA 06/02/82 1st	GW, SW, and soil contaminated with asphalt sludge, acid liquids, waste oil, resins, fly ash, coal fires, sulfuric and sulfonic acids, and petroleum waste	Not specified	Removal and offsite disposal of liquid lagoon contents with physical stabilization of lagoons, effluent pond cleanup and dike stabilization; capping; and GW diversion	Not specified	$1,456,000 (capital) $60,000 (annual O&M)
3	Bruin Lagoon, PA 09/29/86 2nd - Final	Soil and bedrock contaminated with acidic sludges and metals	17,500 yd^3	Stabilization/neutralization of sludge and perched liquid zone; in-situ bedrock treatment; and capping	Not specified	$2,695,000 (capital) $16,000 (annual O&M)

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3	Chisman Creek, VA 09/30/86 1st	GW, soil (disposal pits with fly ash), and SW contaminated with trace metals and inorganics	484,600 yd^3	Capping (2 pits); capping and upgradient GW diversion of one pit; alternate water supply; possible deed restrictions; and GW drainage and onsite treatment	Action for nickel complies with the AWQC for protection of fresh water aquatic life (88 - 280 ug/l) and salt water aquatic life (17 ug/l)	$14,119,000 (capital) $506,000 (annual O&M) (year 1) $64,000 (annual O&M) (years 2-30)
3	Chisman Creek, VA Waste Disposal Area 03/31/88 2nd - Final	SW contaminated with metals including nickel and vanadium	Not specified	Diversion of surface runoff from Area A (previously capped) into Pond A; and water quality monitoring	There is no ARAR promulgated for vanadium; however, an unpublished Estimated Advisory Concentration for vanadium of 7.7 ug/l will be met in fresh water systems. Remediation will attain the Clean Water Act level for nickel 13.4 mg/kg	$137,000 (present worth)
3	Craig Farm Drum, PA Industrial Landfill 09/29/89 1st - Final	Soil and GW contaminated with VOCs including benzene; other organics including phenols; metals including chromium and lead; and other inorganics	32,000 yd^3 (soil)	Excavating soil with onsite treatment using solidification; placing treated soil in newly excavated and lined onsite landfill followed by capping; collecting GW using a seep interceptor with offsite treatment; performing GW verification study; and providing deed notices to property owners	Soil will be excavated until organics are undetectable (<50 mg/kg). GW performance levels include benzene 0.005 mg/l (MCL), phenols 3.5 mg/l (AWQC), chromium 0.05 mg/l (MCL), and lead 0.05 mg/l (MCL)	$5,188,000 (present worth) $124,000 (annual O&M) (years 1-30)
3	Croydon TCE, PA TCE Spill Site 12/28/88 1st	GW contaminated with VOCs including TCE and PCE	Not specified	Provision of an alternate water supply to 13 residences; and GW monitoring	Remedy prevents exposure to concentrations of TCE in excess of Federal, State, and local health-based ARARs	$106,000 (present worth) $3,400 (annual O&M) (years 1-30)

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3	Cryo-Chem, PA Fabricating Facility 09/29/89 1st	GW contaminated with VOCs including TCE and PCE	Not applicable	Installation of dual-activated carbon adsorption units or continued maintenance of existing carbon units at affected homes until a permanent clean water supply is developed; implementation of periodic sampling at potentially affected homes; construction of a new uncontaminated water supply to serve affected and potentially affected homes and businesses; and periodic sampling of residences outside the affected area	GW will meet SDWA MCLs or an excess cancer-risk level less than 10^{-6} if an MCL has not been developed for a particular chemical. Target cleanup levels for GW include TCE 5 ug/l (MCL) and PCE 0.66 ug/l (based on a 10^{-6} cancer risk)	$1,260,000 (present worth) $80,000 (annual O&M)
3	Delaware City PVC, DE 09/30/86 1st	GW, SW, and soil contaminated with VOCs including TCE	25,000 yd^3	Excavation and removal of contaminated soil and sludges with offsite disposal; capping; GW pumping and treatment; and alternate water supply	Recovery wells will operate until concentrations of VCM, EDC, and TCE reach 1 ug/l, 0.94 ug/l, and 2.7 ug/l, respectively, for two consecutive sample analyses	$1,904,000 (capital) $43,000 (annual O&M)
3	Delaware Sand and Gravel, DE 27-Acre Industrial Landfill 04/22/88 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs, PAHs, and phenols, and metals including chromium and lead	535,000 yd^3 (soil)	Excavation and onsite incineration of approximately 36,000 tons of contaminated soil and waste from the Drum Disposal and Ridge areas, followed by residual ash disposal offsite, grading, and revegetation of excavated areas; removal and offsite disposal of surface debris from the Inert area, followed by capping; construction of a RCRA cap over the Grantham South area; GW pump and treatment with offsite discharge; and GW monitoring	GW cleanup levels will attain 10^{-6} risk levels or MCLs at the site boundary, and meet NPDES requirements for SW discharge. Individual GW cleanup levels were not specified. Soil cleanup levels were based on acceptable drinking water exposure levels and include toluene 6,000 mg/kg, xylenes 4.8 mg/kg, and phenols 497 mg/kg	$24,994,000 (present worth)
3	Dorney Road Landfill, PA 27-Acre Municipal Landfill 09/29/88 1st	Soil and SW contaminated with VOCs, organics and inorganics	700,000 gals	Offsite disposal of ponded water; regrading and installation of a multi-layer cap; run-on/runoff controls; runoff and GW monitoring; and access and deed restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable. Cancer risk levels onsite will be reduced to below 10^{-6}	$14,000,000 (present worth) $42,000 (annual O&M)

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3	Douglassville, PA 09/27/85 1st	Soil and sediment contaminated with VOCs, pesticides, organics including PAHs and PCBs, and metals	Not specified	Removal and consolidation of contaminated sediment from the drainage ditch, drainage swale, buried lagoon, and drum disposal areas, with onsite disposal under cap; capping former sludge lagoon area and sludge disposal area; installation of levees and dikes to protect from 100-year flooding event; and soil predesign study to determine extent of excavation and capping	Not specified	$5,569,500 (capital) $196,000 (annual O&M)
3	Douglassville Disposal, PA Waste Recycling and Processing Facility 06/24/88 2nd	Buildings, tanks, piping, and process equipment contaminated with VOCs, organics including PCBs and PAHs, and metals including lead	200,000 gals (tank contents)	Removal, transportation, and offsite incineration of liquid and sludge tank waste; decontamination of tanks, piping, processing equipment, and building materials; offsite disposal of building rubble; selling of tanks and other metal materials as scrap; offsite disposal of concrete, asphalt, and other materials; and treatment of generated decontamination fluids, as appropriate	Tanks, piping, processing equipment, and building materials designated for salvage or reuse will be decontaminated to a level not to exceed 100 ug/100 cm^2 PCBs on the surface. Concrete, asphalt, and other materials, which contain PCBs and cannot be decontaminated to less than 50 mg/kg PCBs, will be disposed of at an offsite hazardous waste landfill. This operable unit does not attempt to ensure compliance with all ARARs for the entire site, but will not be inconsistent with a final comprehensive remedy for the site	$4,050,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Douglassville Disposal, PA 50-Acre Abandoned Waste Oil Processing Facility 06/30/89 2nd - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and vinyl chloride; other organics including PAHs, PCBs, and phenols; and metals including lead	48,400 yd^3 (soil and sludge) 600 yd^3 (sediment)	Excavating and incinerating soil and sludge followed by backfilling ash residue onsite, with possible solidification prior to onsite disposal; covering backfilled area and revegetating, capping other source areas and revegetating; conducting test burns; treating and disposing of scrubber wastes from thermal treatment; implementing institutional controls and access restrictions; GW and SW monitoring; and establishing ACLs for GW	Soil will be treated if it exceeds a 10^{-6} cancer-risk level. GW standards will be ACLs and will be established at maximum existing concentrations for monitoring wells. ACLs include benzene 2,000 ug/l, toluene 2,300 ug/l, vinyl chloride 1,200 ug/l, phenols 7.1 ug/l, and lead 227 ug/l. If GW concentrations exceed ACLs, remediation may be necessary. Lead emissions into the air will not exceed NAAQS and State air quality standards, set at 1.5 ug/m^3 (on a quarterly average)	$39,430,000 - $53,769,000 (present worth) $0 (O&M) $150,000 (5-year review present worth)
3	Drake Chemical, PA 09/30/84 1st	GW, SW, soil, and stream sediment contaminated with VOCs, pesticides, and inorganics	Not specified	Capping and grading of leachate stream; partial excavation and temporary onsite storage of contaminated sediment; and construction of conduit and a granular drain	Not specified	$445,311 (capital) $9,427 (annual O&M)
3	Drake Chemical, PA 05/13/86 2nd	GW, soil, sludge, buildings, and debris contaminated with organics and inorganics	3,900 yd^3 192,000 gals	Incineration of onsite chemicals; demolition and offsite removal of buildings, tanks, and debris; wastewater pump and treatment of lagoons; metal recycling; and analysis with possible disposal of metal decontamination recycling fluid	Not specified	$3,143,000 (capital) $0 (O&M)
3	Drake Chemical, PA Industrial Facility 09/29/88 3rd - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene, toluene, TCE, and xylenes, organics including PAHs and phenols, and metals including arsenic, chromium and lead	252,000 yd^3 (soil, sediment, and sludge)	Excavation of soil, sediment and sludge, followed by onsite incineration, backfilling (possibly using incinerator ash), and installation of vegetation cover; GW pump and treatment along with SW, aqueous wastes from the leachate lagoon area, and run-on, after construction of an onsite biological activated carbon treatment plant, followed by offsite discharge to a stream or POTW; GW monitoring; and flood control measures	GW cleanup levels will attain an overall risk level of 10^{-5} by meeting MCLs or MCLGs. Individual cleanup goals were not specified	$97,363,000 (present worth) $787,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Enterprise Avenue, PA 05/10/84 1st - Final	SW and soil contaminated with VOCs, organics, and metals	Not specified	Offsite disposal of soil which fail key indicator parameter testing levels; backfilling of site with soil which passed parameter test; and grading and vegetating as a final cover	Not specified	$4,324,000 (capital) $4,200 (annual O&M)
3	Fike Chemical, WV Industrial Facility 09/29/88 1st	Soil, GW, and SW contaminated with VOCs, organics including PCBs and methyl mercaptan, inorganics including acids, asbestos, cyanide, and metals	600, 000 gals (SW) 750,000 gals (tank contents) 2,800 drums (liquid waste) 100,000 lbs (200 drums of metallic sodium)	Removal and offsite incineration of the tank containing methyl mercaptan and the drums of metallic sodium, followed by offsite disposal; removal, bulking, and offsite treatment and disposal of drums on the ground surface and of the materials found in various tanks, lines, and vessels (using incineration, ion exchange or chemical oxidation, and stabilization/fixation depending on contents); lab packing of laboratory containers with either offsite disposal or offsite incineration; drainage and stabilization of lagoon and sewage treatment ponds, followed by treatment and offsite residual discharge; excavation and offsite disposal of buried drums; and stabilization and/or removal of asbestos-containing insulation	Remedy addresses the control, stabilization, and elimination of the imminent hazards associated with the site to allow for the completion of the RI/FS process. Lagoon liquids will meet NPDES permit requirements. Individual goals were not specified	$8,000,000 (present worth)
3	Fischer & Porter, PA 05/04/84 1st - Final	SW contaminated with VOCs including TCE and PCE	Not specified	Improvements in manufacturing facility to prevent release; onsite installation of pumping wells and packed column aeration to reduce contaminant levels in effluents, with discharge to SW; and treatment of contaminated wells	Not specified	Not specified
3	Harvey-Knott, DE 09/30/85 1st - Final	GW, SW, and soil contaminated with VOCs, metals, organics including PCBs, and inorganics	Not specified	SW collection and treatment with offsite disposal; removal and offsite disposal of sediment, sludges, bulk wastes, drums, and debris; GW extraction and treatment with reinjection to soil for flushing; and site grading with 2 foot clean soil cover	Target soil and GW ACLs will be established during design	$3,572,000 (capital) $44,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Havertown PCP, PA Wood Treatment Facility 09/29/89 1st	SW contaminated with VOCs including benzene, toluene, and TCE; other organics including phenols, dioxins, PCP, and PAHs; metals including chromium; and oils	200 drums (soil and oily debris) 6,000 gals (wastewater)	Offsite land disposal of drums filled with soil and oily debris; offsite treatment and disposal of wastewater stored onsite in tanks; soil monitoring; installation and operation of an oil/water separator at the storm sewer effluent point to SW; multi-media monitoring; and implementation of site access restrictions	Cleanup goals are based on a 10^{-6} risk level. Specific SW cleanup goals include reducing the discharge of PCP-contaminated oil to nearby creek to less than 5 mg/l and reducing the VOC concentrations by 17%	$1,158,200 (present worth) $110,000 (O&M) (years 1-5) $45,000 (O&M years 6-30)
3	Hebelka Auto Salvage Yard, PA 20-Acre Automobile Disposal Area 03/31/89 1st	Soil and debris (battery casings) contaminated with metals including lead	5,000 yd^3 (soil) 1,000 yd^3 (debris)	Excavation and onsite fixation of soil followed by offsite disposal; excavation and recycling of battery casings; and soil backfilling and revegetation	Soil will be excavated down to a lead concentration of 560 mg/kg based on health-risk calculations which consider a safe soil ingestion scenario	$6,073,436 - $6,884,652 (present worth) $0 (O&M)
3	Heleva Landfill, PA 03/22/85 1st - Final	GW and SW contaminated with VOCs including TCE and PCE	Not specified	RCRA capping; SW diversion and gas venting systems; conduction of a predesign study to fully delineate the source of contamination and determine sink-hole activity; construction of an onsite treatment facility; GW pump and treatment; and extension of municipal water main to affected residents	GW will be treated to PCE 1.0 ug/l, TCE 1.8-5.0 ug/l, vinyl chloride 2.0 ug/l, 1,1,1-trichloroethane 21.7 ug/l, and toluene 15,000 ug/l	$7,791,000 (capital) $62,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Henderson Road, PA Waste Disposal Facility 03/30/88 1st	Potential offsite GW contamination from VOCs and organics	Not specified	Extraction of onsite and downgradient (if necessary) GW and treatment using air stripping with probable discharge to adjacent stream and possible reinjection of a portion of the GW near the injection well as part of unsaturated zone treatment; closure of the injection well; excavation of contaminated oil pit sediment and removal of significant waste, if feasible, directly out of the injection well; installation, operation, and maintenance of a carbon adsorption water treatment system at affected offsite active well; deed restrictions; GW monitoring; pilot study testing of in-situ volatilization (ISV) or other technology in the unsaturated zone; and periodic reevaluation of cleanup goals	GW cleanup will attain a $7x10^{-4}$ cancer-risk level. Complete aquifer restoration not considered feasible due to background contamination. Individual cleanup goals provided for 46 chemicals	$5,500,000 (without ISV) (present worth) or $12,200,000 (with ISV) (present worth)
3	Henderson Road, PA Industrial Landfill 09/29/89 2nd - Final	The injection well operable unit is contaminated with VOCs including PCE, TCE, toluene, and benzene; and other organics including PAHs	2,735 yd^3 (soil) 5,230 yd^3 (debris) 2,500,000 gals (leachate)	Installation of erosion controls, regrading and capping, including possibly moving the onsite water main; installation of a short- and long-term leachate collection system with treatment and discharge to be determined; excavation and movement of trash, soil, and cinder currently located at the adjacent Turnpike property, to the Henderson Road site, with appropriate remediation of wastes left in place at the Turnpike property; further sample collection in the western portion of the site to determine treatment and/or capping in that area, and contingent GW recovery; GW and leachate monitoring; and implementation of institutional controls	Cleanup goal for soil is based on depth of soil rather than concentration level. GW standards include benzene 5.0 ug/l (MCL), toluene 2,000 ug/l (PMCL), PCE 5.0 ug/l (PMCL), TCE 5.0 ug/l (MCL) and PAHs 2.5 ug/l (CLP detection limit)	$7,265,000 (present worth) $213,260 (annual O&M)
3	Industrial Lane, PA 09/29/86 1st	GW contaminated with VOCs	Not specified	Provision of alternate water supply; and possible GW usage restrictions	Not specified	$30,800 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Kane and Lombard, MD 09/30/87 1st	Soil, GW, and debris contaminated with VOCs, organics including PAHs and PCBs, and metals	67,000 yd^3	Removal of drums, hot spots, and 67,000 yd^3 soil with onsite soil capping; construction of subsurface containment/diversion system; development of SW run-off management facility; and future use of institutional controls	Chemical-specific cleanup levels will be addressed in 2nd OU	$4,692,660 (capital) $28,930 (annual O&M)
3	Kimberton, PA Industrial Facility 09/30/88 1st	GW contaminated with VOCs including TCE	Not specified	Interim remedy selects no further action with continued GW monitoring and treatment at residential and commercial establishments by filtration using granular activated carbon adsorption	GW treatment will attain a 10^{-6} risk level for VOCs. The use of GAC filters on impacted wells has reduced contaminants of concern to non-detectable levels	$3,850,000 (present worth) $250,000 - $300,000 (annual O&M)
3	Kimberton Site, PA Industrial Facility 06/30/89 2nd - Final	GW and SW contaminated with VOCs including TCE and DCE	Not specified	Continued provision of alternate water supplies through GAC treatment system and/or potable water supply storage tanks; GW pumping and treatment using air stripping with onsite discharge to an adjacent stream; GW monitoring; SW collection and treatment using air stripping; and implementation of institutional controls restricting GW use	GW remediation goal is to achieve natural background conditions. GW will gradually meet MCLs including TCE 5 ug/l and DCE 7 ug/l. SW will meet AWQC including TCE 21,900 - 45,000 ug/l and DCE 11,600 ug/l. Air emissions from air stripping will comply with State air toxic guidelines	$2,630,000 (present worth) $175,000 (annual O&M)
3	Lackawanna Refuse Site, PA 03/22/85 1st - Final	SW and soil contaminated with VOCs, organics, and metals	Not specified	Excavation and offsite disposal of drums and highly contaminated fill; leachate collection and surface drainage diversion; clay capping and construction of gas venting systems; and reconstruction of access road	Excavation limits will be determined by background contaminant levels	$8,200,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	L.A. Clarke and Son, VA Industrial Facility 03/31/88 1st	Soil and sediment contaminated with constituents of creosote including PNAs and benzene	118,000 yd^3	In-situ soil flushing of subsurface soil followed by in-situ biodegradation; onsite land farming of excavated surface soil, sediment, and subsurface wetland soil; biological degradation of creosote contaminated bottom sediment; excavation/dredging and consolidation of nontreated contaminated sediment, subsurface wetland soil, buried pit materials and remaining surface soil; erosion sedimentation control; backfilling of excavated areas with treated soil and sediment and addition of topsoil for revegetation; and GW monitoring	Soil cleanup levels will attain a cumulative 10^{-5} cancer-risk level. Individual goals include carcinogenic PNAs 10.3 mg/kg and benzene 94.03 mg/kg	$23,409,000 (present worth) $33,900 (present worth O&M)
3	Lansdowne Radiation, PA 08/02/85 1st	Dwellings contaminated with radioactive materials including radium	Not specified	Permanent relocation of residents	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/g	$1,500,000 (capital) $10,000 (annual O&M)
3	Lansdowne Radiation, PA 09/22/86 2nd	Dwellings and soil contaminated with radioactive materials including radium	Not specified	Demolition and offsite disposal of two homes; and excavation and offsite disposal of contaminated soil	EPA guidelines for radiation include gamma 0.17 rem/yr, radon 0.03 WL, and soil activity 5-15 pCi/G	$4,000,000 - $4,500,000 (capital) "Minimal" (O&M)
3	Leetown Pesticide, WV 03/31/86 1st - Final	Soil and debris contaminated with pesticides	3,600 yd^3	Excavation, consolidation, and anaerobic biodegradation of contaminated soil; and removal and offsite disposal of contaminated debris	Target soil levels for DDT and its metabolites is 300 ug/kg, which is equivalent to the 10^{-6} carcinogenic-risk level	$1,014,000 (capital) $10,000 (annual O&M) (year 1) $7,500 (annual O&M) (year 2)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Lehigh Electric, PA 02/11/83 1st - Final	Soil contaminated with VOCs and PCBs	Not specified	Excavation and removal of contaminated soil, transformers, and debris with offsite disposal of soil; demolition of onsite buildings; and backfilling, grading, and vegetation of site to minimize erosion and control runoff	Offsite disposal of soil with PCB concentration >50 mg/kg	$6,401,000 (capital) $46,000 (annual O&M)
3	Limestone Road, MD 09/30/86 1st	Soil, GW, SW, and sediment contaminated with VOCs including TCE and PCE, and metals	Not specified	Capping with grading and fencing	Not specified	$1,192,580 (capital) O&M (to be determined)
3	M.W. Manufacturing, PA Industrial Facility 03/31/89 1st	Soil contaminated with VOCs including PCE and TCE; other organics including PCBs; and metals including lead	875 yd^3 (waste pile and soil)	Excavation of carbon waste pile and underlying soil with transportation to an offsite incineration facility and disposal of ash in a RCRA landfill	Soil excavation will be based on visible contamination. Carcinogens will be treated to <2 ug/kg for individual contaminants, which corresponds to the 10^{-4} to 10^{-6} risk range	$2,061,000 (capital) $0 (annual O&M)
3	Matthews Electroplating, VA 06/02/83 1st - Final	GW and soil contaminated with metals including chromium	Not specified	Extension of existing municipal water system to affected residents	Not specified	$662,000 (capital) $292,000 (annual O&M)
3	McAdoo, PA 06/05/84 IRM	GW and soil contaminated with organics and inorganics	Not specified	Cleaning and removal of underground waste storage tanks; excavation and offsite disposal of visibly contaminated soil; and evaluation of analytical results of soil analyses	Not specified	$114,500 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	McAdoo Associates, PA 06/28/85 2nd	GW, SW, and soil contaminated with paint sludges, spent solvents, metallic sludges, and acid and caustic liquids, toluene, waste oil/water, and solid waste	Not specified	Removal and offsite disposal of the onsite tank, debris, and contaminated soil; limited excavation of soil; RCRA capping; SW diversion; and site covering	Excavation of soil "hot spots" which exceed cadmium 0.2 ug/kg, chromium 809 ug/kg, and cyanide 33 ug/kg	$2,360,000 (capital) O&M (not provided)
3	Middletown Road, MD 03/17/86 1st - Final	No threat	None	No action	Not specified	$0 (capital) $0 (O&M)
3	Middletown Airfield, PA Federal Facility 12/31/87 1st	GW contaminated with VOCs including PCE and TCE	Not specified	Provision of a potable water supply; construction of a central treatment plant; and GW pump and treatment using air stripping	GW cleanup levels will meet a cumulative 10^{-6} cancer-risk level for PCE 1.0 ug/l, and MCLs for TCE 5.0 ug/l, benzene 5.0 ug/l, and toluene 2,000 ug/l (MCLG)	$3,750,000 (capital) $160,000 (annual O&M)
3	Millcreek Dump, PA 05/07/86 1st - Final	Soil, sediment, and GW contaminated with VOCs, organics including PCBs and PAHs, inorganics, and metals	Not specified	Excavation and onsite consolidation of soil under a RCRA cap with site grading and revegetation; soil capping over remaining soil; SW management; GW pump and treatment; and flood retention system	Soil cleanup goals include PCBs 10 mg/kg, PAHs 2,940 ug/kg, TCE 10 ug/kg, phenols 9,000 ug/kg, and toluene 1,783 ug/kg	$12,000,000-$18,000,000 ($15,000,000 estimated baseline) (capital) $1,763,000 (present worth O&M)
3	Moyer Landfill, PA 09/30/85 1st - Final	GW and SW contaminated with metals, VOCs including TCE, arsenic, and radioactive materials	Not specified	Soil/clay capping; erosion and sedimentation control measures; SW diversion; leachate collection, treatment, and discharge; methane gas recovery and sale; security/fencing measures; and RCRA closure	Not specified	$6,293,500 (capital) $332,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	New Castle, DE Waste Disposal Facility 03/31/88 1st - Final	None	None	No action with SW monitoring until deletion from NPL and implementation of State Closure	Concentrations of lead, cadmium, and chromium are below levels established as MCLs	$0
3	New Castle Spill, DE Former Manufacturing Facility 09/28/89 1st - Final	GW contaminated with tris (2-chloropropyl)-phosphate	Not specified	Natural attenuation; GW, SW, and sediment monitoring; and implementation of institutional controls restricting further well installation in the shallow aquifer	Because there are no ARARs for tris (2-chloropropyl)-phosphate, EPA has established a TBC criterion of 4.4 mg/l which is based on an average daily intake of 0.125 mg/kg/day of tris (2-chloropropyl)-phosphate	$466,147 (present worth) $25,000 (O&M)
3	Ordnance Works Disposal, WV Waste Disposal Area 03/31/88 1st	Soil and sediment contaminated with metals including arsenic, and organics including PAHs and PCBs	Not specified	Consolidation of existing landfill waste and application of a multi-layer RCRA cap; excavation and onsite incineration of lagoon area and scraped-area soil and impacted stream sediment with onsite disposal of treatment residuals in the landfill prior to capping (assuming the ash is not EP toxic); placement of clean fill in the excavated area, followed by grading and revegetation; implementation of surface management techniques for drainage and sediment control in the landfill area; and ambient air and post-treatment monitoring	Risk-based cleanup levels for indicator chemicals were developed for arsenic 20 mg/kg, PAHs 26 mg/kg, and mercury 175 mg/kg. A PCB cleanup level of 5 mg/kg was used based on EPA cleanup goals for industrial sites	$6,718,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Ordnance Works Disposal Areas, WV Chemical Facilities 09/29/89 1st (Amendment)	Soil and sediment contaminated with organics including cPAHs; and metals including arsenic and lead	13,885 yd^3 (soil)	Excavation and onsite treatment of inorganic-contaminated soil using solidification, followed by placement of treated soil in landfill before capping; installing RCRA cap on landfill, regrading, and revegetation; excavation of organic-contaminated soil and sediment with onsite treatment by bioremediation; GW, SW and sediment monitoring; and implementation of deed restrictions	Cleanup goals for carcinogens are based on a 10^{-6} excess-risk level and include cPAHs 44.7 mg/kg, arsenic 88.8 mg/kg, and lead 500 mg/kg	$8,332,000 (present worth)
3	Palmerton Zinc, PA 09/04/87 1st	Defoliation of mountain side from zinc, lead, cadmium, and sulfur dioxide	Not specified	Onsite installation of concrete pad with berms to mix offsite sewage sludge and fly ash; application of lime (10 tons/acre) and potash (80 lbs/acre) on target areas; application of fly ash and offsite sludge on target areas; and application of grass seed, seedlings, and mulch	State loading rates for metals include cadmium 3.0 lbs/acre, copper 100.0 lbs/acre, chromium 100.0 lbs/acre, lead 100.0 lbs/acre, mercury 0.3 lbs/acre, nickel 20.0 lbs/acre, and zinc 200.0 lbs/acre. The maximum dry sludge application rate is 60 tons/acre	"Minimal" to none
3	Palmerton Zinc, PA Industrial Facility/ Zinc Smelter 06/29/88 2nd	Sediment, GW, and SW contaminated with metals including cadmium, lead, and zinc	27,500,000 tons (smelter process residues)	Slope modification, capping, and application of a vegetation cover on the residue bank; construction of SW diversion channels; SW/leachate collection and treatment using lime-activated filtration lagoons and/or constructed wetlands; implementation of an inspection, monitoring, and maintenance plan; and wetlands restorative measures, if necessary	SW/leachate treatment levels will meet CWA requirements and attain SW background levels. Individual goals were not specified	>$2,861,000 (present worth) (exact figure to be determined during design)
3	Presque Isle, PA 09/30/87 1st - Final	None	Not applicable	No further action	Not specified	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Publicker/Cuyahoga Wrecking, PA 37-Acre Abandoned Manufacturing Facility 06/30/89 1st	Soil and GW contaminated with VOCs and other organics including PCBs and pesticides	852,275 gals (waste stream) 20 yd^3 (debris)	Offsite treatment and disposal of waste streams in RCRA-permitted facilities; demolition of above-ground process lines with proper packaging of contaminated insulation and onsite storage pending disposition in a subsequent remedial action; and offsite disposal of hazardous chemicals recovered from within the lines	The selected remedy will stabilize the site and remove the threat associated with fire and/or explosion by removing and disposing of waste streams offsite. No chemical-specific goals were provided	$13,900,000 (capital) $0 (O&M)
3	Reeser's Landfill, PA 15-Acre Municipal/ Industrial Landfill 03/30/89 1st - Final	None	Not applicable	No action remedy with GW review within five years	Not applicable	Not specified
3	Rhinehart Tire Fire, VA Waste Disposal Facility 06/30/88 1st	Soil, GW and SW contaminated with metals including arsenic, lead and zinc	Not specified	Collection and gravity settling of surface water runoff; collection, oil-water separation and transport to POTW of shallow GW oily seeps; increased freeboard in existing onsite ponds; and soil erosion control	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$1,332,340 (present worth) $145,000 (O&M)
3	Saltville Waste Disposal Ponds, VA 06/30/87 1st	Soil, sediment, SW, air, and biota contaminated with mercury	Not specified	Upgrading run-on controls; treatment of waste pond outfall with either sulfide precipitation or carbon adsorption; and institutional controls to include possible implementation of local zoning ordinances	Treated effluent discharged into river will meet the State standard for mercury 0.05 ug/l in water	$840,052 - $2,143,052 (capital) $221,941 - $258,941 (sulfide ppt. or carbon system, respectively) (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Sand, Gravel & Stone, MD 09/30/85 1st	GW, SW, soil, and sediment contaminated with organics and metals	Not specified	Excavation and offsite disposal of hazardous materials; and GW extraction and treatment with discharge to ponds, aquifer, or creek	GW will be treated to background levels for heavy metals and organic compounds	$7,095,000 (capital) $753,000 (annual O&M)
3	Southern MD Wood Treating, MD Wood Preserving Facility 06/29/88 1st - Final	Soil, sediment, SW, GW, and debris contaminated with VOCs, and organics including PNAs	102,000 yd^3 (soil and sediment)	Excavation/dredging of soil, sediment, cement, and tank liquids and treatment using onsite incineration with onsite disposal of residual ash, backfilling, regrading, and revegetating, where necessary; installation of a slurry wall; GW and SW pump and treatment using activated carbon adsorption of hydrogen peroxide and UV irradiation with discharge to the onsite pond; installation of a geotextile silt fence, sedimentation basins, and/or diversion/surface management; and GW, SW, environmental, organic vapor, and dust monitoring	All media will attain the cleanup goal for carcinogenic PNAs (CPNAs) of 2.2 ppm based on the maximum lifetime cancer risk. These goals were established for onsite future residents. The ash residue is expected to meet Best Demonstrated Available Technology	$38,163,000 (present worth) $44,000 (O&M present worth)
3	Strasburg Landfill, PA 222-Acre Industrial/ Municipal Landfill 06/29/89 1st	GW and SW contaminated with VOCs including TCE, PCE, Toluene, and xylenes	Not specified	Leachate collection with an interceptor drain and offsite treatment; and provision of an alternate water supply using point-of-use activated carbon treatment system	Treated GW concentrations for carcinogenic contaminants will be such that the aggregate carcinogenic risk would be $<10^{-6}$. Target GW concentrations for non-carcinogenic contaminants will ensure an HI <1. MCLs are ARARs and may be considered target levels. Because of an ARAR waiver for leachate, no chemical-specific cleanup goals were specified for leachate seep	$42,850 (capital) $4,500 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Taylor Borough, PA 06/28/85 1st	SW, soil, and sediment contaminated with VOCs including TCE, and organics	Not specified	Removal and offsite disposal of drums and remnants; SW collection and treatment; excavation and offsite disposal of contaminated soil, waste, and sediment from two of the former drum storage areas (areas 1 & 2) with backfilling and placement of a 24-inch soil cover over the remaining three former drum storage areas; and fencing	Excavation of sediment, soil, and wastes to background levels	$4,237,000 (capital) O&M (not provided)
3	Taylor Borough, PA 03/17/86 2nd - Final	Possible GW contamination with VOCs and metals	Not specified	No further action with semi-annual GW monitoring	Not specified	$0 (capital) $8,000 or $16,000 (annual O&M)
3	Tybouts Corner Landfill, DE 03/06/86 1st - Final	Soil and GW contaminated with VOCs including TCE, and inorganics	Not specified	Excavation of waste and soil with onsite consolidation and capping; and GW pump and treatment	GW will be treated to the cancer risk of 10^{-4} for carcinogens, which includes TVO 100 ug/l	FS estimate: $35,000,000 (capital) PRP estimate: $15,000,000 (capital) $4,600,000 (present worth O&M)
3	Tyson's Dump, PA 12/21/84 1st	GW, SW, soil, and stream sediment contaminated with VOCs	Not specified	Excavation and offsite disposal of contaminated soil and wastes; upgrading of the existing air stripping facility to treat leachate, shallow GW, and surface run-on; and excavation and offsite disposal of contaminated sediment	Not specified	$5,718,000 (capital) $351,000 (annual O&M)
3	Tyson's Dump, PA Waste Disposal Facility 09/30/88 2nd - Final	GW contaminated with VOCs including toluene 1,2,3-trichloropropane, and xylenes	Not specified	GW pumping and treatment using air stripping and vapor-phase carbon, and if necessary, GAC polishing of air-stripped water with offsite discharge of treated water; and GW monitoring	GW cleanup levels include toluene 2.0 mg/l, 1,2,3- trichloropropane 0.00035 mg/l, and xylenes 0.12 mg/l based on 10^{-6} risk level, MCLs, and WQC	$6,170,000 - $6,910,000 (present worth) $424,300 - $509,900 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Tyson's Dump, PA Waste Disposal Facility 03/31/88 Addendum to 12/21/84 ROD	Soil and bedrock contaminated with VOCs	Not specified	In-situ treatment of soil and bedrock using vacuum extraction; treatment of vacuum-extracted water using the onsite leachate water treatment system; and installation of a soil cover following treatment	Cleanup levels were developed using health-based acceptable intake levels and hypothetical exposure scenarios. The scenario producing the most stringent cleanup requirement was selected as the cleanup goal. Individual cleanup goals were listed for 45 contaminants. Cleanup levels for indicator compounds include benzene 50 ug/kg, trichloroethane 50 ug/kg, PCE 50 ug/kg, and 1,2,3-trichloropropane 50 ug/kg	$10,200,000 (present worth)
3	Voortman Farm, PA Waste Disposal Facility 06/30/88 1st - Final	GW monitored for contamination from metals including lead and cadmium	Not specified	No action alternative with continued GW monitoring	Currently, the GW does not violate drinking water standards	$26,010 (present worth) $6,860 (annual O&M)
3	Wade, PA 08/30/84 1st - Final	Soil contaminated with organics, metals, and inorganics	Not specified	Removal and offsite disposal of contaminated soil, tires, tankers, waste piles, and underground storage tanks; demolition of buildings, leveling of debris, filling and grading of property; and top soil and seed capping	Not specified	$1,580,050 (capital) $320,000 (annual O&M)
3	West Virginia Ordnance Works, WV 03/27/87 1st	Soil, sediment, and SW line contaminated with organics and asbestos	4,305 yd^3	In-situ flaming treatment of reactive nitroaromatic residue; capping of treatment residuals with nitroaromatic concentrations >50 mg/kg; excavation, flushing, and backfilling of reactive sewer lines; offsite disposal of asbestos; and institutional controls to include deed restrictions	Soil cleanup will attain less than the 10^{-6} individual lifetime cancer-risk level. This sets the cleanup goal of total nitroaromatics at 50.0 mg/kg	$1,807,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	West Virginia Ordnance Works, WV Industrial Facility 09/30/88 2nd - Final	Soil, sediment, and GW contaminated with nitroaromatics and lead	Not specified	Remedy addresses three distinct areas of contamination. Area 1 - GW pump and treatment with discharge to SW; purchase land, construct a soil cover over the contaminated area, and incorporate land into existing wildlife preserve Area 2 - Relocation of ponds 1 and 2, followed by backfilling with clean fill; and GW pump and treatment with discharge to SW Area 3 - Installation of a soil cover; and GW pump and treatment with discharge to SW	GW goals are based on available standards or a 10^{-6} cancer risk. GW cleanup goals were provided for six contaminants including TNT 50 ug/l	$3,365,000 (present worth) $216,500 (O&M)
3	Westline Site, PA 07/03/86 1st - Final	Soil contaminated with tars containing phenols and PAHs	710 yd^3	Excavation and offsite incineration of tar deposits; backfilling with clean soil; and GW verification study	Soil will be excavated to a 10^{-4} cancer-risk level for contaminants present onsite, which is consistent with the 10^{-6} risk level for GW	$744,000 (capital) $0 (O&M)
3	Westline, PA Wood Processing Facility 06/29/88 2nd - Final	GW contaminated with VOCs including benzene, and organics	Not specified	No action with continued GW monitoring; and implementation of institutional controls to prevent the addition of new drinking water wells	The remedy meets the 8.93×10^{-5} increased cancer-risk level. Natural attenuation can meet the MCL for benzene 5 ug/l within a 5 to 10 year period. Additionally, WQC and standards have not been exceeded	$0 (capital)
3	Whitmoyer Laboratories, PA Industrial Facility 06/30/89 1st	Concentrated liquids contaminated with VOCs including PCE and metals including arsenic	69,000 gals (concen-trated liquid wastes)	Consolidating, transporting offsite, and treating concentrated liquid wastes using thermal treatment, biodegradation, or recycling at a RCRA-permitted facility, followed by disposal of treated water in offsite SW and disposal of solid residuals in an offsite landfill; decontaminating tanks and piping to meet RCRA closure standards; and treating and disposing of cleaning agent residuals offsite at RCRA-permitted facilities	This interim remedial action will comply with ARARs; however, chemical-specific cleanup levels were not provided	$475,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
3	Wildcat Landfill, DE 44-Acre Industrial/ Municipal Landfill 06/29/88 1st	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes, organics including PCBs and metals including arsenic	160 drums (waste material)	Removal and offsite disposal of drums and drum contents with offsite disposal by landfilling, if not hazardous, or incineration, if hazardous; grading, soil cover, and revegetation of direct contact risk areas; replacement of two domestic wells adjacent to the site; GW monitoring; and institutional controls including well and land use restrictions	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$5,400,000 (present worth)
3	Wildcat Landfill, DE 2.7-Acre Landfill Pond 11/28/88 2nd - Final	Sediment and GW contaminated with metals including arsenic, chromium, and lead	Not specified	Draining, filling and revegetating pond; constructing a new pond onsite; implementing institutional controls including land use restrictions; and GW monitoring	Remedy will ensure Federal water quality criteria are not exceeded when discharging SW. Quantitative cleanup goals are not applicable	Not specified (remedy will be imple-mented as part of first operable unit construction)
4	Aberdeen Pesticide Dumps/Fairway Six, NC Pesticide Disposal Site 06/30/89 1st	Soil and debris contaminated with organics including pesticides	22,000 yd^3 (soil and debris)	Excavating and homogenizing pesticide-contaminated wastes with onsite incineration; reinjecting process wastewater or scrubber blowdown into thermal treatment facility; analyzing ash residues with onsite redisposal; and air emissions monitoring	The air pollution control system will achieve performance standards which are defined as hydrogen chloride <4 lbs/hr and particulate matter of <0.08 grains/dry ft^3 in the exhaust gas connected to 7% oxygen content	$14,533,000 (present worth) $0 (O&M)
4	Airco, KY 2.7-Acre Industrial Landfill 06/24/88 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, EDC, PCE, and TCE, organics including PAHs and PCBs, and inorganics	5,000 yd^3 (soil) 6,075,000 ft^3 (GW) (includes volume from Goodrich, B.F. site)	Excavation of contaminated soil with placement in pit area located on the adjacent B.F. Goodrich NPL site property, cover pit with a RCRA cap, and construct an organic vapor recovery system to separate VOCs from soil; construction of a flood protection dike; installation of a leachate extraction system around landfill and upgrading of the existing landfill clay cap; GW pump and treatment using air stripping with discharge to the river; and implementation of institutional controls including deed restrictions	GW will be treated to meet ACLs. Individual ACL goals were calculated using a multiplier and MCLs or AWQC. Individual goals include EDC 8.5 mg/l, TCE 8.5 mg/l, PCE 1.5 mg/l, and benzene 8.5 mg/l. Soil cleanup levels will attain and EDC level of 139 mg/kg based on the allowable EDC GW concentration	$2,960,000 (capital) $3,130,000 (present worth O&M) (combined with costs from Goodrich, B.F. site)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Alpha Chemical, FL Industrial Facility 05/18/88 1st - Final	GW contaminated with low-level organics	Not specified	Capping of the small unlined pond; and long-term GW and SW monitoring	Recommended AWQC are currently met for all wells at the property line and immediately downgradient of all site areas except the unlined pond. Capping will manage the threat of future releases from the pond area and meet AWQC for ethylbenzene 1.4 mg/l, and 1,2-dichloropropane 1.4 mg/l downgradient of the unlined pond	$142,400 (capital) $186,200 (present worth O&M)
4	A.L. Taylor, KY 06/18/86 1st - Final	Soil, sediment, and SW contaminated with VOCs, PCBs, PAHs, and metals	Not specified	Excavation of soil, sediment, and sludge with onsite containment and capping	Not specified	$795,349 (capital) O&M (not provided)
4	American Creosote, FL 09/30/85 1st	Soil contaminated with aromatic hydrocarbons	Not specified	Excavation and consolidation of contaminated soil from areas both on and off the site in an onsite RCRA landfill	Excavation of soil and sludges to MCLs including PAHs 12.0 mg/kg and benzene 0.13 mg/kg	$5,678,000 (capital) $50,000 (annual O&M) (years 1-5) $19,000 (annual O&M) (years 6-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	American Creosote (Jackson Plant), TN Wood Preserving Facility 01/05/89 1st	Sludge, structures and debris, and tanked liquids contaminated with VOCs and other organics including phenols and PAHs	115,000 gals (sludge) 25,000 gals (oil) 500,000 gals (tanked liquids)	Consolidation and incineration of sludge around the buildings and tanks; on- or offsite incineration of soil and sludge from the tanks; onsite treatment of tanked process liquids using a sand filter, filter press, and carbon adsorption unit followed by discharge to SW; decontamination and offsite disposal of site structures; construction of a flood-protection dike; fencing; and site stabilization pending final remedy including monitoring onsite water levels behind the dikes; pumping, treatment (if needed), and discharge of impounded water; and implementation of institutional controls including deed restrictions	Remedy is geared towards reducing potential for direct exposure to sludge and process liquids while further information is gathered and analyzed. Quantitative goals were not provided for final site remediation	$5,000,000 - $6,000,000 (present worth) O&M (not specified)
4	American Creosote (Pensacola Plant), FL Former Wood Preserving Facility 09/28/89 2nd	Soil contaminated with organics including PAHs, dioxins, and PCP	23,000 yd^3 (surface soil)	Excavating and treating soil using solid-phase bioremediation in an onsite land treatment area followed by onsite disposal; implementing temporary erosion control measures, to preserve SW quality; filling and leveling land treatment area with clean fill; collecting leachate and spraying over treatment area to moisten soil; oxygen, pH, nutrient and soil moisture content monitoring, and implementing land and GW use restrictions	Soil cleanup levels are based on cancer potency factors and a 10^{-5} excess cancer risk for carcinogens. Soil cleanup goals include cPHAs 50 mg/kg (based on risk assessment and persistence in the environment), dioxins 2.5 ug/kg (based on modified CPF), and PCP 30 mg/kg	$2,275,000 (present worth) $319,000 (O&M)
4	Amnicola Dump, TN 18-Acre Disposal Area 03/30/89 1st - Final	Soil, debris, and GW contaminated with organics including PAHs and metals including chromium	400 yd^3 (soil) 200 yd^3 (debris)	Excavation and screening of contaminated soil and debris, followed by onsite solidification/ fixation and onsite disposal; GW monitoring; conducting a public health assessment five years after completion; and imposing institutional controls including land and GW use restrictions	Soil will be treated to the health-based level of 100 mg/kg for total cPAHs. GW will meet ACLs including chloroform 86 ug/l and chromium 890 ug/l through GW use restrictions	$640,000 (present worth) $384,000 (total O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Biscayne Aquifer Site, FL 09/16/85 1st - Final	GW contaminated with VOCs	Not specified	Addition of air stripping to existing water treatment system; and operation of Miami Spring and Preston municipal wells	Cleanup goals based on EPA primary drinking water standards and the 10^{-6} cancer-risk level have been identified for 50 priority pollutants	$5,268,000 (capital) $334,400 (annual O&M)
4	Brown Wood Preserving, FL Wood Preserving Facility 04/08/88 1st - Final	Soil, sediment, sludge, and wastewater contaminated with creosote constituents including PAHs	3,000 yd^3 (creosote sediment/ sludge)	Removal, treatment (if necessary), and discharge of lagoon water to a POTW; excavation, treatment, and offsite disposal of 1,500 tons of the most severely contaminated soil/sludge; onsite biodegradation of approximately 10,000 tons of the remaining soil in a 14-acre treatment area constructed with a liner and an internal drainage and spray irrigation system; covering of treatment area with clean fill after bioremediation; and GW monitoring	Cleanup levels will meet a 10^{-6} health-based risk level accomplished by reducing the concentration of total carcinogenic indicator PAH compounds to 100 mg/kg throughout the volume of the material treated	$2,740,000 (present worth)
4	Cape Fear Wood Preserving, NC Wood Treatment Facility 06/30/89 1st - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene; other organics including PAHs; and metals including arsenic and chromium	15,000 gals (wastewater)	Offsite disposal at a RCRA landfill of CCA salt crystals found in the drainage system and solidified creosote; offsite disposal of asbestos-containing pipe insulation at the county solid waste facility; removal and decontamination of onsite pipes and tanks; excavation and onsite treatment of soil and sediment using soil flushing as the preferred alternative or a low thermal desorption process to remove organics followed by soil washing or fixation/ stabilization/solidification to address inorganics (a soil washing treatability study will determine if the preferred alternative would be appropriate) followed by placement in excavated area and revegetation; GW and SW pumping with onsite treatment followed by offsite discharge at a POTW or surface stream; sale or treatment of CCA solution; and GW monitoring	Soil cleanup criteria include arsenic 94 mg/kg (risk assessment), benzene 0.005 mg/kg (CLRQL), chromium 88 mg/kg (background), cPAHs 2.5 mg/kg (risk assessment) and total PAHs 100 mg/kg (background); for sediment, total PAHs 3 mg/kg (EPA-established biota protection level), arsenic 94 mg/kg (risk assessment), and chromium 88 mg/kg (background); and for GW, benzene 5 ug/l (MCL), cPAHs 10 ug/l (CLRQL), and noncarcinogenic PAHs 14,350 ug/l (risk assessment); for SW, arsenic 12 ug/l (AWQL), chromium 11 ug/l (AWQL), and copper 14 ug/l (background)	$14,370,000 - $14,910,000 (present worth) $1,020,000 - $1,310,000 (present worth O&M) (years 1-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Carolawn, SC Abandoned Waste Storage and Disposal Facility 09/27/89 1st	GW contaminated with VOCs including TCE and metals including lead	Not specified	GW pumping and treatment using one or more of the following methods: air stripping, biodegradation, activated carbon filtration, and metals removal, with method selection based on contaminant level found and the treated GW discharge point selected; plugging condemned wells; disposing two inactive incinerators and two remaining drums; GW and soil monitoring, and implementing deed restriction	GW will meet SDWA MCLs. Target cleanup levels include TCE 5 ug/l and lead 5 ug/l	$1,141,071 - $1,356,305 (present worth) $753,433 - $916,723 (present worth O&M) (years 1-30)
4	Celanese Fibers Operations, NC Industrial Facility 03/23/88 1st	GW contaminated with VOCs including benzene and PCE, organics including phenols, and metals including chromium	Not specified	GW pump and treatment onsite using air stripping, biological treatment, and carbon adsorption (if necessary), followed by discharge to the onsite wastewater treatment plant	GW cleanup will attain Federal or State MCLs, whichever is more stringent. Individual cleanup goals were not specified	$2,032,000 (present worth) $1,069,230 (present worth O&M)
4	Celanese (Shelby Fiber Operations), NC Waste Disposal Site 03/28/89 2nd - Final	Soil, stream sediment, sludge, and other waste contaminated with VOCs including benzene and TCE; other organics including phenols and PAHs; and metals including lead and chromium	110 yd^3 (sediment) 1,800 yd^3 (sludge) 1,800 yd^3 (other wastes)	Excavation of soil, sediment, GRU sludge, and other wastes with onsite incineration of contaminated soil and GRU sludge and chemical fixation (solidification) of incinerator ash, burn pit residue, stream sediment, and other wastes followed by onsite disposal of inert solidified material; regrading excavated area; and GW monitoring	The selected remedy will attain a 10^{-6} cancer-risk level as it removes the source of GW contamination. No chemical-specific goals were provided	$3,500,000 (present worth) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Chemtronics, NC Waste Disposal Facility 04/05/88 1st - Final	Soil and GW contaminated with VOCs, organics, metals, pesticides, and explosives	Not specified	Multi-layer capping of five disposal areas with fencing, placement of a vegetative cover over the cap, and installation of a gas collection/ ventilation system, if necessary; treatability studies for soil associated with Disposal Area 23 to determine the most appropriate soil fixation/stabilization/solidification process and mixing ratios followed by onsite capping; GW pump and treatment which may include air stripping, carbon adsorption, or metal removal with discharge and treatment to be determined during design; and sediment, GW, and SW monitoring	GW cleanup levels were based on MCLs and several TBCs. Some individual goals include: TCE 0.005 mg/l, benzene 0.005 mg/l, PCE 0.007 mg/l, toluene 2.0 mg/l, RDX 0.035 mg/l, TNT 0.044 mg/l, lead 0.05 mg/l, and chromium 0.05 mg/l. Some individual soil cleanup goals include: PCBs 10 mg/kg, RDX 95 mg/kg, TNT 305 mg/kg, and CS 43.3 mg/kg	$6,247,300 - $8,242,900 (present worth)
4	Chemtronics, NC 1,027-Acre Waste Disposal Facility 04/26/89 1st (Amendment) - Final	Soil, sediment, GW, and SW contaminated with VOCs including TCE, PCE, toluene, and benzene; other organics including PCBs and pesticides; metals including chromium and lead; and explosives	Not specified	Multi-layer capping of disposal areas; GW pumping and treatment using air stripping, carbon adsorption, or metal removal with treatment and discharge to be determined during design; SW treatment using GW treatment system and onsite disposal of sediment; sediment, GW, and SW monitoring; and implementation of institutional controls and access restrictions	GW cleanup levels are based on MCLs/PMCLs and several TBCs. Individual goals include: TCE 0.005 mg/l (MCL), benzene 0.005 mg/l (MCL), PCE 0.007 mg/l (RSD), toluene 2.0 mg/l (PMCLG), RDX 0.035 mg/l (USAIWQC), TNT 0.044 mg/l (PPLV), lead 0.05 mg/l (TSCA), and chromium 0.05 mg/l. Individual soil cleanup goals include PCBs 10 mg/kg, RDX 95 mg/kg, TNT 305 mg/kg, and CS 43.3 mg/kg (PPLV)	$2,248,900 (present worth) $501,900 (annual O&M)
4	Ciba-Geigy (McIntosh Plant), AL Manufacturing Facility 09/28/89 1st	GW contaminated with VOCs including benzene and toluene; other organics including pesticides; and metals including arsenic	Not specified	Not further action beyond continued GW pumping and treatment using an existing biological wastewater treatment system, followed by discharge to SW; and GW and effluent monitoring	GW cleanup goals will be attained by continued use of the existing GW pumping and treatment system. GW cleanup goals include benzene 5 ug/l (MCL), toluene 2,000 ug/l (PMCL), and arsenic 50 ug/l (MCL)	$0 (capital) $325,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Coleman Evans, FL 09/25/86 1st - Final	GW, soil, and sediment contaminated with VOCs, organics including PCP, and metals including chromium	9,000 yd^3	Excavation of PCP contaminated soil and sediment with onsite incineration; backfilling with decontaminated soil; GW recovery, storage and analysis; possible onsite GW treatment using carbon adsorption with discharge to surface	All soil containing PCP in excess of 10 mg/kg will be excavated. GW will be treated to levels which comply with Drinking Water Standards or Water Quality Criteria	$3,000,000 - $3,800,000 (capital) $0 (O&M)
4	Davie Landfill, FL 09/30/85 1st	GW and sludge lagoon contaminated with organics, and inorganics including cyanide and sulfide	75,000 yd^3	Dewatering and stabilization of sludge lagoon contents and placement in single lined cell; and capping	Cleanup goals prevent exceedance of drinking water standards or the 10^{-6} cancer-risk level	$3,000,000 - $3,700,000 (capital) $100,000 (annual O&M)
4	Distler Brickyard, KY 08/19/86 1st - Final	GW and soil contaminated with VOCs including TCE, metals, and inorganics	8,000 yd^3	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soil; and GW pump and offsite treatment at POTW with reinjection into the aquifer	GW will be treated and soil will be excavated to background levels	$7,500,000 (present worth) $1,568,000 (annual O&M) (years 1-2) $44,000 (annual O&M) (years 3-30)
4	Distler Farm, KY 08/19/86 1st - Final	GW and soil contaminated with VOCs including TCE and PCE, metals, and inorganics	Not specified	Excavation and offsite disposal of all contaminated soil; backfilling with clean natural granular soil; and GW pump and offsite treatment at POTW with reinjection of uncontaminated water into the aquifer	GW will be treated and soil will be excavated to background levels	$11,138,400 (capital) $113,600 (annual O&M) (years 1-10) $20,000 (annual O&M) (years 11-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Flowood, MS Industrial Area 09/30/88 1st - Final	Soil and sediment contaminated with lead	6,000 yd^3	Excavation and stabilization/solidification of contaminated soil and sediment, followed by backfilling and capping with clean fill, as necessary; and GW monitoring	Soil and sediment cleanup levels will attain lead 500 mg/kg, a risk-based level	$2,000,000 (present worth) $25,000 (O&M) (year 1)
4	Gallaway Ponds, TN 09/26/86 1st - Final	Pond sediment contaminated with pesticides and inorganics	1,600 yd^3	Excavation of sediment with onsite consolidation; RCRA site closure; pond water dilution with discharge to tributary; and institutional controls	Pond water dilution will meet Ambient Water Quality Criteria	$344,735 (capital) $163,265 (present worth O&M)
4	Geiger (C&M Oil), SC 03/27/87 1st	Soil and GW contaminated with VOCs, organics including PCBs, and metals	11,300 yd^3 62,000,000 gals	Excavation and onsite thermal treatment of soil followed by solidification/stabilization with backfilling of excavated area using grading and covering; and GW pump and treatment with discharge to SW	Specified preliminary goals for soil based on MCLs to include lead 166.5 mg/kg, chromium 3.7 mg/kg, benzene 14.4 mg/kg, trans-1,2-dichloroethylene 76.0 ug/kg, toluene 971.0 ug/kg, and PCB (Aroclor 1254) 1,050 ug/kg. GW will attain the cumulative 10^{-5} cancer-risk level which includes MCL values for benzene 5.0 ug/l, toluene 175.0 ug/l, and lead 50.0 ug/l	$6,917,000 - $7,693,400 (present worth) $367,200 (present worth O&M)
4	Gold Coast, FL 09/11/87 1st - Final	Soil and GW contaminated with VOCs including TCE and PCE, and metals	1,500 yd^3 100,000 gals	Stabilization/solidification of 1,000 yd^3 metal contaminated soil with onsite disposal and capping; excavation of 500 yd^3 soil and sludges with offsite disposal at a RCRA facility; GW pump and treatment (to be identified during design) with offsite discharge; and well closure	Soil will be excavated to the 10^{-4} health-based risk level which includes lead 100.0 mg/kg. GW treatment will attain MCLs for VOC contamination which include 1,1-dichloroethane 5.0 ug/l, methylene chloride 5.0 ug/l, trans-1,2-dichloroethylene 70.0 ug/l, tetrachloroethylene 3.0 ug/l, toluene 340.0 ug/l, and trichloroethylene 3.0 ug/l	$3,711,660 (capital) $74,850 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Goodrich, B.F., KY (RI/FS prepared as B.F. Goodrich/Airco site) 1-Acre Industrial Landfill 06/24/88 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, EDC, PCE and TCE, organics including PAHs, and PCBs and inorganics	5,000 yd^3 (soil) 6,075,000 ft^3 (GW) (includes volume from Airco, KY site)	Excavation of contaminated soil with placement in pit area, cover with a RCRA cap and construct an organic vapor recovery system to separate VOCs from soil; construction of a flood protection dike; installation of a leachate extraction system around landfill and upgrading of the existing landfill clay cap; GW pump and treatment using air stripping with discharge to the river; and implementation of institutional controls including deed restrictions	GW will be treated to meet ACLs. Individual ACL goals were calculated using a multiplier and MCLs or AWQCs. Individual goals include EDC 8.5 mg/l, TCE 8.5 mg/l, PCE 1.5 mg/l, and benzene 8.5 mg/l. Soil cleanup level will attain an EDC level of 139 mg/kg based on the allowable EDC GW concentration	$2,960,000 (capital) $3,130,000 (present worth O&M) (combined with costs from Airco, KY site)
4	Hipps Road Landfill, FL 09/03/86 1st - Final	GW contaminated with VOCs including TCE, and metals	Not specified	GW pump and treatment at POTW; RCRA Subtitle D landfill closure; and institutional controls	GW will be treated to meet SDWA requirements, Water Quality Criteria Human Health Standards, or the 10^{-6} cancer risk	$3,900,000 - $4,400,000 (capital) O&M (not provided)
4	Hollingsworth, FL 04/10/86 1st - Final	GW and soil contaminated with VOCs including TCE	Not specified	Excavation, aeration and onsite replacement of VOC contaminated soil; and GW pump and treatment with reinjection into the aquifer	GW cleanup goals will be based on the 10^{-6} cancer-risk level and State Drinking Water Standards	$653,730 (capital) $364,215 (annual O&M)
4	Independent Nail, SC 09/28/87 1st	Soil and sediment contaminated with metals	6,200 yd^3	Excavation of metal contaminated soil and lagoon sediment with solidification/ stabilization; backfilling of treated soil; and covering	Soil will attain a 10^{-6} or less, cancer-risk level which includes cadmium 2.6 mg/kg, chromium 5.3 mg/kg, cyanide 0.02 mg/kg, nickel 18.0 mg/kg, and zinc 1,785.0 mg/kg	$1,032,000 (capital) $22,500 (annual O&M) (years 1-2) $5,600 (annual O&M) (years 3-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Independent Nail, SC Industrial Facility 08/30/88 2nd - final	GW contaminated with metals including chromium	Not applicable	No action remedy	GW poses no threat, thus individual cleanup goals are not applicable	$0
4	Kassauf-Kimerling Battery, FL 1-Acre Landfill 03/31/89 1st	Soil, debris, and GW contaminated with metals including arsenic, cadmium, and lead	11,350 yd^3 (soil and debris)	Excavation of landfill wastes and underlying soil followed by solidification/chemical fixation and onsite disposal int he landfill	Soil and debris in the source area will be treated to meet RCRA criteria including EP toxicity concentrations. GW will meet MCLs and AWQC over a short period of time due to excavation and fixation of the landfill materials	$2,500,000 - $3,500,000 (present worth) O&M (not specified)
4	Lees Lane Landfill, KY 09/25/86 2nd - Final	GW, SW, and soil contaminated with VOCs, metals, and inorganics	212,400 tons	Removal of exposed drums and offsite disposal; capping of hot spots and exposed trash areas; gas collection and venting system; possible alternate water supply; bank stabilization; and institutional controls	ACLs will be developed from GW monitoring data	$2,343,000 (capital) $127,440 (annual O&M)
4	Miami Drum Services, FL 09/13/82 1st	GW and soil contaminated with organics, pesticides, and metals	Not specified	Excavation and offsite disposal of soil; and treatment of GW encountered during excavation	Not specified	$1,568,660 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Mowbray Engineering, AL 09/25/86 1st - Final	SW and soil contaminated with PCBs	4,800 yd^3	Excavation of PCB-contaminated soil with either onsite incineration, offsite incineration, or solidification/stabilization of the waste	Soil with 25 mg/kg PCBs or greater will be excavated and treated	$1,200,000 - $2,000,000 (offsite incineration) (present worth) $1,100,000 - $1,800,000 (onsite incineration) (present worth) $750,000 (solidification/ stabilization) (present worth) $0 (O&M)
4	National Starch and Chemical Corporation, NC Industrial Plant 09/30/88 1st	GW, SW, and sediment contaminated with VOCs including benzene, TCE, toluene and xylenes, and metals including chromium	Not specified	Installation of a GW interception and extraction system downgradient of the source areas with pretreatment including air stripping, filtration through an activated carbon filter, metal removal, or treatment through existing lagoon system which includes presettling and surface aeration; and SW and sediment monitoring. If the POTW declines to accept the treated GW, it will be discharged to a local stream under a NPDES permit	GW cleanup goals were provided for the 25 chemicals of concern and will meet MCLs, if available. if an MCL is not available, the cleanup goal for a carcinogen is set at the limit of detection; and for a noncarcinogen, at the RfD or ACI equivalent level. However, ethyl benzene will meet the proposed MCLG. Individual cleanup goals include: arsenic 10 ug/l (MCL), benzene 5 ug/l (MCL), TCE 5 ug/l (MCL), chromium 2,000 ug/l (MCL), and xylenes 340 ug/l (MCL)	$3,036,000 (present worth) $55,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Newport Dump, KY 03/27/87 1st	Soil and GW contaminated with organics including PCBs and PAHs, and metals	1,000,000 yd^3	Implementation of multimedia monitoring program; restoration and extension of leachate collection system; and restoration, regrading, and bank stabilization of existing clay cap with revegetation	PCBs, nickel, toluene, and other organics will be treated to the 10^{-6} health-based risk level. Barium and chromium will attain the MCL values of 1,000.0 ug/l and 50.0 ug/l, respectively	$516,000 (capital) $63,000 (annual O&M) (years 1-2) $35,000 (annual O&M) (years 3-30)
4	Newsom Brothers/ Old Reichhold, MS Wood Preserving Facility 09/18/89 1st - Final	Soil, sediment, and bulked wastes contaminated with organics including PAHs, PCBs, and PCP; and metals	30,300 yd^3 (soil) 7,300 yd^3 (sediment) 650 yd^3 (waste material)	Excavation and offsite disposal of contaminated soil and sediment; excavation and offsite incineration of waste materials and any soil/sediment containing RCRA hazardous waste, followed by offsite disposal; draining, filling, and capping onsite ponds; recontouring site; and GW monitoring	Soil, sediment, and waste material cleanup goals are based on a 10^{-6} excess cancer risk. Goals include cPAHs 10 mg/kg and PCP 1.2 mg/kg	$14,180,000 (present worth) $520,225 (present worth O&M)
4	N.W. 58th Street Landfill, FL 09/21/87 3rd - Final	GW contaminated with VOCs including TCE and PCE, and metals	27,000,00 yd^3	Landfill closure for all contaminated soil; controlling leachate generation through grading, drainage control, and capping; and provision of an alternate water supply to private well users east of landfill	The GW remedial action, as required in the 1985 ROD, will provide air stripping to bring contaminants into compliance with MCLs	$5,500,000 (present worth) $1,500,000 (O&M) (present worth O&M)
4	Palmetto Wood Preserving, SC 09/30/87 1st - Final	Soil and GW contaminated with metals	19,895 yd^3 10,500,00 gals	Excavation of contaminated soil with onsite flushing and backfilling of treated soil; pumping of wastewater to onsite treatment facility; GW pump and treatment with offsite discharge to SW; and installation of municipal waterline to affected residents or the drilling of new wells	Soil cleanup will attain public health evaluation levels which include chromium 627.0 mg/kg and arsenic 200.0 mg/kg. GW will attain MCL values which include chromium 50.0 ug/l, copper 1,000.0 ug/l, and arsenic 50.0 ug/l	$1,393,000 (capital) $176,163 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Parramore Surplus, FL 09/15/87 1st - Final	Possible contamination of GW with metals	Not applicable	No further action with monitoring of GW and SW	Cleanup standards to be reviewed as part of GW quality assessment include MCLs and WQC	$21,000 (capital) $19,000 (annual O&M)
4	Pepper's Steel, FL 03/12/86 1st - Final	GW, soil, and sediment contaminated with organics including PCBs, and metals	PCB >1 mg/kg, approximately 48,000 yd^3; lead >1,000 mg/kg, 21,500 yd^3; arsenic >5 mg/kg, 9,000 yd^3 (waste quantities not additive)	Excavation, solidification/stabilization, and onsite disposal of soil; collection and offsite disposal of free oil; and land use institutional controls	Excavation of soil exceeding PCB 1 mg/kg, lead 1,000 mg/kg, and arsenic 5 mg/kg	$5,212,000 (capital) $42,500 (annual O&M)
4	Perdido Groundwater, AL Waste Spill Area 09/30/88 1st - Final	GW contaminated with benzene	Not specified	GW pump and onsite treatment using air stripping or carbon adsorption with reinjection into the aquifer; and GW monitoring	GW cleanup level will attain the MCL for benzene 5 ug/l	$169,000 (capital) $103,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Pioneer Sand, FL 09/26/86 1st - Final	Soil and pond waters contaminated with VOCs, sludges, metals, and inorganics	Not specified	RCRA Subtitle D landfill closure; leachate collection, treatment, and onsite disposal; SW treatment and onsite discharge; and cover system for sludge and pond waste	Not specified	$462,025 (captial) $45,000 (O&M) (year 1) $34,900 (annual O&M) (years 2-30)
4	Powersville Landfill, GA 09/30/87 1st - Final	Soil and GW contaminated with VOCs, organics, pesticides, and metals	Not specified	Capping with grading; installation of monitoring wells and gas vents; provision for alternate water supply (extension of existing municipal water supply); and institutional controls including deed restrictions to restrict drilling or construction activities	Current contaminant concentration levels do not exceed SDWA	$4,000,000 (capital) $577,013 (present worth O&M)
4	Sapp Battery, FL 09/26/86 1st - Final	GW, SW, soil, and sediment contaminated with metals	94,000 yd^3 (soil) 20,000 yd^3 (sediment)	Excavation, solidification/fixation, and onsite disposal of solidified soil and sediment; GW pump and treatment; SW treatment and discharge; and assessment of potential institutional controls	Cleanup criteria for indicator chemicals were set based on Federal and State standards and risk-based levels	$14,318,544 (capital) $25,631 (annual O&M)
4	SCRDI/Dixiana, SC 09/26/86 1st - Final	GW contaminated with VOCs including PCE, organics including PAHs and PCBs, inorganics, and pesticides	Not specified	GW pump and treatment with discharge to SW	GW will be treated to attain the ACL equivalent to 10^{-6} excess cancer risk	$751,250 (capital) $2,128,100 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Smith's Farm, KY 80-Acre Hazardous Waste Disposal Area 09/29/89 1st	Soil and sediment contaminated with organics including PAHs and PCBs; and metals including lead	26,200 yd^3 (soil) 5,200 yd^3 (sediment)	Site remediation is divided into two areas, Area A and Area B and includes excavation and onsite incineration of soil; sediment, debris, and fill material from Area B; solidification/fixation of approximately 50% of treated material followed by onsite placement of all treated material in Area B; incineration of a small amount of hot spot material and consolidation in Area A; construction of RCRA cap over Area A; construction of a leachate collection system; maintenance of RCRA cap and leachate collection system; leachate removal and disposal for 30 years; GW monitoring; and implementation of site access restrictions	Action levels for contaminated soil and/or sediment are based on an excess lifetime cancer risk of 10^{-5} with the exception of lead, which was based on an HI <1.0. Chemical-specific goals include cPAHs 5 mg/kg, PCBs 2 mg/kg, and lead 500 mg/kg	$26,900,000 (present worth) $1,330,00 (O&M)
4	Sodyeco, NC 09/24/87 1st - Final	Soil, SW, and GW contaminated with VOCs including TCE, and organics including PAHs	150 yd^3 (area D soil)	Excavation and incineration of 150 yd^3 of contaminated soil in area D and backfilling with clean soil; onsite treatment of contaminated soil in area C which may include flushing, soil washing, thermal processing, or in-situ steam stripping; capping of Area 3 with asphalt; and GW pump and treatment with discharge to SW	Soil treatment will attain all ARARs following GW remediation. GW cleanup goals are based on MCLs, AWQC, MCLGs, NAAQ, and public health evaluation levels which include TCE 2.7 ug/l, PCE 0.8 ug/l, toluene 2,000.0 ug/l, xylene 440.0 ug/l, total PAHs 2.8 ng/l, chlorobenzene 60.0 ug/l, 1,2-DCE 400.0 ug/l, and ethylbenzene 680.0 ug/l	$2,089,000 - $3,865,000 (present worth)
4	Stauffer Chemical (Cold Creek Plant), AL Chemical Manufacturing Facility 09/27/89 1st	GW contaminated with VOCs including carbon tetrachloride and other organics including pesticides	Not specified	Continued operation of the existing intercept/treatment system; installation of additional extraction/monitoring wells; modification of treatment system; and monitoring of effluent, GW concentrations, and pumping rates	GW cleanup levels are based on SDWA MCLs or RfDs and include carbon tetrachloride 5 ug/l (MCL)	$3,119,200 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Stauffer Chemical (LeMoyne Plant), AL Chemical Manufacturing Facility 09/27/89 1st	GW contaminated with VOCs including carbon tetrachloride and other organics including pesticides	Not specified	Continued operation of the existing intercept/treatment system; installation of additional extraction/monitoring wells; modification of treatment system; and monitoring of effluent, GW concentrations, and pumping rates	GW cleanup levels are based on SDWA MCLs or RfDs and include carbon tetrachloride 5 ug/l (MCL)	$3,119,200 (capital) O&M (not specified)
4	Sydney Mine Sludge Ponds, FL Former Waste Disposal Pits 09/29/89 1st - Final	GW contaminated with VOCs including benzene, toluene, TCE and xylenes	Not specified	Remedy includes continued GW pumping and onsite treatment by air stripping and spray irrigation on land adjacent to the disposal pits; evaluation of existing GW pumping and treatment system with implementation of any necessary modifications; GW monitoring, and implementation of deed and GW use restrictions	Cleanup goals were set according to State drinking water standards and SDWA MCLs and PMCLs. Chemical-specific cleanup goals include benzene 1 ug/l (PDWS) and toluene 2,000 ug/l (PMCL)	$2,448,000 (present worth) $576,000 (annual O&M)
4	Tower Chemical, FL 07/09/87 1st	Soil and GW contaminated with pesticides and metals	4,000 yd^3 100,000,000 gals	Excavation and onsite thermal treatment of 4,000 yd^3 of soil and contaminated drum contents; decontamination of debris; residual analysis (if non-hazardous, backfill treated soil and debris onsite); GW pump and onsite treatment using filtration and activated carbon with offsite discharge to SW; installation of two individual treatment units for private wells; and institutional controls to include access restrictions	Soil cleanup goals will attain a 10^{-6} health-based risk level, which includes copper 100.0 mg/kg, lead 100.0 mg/kg, arsenic 5.0 mg/kg, and DDT 35.0 mg/kg. GW treatment will attain Florida Administrative Code levels, drinking water health advisory levels, 10^{-6} health-based levels, and alternate concentration levels (based on 10^{-6} risk level), which include arsenic 0.05 ug/l, nickel 350.0 ug/l, chromium 0.05 ug/l, alpha-BHC 0.05 ug/l, chloroform 5.0 ug/l, DDT 0.01 ug/l, chlorobenzilate 1.0 ug/l, and dicoto 1.0 ug/l	$6,788,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Tri-City Oil, FL 09/21/87 1st - Final	None	Not applicable	No further action	Contaminant concentration levels are below analytical detection limits	$0
4	Varsol Spill Site, FL 03/29/85 1st	None	Not specified	No further action	Not specified	$0
4	Wamchem, SC Industrial Facility 06/30/88 1st	Soil and GW contaminated with VOCs and organics	2,000 yd^3	Excavation and low temperature thermal aeration of contaminated soil followed by onsite disposal; GW pump and treatment using carbon adsorption; and GW monitoring	GW cleanup goals were based on Federal AWQC and include: benzene 0.7 mg/l, toluene 5.0 mg/l, xylenes 2.0 mg/l. Soil cleanup goals were based on estimates of contaminants that would not result in future exceedances of AWQL in GW at the source due to soil contaminant leaching. Some individual goals include: benzene 2.43 mg/kg, toluene 34.47 mg/kg, total xylenes 67.58 mg/kg, and naphthalene 74.57 mg/kg	$1,310,600 (capital) $155,100 (annual O&M)
4	Whitehouse Waste Oil Pits, FL 05/30/85 1st - Final	GW, SW, and soil contaminated with VOCs including benzene, metals including chromium, and organics including phenols and PAHs	Not specified	Slurry wall construction; GW pump and treatment; removal of contaminated sediment; and RCRA capping of the entire site	GW and SW quality should meet State primary drinking water standards. Soil and sediment will be removed to background or "minimal" risk levels	$3,049,000 (capital) $96,630 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
4	Zellwood, FL Waste Disposal Facility 12/17/87 1st - Final	Soil, sediment, sludge, and GW contaminated with organics, metals, inorganics, and pesticides	147,825 tons	Excavation of soil and sediment with onsite thermal destruction; residual testing to determine final ash disposal; GW pump and treatment with flushing of treated GW through the abandoned drum area; and GW monitoring	Not specified	$41,264,000 - $61,908,000 (present worth)
5	A&F Materials-Greenup, IL 11/23/83 IRM	GW and soil contaminated with organics including PCBs, metals, and inorganics	Not specified	Removal and offsite disposal of contaminated tank liquids and drum wastes; and temporary capping of lagoons	Not specified	$111,000 (capital) O&M (not provided)
5	A&F Materials Company, IL 06/14/85 2nd	Soil and SW contaminated with organics including PCBs, and metals	Not specified	Removal and offsite disposal of all contaminated soil; cleaning and removal of onsite equipment and buildings; soil testing beneath the building with disposal if above recommended action levels; site grading; and removal of site fencing	Soil >1 mg/kg PCBs will be removed. Other Action Levels for key contaminants include benzene 1 ug/gm, toluene 12 ug/gm, trichloroethylene 1 ug/gm, chromium 80 ug/gm, and cadmium 5 ug/gm	$824,000 (capital) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	A&F Materials, IL 08/14/86 3rd - Final	GW contaminated with VOCs including TCE, inorganics, and metals	Not specified	GW monitoring with installation of additional monitoring wells; and institutional controls	Not specified	PRP responsibility
5	Acme Solvents, IL 09/27/85 1st	GW and soil contaminated with organics including PCBs, VOCs including TCE, and inorganics	Not specified	Provision for interim alternate water supply system by installation of home carbon treatment units; and excavation and offsite disposal of non-incinerable wastes and incineration of other waste materials and soil	Not specified	To be determined
5	Adrian Municipal Well Field, MN Municipal Well Field 09/29/89 1st - Final	Soil and GW contaminated with petroleum-related releases	Not applicable	No further action will be taken by the Superfund program because the program does not have the authority to address cleanup of petroleum releases. EPA will transfer the site to its UST program for further action	Not applicable	$0 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Allied/Ironton Coke, OH Industrial Facility 09/29/88 2nd - Final	Soil and GW contaminated with VOCs including benzene, and organics including phenolss and PAHs, and metals	456,000 yd^3	Installation of a containment system including a slurry wall surrounding the disposal area and multi-media RCRA cap; GW pump and treatment using activated carbon with residual discharge to the Ohio River; provision of an alternate drinking water source; deed restrictions; preparation of a supplemental RI/FS addressing nonaqueous phase substance contamination with implementation of remedy, if different from present containment; and GW monitoring	GW cleanup levels are based on MCLs, AWQC and 10^{-6} health-based levels and include benzene 5 ug/l (MCL), phenolss 300-3,500 ug/l, and PAHs 0.005 ug/l	$13,130,000 (present worth) $515,000 (annual O&M)
5	Alsco Anaconda, OH 4.8-Acre Former Sludge Disposal Area 09/08/89 1st	Soil and sludge contaminated with organics including PCBs; and metals including chromium, cyanide, and arsenic	8,870 yd^3 (soil and sludge)	Excavating sludge contaminated with >500 mg/kg of PCBs followed by offsite incineration and disposal; excavating sludge and soil contaminated with <500 mg/kg of PCBs followed by offsite treatment and disposal or reuse; backfilling and revegetating excavated areas; and implementing institutional controls including site access and deed restrictions	Soil cleanup goals will meet clean closure levels, which require soil and sludge to be excavated until remaining soil contaminant concentrations attain a cumulative HI value <1 for critical effect. Chemical-specific cleanup goals were not specified, but will be established during the remedial design	$4,161,066 (capital) $0 (O&M)
5	Arcanum Iron & Metal, OH 09/26/86 1st - Final	GW, SW, soil, and sediment contaminated with inorganics including lead, antimony, and arsenic	Onsite soil with >500 mg/kg lead, 20,000 yd^3; battery casing chips, 3,800 yd^3; offsite soil volume not specified	Excavation and offsite disposal of soil with >500 mg/kg lead; excavation and onsite disposal of soil with lead between background and 500 mg/kg; removal of battery casings; conduction of treatability studies and onsite landfilling; and deed restrictions on land and aquifer usage	Soil cleanup goals based on CDC Acceptable Daily Intake levels including offsite disposal of lead >500 mg/kg and onsite disposal of lead between background and 500 mg/kg. Excavation of offsite soil will be conducted until background levels are reached	$9,929,000 (capital) $37,000 (annual O&M)
5	Arrowhead Refinery, MN 09/30/86 1st - Final	GW, SW, soil, and sediment contaminated with VOCs, organics including PAHs, and metals including lead	4,600 yd^3 (sludge) 20,500 yd^3 (soil and sediment)	Excavation and onsite incineration of contaminated soil, sediment, and sludge; GW pump and treatment; and extension of municipal water supply system to affected residents	Soil and sediment will be excavated and treated to achieve a 10^{-6} excess cancer-risk level. GW treatment will also achieve the 10^{-6} level	$22,000,000 (capital) $130,000 - $180,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Auto Ion Chemicals, MI Industrial Waste Treatment Facility 09/27/89 1st	Soil contaminated with organics including PAHs; and metals including arsenic, chromium, and lead	7,200 yd^3 (soil)	Excavation and offsite stabilization of contaminated soil, followed by offsite disposal of treated soil; and replacement of excavated soil with clean fill	Soil will be treated to meet a total cancer-risk level of 10^{-6} and must pass the TCLP test before offsite disposal. Individual contaminant goals were not specified	$3,332,988 (capital) $5,900 (annual O&M)
5	Belvidere Landfill, IL 19.3-Acre Industrial/Municipal Landfill 06/30/88 1st - Final	GW and soil contaminated with organics including PAHs and PCBs, and metals including lead	790,000 yd^3	RCRA capping over entire landfill; remediation of soil from the drum disposal area following sampling to determine extent of PCB contamination; GW pump and treatment possibly using air stripping with either discharge to the river or city treatment plant; GW, pond, and river fish monitoring; fencing; deed restrictions; and flood control measures	GW will be treated until a 10^{-6} cumulative lifetime cancer risk is met at the boundary, which is the point of compliance. PCBs >50 mg/kg will be disposed of, or incinerated, offsite. PCBs <50 mg/kg will be consolidated on the landfill. Quantitative goals were not specified for other indicator chemicals	$5,900,000 (capital) $271,000 (annual O&M)
5	Berlin & Farro, MI 02/29/84 1st	SW, soil, and air contaminated with VOCs, and organics including PCBs	Not specified	Excavation of contaminated landfill, drum, and soil area; separation of PCB and non-PCB wastes with offsite disposal; offsite incineration of liquid wastes and landfilling of solid wastes; and backfilling or capping of site	Not specified	Not specified
5	Big D Campground, OH 1.2-Acre Landfill 09/29/89 1st - Final	Soil and GW contaminated with VOCs including PCE and TCE; other organics; and metals including chromium and lead	2,500-5,000 (drums) 25,000-30,000 yd^3 (soil) 40,000,000-60,000,000 gals (GW)	Removing and incinerating drums, bulk wastes, and soil followed by onsite disposal of nonhazardous ash residues; GW pumping and treatment using GAC followed by onsite discharge to SW; GW and SW monitoring; and implementing deed and land use restrictions	Remedial action will reduce health risks identified in GW to an HI $\leq$1.0 and a cumulative carcinogenic risk of 10^{-6} or less. GW cleanup goals are based on MCLs and include TCE 5 ug/l and chromium 50 ug/l	$39,000,000 (present worth) $320,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Bowers Landfill, OH Municipal/Industrial Landfill 03/24/89 1st - Final	Soil, sediment, debris, and GW contaminated with VOCs including PCE and benzene; other organics including PAHs and PCBs; metals including lead and chromium; and other inorganics	Not specified	Removal of surface vegetation and debris, followed by offsite disposal at a hazardous waste landfill or a solid waste landfill; erosion controls including surface regrading in areas prone to flooding and erosion; excavation and dewatering of drainage ditch sediment followed by onsite disposal; replacement of discharge pipe; construction of a soil and clay cap; GW monitoring; and implementation of site access and GW use restrictions	Chemical-specific cleanup goals were not provided; however, cleanup levels will be based on MCLs where available and a 10^{-6} cancer risk for all other contaminants	$4,300,000 (present worth) $116,000 (annual O&M) (years 1-30)
5	Burlington Northern, MN 06/04/86 1st - Final	GW and soil contaminated with organics	9,500 yd^3	Excavation and onsite aerobic breakdown and transformation of contaminated soil and sludge; and onsite RCRA capping	Possible goals are to achieve detoxification of soil as defined by the microtox test and achieve total PAH and benzene extractable concentrations in the treatment zone equal to or less than concentrations present in the soil left in place	$582,000 (capital) $36,000 (annual O&M)
5	Burrows Sanitation, MI 09/30/86 1st - Final	GW, SW, soil, and sediment contaminated with metals, and inorganics including cyanide	250 yd^3	Excavation, solidification/fixation, and offsite disposal of metal hydroxide sludge; and GW pump and treatment	GW cleanup based on current lowest regulated concentrations for each indicator chemical. Criteria will be taken from the SDWA, Acceptable Chronic Intake Levels, and Health Advisories. Soil cleanup will be based on the site-specific Endangerment Assessment	$1,256,700 - $1,335,400 (depending on distance to offsite RCRA facility) (capital) $115,000 (annual O&M)
5	Byron/Johnson Salvage, IL 03/13/85 1st	Soil contaminated with VOCs, organics including PCBs, and metals including lead and arsenic	Not specified	Excavation and offsite disposal of drums; offsite RCRA disposal of EP toxic soil and, if possible, incineration or treatment of liquids; and in-situ treatment of cyanide contaminated soil	Remedy consists of treatment of soil that exceeds 100 times the drinking water standard, and onsite treatment of soil containing 71 mg/kg amenable cyanide	$1,170,919 (capital) $6,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Byron/Johnson Salvage Yard, IL 09/23/86 2nd	GW contaminated with VOCs including TCE, metals, and inorganics including cyanide	Not specified	Provision of home carbon treatment units and bottled water as an interim alternate water supply	Remedy will comply with 10^{-6} cancer-risk levels for suspected carcinogens	$115,500 (capital) $165,300 (annual O&M)
5	Byron Salvage Yard, IL Waste Disposal/ Dumping Area 06/30/89 3rd	GW contaminated with VOCs including benzene, PCE, and TCE; metals including arsenic, chromium, and lead; and other organics including cyanide	Not specified	Removing wastes generated during the remedial investigation; covering, regrading, and revegetating surface; GW and SW monitoring; plugging and abandoning monitoring wells no longer in use; providing an alternate source of drinking water by extending the water main of the municipal system; and implementing institutional controls including GW use and deed restrictions	Cleanup levels will be based on ACLs, which will be set at contaminant concentrations currently found in the aquifers. AWQC and/or State water quality standards will be attained in nearby pond and river	$1,100,000 (present worth) $16,000 (annual O&M)
5	Cemetery Dump, MI 09/11/85 1st	GW and soil contaminated with VOCs, and organics including PCBs	Not specified	Excavation and offsite RCRA disposal of 250 drums	Not specified	$1,883,261 (capital) O&M (not provided)
5	Cemetery Dump, MI Former Chemical dumping Area 09/29/89 2nd - Final	None	Not applicable	No further action is necessary because previous remedial activities appear to provide adequate protection. GW will be monitored annually to ensure the site continues to pose no threat to human health	Not applicable	$0 (present worth) $0 (O&M)
5	Charlevoix, MI 06/12/84 IRM	GW contaminated with VOCs including TCE and PCE	Not specified	Provision for a permanent alternate water supply	Not specified	$1,954,000 (capital) $118,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Charlevoix, MI 09/30/85 2nd - Final	GW contaminated with VOCs including TCE and PCE	Not specified	Plume discharge to Lake Michigan under natural flow conditions; long-term plume monitoring; and institutional controls on private well installation	Under natural flow conditions, TCE and PCE will meet 0.008 ug/l and 0.01 ug/l, respectively	$0 (capital) $17,000 (annual O&M)
5	Chem-Dyne, OH 07/05/85 1st - Final	GW and soil contaminated with VOCs, organics including PCBs, and metals	Not specified	GW pump and treatment; demolition of onsite buildings; removal of selected soil; and RCRA capping	GW will be treated to <100 ug/l total VOCs to meet background levels, or 10^{-6} cancer-risk level	$11,600,000 (capital) $597,000 (annual O&M)
5	Cliffs/Dow Dump, MI Tar Waste Disposal Area 09/27/89 1st - Final	Soil contaminated with VOCs including benzene, toluene, PCE, and xylenes; and other organics including PAHs and phenols	9,600 yd^3 (tar waste)	Excavation and offsite incineration of 200 yd^3 of exposed tars; excavation and biological treatment of 9,400 yd^3 of residual contaminated fill material followed by offsite incineration of 200 yd^3 of buried tars; in-situ biodegradation of residual contaminated fill material; installation of a soil cover and revegetation of bioremediated fill area; GW and air monitoring; and implementation of deed restrictions to prevent new well installation and disturbance of the fill materials	GW contaminant levels, which are already below levels of concern, will further decrease through biodegradation and natural attenuation. No chemical-specific goals were provided for source control	$2,842,165 (present worth) $63,280 (annual O&M)
5	Coshocton Landfill, OH 80-Acre Municipal/ Industrial Landfill 06/17/88 1st - Final	Sediment, GW, SW, and leachate contaminated with VOCs including TCE and toluene, organics including PAHs and PCP, and metals including copper, nickel, and zinc	Not specified	Implementation of institutional controls including deed and access restrictions; site grading; State solid waste landfill capping followed by a topsoil cover and revegetation; and GW, SW, and landfill gas monitoring. Components to be evaluated during design include landfill gas collection and venting; and leachate and GW collection, onsite storage, and onsite or offsite treatment	Contaminants which have established MCLs were below MCL levels. SW and sediment chronic concentration values for aquatic life were not exceeded. State sanitary landfill closure requirements will be met to manage the principle threat of future releases from the site	$8,010,000 (capital) $96,000 (annual O&M)
5	Cross Brothers, IL 03/25/85 IRM	Soil contaminated with VOCs	Not specified	Excavation and offsite disposal of surficial and buried waste materials, and visibly contaminated soil	Not specified	$377,728 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Cross Brothers Pail (Pembroke), IL Drum and Pail Recycling Facility 09/28/89 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene, and xylenes; and other organics including PCBs	33,880 yd^3 (soil)	Re-sampling PCB-contaminated soil followed by excavation and offsite incineration of soil with a PCB level >10 mg/kg; covering a 10-acre portion of the site; GW pumping and treatment with onsite discharge to VOC-contaminated soil area for soil flushing; GW monitoring; and implementation of deed and access restrictions	GW cleanup goals will meet MCLs, not exceed a 10^{-6} lifetime cancer risk, and attain an HI ration $\leq$1.0. PCB-contaminated soil will be excavated until PCB levels are <10 mg/kg (based on TSCA Spill Policy)	$2,076,500 (present worth) $59,235 (annual O&M) (years 1-15)
5	E.H. Schilling Landfill, OH 2.7-Acre Landfill 09/29/89 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including phenols, PAHs, and pesticides; and metals including arsenic	30,000 yd^3 (subsurface soil under landfill) 750 yd^3 (surface soil to be excavated) 70,000 yd^3 (solid waste beneath landfill) 500 yd^3 (sediment to be excavated) 7,000,000 gals (leachate)	Excavation of sediment and soil for consolidation in landfill; construction of RCRA cap; construction of clay berm; construction of a perimeter cut-off wall; construction of interceptor drum; dewatering the landfill of leachate and treating leachate using air stripping and carbon adsorption to remove organics and sulfide precipitation to remove inorganics, followed by discharge to SW; treatment and discharge of additional wastewater generated during remedial action; GW monitoring; and implementation of site access and deed restrictions	Soil and sediment will be excavated and consolidated to achieve a cumulative carcinogenic risk $<10^{-6}$ and a cumulative non-carcinogenic HI <1.0. GW will be treated if it exceeds action levels that have been established as a cumulative cancer risk $<10^{-6}$ and a cumulative non-carcinogenic HI <1.0	$6,444,000 (capital) $99,000 (annual O&M) (years 1-30)
5	Eau Claire, WI 06/10/85 IRM	GW contaminated with VOCs including PCE	11,200,000 gals/day	GW treatment using air stripping with discharge to municipal water treatment plant and distribution system	Aeration treatment will remove 99.6% 1,1-dichloroethene from GW	$1,420,000 (capital) $195,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Eau Claire, WI Municipal Well Field 03/31/88 2nd - Final	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using the existing air stripper with discharge to the municipal water system; and provision of municipal water to private well users	GW treatment will attain the additive 10^{-6} health-based risk level at the potential receptor, and meet MCLs for TCE 5 ug/l, DCE 7 ug/l, and chloroform 100 mg/l, and State WQC for PCE 1 ug/l	$1,214,200 (capital) $396,700 (annual O&M)
5	Envirochem, IN 09/25/87 1st	Soil, sediment, SW, and GW contaminated with VOCs, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soil and sediment under a RCRA multi-layer cap; re-routing of SW; GW collection and treatment; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5 ug/l, 1,1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 (present worth)
5	Fields Brook, OH 09/30/86 1st	Brook sediment contaminated with VOCs including TCE and PCE, organics including PCBs, and metals	36,000 yd^3 16,000 yd^3	Excavation, solidification, and onsite disposal of contaminated sediment. Excavation and thermal treatment of contaminated sediment with onsite disposal of residuals	Sediment will be excavated to a 10^{-6} excess cancer risk or to 50 mg/kg PCBs, whichever is greater	$35,100,000 (capital) $72,000 (annual O&M)
5	FMC, MN 09/30/87 1st - Final	GW contaminated with VOCs including TCE	Not specified	GW extraction with discharge of untreated GW to POTW; and institutional controls to include land use restrictions to mitigate against near-term contaminated GW usage	GW treatment will attain a 10^{-6} health-based risk level and meet the MCLs for 1,2-DCA 5.0 ug/l, 1,1,1-TCA 200 ug/l, TCE 5.0 ug/l, PCE 10.0 ug/l, 1,1-dichloroethylene 7.0 ug/l, and benzene 5.0 ug/l. Minnesota Recommended Drinking Water Limits will be met for 1,1,2-TCA 6.1 ug/l, 1,2-DCE 7.0 ug/l, toluene 2,000.0 ug/l, and xylenes 440.0 ug/l	$1,518,005 (present worth)
5	Forest Waste, MI 02/29/84 IRM	Soil contaminated with organics including PCBs	Not specified	Fencing	Not specified	$100,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Forest Waste, Mi 06/30/86 1st	Soil and sediment contaminated with organics and metals	4,000 yd^3 110,000 gals	Excavation of sludge and sediment and removal of aqueous lagoon wastes with solidification and offsite RCRA disposal	Cleanup levels will achieve an ingestion rate of 0.1 g/day of soil for a 70 kg adult	$1,295,000 (capital) $0 (O&M)
5	Forest Waste Disposal, Mi 11-Acre Industrial/Municipal Landfill 03/31/88 2nd - Final	Soil and GW contaminated with organics including PAHs and PCBs, VOCs including TCE and toluene, and metals including arsenic and lead	1,000 yd^3 (soil) 4,000 drums (liquid and solid waste)	Removal and offsite incineration of drums and associated contaminated soil, followed by installation of a containment system around the landfill including a RCRA cap, slurry wall, and a dewatering system with a leachate collection, treatment and disposal system; access and deed restrictions; and GW monitoring	Remedy addresses control of contamination, which will ensure GW lifetime cancer-risk range of 10^{-4} to 10^{-7}. Cleanup goals for individual chemicals were not specified	$23,820,000 (present worth) $440,500 (annual O&M)
5	Fort Wayne Reduction, IN 15-Acre Municipal Landfill/Waste Disposal Facility 08/26/88 1st - Final	Soil and GW contaminated with 43 indicator chemicals including VOCs, organics, and metals	4,600 drums (liquid wastes)	Municipal landfill: solid waste closure capping; GW monitoring; and deed and access restrictions. Waste disposal facility: excavation, reconsolidation, and on- or offsite incineration from Area C followed by soil capping; GW collection and treatment, if necessary; flood control measures; and compensation for 0.3 acres of wetlands through enhancement of remaining wetlands	Contaminant levels in the area of the municipal landfill do not pose a threat to human health or the environment. GW monitoring will ensure protection of the river through the use of ACLs as a performance standard. Specific goals will be determined during design. MCLs are not ARAR since GW is not used as a drinking water source. The fate of GW in the waste disposal facility area will be determined during design	$10,020,000 (present worth)
5	Galesburg/Koppers, IL Wood Treatment Facility 06/30/89 1st - Final	Soil and GW contaminated with organics including phenolss, PCP, and PAHs	15,200 yd^3 (soil)	Excavation and onsite consolidation with onsite biological treatment of soil; implementation of a biological monitoring program; construction of shallow GW interceptor trenches and deep pumping wells with GW pumping and pretreatment using existing wastewater treatment system, followed by discharge to a POTW; GW monitoring; and implementation of access and land use restrictions	No chemical-specific soil cleanup goals were established. Soil will be excavated 6" beyond visible contamination and will be treated to background toxicity levels. GW cleanup levels are based on a 10^{-6} excess carcinogenic risk goal	$4,286,844 (present worth) $170,012 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Hedblum Industries, MI Manufacturing Facility 09/29/89 1st - Final	GW contaminated with VOCs including benzene, toluene, xylenes, TCE, and PCE; and metals including lead	Not specified	GW pumping and treatment using activated carbon adsorption with discharge to the bayou; and GW and soil monitoring	Cleanup goals will meet SDWA MCLs. Specific goals include benzene 5 ug/l, TCE 5 ug/l, and lead 50 ug/l	$1,379,000 (present worth) $264,000 (annual O&M)
5	IMC/Terre Haute, IN Industrial Facility 06/22/88 1st - Final	Soil contaminated with BHC-tech and the pesticide lindane	28,500 yd^3	No further action (because previous soil cleanup has proven effective in containing the source of contamination) with implementation of a maintenance program; GW monitoring; access restrictions; and establishment of a contingency plan	Remedy addresses control of contaminant migration, thus individual goals are not applicable	$159,000 (present worth O&M)
5	Industrial Excess Landfill, OH 09/30/87 1st	GW contaminated with VOCs, organics, and inorganics	Not specified	Provisions of an alternate water supply to approximately 100 homes	Chemical-specific cleanup goals will be selected in 2nd O.U.	$1,715,870 - $2,289,060 (present worth)
5	Industrial Excess Landfill, OH Former Mixed Industrial and Refuse Landfill 07/17/89 2nd - Final	Soil, sediment, GW and air contaminated with organics including methane and metals	256,000,00 1 gals (GW)	Capping landfill with RCRA cap; expanding existing methane venting system; GW pumping and treatment by air stripping, carbon adsorption; and flocculation/sedimentation/ filtration to achieve compliance with CWA discharge criteria; treating SW from ponds and ditch, if necessary; dredging and consolidating sediment from ponds and ditch under the cap; multi-media monitoring; and implementing institutional controls restricting future use of the site	Landfill gas concentrations beyond the site will not exceed 5% methane. GW cleanup is based on a 10^{-6} excess cancer-risk level and will be treated to achieve SDWA MCLs in the aquifer and discharged in compliance with CWA NPDES requirements. Specific GW cleanup goals include benzene 5 ug/l and vinyl chloride 2 ug/l	$18,548,000 (present worth) $440,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Ionia City Landfill, MI 20-Acre Industrial, Commercial and Municipal Landfill 09/29/89 1st	Soil and debris contaminated with VOCs including vinyl chloride and methyl chloride; other organics; and metals including chromium	5,000 yd^3 (soil and drummed wastes)	In-situ vitrification of point source area; GW monitoring; upgrading landfill cover; implementing access and land use restrictions	Target cleanup levels for the soil-matrix to determine extent of excavation will not be established; instead, the extent of excavation will be based on the extent of buried drums and results of additional sampling	$3,630,525 (present worth) $112,750 (annual O&M) (year 1) $51,000 (annual O&M) (years 2-10)
5	Johns-Manville, IL 06/30/87 1st - Final	Soil, SW, GW, and air contaminated with inorganics including asbestos	Not specified	Grading and covering waste materials and soil in inactive water disposal areas; closure of asbestos pit cover; offsite disposal of asbestos-containing material generated from reconstruction activities following final closure of disposal pit in FY89; and SW, GW, and air monitoring system	All media will attain NESHAP requirements for asbestos	$4,026,000 (capital) $49,000 (annual O&M)
5	Kummer Landfill, MN 06/12/85 1st	GW contaminated with VOCs	Not specified	Provision for an alternate water supply	Remedy will reduce cancer threat to $<10^{-6}$ risk level	$1,624,850 (capital) $28,440 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Kummer Sanitary Landfill, MN 35-Acre Landfill 09/30/88 2nd	Soil and GW contaminated with VOCs including TCE, PCE, and benzene	1,300,000 yd^3 (soil and waste material)	Consolidation of soil and other waste material with site grading and construction of a cap consisting of a gas control layer, a low permeability layer (clay or synthetic membrane), and a drainage layer, with soil cover and vegetation; access and deed restrictions; and GW and landfill gas monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	Clay cap $7,400,000 - $12,500,000 (capital) $35,000 (annual O&M) or synthetic membrane $6,900,000 - $11,200,000 (capital) $33,000 (annual O&M)
5	Kysor Industrial, MI Industrial Facility 09/29/89 1st - Final	Soil and GW contaminated with VOCs including PCE, toluene, xylenes, and TCE; and metals including chromium	Not specified	GW pumping and treatment using carbon adsorption and air stripping with vapor-phase carbon adsorption followed by offsite discharge to SW; in-situ soil vacuum extraction with air pollution control equipment; GW monitoring; and implementation of site access and GW and land use restrictions	GW cleanup goals are derived from State and SDWA MCL standards. Specific goals include PCE 1 ug/l, xylenes 440 ug/l, toluene 40 ug/l, TCE 5 ug/l, and chromium (hexavalent) 50 ug/l. Soil cleanup goals are derived from State and RCRA standards. Specific goals include xylenes 141 mg/kg, toluene 724 mg/kg, and TCE 0.07 mg/kg	$16,000,000 (present worth) $5,000,000 (present worth O&M)
5	Lake Sandy Jo, IN 09/26/86 1st - Final	SW, soil, and sediment contaminated with VOCs, organics including PAHs, and metals	2,500 yd^3	Soil capping; alternate water supply; onsite consolidation of sediment; and institutional controls including deed restrictions on aquifer usage	Sediment with contaminants above the 10^{-6} risk level will be excavated and consolidated	$4,747,000 (capital) $63,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	LaSalle Electrical, IL 08/29/84 1st	Offsite soil contaminated with VOCs, and organics including PCBs	25,530 yd^3	Excavation and onsite incineration of offsite soil	Excavation and incineration of soil with greater than 5 mg/kg PCBs in the first 12 inches of soil, and greater than 10 mg/kg in soil at depths below 12 inches	$26,400,000 (present worth) $0 (O&M)
5	LaSalle Electrical Utilities, IL Industrial Facility 03/30/88 2nd - Final	Soil, sediment, and GW contaminated with VOCs, and organics including PCBs	25,500 yd^3	Excavation and onsite incineration of contaminated soil and sediment; flushing and mechanical cleaning of sewer lines; demolition and disposal of buildings; and GW collection and treatment	GW will be treated to achieve MCLs for VOCs. PCBs >1 mg/l will be treated. Soil will be excavated to 5 mg/kg in surface soil and 10 mg/kg at depths >1 foot	$34,495,180 (present worth) $64,000 (annual O&M)
5	Laskin Poplar Oil, OH 08/09/84 1st	SW and soil contaminated with VOCs, and organics including PCBs and PAHs	Not specified	Incineration of contaminated waste oil; and treatment of contaminated wastewater	Not specified	$1,043,000 (capital) $0 (O&M)
5	Laskin Poplar Oil, OH 09/30/87 2nd	Soil, oil wastewater, and sludge contaminated with VOCs, organics including PCBs and PAHs, and inorganics	900,000 yd^3 771,000 gals	Onsite incineration of oils, sludge, and soil with offsite disposal of all incinerator ash; offsite treatment of wastewater; decontamination of water and scrubber water; dismantling and offsite disposal of all tanks; crushing and incineration of pit cinder block walls; and backfilling and/or grading of all excavated areas	Selection of cleanup levels are scheduled in FY88	$8,490,865 (capital) $0 (O&M)
5	Laskin Poplar Oil, OH Waste Oil Disposal Facility 06/29/89 3rd - Final	Soil, structures, and debris contaminated with organics including PCBs, PAHs, dioxin, and pesticides; and metals including lead	Not specified	Draining onsite freshwater and retention ponds with offsite discharge and refilling; thermally treating contaminated soil, ash, and debris with either onsite disposal of ash or offsite disposal in RCRA landfill; demolishing and thermally treating or decontaminating dioxin-contaminated structures; constructing an upgradient GW diversion trench; capping, GW and SW monitoring; and implementing access and land use restrictions	No specific cleanup goals were provided; however, remediation goals will prevent exposure to soil and debris exceeding a 10^{-6} cancer-risk level or a total HI >1	$11,000,000 (present worth) $1,000,000 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	LeHillier/Mankato, MN 09/27/85 1st - Final	GW and soil contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping; extension of LeHillier water supply system to affected areas; and abandonment of contaminated wells	The goal of plume extraction and treatment is consistent with the 10^{-6} cancer-risk concentration for TCE 2.8 ug/l	$800,000 (capital) $70,000 (annual O&M)
5	Liquid Disposal, MI 09/30/87 1st - Final	Soil and GW contaminated with VOCs, organics including PCBs, and inorganics	Not specified	Onsite land disposal of all debris and equipment; onsite solidification/fixation of soil and waste; construction of a slurry wall and impermeable cap containment system; and GW pump and treatment using air stripping and ion exchange with discharge to SW	Target cleanup levels (TCLs) for soil and GW will be based on 10^{-6} health-based risk level. For noncarcinogens in GW, MCLs and health-based levels were used as TCLs which include barium 1,000.0 ug/l, cadmium 10.0 ug/l, chloroform 0.1 ug/l, benzene 0.2 ug/l, methylene chloride, 1.0 ug/l, and TCE 0.8 ug/l. TCL soil cleanup goals include TCE 77.0 ug/g, PCE 16.0 ug/g, benzo(a) pyrene 0.4 ug/g, PCBs 1.0 ug/g, and lead 20.0 ug/g	$21,743,100 (capital) $316,600 (present worth O&M)
5	Long Prairie, MN Municipal Well Field 06/27/88 1st - Final	Soil and GW contaminated with VOCs including PCE and TCE	7,000,000 gals	GW pump and treatment using air stripping with discharge to the river; and onsite soil treatment using active venting	Protection will be provided corresponding to the 10^{-5} carcinogenic risk level. Individual goals include TCE 5 ug/l (MCL), vinyl chloride 0.15 ug/l (State), and DCE 70 ug/l (State). Currently, there are no MCLs for PCE or DCE. AWQC will be met by the discharge limit for PCE 5 ug/l. Following treatment, PCE in soil will correspond to the 10^{-6} carcinogenic risk level of 1,400 ug/kg	$2,000,000 (present worth) $390,000 (annual O&M) (year 1) $250,000 (annual O&M) (years 2-5)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Main Street, IN 08/02/85 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW treatment using air stripping with discharge to water treatment system and drinking water distribution system	The air stripping system is designed to achieve a 99.1% removal of TCE, 88.9% removal of PCE, and 96.7% removal of 1,1-DCE	$1,106,000 (capital) $158,000 (annual O&M)
5	Marion-Bragg Landfill, IN 09/30/87 1st - Final	Soil, SW, and GW contaminated with VOCs, organics including PAHs, and inorganics	1,100,000 yd^3	Regrading and capping of site; provision for maintaining flood control measures; construction and maintenance of perimeter fence; provision of three private use drinking water wells; and additional GW studies, as necessary	Selection of appropriate GW cleanup levels deferred until selection of GW treatment O.U.	$5,800,000 (capital) $1,000,000 (present worth O&M)
5	Mason County Landfill, MI 10-Acre Landfill 09/28/88 1st	GW contaminated with VOCs including benzene, PCE, TCE, and xylenes	Not specified	Construction of a RCRA cap over the landfill; deed and access restrictions; and GW monitoring	Remedy addresses control of contaminant migration; establishment of cleanup goals for GW contamination is deferred until a remedy is selected for the GW operable unit	$2,800,000 (present worth) $1,000,000 (present worth O&M)
5	Metamora Landfill, MI 09/30/86 1st	GW and soil contaminated with VOCs including TCE and PCE, and metals	18,150 yd^3	Excavation and offsite thermal destruction of wastes from Areas 1 and 4	GW and soil cleanup targets will be established in the FY88 RI/FS	$41,500,000 (present worth) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	MIDCO I, IN Industrial Waste Recycling, Storage, and Disposal Facility 06/30/89 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene and TCE; other organics including PCBs, phenolss, and PAHs; metals including chromium and lead	12,400 yd^3 (soil) 1,200 yd^3 (sediment)	Treatment of soil and subsurface materials using a combination of vapor extraction and solidification/stabilization followed by onsite disposal; excavation and onsite solidification/ stabilization of sediment in wetlands; and covering the site in accordance with RCRA landfill closure requirements. GW will be recovered and handled in one of the following ways: 1) deep well injection without treatment if EPA grants a petition to allow land disposal of waste prohibited under RCRA; 2) if a petition is not approved, GW will be treated using air stripping and a liquid-phase granular activated carbon polish system, followed by deep well injection; or 3) treatment for hazardous substances followed by reinjection into the aquifer in a manner that will prevent spreading of the slat plume; and implementation of site access and deed restrictions	Soil and sediment will be treated if they exceed one of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-6}, cumulative chronic noncarcinogenic index equal to 1.0, or subchronic risk index equal to 1.0. GW will be treated if it exceeds one of the following risk-based levels: cumulative lifetime cancer risk equal to 10^{-5}, cumulative noncarcinogenic index equal to 1.0, subchronic risk equal to 1.0, MCLs, or chronic AWQC multiplied by a 3.9 dilution factor	$10,728,000 - $13,989,000 (present worth) $188,000 - $525,000 (annual O&M) Costs depend on whether GW is treated
5	MIDCO II, IN 7-Acre Waste Storage and Disposal Facility 06/30/89 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, TCE and xylenes; other organics including PCBs; and metals including arsenic, chromium, and lead	35,000 yd^3 (soil and waste materials) 500 yd^3 (sediment)	Treatment of soil and waste materials using solidification/stabilization followed by onsite disposal; excavation and onsite solidification/ stabilization of sediment; covering site in accordance with RCRA landfill closure requirements. GW will be recovered and handled in one of the following ways: 1) deep well injection without treatment, if EPA grants a petition to allow land disposal of waste prohibited under RCRA; 2) if petition is not granted, GW will be treated using air stripping and a liquid phase granular activated carbon polish system, followed by deep well injection; or 3) treatment for hazardous substances followed by reinjection into the aquifer in a manner that will prevent spreading of the salt plume; and implementation of site access and deed restrictions	Soil and sediment will be treated if they exceed one of the following risk-based levels: cumulative lifetime carcinogenic risk equal to 10^{-5}, cumulative chronic noncarcinogenic index equal to 1.0, or subchronic risk index equal to 1.0. GW will be treated if it exceeds a 10^{-5} cancer-risk level, cumulative noncarcinogenic index equal to 1.0, subchronic risk equal to 1.0, MCLs, or chronic AWQC multiplied by a 3.6 dilution factor	$14,419,000 - $18,596,400 (present worth) $301,000 - $733,000 (annual O&M) Costs depend on whether GW is treated

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Miami County Incinerator, OH Incinerator/Waste Disposal Facility 06/30/89 1st - Final	Soil and GW contaminated with VOCs including PCE, toluene, and TCE; other organics including PCBs, PAHs, dioxin, and pesticides; and metals including lead	104,000 - 150,000 barrel-equival-ents (liquid waste)	Excavation and onsite consolidation of ash wastes and soil into landfills with capping of landfills and previously excavated areas; GW pumping and treatment with discharge to POTW; vapor/vacuum extraction of liquid disposal area using carbon filters; continued testing of soil, ash, and tributary sediment; provision of an alternate water supply for area residents and businesses; and implementation of deed and land use restrictions	No chemical-specific cleanup goals have been established at this time. Cleanup levels will be based on MCLs, an HI of 1, a 10^{-5} cancer-risk level at the waste boundary, and a 10^{-6} cancer-risk level at the nearest receptor	$19,400,000 (present worth) $4,666,000 (O&M)
5	Mid-State Disposal Landfill, WI 33-Acre Industrial/Municipal Landfill 09/30/88 1st - Final	Soil, GW, and SW contaminated with VOCs including benzene, PCE and TCE, and metals	Not specified	Installation of new soil/clay caps for lagoon and landfill and in-situ solidification/ stabilization of sludge and landfill gas flaring, if necessary; site monitoring that includes GW, SW, and landfill gas monitoring; offsite GW monitoring; provision of an alternate water supply for nearby residences; improvement of SW drainage; leachate and ponded water collection and offsite treatment; access restrictions; institutional controls;	GW will gradually meet State standards and 10^{-6} cancer-risk levels for ingestion as a result of natural attenuation and a decrease in leachate contamination. Individual contaminant goals were not specified	$16,000,000 (present worth) $220,000 (O&M) (year 1) $100,000 (O&M) (years 2-30)
5	Morris Arsenic, MN 08/07/85 1st - Final	None	None	No further action	Not specified	$0
5	New Brighton, MN (Interim Water Treatment) 06/24/83 IRM	GW contaminated with VOCs including TCE	Not specified	Interim GW treatment using granular activated carbon and air stripping	Not specified	$150,400 (capital) $30,526 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	New Brighton, MN (Water Supply System) 09/19/83 IRM	GW contaminated with VOCs including TCE	Not specified	Extension of existing public water supply system to affected residents	Not specified	$217,958 (capital) O&M (not provided)
5	New Brighton, MN (Water Supply System) 08/02/84 IRM	GW contaminated with VOCs	Not specified	Extension of existing public water supply system to replace contaminated municipal system	Not specified	$142,090 (capital) O&M (not provided)
5	New Brighton/ Arden Hills/St. Anthony, MN 06/30/86 4th	GW contaminated with VOCs including TCE and PCE, and organics	Not specified	Provision of alternate water supply through well construction	Not specified	$600,500 (capital) $22,820 (annual O&M)
5	New Brighton/ Arden Hills/St. Anthony, MN 03/31/87 5th	GW contaminated with VOCs including TCE and PCE	Not specified	Construction of granular activated carbon (GAC) water treatment facilities with discharge to the municipal water treatment plant; and construction of a pipeline from wells to the treatment facilities	GW treatment will attain the MCL for TCE of 5.0 ug/l. MCLs for other VOCs have not been exceeded	$1,100,500 (capital) $160,770 (annual O&M)
5	New Brighton/ (TCAAP), MN 09/25/87 3rd	GW contaminated with VOCs and metals	Not specified	GW pump and treatment with air stripping and onsite reinjection to aquifer	GW cleanup goals will attain 10^{-6} health-based levels. Discharged water will, at a minimum, meet MCL values which include benzene 5 ug/l, toluene 2,000.0 ug/l, TCE 5 ug/l, PCE 6.9 ug/l, vinyl chloride 2 ug/l, xylenes 440 ug/l, arsenic 50 ug/l, and chromium 50.0 ug/l	$4,000,000 (capital) $120,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	New Brighton/ Arden Hills (TCAAP), MN Federal Facility Army Ammunition Manufacturing Plant 07/19/89 7th	Soil contaminated with VOCs including TCE and PCE; other organics including PCBs; and metals including arsenic and lead	1,400 yd^3 (soil)	Onsite treatment of soil using mobil infrared thermal treatment; analysis of treated soil to ensure PCB treatment goal is met, followed by onsite treatment; discharge of treated scrubber wastewater to sanitary sewer system and ultimately to POTW; decontamination and removal of equipment used in treatment process; and air monitoring during soil treatment	Soil will be treated to reach 2 mg/kg PCBs as required under TSCA	$1,200,000 (total cost)
5	New Brighton/ Arden Hills, MN Municipal Well Field 08/11/89 4th (Amendment)	None	Not applicable	Amend June 1986 ROD by cancelling the installation of a new municipal well	Not applicable	$0 (present worth) $0 (O&M)
5	New Lyme Landfill, OH 09/27/85 1st - Final	GW, soil, and sediment contaminated with VOCs, organics, and inorganics including asbestos	Not specified	Capping; installation and operation of extraction/containment wells to dewater landfill and eliminate leachate; onsite GW and leachate treatment using biological disc, sodium hydroxide precipitation, and granular activated carbon; onsite consolidation of contaminated sediment; and fencing	Not specified	$10,798,000 (capital) $44,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Ninth Avenue Dump, IN Waste Disposal Area 09/30/88 1st	GW contaminated with VOCs including benzene, toluene, xylenes, organics including PCBs, metals, and cyanides	250,000 - 700,000 gals (oil)	Extraction of oil and GW with diversion of GW to a recharge system and oil to an onsite storage tank; construction of a soil-bentonite slurry wall which will require filling 0.5-1.0 acre of wetlands; and GW monitoring	Remediation invokes the interim remedy waiver for contaminant-specific ARARs; however, GW treatment and discharge will meet MCLs. Individual MCL goals were not provided	$1,960,000 (capital) $190,000 (annual O&M)
5	Ninth Avenue Dump, IN Waste Disposal Area 06/30/89 2nd - Final	Soil, sediment, fill material, and GW contaminated with VOCs including benzene, TCE, and toluene; other organics including PAHs and PCBs; and metals including lead	36,000 yd^3 (fill material) 1,000 - 2,000 drums (liquid waste)	Excavation of oil-contaminated waste and fill material with onsite thermal treatment, followed by filling the excavated area with incinerator and GW treatment process residues, discarded drums, sediment, and trench spoils; capping area contained by the slurry wall; pumping and treatment of GW inside slurry wall with reinjection into slurry wall to promote soil flushing; dismantling, decontaminating, and removing oil storage unit constructed under first O.U.; long-term GW monitoring; and implementation of deed and access restrictions	Soil remedy is designed to ensure long-term success of the containment and GW components. GW target levels are based on MCLs or a 10^{-5} risk level, whichever is more stringent for carcinogens; and MCLs, MCLGs, or an HI of 1, whichever is more stringent, for noncarcinogens	$22,209,000 (present worth) $489,000 (annual O&M)
5	NL/Taracorp/ Golden Auto Parts, MN Industrial Facility/ Lead Smelter 09/29/88 2nd - Final	None	None	No action remedy	No action attains the State ARAR of 1,000 mg/kg for soil lead, as well as the ATSDR guidance level of 500-1,000 mg/kg	$0
5	Northern Engraving, WI 09/29/87 1st - Final	Soil, sludge, and GW contaminated with VOCs including TCE, and inorganics	4,400 yd^3	Excavation and onsite solidification of sludge and soil; installation of RCRA cap atop lagoon; and institutional controls to include deed and access restrictions to seepage pit	GW cleanup will be managed through the use of ACLs that are protective of the river. ACLs include TCE 21,900.0 ug/l, copper 12.0 ug/l, nickel160.0 ug/l, and zinc 110.0 ug/l	$295,000 (capital) $16,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Northernaire, MI 09/11/85 1st	GW, soil, and sewer sediment contaminated with metals including chromium and cadmium	Not specified	Excavation and offsite disposal of soil and sewer line to privately-owned RCRA facility; cleaning dust and hazardous residue from building floor; breaking up of 300 ft^2 of floor and drywell, sampling soil, excavation, and disposal of any contaminated debris and soil at a RCRA Subtitle C facility; and backfilling of area with clean soil	Excavation of soil and sediment will meet response objectives of chromium 50 mg/kg and cadmium 10 mg/kg	$75,000 (capital) $0 (O&M)
5	Northernaire Plating, MI Former Electroplating Facility 09/29/89 2nd - Final	GW contaminated with VOCs including toluene, TCE, PCE, and xylenes; and metals including chromium	Not specified	Two-stage GW pumping and treatment system using carbon adsorption to remove metals and air stripping with vapor phase carbon adsorption to remove VOCs, followed by discharge to SW; GW monitoring; and implementation of site access and GW and land use restrictions	GW will meet or exceed State and SDWA MCL standards. Target GW cleanup levels include xylenes 440 ug/l, toluene 40 ug/l, PCE 1 ug/l, TCE 5 ug/l, and chromium 50 ug/l	$16,000,000 (present worth) $5,000,000 (O&M) (years 1-60)
5	Northside Landfill, IN 09/25/87 1st	Soil, sediment, SW, and GW contaminated with VOCs including TCE, organics including PCBs, and inorganics	4,200 yd^3	Excavation, dewatering, and onsite disposal of soil and sediment under a RCRA multi-layer cap; re-routing of SW; GW and leachate collection and treatment system; and institutional controls to include deed and access restrictions	GW will attain MCL values which include benzene 5.0 ug/l, 1,1-DCE 7.0 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, and TCE 200.0 ug/l	$33,900,000 (present worth)
5	Novaco Industries, MI 06/27/86 1st	GW contaminated with metals including chromium	36,000,000 gals	GW pump and treatment using electrochemical reduction, precipitation, filtration, and ion exchange with discharge to creek; and GW extraction from the sand/gravel aquifer	Treatment will remove hexavalent chromium from the GW to concentrations below 50 ug/l and trivalent chromium concentrations to below 100 ug/l	$560,000 (capital) $419,000 (annual O&M) (years 1-6)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Oak Grove Landfill, MN 45 to 50-Acre Municipal Landfill 09/30/88 1st	Soil, GW and SW contaminated with VOCs including toluene and xylenes	Not specified	Deed and site access restrictions; capping with low permeability layer, and top soil cover and vegetation; and air and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$6,400,000 - $11,100,000 (clay cap) (present worth) or $5,500,000 - $9,300,000 (synthetic membrane) (present worth) $42,000 (clay cap) (annual O&M) or $40,000 (synthetic membrane) (annual O&M)
5	Old Mill, OH 08/07/85 1st - Final	GW and soil contaminated with VOCs and organics including PCBs	Not specified	Removal and offsite disposal of 95% of soil contaminants; GW extraction and treatment using granular activated carbon; aquifer use restrictions; and provision of public water supply to residences potentially affected	Soil contaminated with base/neutral compounds will be removed to background, and VOC removal will be to the 10^{-6} cancer-risk level. GW cleanup has been proposed to meet the 10^{-5} risk level	$3,917,000 (capital) $45,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Ott/Story/Cordova Chemical, MI Industrial Facility 09/29/89 1st	GW and SW con-contaminated with VOCs including benzene, PCE, TCE, toluene, vinyl chloride, and xylenes; other organics including PCBs and pesticides; and metals including arsenic	Not specified	GW pumping and treatment using UV-oxidation, carbon adsorption, biological treatment (activated sludge), and filtration with discharge to SW; and environmental monitoring	Effluent levels will meet State NPDES levels, which are dependent on final discharge point. ARARs pertaining to GW restoration will be addressed in a subsequent overall GW operable unit	$11,751,000 (present worth) $1,500,000 - $1,600,000 (annual O&M) (years 1-5)
5	Outboard Marine Corp., IL 05/15/84 1st	GW, soil, and river sediment contaminated with VOCs, and organics including PCBs	Not specified	Excavation and offsite disposal of PCB contaminated materials; construction of onsite containment cell for moderately contaminated PCB material; capping; GW diversion; construction of clay-lined dewatering lagoon; and treatment of supernatant with discharge to harbor	Not specified	$21,570,000 (present worth) O&M (not specified)
5	Outboard Marine, IL Marine Products Manufacturing Facility 03/31/89 1st (Amendment)	Soil and sediment contaminated with organics including PCBs	700,000 lbs (soil) 300,000 lbs (sediment)	Construction of containment cell and a new slip; relocation of Larsen Marine; removal, treatment, and onsite disposal of Slip 3 sediment exceeding 500 mg/kg PCB; dredging and disposal of harbor sediment above 50 mg/kg; excavation and onsite treatment of soil and sediment exceeding 10,000 mg/kg PCBs; construction of a west containment cell for treatment residues and lower concentration PCB-contaminated soil; construction of an east containment cell around the parking lot area; construction of a temporary onsite water treatment facility for dredged water; construction of a permanent water treatment facility; onsite treatment of containment cell water followed by discharge to a POTW or an onsite location; capping of all contaminant cells; and GW monitoring	A PCB cleanup goal of 50 mg/kg was established based on site-specific data	$19,000,000 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Petersen Sand & Gravel, IL Mining and Waste Disposal Area 09/14/88 1st - Final	None	Not applicable	No further action with SW and sediment monitoring	Not applicable	$0
5	Poer Farm, IN Industrial Facility 09/29/88 1st - Final	None	Not applicable	No further action after abandoning GW monitoring wells	Not applicable	$0
5	Pristine, OH Waste Disposal Facility 12/31/87 1st - Final	Soil, sediment, GW, SW, and buildings contaminated with VOCs including PCE and TCE, metals, and pesticides (dioxin in soil and sediment only)	37,700 yd^3	Excavation, onsite consolidation; of 1,725 yd^3 of sediment and soil; and in-situ vitrification of soil; installation of a french drain; GW pump and treatment using air stripping with offsite discharge to Mill Creek; decontamination of structures followed by removal and disposal at a solid waste landfill; implementation of institutional controls including deed and access restrictions; and GW monitoring	The overall health-based cleanup standard of 10^{-6} cumulative excess cancer risk at the plume boundary will be met for all media. Additionally, this remedy will meet the MCL for lead 50 ug/l	$20,837,000 (capital) $94,800 (annual O&M)
5	Reilly Tar, MN 06/06/84 1st	GW contaminated with VOCs and organics including PAHs	Not specified	GW treatment using granular activated carbon	Not specified	$750,000 (capital) $188,000 (annual O&M)
5	Reilly Tar & Chemical, MN 05/30/86 2nd	GW and soil contaminated with VOCs, and organics including PAHs	800,000 - 1,000,000 yd^3	GW pump and treatment; capping and filling of exposed wastes; and discharge of hazardous waste to sewer	Drinking water criteria for PAHs were developed through State and EPA consultations	Cost estimates not fully developed

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Republic Steel Quarry, OH Industrial Facility 09/30/88 1st - Final	Soil contaminated with VOCs and metals	100 yd^3 (soil)	Excavation and offsite disposal of contaminated soil; and GW monitoring	Soil treatment before offsite disposal to meet LDR requirements is not expected to be necessary. Individual removal goals were not specified	$63,200 (present worth)
5	Rose Township, MI 09/30/87 1st - Final	Soil and GW contaminated with VOCs, organics including PCBs and PAHs, and inorganics	50,000 yd^3	Excavation of soil and onsite thermal destruction with disposal of ash as either backfill or placement in an offsite RCRA facility (if ash is EP toxic, leachable lead removal treatment will be required); GW pump and treatment using chemical coagulation, air stripping, and activated carbon adsorption with discharge in appropriate manner; and fencing	Cumulative soil cleanup will attain 10^{-6} cancer-risk level which includes arsenic 14.0 mg/kg, PCBs 10.0 mg/kg, and lead 70.0 mg/kg. GW levels will also attain the 10^{-6} cancer-risk level which includes vinyl chloride 0.015 ug/l, arsenic 50.0 ug/l, lead 50.0 ug/l, chlorobenzene 60.0 ug/l (proposed MCLG), benzene 0.133 ug/l, TCE 0.627 ug/l, PCBs 0.002 ug/l, and methylene chloride 0.919 ug/l	$32,547,000 (capital) $200,000 (annual O&M) (years 1-10) $70,000 (annual O&M) (years 10-30)
5	Rose Township, MI 01/18/89 1st - Final (Amendment)	Soil and GW contaminated with VOCs; other organics including PCBs and PAHs; and metals including arsenic and lead	25,000 yd^3 (soil)	Excavating soil with onsite thermal destruction and disposing the resulting ash onsite or in landfills offsite, based on leachability test results; excavating subsurface soil with onsite thermal destruction or onsite soil flushing, pending results of laboratory or pilot tests demonstrating the effectiveness of soil flushing technology; GW pumping and treatment using chemical coagulation, air stripping, and activated carbon adsorption with onsite discharge of treated water to adjacent wetlands and regeneration/incineration of carbon filters; and implementing site access restrictions	GW and soil cleanup levels will attain the 10^{-6} cancer-risk level. Chemical-specific cleanup levels for GW include arsenic 50 ug/l (MCL), lead 50 ug/l (MCL), PCBs 0.002 ug/l, and benzene 1 ug/l. Soil Target Cleanup Levels (TCLs) were based on the noncarcinogenic risk calculation for each chemical where no MCL currently exists. Soil cleanup levels include PCBs 10 mg/kg (TSCA), lead 70 mg/kg (TCL), arsenic 14 mg/kg (TCL), and VOCs 70 ug/kg (TCL)	$14,000,000 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Schmalz Dump, WI 08/13/85 1st	Soil contaminated with VOCs, organics including PCBs, and metals including chromium	3,500 yd^3	Excavation and offsite disposal of contaminated building debris and sediment with dewatering	PCBs will be removed in the dewatering process to below 0.5 ug/kg	$2,088,300 (capital) $0 (O&M)
5	Schmalz Dump, WI 09/30/87 2nd - Final	Soil contaminated with metals	Not specified	Installation of a low permeability, compacted earth material cap over approximately 7 acres of soil	Trivalent chromium does not exceed the MCL (50.0 ug/l) and lead was not reported above detection units	$687,664 (capital) $17,940 (annual O&M)
5	Seymour, IN 09/30/86 1st	GW and soil contaminated with VOCs, organics, and metals	101,690,000 gals	GW extraction and treatment with discharge to POTW	Water discharge will conform with POTW standards	$300,000 (capital) $100,000 (annual O&M)
5	Seymour Recycling, IN 09/25/87 2nd - Final	Soil, sediment, and GW contaminated with VOCs including TCE, and organics	3,000 yd^3	Implementation of a full scale soil vapor extraction system; installation of a multimedia cap; excavation of contaminated sediment and consolidation of sediment beneath cap; GW pump and treatment; and institutional controls to include deed restrictions, and site access restrictions with compliance point at the edge of the cap	GW cleanup levels will attain a cumulative 10^{-5} to 10^{-6} cancer-risk level. MCLs attributing to this level include benzene 5.0 ug/l, chloroform 100.0 ug/l, 1,2-DCE 7.0 ug/l, TCE 5.0 ug/l, and vinyl chloride 2.0 ug/l. GW cleanup levels for inorganics will meet chronic health values including lead, cadmium, and barium 50.0 ug/l each	$10,536,000 (capital) $7,200,000 (present worth O&M)
5	South Andover, MN Waste Disposal Facility 03/30/88 1st	GW contaminated with VOCs including PCE, TCE, and toluene, and metals including arsenic, cadmium, and chromium	Not specified	GW extraction; provision of an alternate water supply to private well users; GW monitoring; and implementation of well use restrictions	Remediation is aimed at controlling migration, not restoring the aquifer to drinking water standards, thus no cleanup levels were established	$760,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Spiegelberg Landfill, MI 09/30/86 1st	GW and soil contaminated with VOCs, organics, and metals	5,000 yd^3 10,000 yd^3	Excavation of waste materials with offsite incineration of liquid paint sludges and offsite disposal of solid paint sludge	Excavation of all materials exceeding a 10^{-6} excess cancer risk	$15,771,000 - $18,395,000 (capital) $0 (O&M)
5	Summit National, OH Waste Disposal Facility 06/30/88 1st - Final	Soil, sediment, GW and SW contaminated with VOCs including benzene, toluene, xylenes and TCE, organics including phenolss, PAHs and PCBs, and metals including arsenic and chromium	30,500 yd^3 (soil) 1,500 yd^3 (sediment) 80,000 gals (drum contents) 1,000 - 7,500 gals (tank contents)	Excavation and onsite incineration of soil, sediment, and contents of buried drums and tanks, with disposal of incinerator residues in an onsite RCRA landfill; GW pump and treatment and onsite SW treatment using precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption with discharge of treated water to downgradient SW; installation of multi-layered cap with grading and revegetation, and construction of a slurry wall around site perimeter; dismantling and onsite disposal of onsite structures; site access and deed restrictions; GW and SW monitoring; and residence relocation	Soil cleanup goals will attain a $2x10^{-5}$ cancer-risk level. Discharge levels for treated GW and SW will meet Federal and/or State water quality standards. Individual goals for soil and GW contaminants were not specified	$25,000,000 (present worth) $1,132,250 (annual O&M)
5	United Scrap Lead, OH Industrial Facility 09/30/88 1st - Final	Soil and sediment contaminated with arsenic and lead	46,600 yd^3 (soil) 400 yd^3 (sediment) 55,000 yd^3 (battery casings)	Excavation and treatment of battery casings and contaminated soil by washing, with lead recovery and offsite disposal or recycling of casings, and replacement of residual soil onsite; excavation and dewatering of sediment onsite and disposal with soil; construction of a soil cover, and revegetation; decontamination of contaminated buildings and debris with offsite disposal; installation of a new residential well; deed restrictions; drainage control; and GW and SW monitoring	The target level for cleanup of battery casings and surficial soil is lead 500 mg/kg based on guidelines from the Center for Disease Control. Soil deeper than 1 ft will be cleaned to the EP toxicity value for lead, 5 mg/l. Sediment will be cleaned to background lead levels (68 mg/kg)	$26,924,000 (present worth) $55,375 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	U.S. Aviex, MI Industrial Facility 09/07/88 1st - Final	Soil and GW contaminated with VOCs including benzene, PCE, TCE, toluene and xylenes	11,500 yd^3 (soil)	Onsite soil will be treated using soil flushing; GW pump and treatment (including on-site and offsite GW and fluids from the soil flushing) using air stripping with discharge to SW	GW cleanup goals will meet MCLs, proposed MCLGs, or Federal or State water quality criteria. Individual goals include benzene 5 ug/l (MCL), toluene 2,000 mg/l (PMCLG), xylenes 440 ug/l (PMCLG), PCE 0.88 ug/l (WQC), and TCE 5 ug/l (MCL)	$3,024,100 (present worth)
5	Velsicol Chemical Corporation, IL Waste Disposal Facility 09/30/88 1st - Final	Soil, sediment, GW, and SW contaminated with VOCs including benzene, organics including PAHs, and pesticides	87,900 yd^3 (soil) 10,200 yd^3 (sediment)	Excavation of soil and sediment, backfilling with clay, and revegetation; construction of a diversion channel; consolidation of all wastes onsite with clean backfill of excavated areas and in-situ stabilization, followed by construction of a RCRA cap; construction of a GW collection drain with disposal via deep well injection or treatment using granular activated carbon before offsite discharge; GW and surface monitoring; and deed restrictions	GW cleanup will attain ACLs including benzene 2,000 ug/l; cPAHs 0.031 ug/l; noncarcinogenic PAHs 5.4 ug/l; and phenolss 100 ug/l. Soil and sediment will achieve ACLs including benzene 2 mg/kg; cPAHs 0.010 mg/kg; noncarcinogenic PAHs 0.046 mg/kg and phenolss 100 mg/kg	$9,081,000 (present worth)
5	Verona Well Field, MI 05/01/84 IRM	GW and air contaminated with VOCs including TCE and PCE	Not specified	Provision for new wells; implementation of barrier system; treatment of purge water using air stripping system; and treatment of air emissions using activated carbon adsorption	Not specified	$1,796,000 (capital) $470,000 (annual O&M)
5	Verona Well Field, MI 08/12/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Soil treatment using enhanced volatilization; and GW pump and treatment using existing air stripper	It is estimated that within 3 years, GW contamination will decrease to 100 ug/l VOCs	$1,660,000 (capital) $90,000 (annual O&M) (years 1-2) $46,000 (annual O&M) (years 3-30)

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5	Waite Park Wells, MN Municipal Wells 09/28/89 1st - Final	GW contaminated with VOCs including PCE and TCE	Not specified	Installation of GW extraction wells in the contamination plumes; treatment of extracted GW via packed tower aeration; discharge of treated GW via storm drain to river; and SW and GW monitoring	Chemical-specific GW cleanup goals include PCE 6.6 ug/l (RAL) and TCE 5 ug/l (MCL). SW discharge will comply with CWA AWQS. Chemical-specific GW discharge goals include PCE 8.9 ug/l and TCE 123 ug/l	$913,000 (present worth cost) O&M (not specified)
5	Waste Disposal Engineering, MN Waste Disposal Area 12/31/87 1st - Final	GW contaminated with VOCs and organics; landfill covered with lime-sludge cap	Equivalent of 60,000 - 100,000 barrels of hazardous waste within 2,500,000 yd^3 of solid waste	Installation of a RCRA cap; GW pump and treatment using carbon adsorption with offsite discharge to Coon Creek; installation of a clay slurry wall; implementation of institutional controls including well use restrictions; and site monitoring	The existing concentrations of contaminants in Coon Creek will be brought to below the 10^{-6} health-based risk level and other fresh water criteria established under CWA. The point of compliance will be set at the landfill boundary. SWDA standards are not ARAR since institutional controls will prevent any potential use of the contaminated GW. Also, MCLs have not been established for site contaminants	$9,504,796 (capital) $1,862,915 (present worth O&M)
5	Wauconda Sand & Gravel, IL 09/30/85 1st	GW, SW, and soil contaminated with VOCs, organics including PCBs, and metals	Not specified	Installation of leachate collection drains; provision for leachate disposal at sewage treatment plant or at an offsite hazardous waste treatment facility; regrading with clean soil cover and revegetation of bare and eroded areas; and fencing	Not specified	$1,600,000 (capital) $50,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
5	Wauconda Sand & Gravel, IL 52-Acre Industrial/ Municipal Commercial/ Residential Landfill 03/31/89 2nd - Final	GW, SW, and air contaminated with VOCs including vinyl chloride and benzene; metals including arsenic and lead; and methane	Not specified	Long-term monitoring of GW, SW, and air emissions with possible evaluation of additional remedial alternatives, if necessary; further upgrade of site cap; installation and operation of improved venting system; continued O&M of leachate collection and venting systems; maintenance of site cap, fence, and monitoring well network; and implementation of institutional controls to restrict GW use	MCLs and State Public and Food Processing standards are considered ARARs for offsite GW quality. If offsite GW exceeds an MCL or a 10^{-5} cumulative cancer-risk level for lifetime drinking water usage (excluding arsenic and vinyl chloride) and background levels, additional investigations will be performed. Leachate collection system will operate until action levels are established and attained. Air emissions will be controlled and treated if incremental risk to nearby residents is $>10^{-6}$ lifetime exposure	$12,155,606 (present worth) $174,500 (annual O&M)
5	Wausau Water Supply, WI Well Field 12/23/88 1st	GW contaminated with VOCs including TCE	Not specified	GW pumping and treatment using air stripping with onsite discharge to SW; and GW monitoring	Remedy addresses plume management not remediation. Effluent levels will satisfy BAT	$750,000 (present worth) $105,000 (annual O&M) (year 1) $81,000 (annual O&M) (subsequent years)
5	Wausau Water Supply, WI Municipal Water Supply Facility 09/29/89 2nd - Final	Soil and GW contaminated with VOCs including TCE and PCE	Not specified	Treatment of soil using an in-situ soil vapor extraction (SVE) system and treatment of gases emitted from the SVE system using vapor phase carbon filters; and continued GW pumping and treatment using existing air strippers with modified pumpage rates	Performance goals for this remedial action are based on State GW standards including PCE 1.0 ug/l and TCE 1.8 ug/l	$738,000 (present worth) $482,000 (present worth O&M)

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5	Wedzeb Enterprises, IN Industrial Warehouse Facility 06/30/89 1st - Final	Sewer sediment contaminated with organics including PCBs	Not specified	Hydraulic flushing and vacuum pumping of sewer lines followed by filtering the resulting water and sediment and discharging to POTW; offsite incineration and disposal of sediment and waste drums, if PCB levels are 50 mg/kg or greater or offsite disposal only if PCB levels are below PCB 50 mg/kg; and a television inspection of the pipeline to ensure structural integrity	The cleanup goal of 10 mg/kg for PCBs was established by the TSCA Spill Policy	$45,000 (present worth) $0 (O&M)
5	Whitehall Municipal Wells, MI Municipal Well Fields 09/29/89 1st - Final	None	Not applicable	No further action is being taken because contaminant levels in the site's wells do not exceed any State or Federal drinking water standards or criteria	Not applicable	$0 (present worth)
5	Windom Dump, MN Former Municipal Landfill 09/29/89 1st - Final	GW contaminated with VOCs including benzene, PCE, and TCE; metals including arsenic; and other inorganics	Not specified	Grading, capping, and revegetating the fill area; modifying the existing municipal waste plant by installing additional aeration nozzles and structure venting; and GW monitoring	The municipal water treatment system will remove VOCs and will ensure that contaminants of concern do not exceed a 10^{-5} lifetime excess cancer risk and SDWA MCLs. GW will be treated if the GW exceeds a single allowable limit. Specific limits are based on State solid waste management rules and include TCE 7.8 ug/l, PCE 1.7 ug/l, benzene 3.0 ug/l, and arsenic 12.5 ug/l	$865,000 (present worth) $5,700 (O&M) (years 1-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	AT&SF (Clovis), NM Waste Disposal Area 09/23/88 1st - Final	Soil, sediment, GW, and SW contaminated with organics including phenolss, inorganics, and metals including arsenic, chromium, and lead	Not specified	Installation of SW run-on controls; evaporation of lake water using a pump and spray sprinkler system; excavation and onsite biodegradation of evaporate and lake sediment in an onsite treatment area; in-situ biodegradation of contaminated soil underneath the lake sediment, followed by excavation and placement of the treated soil into the sediment treatment area; capping the treatment area with PVC liner and vegetated soil layer; grading and revegetating the disturbed area; access restrictions; and GW and treatment area monitoring	Remedy is aimed at preventing contamination of the aquifer and will meet all primary State and Federal standards for drinking water. Individual cleanup levels were not specified	$2,840,000 (present worth)
6	Bailey Waste Disposal, TX Waste Disposal Facility 06/28/88 1st - Final	Soil and sediment contaminated with VOCs including benzene, organics including PAHs, and metals	66,980 yd^3	Relocation, consolidation, and treatment of contaminated sediment and wastes using a solidification technique developed during design followed by onsite disposal and capping of the residual matrix	Remediation will attain the excess cancer-risk level of $9x10^{-6}$ for adults and $1.2x10^{-5}$ for children. No ARARs exist at this site for contaminated soil and sediment, so no chemical-specific ARARs are available	$13,700,000 (present worth)
6	Bayou Bonfouca, LA 08/15/85 1st	GW, soil, and sediment contaminated with creosote	Not specified	Offsite disposal of creosote waste	Not specified	$903,000 (capital) $173,743 (annual O&M)
6	Bayou Bonfouca, LA 03/31/87 2nd - Final	Soil, sediment, and potentially GW, contaminated with organics including PAHs	71,500 yd^3	Excavation and onsite incineration of 51,500 yd^3 of soil, sediment, and sludge with onsite disposal of ash and capping (20,000 yd^3, 34 acres); and GW pump and treatment using technologies to be evaluated during design with reinjection	Soil/sediment contamination >1,300 mg/kg PAHs will be treated. Soil/sediment contamination >100 mg/kg PAHs will be capped. GW treatment will target the 10^{-4} to 10^{-7} cancer-risk level (CWA suggests 3.1 ng/l level for PAHs). Point of compliance is facility property line	$59,594,534 (capital) $173,748 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Bayou Sorrel, LA 11/14/86 1st - Final	Soil and GW contaminated with pesticides, VOCs, organics, and inorganics	36,400 yd^3	Regrading with top soil; RCRA geomembrane/clay capping of former disposal areas; installation of sand/geofabric pore water drainage layer; installation of a venting system to reduce buildup of gases beneath cap; installation of slurry wall; consolidation of all miscellaneous wastes for grading, fill or offsite disposal; fencing of all capped areas; and construction of gravel access roads around fenced areas	Chemical-specific cleanup levels not provided	$23,200,000 (capital) $5,700,000 (present worth O&M)
6	Bio-Ecology Systems, TX 06/06/84 1st - Final	Soil and SW contaminated with VOCs including TCE, organics including PCBs, and metals	Not specified	Construction of onsite disposal cell with synthetic liner, leachate collection system, and final cover; stabilization of waste and onsite placement in cell; elevation of site above 100-year flood plain; and fencing	Not specified	$3,709,600 (capital) $20,000 (annual O&M)
6	Brio Refining, TX Industrial Facility 03/31/88 1st - Final	Soil, sludge, GW, and debris contaminated with VOCs and organics	500,000 - 700,000 yd^3 (soil) 170,225 gals (tank liquids, and NAPLs) 1,757 drums (liquid and solid wastes)	Excavation of soil, pit contents, and surface seeps followed by either incineration (EPA preferred alternative) or aqueous phase biological treatment (PRP preferred alternative) with backfilling of treatment residuals; removal of offsite soil contamination found during RI or RA; consolidation of onsite inert debris and rubble with disposal to be determined during design; removal, decontamination, and dismantling of tanks for future sale or offsite disposal; regrading, placement of topsoil, and revegetation; GW treatment of channel and natural attenuation of aquifer; implementation of institutional controls including deed and access restrictions; and GW, SW, and air monitoring	Media above Endangerment Assessment action levels will be treated to target levels based on a 10^{-6} incremental cancer risk for carcinogens and on an acceptable chronic daily intake for non-carcinogens. Individual action and target levels were not specified. Offsite soil contamination above unspecified background levels will be removed. GW in the channel will be treated to a level determined during design. Since the GW may never be used as a GW source, immediate application of MCLs is not appropriate	$23,308,000 - $23,333,000 (biological treatment) (present worth) $22,458,000 - $26,598,000 (incineration) (present worth)
6	Cecil Lindsey, AR 04/23/86 1st - Final	None	Not specified	No further action with site access restrictions and GW monitoring	Not specified	$61,000 (capital) $10,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Cleve Reber, LA 03/31/87 1st	Soil, SW, GW, and debris contaminated with organics	6,400 drums 220,000 yd^3 500,000 gals	Excavation and onsite incineration of buried drums and sludge; RCRA capping on land used for disposal of industrial hazardous waste; installation of gas venting pipes; drainage and backfilling of onsite ponds; pond water pump and treatment with discharge to SW; and fencing	Remediation will attain the 10^{-6} cancer-risk level through CWA water quality criteria. Specific cleanup goals include hexachlorobutadiene 0.45 ug/l, hexachlorobenzene 21.0 ng/l, and hexachloroethane 2.4 ug/l. Specific excavation and treatment levels not provided	$25,000,000 (capital) $100,000 (annual O&M)
6	Compass Industries Landfill, OK 09/29/87 1st - Final	Soil and GW contaminated with organics and inorganics	620,000 yd^3	RCRA capping with site grading; SW diversion; fencing with warning signs along cap perimeter; and GW extraction and onsite treatment in upper perched water-bearing zone	GW solid effluent levels will meet NPDES requirements. Other chemical-specific levels not provided	$9,255,526 (capital) $272,830 (annual O&M)
6	Crystal City Airport, TX 09/29/87 1st - Final	Soil and debris contaminated with pesticides and inorganics	12,000 yd^3	Onsite consolidation of all materials which exceed 100 mg/kg total pesticides; RCRA capping over consolidation cell; and disposal of decontamination liquids	Soil cleanup will attain 10^{-6} health-based cancer-risk level for total pesticides >100.0 mg/kg. Debris cleanup will be based on visible inspection	$1,600,000 (present worth)
6	Dixie Oil, TX Industrial Facility 03/31/88 1st - Final	Soil, GW, and debris contaminated with VOCs, organics, and metals including copper	107,351 yd^3	Site controls including access and deed restrictions; excavation and removal of contaminated offsite soil; consolidation and disposal of onsite debris and rubble; remediation of Mud Gully; operation of the wastewater treatment system followed by dismantling and removal; dismantling, removal, and disposal of tank contents and drums and either selling or offsite disposal of tanks; dismantling and disposal of all process equipment; ambient air sampling and air emissions controls; sampling and monitoring of Mud Gully sediment and GW; and site regrading and revegetation	Endangerment Assessment (EA) did not identify contaminated soil above unspecified EA action levels; therefore, soil treatment is not necessary as long as site controls are enforced. Offsite soil contamination above unspecified background levels will be removed. Mud Gully flood control ditch and the bottleneck will be remediated based on a performance standard to be set during design in cooperation with the Harris County Flood Control District	$241,000 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	French Limited, TX Industrial Facility 03/24/88 1st - Final	Soil, sludge, and GW contaminated with organics including PCBs and PCP, VOCs, and inorganics including arsenic and metals	70,100 yd^3 (sludge/ sediment) 79,500 yd^3 (soil)	In-situ biological treatment; GW pump and treatment; SW treatment; stabilization to prevent leachate generation; backfilling of lagoons with clean soil; and site monitoring	GW will be treated until the point where the 10-6 human health criteria can be achieved through natural attenuation in 10 years or less. Additionally, remediation will be consistent with WQC for GW and SW, and TSCA regulations and policy for cleanup of PCBs and PCB-contaminated material. Individual cleanup goals were not specified	$47,000,000 (present worth)
6	Geneva Industries, TX 09/18/86 1st - Final	GW and soil contaminated with VOCs including TCE, and organics including PAHs and PCBs	22,500 yd^3	Excavation and offsite disposal of contaminated soil and drums; capping; and GW pump and treatment using carbon adsorption with discharge to adjacent flood control channel	Soil will be excavated to PCBs 100 mg/kg. GW will be treated to below TCE 1 ug/l	$14,990,000 (capital) $532,000 (annual O&M) (years 1-2) $483,000 (annual O&M) (years 3-30)
6	Gurley Pit, AR 10/06/86 1st	Soil and sediment contaminated with organics including PCBs; pit sludge/ sediment contaminated with oily waste and metals	432,470 ft^3 (soil, sludge, sediment) 4,100,000 gals	Excavation and stabilization of sludge, soil, and sediment with placement in onsite RCRA landfill; removal of oil from water by oil/water separation with incineration of oil; treatment of pond water with discharge to bayou; and removal of pond water solids to be disposed with pit sludge	Remedy meets RCRA, CAA, NAAQ, and TSCA criteria for PCBs. Specific levels were not provided. Treated pond water discharges comply with NPDES permit requirements	$5,780,000 (capital) $21,000 (annual O&M)
6	Gurley Pit, AR Waste Disposal Facility 09/26/88 2nd - Final	GW contaminated with metals	Not applicable	No action remedy (long-term GW monitoring as part of a previous source control design)	Concentrations of metals including arsenic, iron, and manganese that exceeded MCLs were not attributable to site contaminants, thus GW cleanup goals are not applicable for this site	$0

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Hardage/Criner, OK 11/14/86 1st	Soil, GW and debris contaminated with VOCs including TCE and PCE, organics including PCBs, and inorganics	180,000 yd^3 10,000 - 20,000 (drums)	RCRA capping; installation of leachate collection system; excavation of sludge, drum mounds, and main pit; temporary capping of former source areas (interim measures); onsite or offsite physicochemical treatment of inorganic liquids with discharge to POTW; and treatment of solids by technology to be identified during design. GW remediation to be addressed in future O.U.	Soil and GW cleanup levels will be addressed in 2nd O.U.	$68,014,000 (capital) $2,282,000 (present worth O&M)
6	Highlands Acid Pit, TX 06/25/84 1st	GW, soil, and sludge contaminated with VOCs, organics, and metals	Not specified	Excavation and offsite disposal of waste material; backfilling and seeding; and fencing	Not specified	$2,407,000 (capital) $14,100 (annual O&M)
6	Highlands Acid Pit, TX 06/26/87 2nd - Final	Possible contamination of SW and GW with VOCs and metals	Not applicable	No further action with SW and GW monitoring	Contaminant concentration levels meet WQC and MCL requirements	$4,700 (capital) $11,120 (annual O&M) (year 1) $6,980 (annual O&M) (years 2-30)
6	Homestake Mining, NM Uranium Processing Mill 09/27/89 1st - Final	None	None	No action remedy. Tailing embankments not found to be significant source of offsite radon	Not applicable	$0 (present worth)

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6	Industrial Waste Control, AR Industrial Landfill 06/28/88 1st	Soil, sediment, and GW contaminated with VOCs including toluene, organics, and metals including arsenic, chromium, and lead	Area C: 200 drums (liquid wastes) 16,900 yd^3 (soil) Area D: 3,000 drums (liquid wastes) 2,600 yd^3 (soil)	Installation of a french drain with a synthetic liner; excavation of Area D liquid-filled drums with offsite disposal; excavation and onsite stabilization of Area C and D soil with onsite disposal of residual matrix in Area C; categorization and disposal of solids and liquid wastes resulting from previous investigations; GW pump for offsite treatment, mix with contaminated soil and stabilized onsite, or treatment in an onsite facility with discharge to be determined during design; multi-layer RCRA capping of area bound by french drain and northern site border; access and land use restrictions; and GW and site monitoring	MCLs for arsenic, cadmium, chromium, lead, and TCE are relevant and appropriate GW cleanup standards; however, the quantitative MCL goals were not specified. GW discharge and effluent limitations will be established by EPA and ADPCE. The stabilized matrix will pass RCRA TCLP and/or other EPA-approved leachate tests as well as the ASTM strength test	$11,400,000 (present worth)
6	Koppers Texarkana, TX Wood Preserving Facility 09/23/88 1st	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and xylenes, metals including arsenic, and organics including PAHs and PCP	3,300 - 19,400 yd^3 (soil) 45,000,000 gals (GW)	Excavation of soil exceeding 100 mg/kg cPAHs with backfilling using clean soil, grading, placement of a sod cover, and washing contaminated soil with disposal in an onsite gravel pit or offsite hazardous waste disposal facility; collection and treatment of NAPLs at an onsite wastewater treatment plant using oil/water separation followed by either an activated carbon or fluidized carbon bed system, and recycling or incineration offsite of NAPLs, with reinjection of treated GW into the aquifer with excess GW discharged to SW or to an offsite treatment plant; excavation and treatment of drainage ditch sediment in the soil washing unit; deed and access restrictions; and GW monitoring	The soil cleanup goal is cPAHs 100 mg/kg, corresponding to a $3x10^{-5}$ risk factor. GW levels of free phase creosote will be remediated to a level of non-detection, and NAPLs will be removed to the maximum extent practicable	$6,400,000 (present worth) $300,000 (annual O&M)

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6	Mid-South, AR 11/14/86 1st	Soil, sediment, SW, and GW contaminated with organics including PAHs, and inorganics	45,750 yd^3	Excavation of soil with consolidation and capping; consolidation and stabilization of oils, liquids, or sludge; RCRA capping; backfilling, grading and seeding (or gravel cover) of all excavated areas; fencing; institutional controls to include deed restrictions; and GW pump and treatment using carbon filtration with discharge to SW	Cleanup goals for all media are based on Public Health Evaluation levels or concentrations that exceed background levels. Specific soil goals based on the 10^{-5} health-based risk level include total PAHs 3.0 mg/kg, arsenic 5.6 mg/kg, and chromium 19.4 mg/kg	$3,500,000 (capital) $153,500 (annual O&M)
6	Motco, TX 03/15/85 1st	Soil and SW contaminated with organics including PCBs	Not specified	Offsite biological treatment of contaminated pit water; offsite TSCA incineration of organic liquids; and offsite RCRA disposal of sludge/ tars and soil	Not specified	$42,300,000 (capital) O&M (not specified)
6	Motco, TX Former Styrene Tar Recycling Operation and Former Industrial Chemical Waste Disposal Facility 09/27/89 2nd - Final	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including PAHs; and metals including arsenic, chromium, and lead	140,000 yd^3 (soil and sediment) 30,000,000 - 40,000,000 gals (GW in transmissive zone) 1,000,000 - 2,000,000 gals (dense, nonaqueous phase organic liquids)	GW pumping and onsite treatment using BAT; extraction and incineration of dense, nonaqueous phase organic liquids; installation of GW gradient control system; implementation of GW compliance monitoring of aquifers; excavation, consolidation, and onsite containment of contaminated surface and soil and sediment; and implementation of site access and deed restrictions	GW treatment is expected to meet Federal and State discharge standards; if discharge standards are not met, GW will be sent to a wastewater treatment plant. Cleanup goals for the upper aquifer are SDWA MCLs or a 10^{-6} cancer-risk level. Treatment of shallow GW will be to health-based numbers and include PAHs 0.0028 ug/l. Soil/sediment excavation will be determined by a 10^{-6} risk level	$8,810,000 (present worth) $453,000 (annual O&M)

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6	North Cavalcade Street, TX Wood Preserving Facility 06/28/88 1st - Final	Soil, sediment, and GW contaminated with PAHs, and VOCs including benzene, toluene, and xylenes	22,300 yd^3 (soil) 5,600,000 gals	In-situ biological treatment of soil (method will be selected after pilot testing); onsite GW pump and treatment using oil/water separation and carbon adsorption with reinjection and, if necessary, discharge into an onsite drainage ditch; and offsite incineration of all nonaqueous phase liquids (NAPLs) separated from the GW	Soil and GW cleanup levels will attain a cumulative 10^{-5} cancer-risk level. Individual soil goals include PAHs 1 mg/kg and benzene 0.04 mg/kg. Individual goals for GW include benzene 5 ug/l (MCL), toluene 2,000 ug/l, and xylenes 440 ug/l. Additionally, GW will be treated until all NAPLs are completely removed	$4,210,000 (present worth)
6	Odessa Chromium I, TX 09/08/86 1st	GW contaminated with metals including chromium	Not specified	Negotiating agreements with Odessa City to extend water supply; and construction of water distribution system	Not specified	$247,920 (capital) $14,350 (annual O&M)
6	Odessa Chromium I, TX Industrial Area 03/18/88 2nd - Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; demolition and disposal of building; and site monitoring	Treatment will eliminate chromium >0.05 mg/l or the MCL promulgated prior to design	$2,836,000 (present worth)
6	Odessa Chromium II, TX 09/08/86 1st	GW contaminated with metals including chromium	Not specified	Extension of municipal water service to affected areas	Not specified	$476,570 (capital) $51,375 (annual O&M)

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6	Odessa Chromium II, TX Industrial Area 03/18/88 2nd - Final	GW contaminated with metals including chromium	Not specified	GW pump and treatment using electrochemical methods with reinjection; and site monitoring	Treatment will eliminate chromium >0.05 mg/l or the MCL promulgated prior to design	$3,618,000 (present worth)
6	Old Inger, LA 09/25/84 1st - Final	GW and soil contaminated with VOCs, pesticides, and metals	Not specified	Onsite land treatment of heavily contaminated soil and sludge; onsite containment and capping of slightly contaminated soil; closing and sealing ungrouted onsite well; GW pump and treatment; and fluid treatment with offsite discharge	Not specified	$3,174,000 (capital) $10,000 (annual O&M)
6	Old Midland Products, AR Industrial Facility 03/24/88 1st - Final	Soil, sediment, sludge, and GW contaminated with organics including PCP and PNAs	9,000 - 21,000 yd^3 (soil) 850 yd^3 (sediment) 450,000 gals (GW) 620,000 gals (lagoon fluids)	Onsite incineration of contaminated surface soil, lagoon sludge and drainageway sediment with onsite disposal of residual ash; placement of a soil cover over ash and revegetation; and lagoon and GW collection and treatment using carbon adsorption	Soil with >1 mg/kg PCP will be excavated and incinerate din accordance with State standards. Soil will meet the 10^{-6} incremental cancer-risk level. Treated GW will attain two cleanup levels: PCP 0.2 mg/l (MCL) and the 10^{-5} increased cancer risk for PNAs 28 ng/l (WQC)	$12,000,000 (present worth)

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6	Pesses Chemical, TX Industrial Facility 12/22/88 1st - Final	Soil, sludge, and debris contaminated with metals including lead	16.6 yd^3 (sludge)	Consolidation of offsite contaminated soil with onsite wastes and surface soil followed by in-situ stabilization and installation of a concrete cap over the fenced portion of the site and a RCRA-clay cap placed in the south field; decontamination of warehouse with resultant solid wastes combined with soil remediation and wastes treated and discharged into sewer system; offsite disposal of drums and equipment not adequately cleaned; offsite disposal of water not meeting discharge requirements; and cleaning and sealing sumps	Soil will be treated to attain cadmium 15 mg/kg and nickel 100 mg/kg based on a 10^{-6} cancer-risk level	$1,200,000 (present worth) $7,000 (annual O&M)
6	Petro-Chemical Systems, TX 03/27/87 1st	Soil contaminated with VOCs, and organics including PAHs	4,000 yd^3	Excavation and temporary storage of soil in an onsite RCRA facility; construction of a road over excavated areas and existing roadway to provide access to site area; and temporary relocation of residents during excavation	Soil will be excavated to below PAHs 100.0 mg/kg or total volatiles 100.0 mg/kg	$1,232,785 (capital) $4,750 (annual O&M)
6	Sand Springs Petrochemical Complex, OK 09/29/87 1st	Soil, surface liquids, and sludge contaminated with VOCs, organics, and inorganics	130,000 yd^3 715,000 gals	Solidification/stabilization of sludge with containment in an onsite RCRA landfill; and excavation with offsite thermal destruction of remaining sludge. Second OU will address GW remediation	Chemical-specific cleanup levels not provided	$37,453,050 (capital) $15,000 (annual O&M)
6	Sand Springs, OK Industrial Facility 06/28/88 2nd - Final	Soil and GW minimally contaminated with VOCs including benzene and TCE, and metals including arsenic, cadmium, chromium, and lead	Not specified	No action with long-term GW and SW monitoring; and implementation of institutional controls, and site access restrictions	Nearby residential wells have not been affected and should not become affected based on the direction of GW flow, which is towards the river. In a worst case scenario, discharge from the site to the river would be 4.6 times less than NPDES regulatory standards	$9,300 (capital) $45,600 (annual O&M)

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6	Sheridan Disposal Services, TX Commercial Waste Disposal Facility 12/29/88 1st	Soil and sludge contaminated with VOCs including benzene and toluene; and other organics including PCBs	13,000 yd^3 (soil) 31,000 yd^3 (sludge) 300 yd^3 (floating oil and emulsion)	Excavation of all material with PCB concentrations >25 mg/kg including soil, sludge, floating oil, and emulsion in the pond and storage tanks. This will be followed by onsite biotreatment of contaminated soil, sludge, and oil with stabilization and onsite disposal of residues in the pond. If PCB concentrations in the residues are <50 mg/kg, they will be placed under a RCRA-compliant cap. Residues containing >50 mg/kg PCB will be placed in a RCRA-compliant landfill in the pond area; capping entire pond and dike area; decontamination and offsite disposal of tanks, drums, and debris; treatment to BAT of any contaminated wastewater and stormwater with discharge to the river; GW monitoring; and implementation of institutional and engineering controls	An action level for PCBs was established at 25 mg/kg based on a health-risk analysis and TSCA Spill Policy. Waste residues will be disposed of according to PCB levels	$27,956,000 (present worth) $863,000 (O&M)
6	Sheridan Disposal Services, TX Former Hazardous and Solid Waste Disposal Facility 09/27/89 2nd	GW contaminated with VOCs including benzene, PCE, and TCE; and metals including arsenic	Not specified	Natural attenuation with GW and SW monitoring; implementation of GW use restrictions; and implementation of corrective action plan if ACLs are exceeded in the future	EPA has set ACLs for GW contaminants in order to meet drinking water criteria in SW. Chemical-specific ACL concentrations include benzene 26 mg/l, TCE 26 mg/l, PCE 41 mg/l, and arsenic 260 mg/l	$0 (present worth) $194,000 (O&M)
6	Sikes Disposal Pits, TX 09/18/86 1st - Final	GW, soil, and SW contaminated with VOCs and organics	150,000 yd^3	Excavation and onsite incineration of sludge and soil with onsite disposal of residual ash; banning usage of onsite upper aquifer during natural attenuation; and SW treatment, as necessary, with discharge to river	Soil and sludge will be excavated to VOCs 10 mg/kg. The upper aquifer will be attenuated to 10^{-5} Human Health Criteria	$102,217,000 (capital) $41,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	Sol Lynn, TX Industrial Facility 03/25/88 1st	Soil contaminated with PCBs	2,400 yd^3	Excavation of soil with alkali metal polyethylene glycolate (APEG) treatment and backfilling	The soil will be treated to attain the TSCA level for PCBs 25 mg/kg	$2,200,000 (present worth)
6	Sol Lynn, TX Industrial Facility 09/23/88 2nd - Final	GW contaminated with VOCs including TCE	12,000,000 gals (GW)	GW pump and treatment using air stripping, and activated carbon before emission to the air, if necessary, with discharge to a sanitary sewer or reinjected into the aquifer; and GW monitoring	GW cleanup will meet the MCL for TCE of 5 ug/l	$2,200,000 (present worth)
6	South Cavalcade Street, TX Wood Preserving Facility 09/26/88 1st - Final	Soil, sediment, and GW contaminated with VOCs including benzene, toluene, and xylenes, metals including arsenic, chromium, and lead, and PAHs	30,000 yd^3 (soil) 50,000,000 gals (GW)	Excavation and onsite soil washing of 19,500 yd^3 of soil with replacement into excavated area, capping, and wash water treatment in GW treatment system; in-situ soil flushing of 10,500 yd^3 of soil; GW pump and treatment of 50,000,000 gals using physical/chemical separation, pressure filtration, and carbon adsorption with reinjection into the aquifer or, if necessary, discharge to the onsite drainage ditch which discharges to Hunting Bayou; offsite incineration or recycling of all nonaqueous phase liquids (NAPLs) separated out from the GW; GW monitoring; and deed restrictions	Soil cleanup will attain a cumulative 10^{-5} cancer-risk level. Individual soil cleanup goals include cPAHs 700 mg/kg and no leaching potential. GW cleanup will attain a cumulative 10^{-4} cancer-risk level for cPAHs. Other GW cleanup levels will attain Federal and State standards or background. Individual goals for GW include cPAHs 1 ng/l (no detection), benzene 5 ug/l (MCL), toluene 28 ug/l, xylenes 440 ug/l, and arsenic, chromium and lead 50 ug/l (MCLs)	$13,000,000 (present worth)
6	South Valley, NM 03/22/85 IRM	GW contaminated with organics	Not specified	Installation of a new water supply well	New water supply will meet the 10^{-6} cancer-risk level by attaining 1,1-dichloroethane 0.25 ug/l, trichloroethene 2.8 ug/l, and tetrachloroethene 0.9 ug/l	$775,000 (capital) $12,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	South Valley Edmunds Street Ground Water, NM Industrial Area 06/28/88 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with reinjection to the aquifer through infiltration galleries; and GW and air monitoring	GW will be treated to meet MCLs and New Mexico Water Quality Control Commission Regulations including PCE 20 ug/l (NMWQCC) and TCE 5 ug/l (MCL)	$874,800 (present worth) $280,200 (present worth O&M)
6	South Valley/ SJ-6, NM Industrial Area 09/30/88 3rd	Well sediment and GW contaminated with VOCs including PCE and TCE	100 ft (well sediment)	Cleaning (excavation of well sediment) and sealing abandoned wells; GW monitoring; and access restrictions	Remedy addresses prevention of contaminant dispersal, thus individual cleanup goals are not applicable. EPA actions involving source control and contaminant plume remediation on adjacent sites will reduce the low concentrations to below State health criteria within 5 years. Federal health criteria are already being attained	$4,000,000 (present worth) $300,000 (annual O&M)
6	South Valley/ (PL-83), NM Industrial Area 09/30/88 4th	Soil and GW contaminated with VOCs including PCE, organics and metals	36,000 yd^3 (soil)	Soil vapor extraction with carbon adsorption treatment of effluent air; GW pump and treatment using air stripping, carbon adsorption, and chemical/physical treatment (if necessary), with reinjection into the aquifer; further sampling and definition of soil and GW contamination; and GW monitoring	Soil will be treated until the vapor extraction system ceases to extract VOCs; GW cleanup will meet MCLs and State WQC. Individual contaminant goals were not specified	$1,820,000 (present worth of soil remediation) (figures for GW remedial action not provided)
6	South Valley, NM Industrial Facilities Area 03/30/89 5th - Final	No significant contamination was identified for this source control remedial action	Not applicable	No further action	Not applicable	$0 (present worth)

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6	Stewco, TX Industrial Facility 09/16/88 1st - Final	No threat	None	No further action	Not specified	$5,000 (capital -- for plugging 16 wells)
6	Tar Creek, OK 06/06/84 1st - Final	GW, SW, and sediment contaminated with acidic wastewater, metals, and organics	Not specified	Diversion and diking at two major inflow areas; and plugging of 66 wells	Not specified	$4,000,000 (capital) $5,000 (annual O&M)
6	Triangle Chemical, TX 06/11/85 1st - Final	Soil contaminated with VOCs	Not specified	Incineration and deep well injection of the tank and drum contents; mechanical aeration of contaminated soil; decontamination of all onsite structures; and offsite disposal of trash and debris	Soil will be aerated to background levels	$385,000 (capital) $500 (annual O&M)
6	United Creosoting Site, TX 09/30/86 1st	Soil contaminated with VOCs, organics including PCP and PAHs, and inorganics including creosote	84,000 yd^3	Demolition and purchasing of six homes with provision for permanent relocation of residents; onsite consolidation of surface soil with temporary capping; excavation and disposal of PAH contaminated soil at appropriate facility or treatment, if available; backfilling and covering; and natural GW attenuation	Excavation and disposal of all soil contaminated above PAH 100 mg/kg	Capital (undeveloped) $43,000 (interim closure period) (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
6	United Creosoting, TX 100-Acre Former Wood Preserving Facility 09/29/89 2nd - Final	Soil contaminated with organics including PAHs, PCPs, and dioxins	94,000 yd^3 (soil)	Excavation and treatment soil using critical fluid extraction and recycling or discharging wastewater generated during treatment process; incineration and disposal of liquid organic concentrate residues offsite; spreading treated soil on commercial portion of the site; backfilling residential areas with clean fill; and air monitoring	Contaminated soil will be excavated and treated if soil exceeds target action levels. Specific target action levels for carcinogens in the soil include PAHs 330 ug/kg for the residential area, and PAHs 40,000 ug/kg for the commercial area of the site. Target action levels for dioxins and furans are based on 2,3,7,8-TCDD 1 ug/kg for the residential area and 2,3,7,8-TCDD 20 ug/kg for the commercial area. Specific target action levels for noncarcinogens include PAHs 2,000 mg/kg and PCP 150 mg/kg	$22,000,000 (present worth) $19,750,000 (present worth O&M) (years 1-30)
6	United Nuclear Corporation, NM Waste Disposal/ Mining Facility 09/30/88 1st	GW contaminated with radiological and nonradiological constituents including arsenic, cadmium, cobalt, nickel, radium$^{226/228}$, selenium, and gross alpha	Not specified	Implementation of a GW monitoring program; GW pump and treatment using existing or new extraction wells to control and remove tailings seepage with discharge to an evaporation disposal system; and implementation of a performance monitoring and evaluation program	GW cleanup levels will attain MCLs or State Water Quality Act standards (or background levels where these are higher). Individual cleanup goals include arsenic 50 ug/l (MCL), cadmium 10 ug/l (MCL), cobalt 50 ug/l (NMWQA), nickel 200 ug/l (NMWQA), radium$^{226/228}$, 5 pCi/L (MCL), selenium 10 ug/l (MCL), and gross alpha 15 pCi/L (MCL)	$17,000,000 (present worth) $1,000,000 (annual O&M)
7	Aidex, IA 08/24/83 IRM	GW and soil contaminated with VOCs and pesticides	Not specified	Offsite disposal of bulk liquids and semi-solids by deep well injection; and onsite drainage control	Not specified	$3,580,175 (present worth) O&M (not provided)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Aidex, IA 09/30/84 2nd - Final	GW and soil contaminated with VOCs and pesticides	Not specified	Excavation and offsite disposal of buried wastes and contaminated soil; backfilling, grading, and seeding of the site; expansion of the monitoring well network and biannual GW testing; and vacuuming and washing interior surfaces, floors, and walls of the onsite building	Not specified	$3,455,175 (capital) $875,000 (annual O&M)
7	Arkansas City Dump, KS Industrial Facility/ 160-Acre Municipal Landfill 09/29/88 1st	Sludge contaminated with organics including PAHs, and sulfuric acid	1,300,000 ft^3 (sludge)	In-situ neutralization of the acid sludge waste, followed by construction of a soil cover over the waste area; institutional controls including deed restrictions; GW monitoring; and completion of feasibility study addressing the subsequent sediment and GW operable unit	Neutralization of acid sludge (pH <2.0) will eliminate the potential for sulfur dioxide emissions	$947,000 (present worth)
7	Arkansas City Dump, KS Former Oil Refinery 09/19/89 2nd - Final	None	Not applicable	No action remedy. EPA has determined that it lacks authority or jurisdiction to undertake cleanup of onsite petroleum wastes that are not being released in significant concentrations	Not applicable	$0 (present worth) $0 (O&M)
7	Big River Sand Company, KS Waste Disposal Area 06/28/88 1st - Final	Metals and VOCs present in soil and GW do not pose a significant health threat	Not specified	No action remedy	Metals in the soil and GW are not outside the range of metals found naturally occurring in soil and GW. Additionally, no MCLs are being exceeded in onsite or offsite drinking water wells	$5,800 (future cost if sampling conducted in 5 years)

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7	Chemplex, IA Manufacturing Facility 09/27/89 1st	GW contaminated with VOCs including benzene, toluene, xylenes, TCE, and PCE; and other organics including carcinogenic and noncarcinogenic PAHs	Not specified	GW pumping and pretreatment followed by treatment of pretreated GW at the existing onsite biological activated sludge wastewater treatment plant with discharge to SW; implementation of GW use and deed restrictions	GW cleanup goals were derived from Health Advisory Levels (HALs), Negligible Risk Levels (NRLs), Water Quality Criteria (WQC), and MCLs. Specific goals include benzene 1.0 ug/l (NRL), toluene 2,000 ug/l (HAL), PCE 10 ug/l (HAL), TCE 3.0 ug/l (NRL), and xylenes 10,000 ug/l (MCL)	$2,622,000 (present worth) $219,600 (annual O&M) (years 1-30)
7	Cherokee County/ Galena, KS Mining District 12/21/87 1st	GW contaminated with metals	Not specified	Provision of an alternate water supply to residences, businesses, and farms; and chlorination rehabilitation of two wells	The goal of this remedial action is to meet the primary MCLs. The water will need no treatment other than chlorination to achieve these levels	$5,300,000 (present worth) $100,000 (annual O&M)
7	Cherokee County, KS Mining District 09/18/89 2nd	GW and SW contaminated with metals including cadmium, chromium, lead, and zinc	Not specified	Removal, consolidation, and onsite placement of surface mine wastes in mine pits, shafts, and subsidences; diversion and channelization of surface streams with recontouring and vegetation of land surface; investigation of deep aquifer well quality followed by plugging all abandoned and inactive wells and rehabilitating active wells, if necessary; and implementation of institutional controls including deed restrictions	The selected remedy provides action levels for the removal and placement of mine wastes below ground. Chemical-specific action levels include lead, 1,000 mg/kg, zinc 10,000 mg/kg, and cadmium 25 mg/kg	$8,295,215 (present worth) $14,963 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Conservation Chemical, MO 09/30/87 1st - Final	Soil and GW contaminated with VOCs, organics, pesticides, metals, and inorganics	Not specified	Capping; GW pump and treatment; and decontaminated and destruction of onsite structures	Cleanup goals are based on 10^{-6} health-based risk level targets. MCL levels to be attained include arsenic 50.0 ug/l, cadmium 10.0 ug/l, total chromium 50.0 ug/l, lead 50.0 ug/l, TCE 5.0 ug/l, benzene 5.0 ug/l, vinyl chloride 2.0 ug/l, and chloroform 0.19 ug/l. AWQC cleanup levels to be met include nickel 13.9 ug/l and zinc 5,000 ug/l	$8,626,000 (capital) $12,774,111 (present worth O&M)
7	Deere, John Dubuque Works, IA Industrial Facility 09/29/88 1st - Final	GW contaminated with VOCs including benzene, PCE, toluene, and TCE	Not specified	Extraction and offsite discharge of GW; continue GW extraction and collection of NAPLs from well-3, with offsite disposal of NAPLs; provision of an alternate water supply; deed restrictions; and implementation of a contingency plan to contain migration if plant shuts down	Discharged GW will meet NPDES guidelines. GW treatment will meet MCLs and EPA Health Advisories, and withdraw the maximum amount of NAPLs. Individual cleanup goals were not specified	$5,151,800 (present worth) $276,600 (annual O&M)
7	Des Moines TCE, IA 07/21/86 1st	GW contaminated with VOCs including TCE, and organics	Not specified	GW pump and treatment with discharge to SW	Extraction and treatment will continue until maximum TCE concentration in monitoring wells is 5 ug/l or less, for 4 consecutive months	$1,196,000 (capital) $63,000 (annual O&M)
7	Doepke Disposal (Holliday), KS Industrial Waste Landfill 09/21/89 1st - Final	Soil and GW contaminated with VOCs including benzene, xylenes, and toluene; other organics including pesticides, PAHs, and PCBs; and metals including chromium and lead	96,000 gals (leachate)	Removal and offsite treatment of contaminated liquids currently ponded underground; construction of a multi-layered cap; collection and offsite treatment of GW seepage at POTW, as necessary; GW monitoring; and implementation of deed and access restrictions	No cleanup criteria were established for soil because soil will be capped. GW cleanup standards were established for four metals and five organic pesticides. Chemical-specific GW cleanup goals were not specified	$5,970,000 (present worth) $107,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Ellisville, MO 07/10/85 1st	Soil and SW contaminated with VOCs, organics, and pesticides	Not specified	Callahan Property: stabilization and erosion control; removal and disposal of plastic cover and cover's hold-down blocks; removal and salvaging of the barbed-wire and chain-link fences; and gravel removal	Not specified	$12,000 (capital) O&M (not specified)
				Rosalie Property: excavation and offsite disposal of contaminated soil, drums, cans, and other debris; and soil testing and analysis	Not specified	$52,000 (capital) O&M (not specified)
7	Ellisville, MO 09/29/86 2nd	Soil contaminated with VOCs, dioxins, and metals	Not specified	Excavation and onsite interim storage of dioxin contaminated soil; and excavation, transportation, and offsite land disposal of soil containing nondioxin waste	Not specified	$20,200,000 (present worth) O&M (not specified)
7	Findett, MO Chemical Plant 12/28/88 1st	Soil and GW contaminated with VOCs and other organics including PCBs	Not specified	Soil excavation with either offsite disposal or treatment; and GW pumping and treatment using air stripping with discharge to POTW	Not specified	$1,100,000 (capital)
7	Fulbright/Sac River Landfill, MO 98- and 114-Acre Municipal Landfills 09/30/88 1st - Final	Soil, sediment, GW, and SW contaminated with low levels of unspecified wastes	Not specified	Removal and offsite treatment or disposal of drum and drum remnants east of Fulbright Landfill; GW, SW, and leachate monitoring; and deed restriction	Not specified	$246,600 - $270,400 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
7	Hastings Ground Water/Colorado Avenue, NE Industrial Facility 09/28/88 1st	Soil contaminated with VOCs including TCE and PCE	42,700 yd^3 (soil)	In-situ soil vapor extraction with activated carbon treatment of extracted vapor, if necessary; and soil, GW and air monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$3,603,000 (present worth)
7	Hastings Ground Water/FAR-MAR-CO, NE Industrial Facility 09/30/88 2nd	Soil contaminated with carbon tetrachloride and ethylene dibromide	33,800 yd^3 (soil)	In-situ soil vapor extraction with treatment of extracted vapor using activated carbon, if necessary; access restrictions; and soil, air, and GW monitoring	Remedy addresses control of contaminant migration, thus individual cleanup goals are not applicable	$2,526,000 (present worth)
7	Hastings Ground Water Contamination, NE Multiple Source GW Contamination 09/26/89 1st	Soil contaminated with VOCs including carbon tetrachloride and chloroform	400 lbs (VOCs in soil)	Treating soil using in-situ soil vapor extraction to remove VOCs from soil; treating vapor emissions by a vapor phase granular activated carbon system; and replacement of carbon filters followed by offsite disposal at an approved regeneration or incineration facility	No cleanup levels were established because this interim source control action is not designed to restore aquifer to drinking water standards. Cleanup effectiveness will be based on the volume of volatile contaminants recovered from soil	$874,000 (capital) $154,000 (annual O&M)
7	Johns' Sludge Pond, KS Waste Oil Disposal Area 09/22/89 1st - Final	None	Not applicable	No further action will be taken at this site because previous interim remedial activities were adequate. Post-closure maintenance and monitoring will be provided in addition to implementation of land use controls	Not applicable	$0 (present worth) $0 (O&M)

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7	Kem-Pest Laboratories, MO Pesticide Manufacturing Facility 09/29/89 1st	Soil and sediment contaminated with VOCs including xylenes; other organics including organochlorine and pesticides; and metals including arsenic	4,050 yd^3 (soil and sediment)	Excavation of soil and sediment with offsite disposal in a RCRA-approved landfill; sampling to verify extent of excavation is sufficient to meet cleanup goals; and backfilling and revegetating excavated area with clean soil	Soil and sediment will be excavated to a level consistent with a 10^{-5} excess cancer risk	$2,600,000 (present worth)
7	Midwest Manufacturing/ North Farm, IA Waste Disposal Facility 09/30/88 1st	Soil contaminated with metals including cadmium and cyanide	200 yd^3 (soil)	Excavation of contaminated soil with either onsite or offsite stabilization, followed by offsite disposal; and backfilling and grading of the excavated area to support a vegetative cover	Soil cleanup will attain the health-based action level for cadmium of 13 mg/kg. Soil will be stabilized to the extent that the leachate contaminant concentration, as measured by the TCLP, meets the Land Disposal Regulations standards for F006 nonwastewaters. These standards are cadmium 0.006 mg/l, total chromium 5.2 mg/l, lead 0.51 mg/l, nickel 0.32 mg/l, silver 0.072 mg/l	$140,000 - $170,000 (present worth)
7	Minker Stout/ Romaine Creek, MO 09/28/87 2nd	Soil and sediment contaminated with pesticides including TCDD	4,400 yd^3	Excavation and temporary storage of soil and sediment in an onsite RCRA facility; and backfilling of excavated areas with clean soil	Soil and sediment will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 ft or once bedrock is reached	$4,488,000 (present worth) $28,000 (annual O&M)
7	Minker Stout/Stout, MO 09/28/87 3rd	Soil contaminated with pesticides including TCDD	3,500 - 5,700 yd^3	Excavation and temporary storage of soil in an onsite RCRA facility; backfilling of excavated areas with clean soil; and institutional controls, and site access restrictions	Soil will be excavated to below TCDD 1.0 mg/kg. Excavation will not continue beyond a depth of 4 ft or once bedrock is reached	$5,817,000 - $7,018,000 (present worth) $6,000 (annual O&M)

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7	Minker Stout/ Romaine Creek, MO Residential Area 09/29/88 2nd	Soil contaminated with dioxin	12,000 yd^3 (soil)	Excavation and offsite thermal treatment at Time Beach facility of soil exceeding 20 ug/kg dioxin including soil in temporary storage, with offsite residual disposal also at Times Beach; and capping of areas contaminated with dioxin not exceeding 20 ug/kg	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5-10 ug/kg dioxin at a depth of 1 ft or greater	$48,800,000 (capital) (includes costs from Times Beach site)
7	Shenandoah Stables, MO 09/28/88 1st	Soil and structures contaminated with dioxins	3,300 yd^3 (soil)	Excavation of dioxin-contaminated soil with backfilling of excavated areas, placement of waste material in polypropylene bags, and storage of bags in a RCRA-equivalent onsite structure; and decontamination of onsite structures	Soil cleanup will remove surface soil exceeding a dioxin concentration of 1 ug/kg until a residual concentration of 5-10 ug/kg is reached or to a maximum depth of 4 ft based on health-based action levels provided by ATSDR	$3,936,500 (present worth)
7	Solid State Circuits, MO Manufacturing Facility 09/27/89 1st - Final	GW contaminated with VOCs including TCE	57,790,000 gals (GW)	GW pumping and treatment using air stripping with offsite discharge to a POTW; and GW and air monitoring	GW exceeding TCE 5 ug/l will be remediated at a POTW. GW with TCE levels above 200 ug/l will be treated onsite before discharge to the POTW. Discharge from the POTW must meet the average monthly State NPDES limits of TCE 2 ug/l. GW cleanup goals will meet a 10^{-6} cancer risk and an HI ratio <1	$4,629,000 (present worth) $445,300 (annual O&M)
7	Syntex Verona, MO Chemical Facility 05/05/88 1st	Soil contaminated with dioxin	860 yd^3 (soil)	Excavation and offsite thermal treatment of all dioxin-contaminated soil exceeding 20 ug/kg, followed by offsite disposal of residual ash; dismantling and decontamination of contaminated equipment with a series of solvents and aqueous rinses; installation of a clay cap and vegetative cover over the Trench Area; and maintenance of vegetative cover over surface soil containing more than 1 ug/kg dioxin	Soil cleanup will attain the site-specific action level of 20 ug/kg	$5,617,000 (present worth)

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7	Times Beach, MO (Interim Storage Facility) 01/13/84 1st	Soil contaminated with dioxin	Not specified	Transportation of highly contaminated soil from other sites for storage in an onsite interim storage facility (to be constructed); and restoration of other sites by excavation and temporary relocation of affected residents	Not specified	$15,734,000 (capital) O&M (not specified)
7	Times Beach, MO Residential Area 09/29/88 2nd	Soil contaminated with dioxin	13,600 yd^3 (soil) 105,000 yd^3 (debris)	Demolition and onsite disposal of all structures; excavation and thermal treatment of dioxin-contaminated soil exceeding 20 ug/kg with onsite residual disposal; capping of areas contaminated with dioxin not exceeding 20 ug/kg; and construction of a ring levee for flood protection of temporary thermal treatment unit	Soil cleanup levels will attain 1 ug/kg dioxin at the surface and 5-10 ug/kg dioxin at a depth of 1 ft or greater	$48,800,000 (capital) (includes costs from Minker Stout/Romaine Creek site)
7	Todtz, Lawrence Farm, IA 2.7-Acre Landfill 11/04/88 1st - Final	GW contaminated with VOCs including benzene, toluene, carbon disulfide, and tetrahydrofuran; and metals including arsenic, lead, and chromium	Not specified	Installation of soil cover over impoundment; provision of an alternate water supply to affected residences; GW monitoring; and implementation of institutional controls and land use restrictions	Not applicable unless chemical-specific action levels (based on MCLs) are exceeded in GW monitoring wells	$1,030,000 - $2,500,000 (present worth) $510,000 (present worth O&M)
7	Vogel Paint & Wax, IA 2-Acre Disposal Area 09/20/89 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene, and xylenes; and metals including chromium and lead	3,000 yd^3 (soil)	Excavation and onsite bioremediation of contaminated soil or onsite thermal treatment if metal content is high; stabilization and onsite disposal of treated soil; offsite incineration, recycling of leachate and offsite treatment of excess leachate at POTW; GW pumping and treatment using air stripping with discharge of treated GW to SW; and GW and air monitoring	Soil treatment will achieve leaching standards and GW will be treated to health-based levels. GW cleanup goals are based on SDWA MCLs/MCLGs or on State action levels. Specific GW cleanup goals include benzene 0.001 mg/l (State), toluene 2.0 mg/l (MCLG), xylenes 10.0 mg/l (MCLG), chromium 0.10 mg/l (MCL), and lead 0.005 mg/l (MCLG)	$1,851,000 (present worth) $54,600 (annual O&M)

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8	Anaconda Smelter, MT Smelter Facility/ 160-Acre Mill Creek Community 10/02/87 1st	Air contaminated with metals including arsenic, cadmium, and lead	Not specified	Relocation of all remaining residents (eight homes) with temporary erosional stabilization using a vegetative soil cover; demolition, consolidation, and temporary onsite storage of debris; implementation of institutional controls including deed and access restrictions; and site maintenance	Risk-based performance goals for arsenic and cadmium appear technically unattainable and were less than background levels. Consequently, background levels for arsenic 0.01 ug/m^3 and cadmium 0.01 ug/m^3 will be met. The NAAQS for lead 1.5 ug/m^3 also will be met	$300,000 (present worth)
8	Broderick Wood Products, CO Wood Preserving Facility 06/30/88 1st	Soil, sludge, oil, and wastewater contaminated with VOCs including benzene, organics including PAHs, PCPs, and dioxins, and metals including arsenic and lead	31,000 yd^3 (soil) 3,000 gals (oil) 3,600 yd^3 (sludge) 560,000 gals (wastewater)	Implementation of site access restrictions; excavation and onsite incineration of sludge and oil with offsite disposal of ash residues; excavation of visibly contaminated soil with either onsite incineration (<2,500 yd^3) or onsite storage (>2,500 yd^3); wastewater filtering and treatment using carbon adsorption with onsite discharge or use in the incineration process; and GW monitoring	Disposal of residue ash will meet BDAT treatment standards which include naphthalene 7.98 mg/kg, phenanthrene 7.98 mg/kg, pyrene 7.28 mg/kg, toluene 0.143 mg/kg, and xylenes 0.162 mg/kg. Wastewater contaminants will be treated to nondetectable levels to comply with State standards. If these levels cannot be met, State standards will be waived and contaminants will be treated to MCLs	$2,264,000 - $3,603,200 (present worth)
8	Burlington Northern (Somers Plant), MT Former Railroad Tie Treating Facility 09/27/89 1st - Final	Soil, sediment, and GW contaminated with organics including PAHs and phenolss, and metals including zinc	11,700 yd^3 (soil and sediment)	Excavation of soil and sediment with onsite biological treatment; restoration of wetlands; installation and operation of hot water flushing system and a water treatment system using ozone UV or peroxide/UV in lagoon and swamp pond areas to treat GW, with in-situ biological treatment to treat residual contaminants; reinjection or discharge to GW to POTW; GW monitoring; and implementation of GW use restrictions	Soil will be treated until the decrease in total PAHs has been <20% per year or background levels have been reached. Soil treatment goal is a risk level of 10^{-6}. GW cleanup goals include cPAHs 0.030 ug/l (WQC), total PAHs 0.030 ug/l (10^{-5} risk-based level), phenols 2,500 ug/l (WQC), benzene 5 ug/l (MCL), and zinc 110 ug/l (WQC)	$11,000,000 (present worth) $661,000 (O&M) (years 1-2) $811,000 (O&M) (years 3-10) $72,000 (O&M) (years 11-30)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	California Gulch, CO Mining District 03/29/88 1st - Final	SW, sediment, and GW contaminated with metals including cadmium, copper, lead, and zinc	210 tons (waste discharged per year)	Construction of surge ponds at Yak Tunnel Portal; construction of concrete plugs at three tunnel locations; sealing of shafts and drill holes; diversion of surface water away from tunnel recharge areas and grouting of highly fractured rock; implementation of a monitoring network to detect leakage, seeps, or GW migration; and installation of pump and interim treatment should surface seepage occur	This operable unit invokes an interim remedy waiver	$11,982,770 (capital) $460,307 (annual O&M)
8	Central City/Clear Creek, CO 09/30/87 1st	Possible contamination of sediment, and downstream SW and GW with inorganics	Not specified	Passive/active treatment system for acid mine drainage discharge	Interim remedy. ARARs will be determined in future O.U.	$1,663,000 (capital) $511,000 (annual O&M)
8	Central City/Clear Creek, CO Mining District 03/31/88 2nd	Soil and SW contaminated with metals	Not specified	Slope stabilization at Big Five Tunnel and Gregory Incline; and run-on controls at all five tailings and waste rock piles	Final ARAR determinations will be addressed in the final operable unit	$1,049,600 (present worth) $20,992 (annual O&M)
8	Denver Radium I (12th & Quivas), CO 09/29/87 4th	Soil contaminated with radium and its decay products	11,000 yd^3	Placement of cap over open 7,600 yd^3 of soil contamination; excavation of contaminated soil under several structures with temporary onsite storage (3,400 yd^3); maintenance of cap and storage area until a facility for permanent disposal becomes available; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20 uR/hr	$3,702,800 (present worth) $290,000 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Denver Radium II (11th & Umatilla), CO 09/29/87 5th	Soil and debris contaminated with radium and its decay products	15,400 yd^3	Excavation of contaminated soil with temporary onsite storage; decontamination of 11 ft^2 of roof and placement in onsite storage facility; maintenance of existing cap and onsite land storage facility until a facility for permanent disposal becomes available (15,400 yd^3); and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20 uR/hr	$4,230,300 (present worth) $194,700 (present worth O&M)
8	Denver Radium III (1,000 West Louisiana), CO 09/30/87 6th	Soil and debris contaminated with radium and its decay products	Not specified	Onsite temporary containment of contaminated material followed by offsite permanent disposal when available; cleanup of the Creative Illumination property; and dismantling of temporary storage facility with offsite disposal; and final offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged more than 5 pCi/g, over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20 uR/hr	$2,172,800 (capital) $305,800 (present worth O&M)
8	Denver Radium/ Card Property, CO 06/30/87 3rd	Soil, sediment, and debris contaminated with radium and its decay products	4,000 yd^3	Excavation of 4,000 yd^3 soil and sediment with temporary onsite storage and final offsite disposal; and decontamination and dismantling of buildings with offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20 uR/hr	$1,148,000 (present worth) $89,500 (present worth O&M)
8	Denver Radium/ Open Space Property, CO 09/29/87 7th	Soil contaminated with radium and its decay products	1,310 yd^3	Onsite temporary containment of 290 yd^3 material followed by offsite permanent disposal; removal of 1,020 yd^3 of material with placement in containers followed by offsite disposal when available; and dismantling of temporary storage facility with offsite disposal	Radium-226 in land averaged over 100 m^2 will not exceed background level by more than 5 pCi/g, averaged over the first 15 cm of soil and 15 pCi/g over 15 cm thick layers of soil. Gamma radiation in buildings not to exceed background level by 20 uR/hr	$955,400 (present worth)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Denver Radium/ ROBCO, CO 09/30/86 2nd	Soil and buildings contaminated with radium	7,000 yd^3 (soil) 200 yd^3 (demolished buildings)	Excavation and offsite disposal of contaminated soil and debris; or excavation, stabilization and temporary onsite consolidation of contaminated soil	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$1,912,400 (capital) $6,000 (annual O&M)
8	Denver Radium Site Streets, CO 03/24/86 1st	Asphalt contaminated with radium	38,500 yd^3	Temporary leaving of contaminated material in place; institutional controls; and routine maintenance	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	$30,000 (capital) Annual O&M (variable)
8	Libby Ground Water, MT 09/26/86 1st	Soil and GW contaminated with organics including creosote, and inorganics	Not specified	Alternate water supply; and controls prohibiting well usage	Not specified	PRP responsibility

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Libby Ground Water Contamination, MT Well Field 12/30/88 2nd	Soil, sediment, and GW contaminated with VOCs including benzene; other organics including dioxin, PAHs, and PCPs; metals including arsenic; and oil	30,000 yd^3 (soil)	Remedial actions are based on three operable units: Soil/source area: excavation and consolidation of unsaturated soil and debris in the waste disposal pit, followed by onsite treatment using a two-step enhanced biodegradation process and final disposition; cleaning saturated soil beneath the waste disposal pit using a closed-loop, water/oil recovery and treatment system; removal of oil and contaminated GW using extraction wells; reinjection of water following treatment in a fixed-bed bioreactor, filling and capping of waste pit, butt dip, and tank farm areas Upper aquifer: in-situ GW bioremediation Lower aquifer: implementation of pilot tests using biorestoration, and oil recovery and dispersion techniques. All three operable units will be subject to institutional controls including deed, land use, and GW restrictions; and GW monitoring	Treatment of soil and debris will attain total cPAHs 88 mg/kg based on 10^{-5} risk level (chemical-specific goals were provided for many PAHs based on BDAT concentrations), PCP 37.0 mg/kg (BDAT), and combined dioxins and dibenzofurans 0.001 mg/kg. Saturated zone and upper aquifer GW treatment will attain total cPAHs 400 ng/l total noncarcinogenic PAHs 40 ng/l; PCP 1.05 mg/l, benzene 5 ug/l (MCL), and arsenic 50 ug/l (MCL). Other organics/ inorganics are not to exceed a 10^{-5} risk level	$5,777,000 (present worth) $670,200 (annual O&M) (year 2) $521,200 (annual O&M) (years 3-5) $232,200 (annual O&M) (years 6-8) $80,000 (annual O&M) (years 9-30)
8	Marshall Landfill, CO 09/26/86 1st - Final	GW and SW contaminated with VOCs including TCE and PCE, organics, and metals	Not specified	Installation of a subsurface collection system; GW treatment using sedimentation, air stripping, and off-gas carbon adsorption; regrading and revegetating; and fencing	Contaminated water will be treated to achieve removal of benzene 0 mg/1, TCE 0 mg/1, cadmium 0.6 mg/l, and lead 4 mg/l	$1,819,000 (capital) $152,000 (annual O&M)
8	Milltown, MT 04/14/84 1st	GW and soil contaminated with metals including arsenic	Not specified	Construction of a new well and distribution system; and flushing and testing residential plumbing systems	GW will be treated to EPA drinking water standards for arsenic 0.050 mg/l	$262,714 (capital) $4,238 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Milltown, MT 08/07/85 2nd	GW and soil contaminated with metals including arsenic	Not specified	Replacement of household water supply appurtenances; and ongoing testing of residential plumbing systems	Not specified	Not specified
8	Monticello Vicinity Properties, UT Uranium Millsite 09/29/89 1st - Final	Soil, construction materials, and debris contaminated with thorium^{230}, radium^{226}, and radon^{222} contained in the vanadium and uranium mill tailings	100,000 yd^3 (soil and construction materials)	Excavation and removal of residual radioactive material from affected properties and restoration/reconstruction using clean materials, or modification of existing structures to isolate radiation sources; filling and regrading excavated areas; and disposal and temporary storage of contaminated material at the Monticello Millsite	Cleanup goals are based on the Uranium Mill Tailings Radiation Control Act of 1978. Individual goals include radium^{226} in land averaged over 100 m^2 shall not exceed 2 pCi/g (background level) by 5 pCi/g averaged over the first 15 cm of soil or 15 pCi/g averaged over 15 cm thick layers of more than 15 cm below the surface. Additionally, habitable buildings $\leq$0.02 WL for annual average radon decay and gamma radiation 20 uR/hr	$5,915,000 (average cost) Corresponds to $65,000 per property multiplied by 91 properties
8	North Dakota Arsenic Trioxide, ND 09/26/86 1st - Final	GW contaminated with metals including arsenic	Not specified	Expansion and hookup of homes to GW treatment and distribution system; and evaluation of possible institutional controls	Water supplied for domestic and agricultural purposes will attain the MCL for arsenic 25 ug/l	$2,212,600 (capital) $57,400 (annual O&M)
8	Rocky Mountain Arsenal, CO 06/04/87 1st	GW contaminated with VOCs including TCE, and inorganics	Not specified	Construction of granular activated carbon (GAC) water treatment system and regeneration of spent carbon at another location; modification of GAC system, if necessary, to include air stripping facility to treat vinyl chloride; replacement of existing well pumps and motors; installation of transmission piping; and construction of laboratory and office space	Treatment will attain the MCLs which include 1,1-dichloroethylene 0.007 mg/l, TCE 0.005 mg/l, PCE 0.005 mg/l, TCA 0.200 mg/l, trans-1,2-dichloroethylene 0.005 mg/l, and vinyl chloride 0.001 mg/l	$8,869,000 or $10,100,000 (with air stripping) (capital) $372,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Sand Creek Industrial, CO Former Pesticide Manufacturing Operation 09/29/89 1st	Soil, onsite buildings, and tanks contaminated with VOCs including TCE and PCE; and other organics including pesticides	1,000 yd^3 (soil)	In-situ vacuum extraction to remove VOCs from contaminated soil and onsite treatment of off-gas by air stripping; excavation and offsite incineration of soil contaminated with >1,000 mg/kg VOCs, with offsite residual disposal in a RCRA landfill; backfilling; demolition and offsite disposal of buildings; and GW monitoring	Soil target levels were calculated using a soil-water leaching model that assumed GW concentration corresponding to SDWA MCLs or a 10^{-6} cancer-risk level. Chemical-specific cleanup levels were provided for PCE 1,095 ug/kg (MCLs) and TCE 285 ug/kg (MCLs)	$5,349,600 (present worth) O&M (not specified)
8	Smuggler Mountain, CO 09/26/86 1st	GW and soil contaminated with metals including cadmium and lead	410,000 yd^3	Excavation and permanent onsite RCRA disposal of soil; soil capping; and alternate water supply	Excavation and onsite isolation of soil with lead greater than 5,000 mg/kg. Soil between 1,000-5,000 mg/kg will be covered with 6-12 inches of topsoil. GW will be monitored to comply with SDWA Standards	$1,816,550 (capital) $30,900 (annual O&M)
8	Union Pacific Railroad, WY 09/26/86 1st	GW and soil contaminated with organics including PCBs and creosote, and inorganics	Greater than 700,000 yd^3	Rechanneling of river; GW pump and treatment with carbon adsorption with discharge to river; and slurry wall barrier construction	Not specified	$7,000,000 (capital) $57,000 (annual O&M)
8	Woodbury Chemical, CO 07/19/85 1st	GW, soil, and sediment contaminated with pesticides, metals, and organics	Not specified	Excavation, offsite transportation, and incineration of highly contaminated rubble and soil with disposal of residual ash; and backfilling with clean soil, regrading, and revegetation	Contaminated soil will be treated to 3 mg/kg and contaminated rubble to total pesticides 100 mg/kg	$2,450,000 (capital) $21,000 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
8	Woodbury Chemical, CO Waste Disposal Area 09/29/89 2nd - Final	Soil contaminated with VOCs including PCE and TCE; other organics including pesticides; and metals including arsenic	12,370 yd^3 (soil)	Excavation and offsite incineration of highly contaminated soil followed by offsite disposal; excavation and offsite disposal of less contaminated soil at a RCRA-permitted landfill; and backfilling and revegetation of the excavated area	Soil cleanup will attain an excess lifetime cancer risk of 10^{-6}. Specific cleanup goals are based on ARARs and background levels and include arsenic 5-10 mg/kg, TCE 0.52 mg/kg, and PCE 1.9 mg/kg	$6,962,600 (present worth) $31,400 (O&M)
9	Atlas Asbestos Mine, CA Asbestos Handling and Shipment Area 07/19/89 1st	Soil and debris contaminated with metals including nickel; and other inorganics including asbestos and mining wastes	14,500 yd^3 (soil)	Excavating and consolidating asbestos- and nickel-contaminated soil and debris; constructing onsite underground waste management unit (WMU) and disposing of contaminated soil in WMU; capping WMU area; regrading excavated area; decontaminating debris; monitoring soil moisture content, GW, air, and personnel; and implementing institutional controls	All contaminated soil and mining wastes will be cleaned up to at or below one area percent asbestos using polarized light microscopy and at or below background levels for nickel	$1,500,000 - $2,500,000 (present worth) $35,000 (annual O&M)
9	Beckman Instruments (Porterville), CA 12-Acre Manufacturing Facility 09/26/89 1st - Final	Soil and GW contaminated with VOCs including TCE and metals including lead	740 yd^3 (soil)	Excavation and offsite disposal of lead-contaminated soil; continued operation of the GW pumping and treatment system for the upper aquifer; pumping and treatment of GW from upper aquitard and lower aquifer using air stripping; offsite discharge of all treated GW into infiltration basins or irrigation canals; and GW monitoring	Soil contaminated with lead above 200 mg/kg will be excavated and disposed of offsite. GW cleanup goals will attain State or Federal MCLs or State action levels. Chemical-specific GW cleanup goals include TCE 5 ug/l	$4,740,000 (present worth) O&M (not specified)
9	Celtor Chemical Works, CA 10/04/83 IRM	GW, SW, and soil contaminated with metals and mining waste	Not specified	Offsite transportation and disposal of tailing piles and contaminated soil; and conduct of RI/FS	Not specified	$340,000 (capital) O&M (not specified)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Celtor Chemical, CA 09/30/85 2nd - Final	SW and soil contaminated with metals including cadmium and arsenic	Not specified	Excavation and RCRA offsite disposal of contaminated soil	Action levels for soil will be based on National Water Quality Criteria. SW and GW will be based on MCLs or DWRs. River criteria will be based on standards for the protection of aquatic life	$3,065,338 (capital) $7,000 (annual O&M)
9	Coalinga Asbestos Mine, CA Asbestos Handling and Shipment Area 07/19/89 1st	Soil and debris contaminated with metals including nickel; and other inorganics including asbestos and mining wastes	14,500 yd^3 (soil)	Excavating and consolidating asbestos- and nickel-contaminated soil and debris; constructing onsite underground waste management unit (WMU) and disposing of contaminated soil in WMU; capping WMU area; regrading excavated area; decontaminating debris; monitoring soil moisture content, GW, air, and personnel; and implementing institutional controls	All contaminated soil and mining wastes will be cleaned up to at or below one area percent asbestos using polarized light microscopy	$1,500,000 - $2,500,000 (present worth) $35,000 (annual O&M)
9	Coast Wood Preserving, CA 09/29/89 1st - Final	Soil and GW contaminated with metals including arsenic and chromium	Not specified	Paving exposed soil; onsite treatment of soil after site closure using best available technology at the time; plume control and aquifer remediation via GW pumping and reuse in CWP's operations to the extent possible or electrochemical treatment of excess GW which cannot be recycled, followed by discharge to the Ukiah sewage treatment plant and/or reinjection, GW monitoring; and development of a contingency plan for offsite GW remediation	Post-closure remedial measures for soil include onsite treatment of contamianted soil to a depth of 1.5 ft for areas containing greater than 100 mg/kg of total chromium and 15 mg/kg (background level) of arsenic. In high contamination areas the depth of excavation is expected to be 5 ft. GW will be treated to remove metal contamination in compliance with State and Federal cleanup standards incluidng arsenic 50 ug/l (MCL) and chromium 50 ug/l (MCL)	$1,000,000 (total cost) $19,500 (O&M for GW remedy)
9	Del Norte, CA 09/30/85 1st - Final	GW and soil contaminated with VOCs, pesticides, and metals including chromium	700 yd^3	Excavation and removal of soil; GW treatment with discharge to POTW; and disposal of chromium-rich waste brine to RCRA facility	Cleanup levels will meet the 10^{-6} cancer-risk level and MCLs under SDWA	$1,240,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Fairchild Semiconductor (Mt. View), CA Industrial Facilities Area 06/09/89 - 06/30/89 1st and 2nd - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenolss	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited excavation and aeration of soil outside the slurry walls with onsite disposal of residues; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	$49,000,000 - $56,000,000 (present worth, which includes O&M cost)
9	Fairchild Semiconductor (S. San Jose), CA Manufacturing Facility 03/20/89 1st - Final	Soil and GW contaminated with VOCs including PCE, TCA, DCE, and xylenes	Not specified	Onsite soil vapor extraction; on-site and offsite pumping and treatment of shallow GW using air stripping followed by discharge to SW; deep GW pumping followed by discharge of untreated GW to SW via storm drains; conducting biodegradation studies of onsite chemicals; implementing institutional controls including deed restriction and land and GW use restrictions; and GW monitoring	The soil cleanup goal is 1 mg/kg for VOCs. Individual cleanup goals for onsite GW include DCE 6 ug/l; TCA 200 ug/l, and xylenes 620 ug/l (based on DHS drinking water action levels), and PCE 2 ug/l (proposed State MCL). Offsite GW will attain an HI of 0.25	$9,393,100 (present worth) $7,231,700 (total O&M)
9	Firestone Tire (Salinas Plant), CA 256-Acre Tire Manufacturing Plant 09/13/89 1st - Final	GW contaminated with VOCs including TCE, PCE, benzene, toluene, xylenes, 1-DCA, 1,1-DCE, and 1,1,1-TCA	Not specified	GW pumping and treatment at the existing treatment facility using carbon adsorption and air stripping, with offsite discharge of treated GW to SW; GW monitoring to ensure that the GW plume is declining; crop testing to ensure that there is no plant uptake of the contaminants; and developing a contingency plan for water in the deep aquifer in case of contamination	GW cleanup goals will be based on chemical-specific ARARs, a cumulative HI=1 for noncarcinogenic risk of 10^{-6} depending on which is more stringent. Chemical-specific goals include benzene 0.7 ug/l (State), TCE 3.2 ug/l (10^{-6} risk level), PCE 0.7 ug/l (10^{-6} risk level), toluene 20 ug/l (HI=1), xylenes 70 ug/l (HI=1), 1,1-DCA 5.0 ug/l (State), and 1,1-DCE 6.0 ug/l (HI=1)	$1,742,000 (present worth) $1,517,000 (O&M) (years 1-3.5)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	IBM (San Jose Plant), CA Industrial Facility 12/15/88 1st - Final	Soil and GW contaminated with VOCs including TCA, toluene, and xylenes; and other organics	Not specified	Onsite soil vapor extraction; GW pumping and treatment using air stripping with onsite discharge to the aquifer and offsite discharge to SW, if necessary	Soil remediation will attain a 1 mg/kg level for all contaminants of concern. GW remediation goals are based on State action levels, EPA reference doses and lifetime health advisories and include TCA 200 ug/l (State), toluene 100 ug/l (State), and xylenes 200 ug/l (State) in the upper zone, and an HI of 0.25 with TCA 50 ug/l in the deeper aquifer zones	Not specified
9	Indian Bend Wash, AZ Industrial/ Residential Areas 09/21/88 1st	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using air stripping (packed column aeration) with air emission controls, followed by distribution of the treated water to the municipal water system	GW cleanup will attain MCLs and State action levels. Individual goals include TCE 5 ug/l (MCL), TCA 200 ug/l (MCL), DCE 7 ug/l (MCL), and PCE 0.67 ug/l	$8,728,000 (present worth) $520,000 (annual O&M)
9	Intel (Mountain View Plant), CA Industrial Facilities Area 06/09/89 1st - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenolss	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited soil excavation and aeration outside the slurry walls with onsite disposal of residues; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	$49,000,000 - $56,000,000 (present worth)

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9	Iron Mountain, CA 10/03/86 1st	SW runoff from mountain contaminated with acid mine drainage consisting of sulfuric acid and metals; fish and sediment are also affected	2.5 acres (to be capped)	Capping of selected cracked and caved enlargement	Cleanup program will be designed for Protection of Aquatic Life for the "worst case" condition of 1978	$68,100,000 (fund-balanced cost) (capital) $4,100,000 (present worth O&M)
9	Jibboom Junkyard, CA 05/09/85 1st - Final	Soil contaminated with VOCs, metals including lead, zinc, and copper, and organics including PCBs	Not specified	Excavation and offsite disposal of contaminated soil	Soil containing lead above 500 mg/kg will be excavated	$1,460,000 (capital) O&M (not specified)
9	Koppers (Oroville Plant), CA Wood Treating Facility 09/13/89 1st - Final	Soil and GW contaminated with VOCs including toluene, xylenes, and benzene; other organics including PAHs, PCP, and dioxins/furans; and metals including arsenic and chromium	334,000 yd^3 (soil) 22,000,000 yd^3 (GW)	Remediation of four discrete soil areas includes in-situ biodegradation; excavation, soil washing, with onsite disposal of treated soil and treatment of residual contamination in the washing fluid of onsite treatment facility; installation of a low permeability cap accompanied by downgradient extraction wells; and excavation and chemical fixation of metal-contaminated soil followed by onsite disposal. GW remediation includes pumping and treatment using activated carbon with reinjection to GW; and formalization and expansion of existing alternate water supply	Soil cleanup goals include PCP 17 mg/kg, dioxins/furans 0.03 ug/kg, background for arsenic and chromium, and cPAHs 0.19 mg/kg. These levels will achieve 10^{-6} excess cancer-risk targets. GW objectives are the more stringent of 10^{-6} excess cancer risk or State action levels and include PCP 2.2 ug/l, cPAHs 0.007 ug/l, dioxins $5.3x10^{-7}$ ug/l or the lowest detection limit, and background for arsenic and chromium	$77,700,000 (present worth) $37,100,000 (present worth O&M)
9	Litchfield Airport, AZ 09/29/87 1st	GW contaminated with VOCs including TCE, and inorganics	Not specified	GW pump and treatment using air stripping and granular activated carbon with reinjection into aquifer	GW treatment will meet MCLs which include 1,1-dichloroethylene 7.0 ug/l, carbon tetrachloride 5.0 ug/l, chromium 50.0 ug/l, and arsenic 50.0 ug/l. Chloroform will meet the WQC of 5.0 ug/l	$2,358,500 (capital) $800,200 (annual O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Litchfield Airport Area, AZ Industrial Facilities 09/26/89 2nd - Final	Soil and GW contaminated with VOCs including TCE, toluene, and xylenes; and metals including arsenic, chromium, and lead	284,100 yd^2 (soil)	The selected remedial action for the northern potion of the site includes treatment of soil using SVE to remove 99% of contaminants; and GW pumping and treatment using air stripping, liquid phase GAC and GAC polishing on air emissions, followed by reinjection or discharge of municipal water system. Remedial activities for the southern portion of the site include treatment of VOC-contaminated soil using SVE; and GW pumping and treatment using air stripping and wellhead treatment followed by discharge to municipal water system	VOC and metal-contaminated soil will be removed until levels remaining will not cause or contribute to GW contamination in concentrations exceeding GW cleanup standards. GW cleanup goals are based on SDWA MCLs, SALs, and AWQC. Chemical-specific GW cleanup goals include toluene 340 ug/l (SAL), TCE 5 ug/l (MCL), xylenes 44 ug/l (SAL), arsenic 50 ug/l (MCL), chromium 50 ug/l (MCL), and lead 50 ug/l (MCL)	$30,227,000 - $31,693,000 (present worth) O&M (to be determined)
9	Lorentz Barrel and Drum, CA Waste Disposal Facility 09/25/88 1st	GW contaminated with VOCs including benzene, PCE, and TCE, and other organics including PCBs and pesticides, and metals including arsenic	Not specified	GW pump and treatment using an ozone/UV treatment system, and ion exchange, if necessary, with discharge to a local creek	GW cleanup levels will meet MCLs and NPDES discharge limits. Individual goals include benzene 5 ug/l (MCL), PCE 5 ug/l (NPDES), and arsenic 0.23 ug/l. PCBs and pesticides will be removed to detection limits	$3,238,000 (present worth) $198,000 (annual O&M)
9	McColl Site, Ca 04/11/84 1st	Soil contaminated with VOCs and inorganics including sulfur dioxide, hydrogen sulfide, and arsenic	Not specified	Excavation and offsite disposal of wastes and soil	Not specified	$21,500,000 (capital) $0 (O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	MGM Brakes, CA Industrial Facility 09/29/88 1st - Final	Soil, sediment, GW, SW, air, and debris contaminated with PCBs and VOCs	13,510 yd^3	Dismantling of the process building; crushing and removal of concrete slab, and excavation of soil and sediment contaminated with PCBs at concentrations equal to or greater than 10 mg/kg with offsite disposal, followed by backfilling, regrading and revegetation; GW pump and treatment with discharge to a POTW; offsite GW and soil monitoring to determine extent of VOC contamination; and additional remedial measures for GW, if necessary	Soil cleanup level is 10 mg/kg for PCBs based on EPA's National PCB Spill Cleanup Policy. GW cleanup will ensure a 10^{-6} risk level at the site boundary	$5,369,300 (capital) $0 (O&M)
9	Motorola 52nd Street Facility, AZ Industrial Facility 09/30/88 1st	Soil and GW contaminated with VOCs including 1,1,1-TCA, and metals	Not specified	Soil-gas extraction and treatment onsite; GW pump and treatment of on-site and offsite GW with treatment onsite and treated GW used in site manufacturing processes	GW cleanup will meet relevant State/Federal standards and control contaminant migration. Individual cleanup goals were not provided	$7,600,000 (present worth) $700,000 (annual O&M)
9	Mountain View/ Globe, AZ 06/02/83 1st - Final	Soil contaminated with asbestos	Not specified	Permanent relocation of residents; onsite burial of containerized mobile homes; and fencing	Not specified	$4,432,000 (capital) $0 (O&M)
9	Nineteenth Avenue Landfill, AZ 213-Acre Municipal and Industrial Landfill 09/29/89 1st - Final	Soil and refuse contaminated with VOCs including toluene and xylenes	Not specified	Containment of landfill wastes onsite by constructing an impermeable cap and surface drainage structure over the landfill and soil-cement levees along the river at the landfill boundary; widening the river channel; collecting and flaring landfill generated gases; implementing institutional controls and access restrictions; air and GW monitoring; and implementing a contingency GW treatment plan whenever GW standards are exceeded at the landfill boundary	Not applicable to landfill wastes. GW currently does not pose a threat to human health or the environment. If GW monitoring detects concentrations exceeding SDWA MCLs at the landfill boundary, a contingency plan will be implemented	$42,990,000 (present worth) $1,010,000 (annual O&M) (years 1-30)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Operating Industries, CA 07/31/87 1st	Leachate contaminated with VOCs including TCE	Not specified	Site control (operation and maintenance of existing systems) to include gas well probes and leachate pumping and collection	Interim remedy. ARARs will be determined in future O.U.	$5,100,000 (present worth)
9	Operating Industries, Ca 190-Acre Municipal Landfill 11/16/87 2nd	Leachate contaminated with VOCs and organics	Not specified	Onsite treatment of leachate and other collected hazardous liquids using air stripping and carbon adsorption with discharge to the sewer system; and construction of a treatment facility	Leachate will be treated to achieve the LASCD discharge requirements. Individual effluent discharge limits include vinyl chloride 0.013 mg/l, oil and grease 10 mg/l, and total toxic organics 1.0 mg/l. The site will achieve the 10^{-6} health-based risk level	$1,900,000 (capital) $700,000 (annual O&M)
9	Operating Industries, CA 190-Acre Municipal Landfill 09/30/88 3rd	Air contaminated with methane and VOCs including benzene, PCE, TCE, and toluene	Not specified	Installation of new and use of existing LFG extraction wells; installation of new integrated perimeter and interior LFG headers; installation of multiple completion monitoring wells at the property boundary; installation of LFG destruction facilities; installation of above-grade condensate pumps to collect condensate from gas headers, leachate pumps in gas wells and above-grade leachate sumps with pretreatment of collected leachate and condensate to POTW requirements	Remedy will attain the State ambient air quality standard for vinyl chloride of 10 ppb for a 24-hr period. Additional goals include carbon monoxide 2,000 ppm, sulfin dioxide 500 ppm, and methane concentrations to less than 5% of the landfill boundary	$73,000,000 (present worth) $2,340,000 (annual O&M)
9	Ordot Landfill, GU 47-Acre Municipal Landfill 09/28/88 1st - Final	Not applicable	None	No action remedy with continued site monitoring	Not applicable	$0

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Purity Oil Sales, CA Used Oil Recycling Facility 09/26/89 1st	Sludge and GW contaminated with VOCs including benzene, TCE, toluene, and xylenes; and metals including lead. Sludge also contaminated with other organics including PCBs, PAHs, pesticides, and phenols	22,500 gals (sludge)	GW pumping and onsite treatment by greensand to remove metals and air stripping to remove VOCs; disposal of treated GW by either reinjection, disposal in a canal, or disposal in local infiltration basins; provision of alternate water supply; creation of GW management zone; GW monitoring; removal, onsite solidification (if necessary), and offsite disposal of contaminant sludge; and cleaning, dismantling, and offsite disposal of tanks containing sludge	GW treatment will meet Federal and State MCLs and State Action Levels (SALs), chemical-specific cleanup goals include TCE 5 ug/l (MCL) and benzene 1 ug/l (SAL)	$11,660,000 (present worth) $6,960,000 (present worth O&M)
9	Raytheon, CA Industrial Facilities Area 06/09/89 1st - Final	Soil and GW contaminated with VOCs including TCE, TCA, PCE, toluene, and xylenes; and other organics including phenolss	Not specified	In-situ vapor extraction of soil with treatment by vapor phase GAC inside slurry walls; limited excavation and aeration of soil outside the slurry walls with onsite disposal of residuals; GW pumping and treatment using air stripping, followed by reinjection or discharge to SW; sealing any conduits or potential conduits to protect deep aquifer; and GW monitoring	Soil cleanup goals are based on ensuring GW remedy attains MCLs. Individual goals include TCE 1 mg/kg inside the slurry walls and TCE 0.05 mg/kg outside the slurry walls. GW goals for shallow aquifers are based on MCLs and a 10^{-4} to 10^{-5} excess cancer risk and include TCE 5 ug/l (MCL); goals for deep aquifers include TCE 0.8 ug/l (based on a 10^{-6} cumulative cancer risk)	49,000,000 - $56,000,000 (present worth)
9	Sacramento Army Depot, CA Waste Disposal Area 09/29/89 1st	GW contaminated with VOCs including PCE and TCE	Not specified	GW pumping and treatment using ultraviolet light/chemical oxidation followed by discharge to the regional treatment plant and industrial reuse of treated GW	GW will be restored to meet current drinking water standards for TCE 5 ug/l (MCL) and PCE 4 ug/l (State action level)	$1,764,000 (capital) $264,000 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	San Fernando Valley, CA 09/24/87 1st	Area-wide GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using aeration a granular activated carbon-air filtering units with discharge to pumping station for chlorination and distribution; and disposal or regeneration of spent carbon	GW treatment will meet the MCL for TCE 5.0 ug/l and the State Action Level for PCE 4.0 ug/l	$2,192,895 (capital) $2,284,105 (present worth O&M)
9	San Fernando Valley (Area 1), CA Municipal Well Field 06/30/89 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	Pumping and treatment of GW exceeding TCE 100 ug/l or PCE 5 ug/l using air stripping with vapor phase GAC adsorption units or stream stripping, followed by discharge to the municipal water supply distribution system; and GW monitoring	Treated GW will meet Federal MCLs or State action levels. Individual goals include TCE 5.0 ug/l (MCL) and PCE 4.0 ug/l (State)	$69,000,000 (present worth) $43,900,000 (annual O&M) (years 1-20)
9	San Gabriel/Area I, CA 05/11/84 IRM	GW contaminated with VOCs including TCE and PCE	Not specified	GW pump and treatment using air stripping; and conduct of RI/FS	Not specified	$525,000 (capital) $38,000 (annual O&M)
9	San Gabriel, CA 09/30/87 1st	GW contaminated with VOCs including PCE	Not specified	Well discharge treatment using activated carbon adsorption; and alternate water supply	Cleanup goals will reduce PCE below the detection limit of 1.0 ug/l for purgable halocarbons	$1,616,000 - $1,771,800 (capital) $181,400 - $303,100 (annual O&M)
9	San Gabriel Valley Areas 1, 2, and 4 Private Utility's Well Field 09/29/88 2nd	GW contaminated with VOCs including PCE and TCE	Not specified	Onsite GW pump and treatment using an air stripping system equipped with air emissions controls, with residual discharge to the utility's water distribution system; floodproofing treatment facility; and GW monitoring	GW treatment will attain a cumulative 10^{-6} cancer-risk level and meet MCLs for TCE 5 ug/l and DCE 7 ug/l, and State Action Levels. This will be attained by remediating PCE to below 1.0 ug/l	$13,052,000 (present worth) $7,623,000 (present worth O&M)

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Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Selma Pressure Treating Company, CA Industrial Facility 09/24/88 1st - Final	Soil and GW contaminated with organics including dioxin/furan and phenolss, and metals including arsenic chromium	16,100 yd^3 2,700,000 gals	GW pump and treatment using precipitation, coagulation, and flocculation with reinjection to the aquifer or offsite discharge; soil excavation, fixation, and replacement into excavated areas followed by construction of a RCRA cap; GW and soil monitoring; and access and land use restrictions and institutional controls on GW use	Soil cleanup will meet the risk-based levels of dioxin/furan 1.0 ug/kg and arsenic 50 mg/kg. GW cleanup will meet the State MCL for chromium of 50 ug/l	$11,280,000 (present worth) $1,300,000 (annual O&M)
9	South Bay Asbestos, CA Residential Area Levee 09/29/88 1st - Final	Levee soil contaminated with asbestos	Not specified	Stripping and rough grading of levee followed by soil cover and revegetation; implementation of erosion control measures; and deed restrictions	No specific goals specified	$2,374,700 (present worth) $19,000 (O&M)
9	South Bay Asbestos Area, CA Asbestos Cement Pipe Manufacturing Facility 09/29/89 2nd - Final	Soil, debris, and air contaminated with asbestos	128,500 yd^2 (paved area)	Paving asbestos-contaminated truck yard and industrial yard; controlling dust emissions through monthly wet sweeping of streets; offsite disposal of asbestos-contaminated waste debris; and implementation of deed restrictions and institutional controls	Areas which receive or have potential to receive heavy vehicular traffic will be paved if asbestos levels exceed one area percent by polarized light microscopy	$7,561,000 (present worth) $134,900 (O&M) (years 1-30)
9	Stringfellow Acid Pits, CA 07/22/83 IRM	GW, SW, and soil contaminated with metals and organics	Not specified	Fencing; cap maintenance; and offsite leachate disposal	Not specified	$2,406,000 (present worth) O&M (not specified)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
9	Stringfellow Acid Pits, CA 07/17/84 1st	GW contaminated with pesticides, metals, and organics	Not specified	GW pump and treatment with offsite discharge to POTW	Not specified	$9,189,000 (capital) $1,724,000 (annual O&M)
9	Stringfellow Acid Pits, CA 06/25/87 2nd	GW contaminated with VOCs including TCE, organics, inorganics, and metals	Not specified	GW pump and treatment with possible discharge to POTW; and SW diversion/collection with discharge to creek	GW treatment will meet SAWPA limitations for discharge to arsenic 2.0 mg/l, cadmium 0.064 mg/l, chromium 2.0 mg/l, lead 0.58 mg/l, total toxic organics (excluding PCBs and pesticides) 0.58 mg/l, and PCBs and pesticides 0.02 mg/l	$1,047,000 - $1,136,000 (capital) $1,243,000 - $1,408,000 (annual O&M)
9	Taputimu Farm/ Insular Territories, AS 12/27/83 1st - Final	Air contaminated with VOCs, and organics including PCBs and pesticides	Not specified	Repacking of chemical/pesticide materials stored onsite; decontamination and sealing of onsite storage facilities; and transportation of all waste materials to mainland for offsite disposal	Not specified	$0
9	Tucson International Airport Area, AZ Industrial Area/Landfill 08/22/88 1st	GW contaminated with VOCs including TCE, benzene, and xylenes	Not specified	GW pump and treatment of areas A and B using air stripping with treatment of emissions by GAC, if necessary, and discharge to the municipal water distribution system	GW cleanup levels will attain an overall excess cancer-risk level of 10^{-6} by remediating TCE to 1.5 ug/l, thereby reducing the levels of other contaminants below their respective MCLs, State Action Levels, and 10^{-6} excess cancer-risk concentrations	$7,328,000 - $7,820,000 (present worth) $393,000 - $450,900 (annual O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Colbert Landfill, WA 09/29/87 1st - Final	GW contaminated with VOCs, including TCE and PCE	Not specified	Installation and operation of interception and extraction wells with onsite GW treatment; and provision of an alternate water supply	Cleanup goals based on MCLs include TCA 200.0 mg/l, DCE 7.0 ug/l, TCE 5.0 ug/l, and DCA 4,050.0 ug/l. Methylene chloride 2.5 ug/l and PCE 0.7 ug/l are based on the 10^{-6} cancer-risk level	$24,000,000 (present worth)
10	Commencement Bay (Near Shore), WA Industrial Area 12/30/87 1st	Soil and SW contaminated with VOCs including benzene, organics including PAHs and PCBs, and metals including lead	45,000 yd^3	Excavation and stabilization of soil exceeding 1% total PAHs; excavation and stabilization of all surface soil exceeding 10^{-6} lifetime cancer risk; removal and stabilization of ponded water; onsite disposal of treatment residuals; asphalt capping of stabilized matrix; SW diversion; GW monitoring; and implementation of institutional controls including land and water use restrictions	Surface soil and sediment exceeding the 10^{-6} health-based risk level will be treated. Individual goals include PCB 1 mg/kg, PAHs 1 mg/kg, benzene 56 mg/kg, and lead 166 mg/kg (acceptable dose). GW cleanup will attain lead 50 mg/l (MCL), benzene 0.53 mg/l (WQC), PCBs 0.2 mg/l (WQC), and PAHs 5-30 ug/l (WQC)	$3,400,000 (present worth)
10	Commencement Bay/Tacoma, WA 190-Acre Industrial/ Municipal Landfill 03/31/88 1st - Final	Soil and GW contaminated with VOCs including benzene, toluene and xylenes, organics and metals including chromium	Not specified	Installation of landfill cap with gas extraction system; GW pump and treatment with offsite discharge to a creek or the sanitary sewer; installation of alternate water supply if needed; and GW monitoring	GW cleanup levels were provided for 10 contaminants of concern based on MCLs, WQC, pretreatment standards, or risk assessments. Individual goals include benzene 5 ug/l (MCL), toluene 14 ug/l (WQC), and xylenes 10 ug/l (risk assessment)	$21,015,000 - $23,418,000 (present worth)
10	Commencement Bay Near Shore/Tide Flats, WA Commercial Seaport 09/30/89 2nd	Sediment contaminated with organics including PCBs and PAHs; and metals including arsenic, mercury, lead, and zinc	1,181,00 yd^3 (sediment)	Identification and control of sources contaminating marine environment at the site; sediment remediation includes a combination of natural recovery and four sediment control technologies such as in-situ capping, confined aquatic disposal, confined near-shore disposal, or removal and upland disposal; sediment monitoring; and implementation of site use restrictions	Cleanup goals for sediment were established using the apparent effects thresholds (AET). Specific sediment objectives include PCBs 150 ug/kg, PAHs 17,000 ug/kg, arsenic 57 mg/kg, and lead 450 mg/kg	$32,300,000 (total cost; includes sediment remediation only)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Frontier Hard Chrome, WA Industrial Facility 12/30/87 1st	Soil and structures contaminated with metals including chromium	7,400 yd^3 (soil)	Excavation of soil and onsite treatment using chemical stabilization with replacement of the treated materials; demolition of site buildings; and placement of a final site cover	Soil with chromium in excess of 550 mg/kg will be treated. There is presently no soil standard for chromium. Testing determined that soil <500 mg/kg would not release chromium to the GW at levels above the drinking water standard of 0.05 mg/l	$2,000,000 (present worth)
10	Frontier Hard Chrome, WA Industrial Facility 07/05/88 2nd - Final	GW contaminated with VOCs including TCE, and metals including chromium	45,000 ft^2 (plume area)	GW pump and treatment using selective media ion exchange to remove chromium followed by carbon adsorption to remove VOCs with discharge into the river or city sewer system; and implementation of institutional controls to restrict GW usage and to control new well drilling	The remedy prevents public exposure to drinking water which exceeds MCLs for chromium 0.050 mg/l, TCE 0.005 mg/l, and 1,1,1-trichloroethane 0.2 mg/l. Additionally, treated GW will meet NPDES requirements, EPA WQC for protection of fresh water aquatic life, or city pretreatment requirements (depending on remedial action determinations for discharge)	$3,800,000 (present worth)
10	Gould, OR Smelter Facility 03/31/88 1st	Soil and sediment contaminated with metals including lead	80,800 yd^3 (battery casings) 3,370 yd^3 (surface soil) 13,650 yd^3 (subsurface soil) 5,500 yd^3 (sediment) 6,000 yd^3 (matte)	Excavation and separation of battery casing fragments and matte with recycling of those components that can be recycled, offsite RCRA landfill disposal for nonrecyclable components, and onsite disposal of nonhazardous, nonrecyclable components; excavation, fixation/ stabilization and onsite disposal of contaminated soil, sediment, and matte followed by soil capping, revegetation, and site grading; and GW, SW, and air monitoring	EP Toxicity Standards for lead, cadmium, chromium, and zinc (values not specified) will determine disposal of nonrecyclable waste. Additionally, the NAAQS for lead 1.5 ug/m^3 (arithmetic average concentration of all samples collected during any one calendar quarter period) will be met	$3,491,603 (capital) $17,073,581 (present worth O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Martin Marietta, OR Industrial Facility 09/29/88 1st - Final	Soil, GW, and debris contaminated with asbestos, VOCs including TCE, organics including PAHs, and inorganics including arsenic, and cyanide	64,870 yd^3	Consolidation of cathode waste material into existing landfill, followed by capping of the landfill; placement of a soil cover over scrubber/sludge ponds; plugging and abandoning production wells and connecting users to the municipal water supply system; collection and treatment of leachate, perched water, and GW using an onsite aqueous treatment (oxidation and precipitation) with onsite discharge to a recycling pond; GW monitoring; and implementation of institutional controls	Soil cleanup goals include arsenic 65 mg/kg based on carcinogenic risk and PAHs 175 mg/kg based on background. GW cleanup will meet proposed ACLs for fluoride 9.7 mg/l and sulfate 3,020 mg/l	$6,707,400 (present worth) $144,000 (annual O&M) (years 1-5) $55,600 (annual O&M) (years 6-30)
10	Northside Landfill, Wa 345-Acre Industrial/ Municipal Landfill 09/30/89 1st - Final	GW contaminated with VOCs including PCE, TCA, and TCE; and metals including iron and lead	Not specified	Landfill closure and capping; GW pumping and treatment during closure with offsite discharge to SW; GW monitoring; provision of an alternate water supply; implementation of institutional controls; and controlling gas emissions	Chemical-specific goals for GW are based on MCLs or AWQC, whichever is more stringent, and include TCA 200 ug/l (MCL) and TCE 5 ug/l (MCL)	$30,000,000 (present worth)
10	Northwest Transformer, WA 1.6-Acre Former Salvage Yard 09/15/89 1st - Final	Soil contaminated with organics including PCBs	1,200 yd^3 (soil)	Excavation, consolidation, and treatment of soil with a PCB concentration >10 mg/kg using in-situ vitrification; filling entire site; abandonment of onsite well; GW monitoring; and sampling of onsite wooden structure to determine whether a second O.U. is necessary	Soil will be treated until the PCB concentration in the residue is <1 mg/kg	$771,000 (present worth) $0 (O&M)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Pacific Hide and Fur, ID Industrial Facility 06/28/88 1st - Final	Soil contaminated with PCBs	8,200 yd^3	Excavation of soil followed by screening to separate large contaminated materials and stabilization fixation of a portion of the soil using an immobilization technique; construction of a bottom clay liner, where necessary; and capping of the stabilized material along with any remaining contaminated materials; removal of some GW monitoring wells; GW monitoring; and deed and access restrictions. Onsite consolidation will be implemented if pilot testing finds treatment impracticable	The soil cleanup goal for PCBs 25 mg/kg by weight was established as the EPA cleanup policy for PCB spills and corresponds with a 10^{-4}-10^{-6} health-based risk level for the entire site (including hot spot areas)	$1,330,000 - $1,890,000 (present worth)
10	Ponders Corner, WA 06/01/84 IRM	GW contaminated with VOCs and organics	Not specified	GW treatment using air stripping; and conduction of RI/FS	Not specified	$1,163,000 (capital) $82,000 (annual O&M)
10	Ponders Corners, WA 09/30/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Continued operation of H1-H2 treatment system; installation of variable-frequency controllers on well pump motors to reduce energy requirements; changing of fan drives on treatment tower; installation of new monitoring wells, upgrading of existing wells, and continued sampling and analysis of aquifer; excavation and offsite disposal of septic tanks and drain field piping; and placement of administrative restrictions on excavation of soil and installation and usage of wells	The remedy will meet the recommended occupational air levels for VOCs which are based on OSHA standards	$334,970 (capital) $82,000 (annual O&M)
10	Queen City Farms, WA 10/24/85 1st	SW, soil, and sediment contaminated with VOCs including TCE, organics including PCBs, and metals including chromium and lead	22,000 yd^3	Excavation, stabilization, and offsite disposal of sludge, sediment, and soil; and capping	Not specified	$3,439,000 (capital) O&M (PRP responsibility)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	South Tacoma Channel Well 12A, WA 03/18/83 IRM	GW contaminated with VOCs including TCE	Not specified	GW pump and treatment using air stripping	Not specified	$1,200,000 (capital) $60,000 (annual O&M)
10	South Tacoma Channel Well 12A, WA 05/03/85 2nd	GW and soil contaminated with VOCs including TCE and PCE	Not specified	Continue operation of IRM; construction of a GW treatment system; excavation and offsite disposal of contaminated soil with soil flushing; and maintenance of institutional controls	Specific GW cleanup goals have not been established. Attainment of the 10^{-6} risk range has been recommended	$1,590,000 (capital) $50,000 (annual O&M)
10	Toftdahl Drums, WA 09/30/86 1st - Final	None	Not specified	No further action with GW monitoring	Not specified	$0
10	United Chrome, OR 09/12/86 1st - Final	GW and soil contaminated with metals including chromium	350 tons (offsite disposal)	Excavation and offsite disposal of soil; flushing of soil above shallow GW table; and GW pump and treatment using chemical reduction and precipitation with discharge to POTW or SW	The chromium cleanup criteria for the confined aquifer is 0.05 mg/l and 10 mg/l for the unconfined zone. A treatment effluent concentration of 0.3 to 0.4 mg/l chromium is expected to be maintained	$1,580,000 (capital) $261,000 (annual O&M)
10	Western Processing, WA 08/05/84 1st	GW and soil contaminated with VOCs including TCE, inorganics including cyanide, pesticides, and metals including arsenic and cadmium	Not specified	Removal and offsite disposal/incineration of all bulk liquids, drummed liquids, waste piles, and other debris; removal and proper disposal of all transformers and substation equipment; demolition and offsite disposal of all onsite buildings; dismantling of all onsite bulk storage tanks; controlling and treatment of stormwater; and onsite and perimeter monitoring of air quality	Not specified	$5,000,000 (capital) O&M (not specified)

FY82-FY89 Record of Decision Summary Table

Region	Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Present Worth/ Capital and O&M Costs
10	Western Processing, WA 09/25/85 2nd	GW, SW, soil, and creek sediment contaminated with VOCs, organics including PCBs and PAHs, and metals	Not specified	Soil sampling and analysis of onsite and offsite areas; excavation and offsite disposal of selected soil and non-soil materials; excavation or cleaning and plugging all utility and process lines in Area I; GW extraction and treatment; stormwater control; excavation and onsite disposal of selected soil; excavation of utility lines; cleaning utility manholes and vaults; capping; performing bench scale testing of soil solidification technique; and excavation of Mill Creek sediment; and performing supplemental remedial planning studies if GW contamination migrates	All soil contaminated with PCBs over 2 mg/kg and hot spots exceeding 10^{-5} risk level will be excavated. Aquatic organisms will be protected through MCL or ACL goals	$18,100,000 (capital) $2,000,000 (annual O&M)
10	Western Processing, WA 09/04/86 2nd (amendment)	Soil, sediment, debris, GW, and SW contaminated with VOCs including trans 1,2-DCE, TCE, PCE, and toluene; other organics including PAHs, PCBs, and phenols; and metals including chromium and lead	Not specified	Soil sampling in all on- and off-property areas and waste sampling in Area I; excavation and offsite disposal of highly contaminated soil and other wastes found in Area I and capping the excavated area; excavation and onsite or offsite disposal of soil found in off-property areas and covering the remaining surface soil; onsite or offsite disposal of all buried containerized wastes; excavation or plugging all utility and process lines in and leaving Area I; decontamination of lead-contaminated house in Area VIII; dredging SW sediment; shallow and deep GW pumping and onsite pretreatment prior to offsite discharge; GW and SW monitoring; and implementing institutional controls including GW and land use restrictions	Soil may not exceed a 10^{-5} excess cancer level or PCB concentration of 2 ug/kg. Chemical-specific GW cleanup levels include trans-1,2-DCE 70 ug/l (based on SDWA proposed MCL)	$40,000,000 (present worth) $0 (O&M)

SECTION V

RECORDS OF DECISION

KEYWORD LIST: FY 1982-1990

The ROD Keyword List presents the RODs approved from FY 1982-1990 by major keyword categories and subcategories. The list is a compilation of those keywords identified for each site in the ROD abstracts found at the beginning of this document. The first two pages of this list provide an index of all keyword categories and subcategories. The following text lists those RODs associated with each keyword.

RECORD OF DECISION KEYWORD LIST INDEX

Listed below are major keyword categories and their subcategories for Superfund Records of Decision (RODs).

Primary Hazardous Substances Detected

Acids
Arsenic
Asbestos
Benzene
Carcinogenic Compounds
Chromium
Dioxin
Inorganics (other than metals)
Lead
Metals
Mining Wastes
Oils
Organics
PAHs
PCBs
PCE
Pesticides
Phenols
Radioactive Materials
Solvents
TCE
Toluene
VOCs
Xylenes

Contaminated Media

Air
Debris
Ground Water
Sediment
Sludge
Soil
Surface Water

Public Health and Environmental Threats

Direct Contact
Public Exposure

Remedy Selection

ARAR Waiver
Institutional Controls
Interim Remedy
No Action Remedy
O&M
ROD Amendment

Water Supply

Alternate Water Supply
Drinking Water Contaminants

Site-Specific Characteristics

Floodplain
Sole-Source Aquifer
Wetlands

Standards/Regulations/Permits/ Guidance

Hybrid/Alternate Closure (not under RCRA)
ARARs (not listed as a keyword after FY 1988)
- Clean Air Act
- Clean Water Act
  - Water Quality Criteria
- RCRA
  - Closure Requirements
  - Clean Closure
  - Landfill Closure
- Safe Drinking Water Act
  - MCLs
  - MCLGs
- State Standards/Regulations
- Toxic Substances Control Act

Public Health Advisory
State Guidance
State Permit

Testing/Pilot Studies

Leachability Tests
Treatability Studies

Technology

Aeration
Air Monitoring
Air Stripping

RECORD OF DECISION KEYWORD LIST INDEX
(Continued)

Biodegradation/Land Application
Capping
Carbon Adsorption (GAC)
Decontamination
Dredging
Excavation
Filling
Ground Water Monitoring
Ground Water Treatment
Incineration/Thermal Destruction
Leachate Collection/Treatment
Levees
Offsite Discharge
Offsite Disposal
Offsite Treatment
Onsite Containment
Onsite Discharge
Onsite Disposal (includes residuals)
Onsite Treatment
Plume Management
Publicly Owned Treatment Works (POTW)
Relocation
Slurry Wall
Soil Washing/Flushing
Solidification/Stabilization
Solvent Extraction
Surface Water Collection/Diversion
Surface Water Monitoring
Surface Water Treatment
Temporary Storage
Treatment Technology
Vacuum Extraction
Venting
Volatilization/Soil Aeration
Vitrification

Miscellaneous

Municipally Owned Site

Historically Significant

ACL
Background Levels
Deferred Decision
Initial Remedial Measure (IRM)
Contingent Remedy

SUPERFUND RECORDS OF DECISION: KEYWORD LIST

Listed below are major keyword categories and their subcategories for Superfund Records of Decision (RODs). Following each of these categories is a broad sampling of RODs containing the listed keyword. Some categories may become obsolete or new categories may develop over time due to changes in the focus of the Superfund remedy selection process; these categories have been noted, as appropriate. The Superfund managers in each Region have copies of all RODs.

KEYWORDS (BY CATEGORY) AND ASSOCIATED ROD SITES (BY SITE, STATE (REGION))

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Acids

Charles George, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Nyanza Chemical, MA (I); Stamina Mills, RI (I); Western Sand & Gravel, RI (I); Yaworski Lagoon, CT (I); Chemical Control, NJ (II); Claremont Polychemical, NY (II)*; PAS Oswego, NY (II); Roebling Steel, NJ (II); Sayreville Landfill, NJ (II); Avtex Fibers, VA (III)*; Bruin Lagoon, PA (III); Douglassville Disposal, PA (III); Fike Chemical, WV (III); Keystone Sanitation Landfill, PA (III); Lackawanna Refuse Site, PA (III); Southern Maryland Wood, MD (III); US Titanium, VA (III); Pickettville Road Landfill, FL (IV); Schuylkill Metal, FL (IV); A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Forest Waste, MI (V)*; Hunts Disposal, WI (V); K&L Landfill, MI (V); Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Arkansas City Dump, KS (VII); Conservation Chemical, MO (VII); Fulbright/Sac River Landfill, MO (VII); Celtor Chemical Works, CA (IX); Iron Mountain Mines, CA (IX); Stringfellow Acid Pits, CA (IX)*; Gould, OR (X); Queen City Farms-IRM/EDD WA (X); Western Processing, WA (X)

Arsenic

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Saco Tannery Waste Pits, ME (I)*; W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Chemical Control, NJ (II); Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II); Claremont Polychemical (09/28/90), NY (II)*; D'Imperio Property, NJ (II); Fulton Terminals, NY (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Mattiace Petrochemicals, NY (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Sealand Restoration, NY (II); Sinclair Refinery, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Syosset Landfill, NY (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); C&R Battery, VA (III); Chisman Creek, VA (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Drake Chemical, PA (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Hederson Road, PA (III); Lord Shope

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Arsenic (continued)

Landfill, PA (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Rhinehart Tire Fire, VA (III); US Titanium, VA (III); Walsh Landfill, PA (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill (11/28/88), DE (III)*; 62nd Street Dump, FL (IV); American Creosote Works, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal (03/30/90), FL (IV)*; Munisport Landfill, FL (IV); National Starch, NC (IV); Newport Dump, KY (IV); North Hollywood Dump, TN (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Algoma Municipal Landfill, WI (V); Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hunts Disposal, WI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO II, IN (V); Morris Arsenic, MN (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine (Amendment), OH (V); South Andover, MN (V); Springfield Township Dump, MI (V); Summit National, OH (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Kem-Pest Laboratory, MO (VII); Todtz, Lawrence Farm, IA (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek (03/31/88), CO (VIII)*; East Helena, MT (VIII); Milltown, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII)*; Celtor Chemical, CA (IX)*; J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); Louisiana-Pacific, CA (IX); McColl, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/NearShore (09/30/89), WA (X); Martin Marietta, OR (X); Silver Mountain Mine, WA (X); Western Processing, WA (X)

Asbestos

Asbestos Dump, NJ (II); Claremont Polychemical, NY (II)*; Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Publicker/Cuyahoga Wrecking, PA (III); West Virginia Ordnance Works, WV (III); Cape Fear Wood

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Asbestos (continued)

Preserving, NC (IV); Fisher Calo Chem, IN (V); Johns-Manville, IL (V); New Lyme, OH (V); Broderick Wood Products, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/21/90), CA (IX)*; Mountain View/Globe, AZ (IX); Purity Oil Sales, CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Martin Marietta, OR (X)

Benzene

Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Mattiace Petrochemicals, NY (II); Myers Property, NJ (II); Port Washington Landfill, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Syosset Landfill, NY (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Volney Landfill, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*;Hranica Landfill, PA (III); Kane and Lombard, MD (III); Keystone Sanitation Landfill, PA (III); L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III)*; Osborne Landfill, PA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Walsh Landfill, PA (III); Westline, PA (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill (Amendment), FL (IV); Jadco-Hughes, NC (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Wamchem, SC (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Bofors Nobel, MI (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Industrial Excess Landfill, OH (V)*; K&L Landfill, MI (V); Kummer Sanitary Landfill (09/30/88), MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; Liquid Disposal, MI (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth

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Benzene (continued)

Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Bailey Waste Disposal, TX (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pits, TX (VI)*; Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/27/89), TX (VI)*; South Calvacade Street, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Missouri Electric Works, MO (VII);Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Koppers (Oroville Plant), CA (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment) (09/28/90), CA (IX)*; Purity Oil Sales, CA (IX); Solvent Service, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X)

Carcinogenic Compounds

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Charles George Landfill 3 & 4, MA (I); Charles George, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Forest Glen Subdivision, NY (II); Fulton Terminals, NY (II); Glen Ridge Radium, NJ (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Hooker Chemical/Ruco Polymer, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Montgomery Township, NJ (II); Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Carcinogenic Compounds (continued)

Processing, NJ (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Upjohn Manufacturing, PR (II); Vestal Water Supply 1-1, NY (II)*; Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Avtex Fibers, VA (III)*; Berks Sand Pit, PA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C&R Battery, VA (III); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Keystone Sanitation Landfill, PA (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tyson Dump #1, PA (III)*; Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Whitmoyer Laboratories, PA (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco,KY (IV); American Creosote Works, TN (IV); American Creosote Works (09/28/89), FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal (03/30/90), FL (IV)*; Munisport Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Anderson Development, MI (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste Disposal, MI (V)*; Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); National Presto Industries, WI (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/20/90), MI (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical (St. Louis Park) (09/28/90), MN (V)*; Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Spiegelberg Landfill, MI (V)*; Springfield

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Carcinogenic Compounds (continued)

Township Dump, MI (V); St. Louis River, MN (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Windom Dump, MN (V); Arkwood, AR (VI); Bailey Waste Disposal, TX (VI); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Shenandoah Stables, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Applied Materials, CA (IX); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/21/90), CA (IX)*; Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX)*; MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX); Operating Industries (09/30/88), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX)*; San Gabriel Area 1, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Watkins Johnson (Stewart Division), CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X)*; Fort Lewis Logistic Center, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Silver Mountain Mine, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

*	Subsequent Record of Decision
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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Chromium

Coakley Landfill, NH (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Nyanza Chemical, MA (I); Saco Tannery Waste Pits, ME (I)*; Stamina Mills, RI (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Byron Barrel & Drum, NY (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II); Claremont Polychemical (09/28/90), NY (II)*; DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); Haviland Complex, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lang Property, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II)*; Preferred Plating, NY (II); Roebling Steel, NJ (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Vestal Water Supply 1-1, NY (II)*; Waldick Aerospace, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Aladdin Plating, PA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Keystone Sanitation Landfill, PA (III); Limestone Road, MD (III); Lord Shope Landfill, PA (III); Matthews Electroplating, VA (III); PA (III); Limestone Road, MD (III); Lord Shope Landfill, PA Matthews Electroplating, VA (III);1 McAdoo-IRM, PA (III); New Castle Steel DE (III); Osborne Landfill, PA (III); US Titanium, VA (III); Voortman Farm, PA (III); Wildcat Landfill, DE (III)*; 62nd Street Dump, FL (IV); Amnicola Dump, TN (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC(IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Davie Landfill, FL (IV); Geiger (C&M Oil), SC (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Independent Nail, SC (IV)*; Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Munisport Landfill, FL (IV); National Starch, NC (IV); Newport Dump, KY (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Fort Wayne Reduction, IN (V); Hunts Disposal, WI (V); Ionia City Landfill, MI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); MIDCO II, IN (V); New Brighton (TCAAP), MN (V)*; Northernaire, MI (V); Northernaire Plating, MI (V)*; Novaco Industries, MI (V); Oconomowoc Electroplating, WI (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Schmaltz Dump, WI (V); Schmaltz Dump (09/30/87), WI (V)*; South Andover, MN (V); Springfield Township Dump, MI (V); Summit National, OH (V); Tri-State Plating, IN (V); Wauconda Sand & Gravel, IL (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Atchison/Santa Fe (Clovis), NM (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium I (03/18/8), TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II (03/18/88), TX (VI)*; South Calvacade Street, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater Contamination (FAR-MAR-CO), NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Chromium (continued)

Portland Cement, IA (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek (03/31/88), CO (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Del Norte, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ*; Louisiana-Pacific, CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); FMC Yakima Pit, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Queen City Farms-IRM/EDD, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X); United Chrome, OR (X); Western Processing, WA (X)*

Dioxin

Baird & McGuire, MA (I); Diamond Alkali, NJ (II); Hyde Park-EDD, NY (II); Love Canal, NY (II); Love Canal, NY (II)*; Love Canal/93rd Street School, NY (II)*; Myers Property, NJ (II); Havertown PCP, PA (III); M.W. Manufacturing, PA (III)*; American Creosote Works, FL (IV); Galesburg/Koppers, IL (V); Laskin/Poplar Oil, OH (V); Miami County Incinerator, OH (V); Pristine, OH (V); Pristine (Amendment), OH (V); Jacksonville Municipal Landfill, AR (VI); Rogers Road Municipal Landfill, AR (VI); Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Conservation Chemical, MO (VII); Ellisville MO (VII); Ellisville Site Area, MO (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach (09/28/88), MO (VII)*; Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII)*; J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Selma Pressure Treating, CA (IX)

Inorganics

Auburn Road, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Claremont Polychemical, NY (II)*; Florence Landfill, NJ (II); Friedman Property, NJ (II); Forest Glen Subdivision, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Price Landfill, NJ (II)*; Roebling Steel, NJ (II); Scientific Chemical Processing, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Chisman Creek (03/31/88), VA (III)*; Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; Fike Chemical, WV (III); Fisher Calo Chem, IN (V); Greenwood Chemical, VA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); New Castle Steel DE (III); Palmerton Zinc, PA (III); Rhinehart Tire Fire, VA (III); US Titanium, VA (III); Voortman Farm, PA (III); Wade, PA (III); Airco, KY (IV); A. L. Taylor, KY (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Distler Brickyard, KY (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Independent Nail, SC (IV)*; Lewisburg Dump, TN (IV); Munisport

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Inorganics (continued)

Landfill, FL (IV); Newport Dump, KY (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste (06/30/86), MI (V)*; Forest Waste Disposal (03/31/88), MI (V)*; Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); South Andover, MN (V); Summit National, OH (V); Wauconda Sand & Gravel, IL (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Cecil Lindsey, AR (VI); Cimarron Mining, NM (VI); Hardage/Criner, OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Motco, TX (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Tar Creek, OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Ellisville, MO (VII); Fulbright/Sac River Landfill, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Syntex Verona, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Coalinga Asbestos Mine, CA (IX)*; Portland Cement (Kiln Dust #2 & #3), UT (VIII); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); South Bay Asbestos Area, CA (IX); Stringfellow Acid Pits, CA (IX); Watkins Johnson (Stewart Division), CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Silver Mountain Mine, WA (X)

Lead

Auburn Road Landfill, NH (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); New Bedford, MA (I); Pinette's Salvage Yard, ME (I); Saco Tannery Waste Pits, ME (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Leaman Tank Lines, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II); Claremont Polychemical (09/28/90), NY (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; Forest Glen Subdivision, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II)*; Montclair/West Orange Radium, NJ (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Preferred Plating, NY (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Vestal Water Supply 1-1, NY (II)*; Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Brown's Battery Breaking, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Hebelka Auto Salvage Yard, PA (III); Hranica Landfill, PA (III); Keystone Sanitation Landfill, PA (III); Lord Shope Landfill, PA (III);

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Lead (continued)

M.W. Manufacturing, PA (III); M.W. Manufacturing, PA (III)*; New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III); Palmerton Zinc (06/29/88), PA (III)*; Rhinehart Tire Fire, VA (III); Voortman Farm, PA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III); Wildcat Landfill (11/28/88), DE (III)*; 62nd Street Dump, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Flowood, MS (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Independent Nail, SC (IV)*; Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Munisport Landfill, FL (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Auto Ion Chemicals, MI (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Master Disposal Service Landfill, WI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Onalaska Municipal Landfill, WI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); South Calvacade Street, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK Wayne Waste Oil, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); South Calvacade Street, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; East Helena, MT (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Louisiana-Pacific, CA (IX); Purity Oil Sales, CA (IX); Stringfellow Acid Pits, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Gould, OR (X); Teledyne Wah Chang Albany (TWCA), OR (X)

Metals

Auburn Road Landfill, NH (I); Auburn Road Landfill (09/29/89), NH (I)*; Baird & McGuire, MA (I); Baird & McGuire (09/27/90), MA (I)*; Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I);

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (continued)

Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Chemical Control, NJ (II); Chemical Control (09/23/87), NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); Florence Landfill, NJ (II); Forest Glen Subdivision, NY (II); Fulton Terminals, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lang Property, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Lone Pine Landfill (09/28/90), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Marathon Battery, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montclair/West Orange Radium, NJ (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Preferred Plating, NY (II); Radium Chemical, NY (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NJ (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Syncon Resins, NJ (II); Syosset Landfill, NY (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Army Creek Landfill (06/29/90), DE (III)*; Avtex Fibers, VA (III); Blosenski Landfill, PA (III); Brown's Battery Breaking, PA (III); Bruin Lagoon, PA (III)*; C&R Battery, VA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Enterprise Avenue, PA (III); Fike Chemical, WV (III); Greenwood Chemical, VA (III); Harvey-Knott, DE (III); Havertown PCP, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Lord Shope Landfill, PA (III); McAdoo-IRM, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing, PA (III)*; New Castle Steel DE (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III); Palmerton Zinc (06/29/88), PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Sand Gravel & Stone (09/28/90), MD (III)*; US Titanium, VA (III); Walsh Landfill, PA (III); Voortman Farm, PA (III); Wade, PA (III); West Virginia Ordnance Works, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill (11/28/88), DE (III)*; 62nd Street Dump, FL (IV); A. L. Taylor, KY (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Bypass 601 Groundwater

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (continued)

Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Distler Brickyard, KY (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Schuylkill Metal, FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Independent Nail, SC (IV)*; Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Miami Drum Services, FL (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Forest Waste Disposal (03/31/88), MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Marion/Bragg Landfill, IN (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V); Schmaltz Dump, WI (V)*; Seymour, IN (V); South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); Tri-State Plating, IN (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel (03/31/89), IL (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bio-Ecology Systems, TX (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit (06/26/87), TX (VI)*; Industrial Waste Control, AR (VI); Johns-Manville, IL (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; Odessa Chromium I, TX (VI); Old Inger, LA (VI); Pesses Chemical, TX (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tar Creek, OK (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (continued)

Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Anaconda Smelter/Mill Metals Creek, MT (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek (03/31/88), CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical Works (09/30/85), CA (IX)*; Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); Jibboom Junkyard, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Louisiana-Pacific, CA (IX); Motorola 52nd Street, AZ (IX); Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); FMC Yakima Pit, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Northside Landfill, WA (X); Queen City Farms-IRM/EDD, WA (X); Silver Mountain Mine, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X); United Chrome, OR (X); Western Processing, WA (X); Western Processing (09/25/85), WA (X)*

Mining Wastes

Cinnaminson Groundwater Contamination, NJ (II); Tar Creek, OK (VI); United Nuclear, NM (VI); Cherokee County, KS (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Milltown, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Whitewood Creek, SD (VIII); Atlas Asbestos Mine, CA (IX); Celtor Chemical Works, CA (IX); Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); Silver Mountain Mine, WA (X)

Oils

Davis Liquid Waste, RI (I); Groveland Wells, MA (I); McKin, ME (I)*; American Thermostat, NY (II)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Roebling Steel, NJ (II); Syosset Landfill, NY (II); Avtex Fibers, VA (III)*; Bruin Lagoon, PA (III); Bruin Lagoon (09/29/86), PA (III)*; Douglassville Disposal, PA(III)*; Dover Air Force Base, DE (III); Enterprise Avenue, PA (III); Havertown PCP, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Rhinehart Tire Fire, VA (III); Airco, KY (IV); American Creosote Works, TN (IV); Cabot/Koppers, FL (IV); Coleman Evans, FL (IV); Dubose Oil Products,

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Oils (continued)

FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); A&F Materials-IRM, IL (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (06/30/89), OH (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Arkwood, AR (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Arkansas City Dump, KS (VII)*; Ellisville, MO (VII); Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII)*; Mystery Bridge at Highway 20, WY (VIII); Union Pacific, WY (VIII); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)

Organics/VOCs

Auburn Road Landfill, NH (I); Auburn Road Landfill (09/29/89), NH (I)*; Baird & McGuire, MA (I); Beacon Heights, CT (I); Beacon Heights Landfill (09/28/90), CT (I)*; Cannon Engineering, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); Keefe Environmental Services (03/21/88), NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin-IRM, ME (I); New Bedford, MA (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Ottati and Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve (09/24/87), MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); American Thermostat (09/28/90), NY (II)*; Bog Creek Farm, NJ (II); Bog Creek Farm (06/28/89), NJ (II)*; Brewster Well Field, NY (II); Brewster Well Field (09/29/88), NY (II)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/29/89), NJ (II)*; Chemical Control, NJ (II); Chemical Control (09/23/87), NJ (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II); Claremont Polychemical (09/28/90), NY (II)*; Clothier Disposal, NY (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Florence Landfill, NJ (II); Forest Glen Subdivision, NY (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Higgins Farm, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II); Kentucky Avenue Wellfield (09/28/90), NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lang Property, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Lone Pine Landfill (09/28/90), NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School,

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Syosset Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Vestal Water Supply 1-1, NY (II)*; Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Army Creek Landfill, DE (III); Avtex Fibers, VA (III)*; Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Butz Landfill, PA (III); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill (06/29/90), PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Douglassville Disposal (Amendment), PA (III); Douglassville Disposal (06/30/89), PA (III)*; Dover Air Force Base, DE (III); Drake Chemical, PA (III); Drake Chemical (05/13/86), PA (III)*; East Mt. Zion, PA (III); Fike Chemical, WV (III); Fike Chemical (09/29/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Industrial Lane, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); Lord Shope Landfill, PA (III); McAdoo-IRM, PA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Raymark, PA (III); Sand, Gravel & Stone, MD (III); Sand Gravel & Stone (09/28/90), MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (09/30/88), PA (III)*; Tyson's Dump (Amendment), PA (III); Tyson Dump #1, PA (III)*; Wade, PA (III); Walsh Landfill, PA (III); Westline, PA (III)*; Westline (06/29/88), PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Alpha Chemical, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); A. L. Taylor, KY (IV); American Creosote Works, FL (IV); American Creosote Works, TN (IV); American Creosote Works (09/29/89), FL (IV)*; Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Ciba-Geigy, AL (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Dubose Oil Products, FL (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); North

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Powerville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Anderson Development, MI (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Charlevoix, MI (V); Charlevoix (09/30/85), MI (V)*; Chem-Dyne-EDD, OH (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V); Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); Kummer Landfill, MN (V); Kummer Sanitary Landfill (09/30/88), MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (Amendment), MN (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton/St. Anthony-IRM, MN (V); New Brighton (TCAPP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Oak Grove Landfill, MN (V); Old Mill OH (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (03/31/90), MI (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V); Seymour (09/25/87), IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wausau Water Supply, WI (V); Wausau Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit (06/27/87), TX (VI)*; Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI); Motco (09/30/88), TX (VI)*; North

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (continued)

Cavalcade Street, TX (VI); Old Inger, LA (VI); Petro-Chemical Systems, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/27/89), TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Triangle Chemical, TX (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII); Libby Ground Water (12/30/88), MT (VIII)*; Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Louisiana-Pacific, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment) (09/28/90), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits (07/17/84), CA (IX); Stringfellow Acid Pits (06/25/87), CA (IX)*; Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Tucson International Airport, AZ (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Teledyne Wah Chang Albany (TWCA), OR (X); Western Processing, WA (X); Western Processing (09/04/86), WA (X)*

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

PAHs (Polynuclear Aromatic Hydrocarbons)

Baird & McGuire, MA (I); Baird & McGuire (09/14/89), MA (I)*; Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Iron Horse Park, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/22/88), VT (I)*; South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Forest Glen Subdivision, NY (II); Fulton Terminals, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Renora Inc., NJ (II); Scientific Chemical Processing, NJ (II); Solvent Savers, NY (II); Vestal Water Supply 1-1, NY (II)*; Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Douglassville Disposal (06/24/88), PA (III)*; Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Taylor Borough, PA (III); Walsh Landfill, PA (III); Westline Site, PA (III); Airco, KY (IV); A. L. Taylor, KY (IV); American Creosote Works, FL (IV); American Creosote Works, TN (IV); American Creosote Works (09/28/89), FL (IV)*; Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Industrial Excess Landfill, OH (V)*; K&L Landfill, MI (V); Lake Sandy Jo, IN (V);Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Onalaska Municipal Landfill, WI (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); St. Louis River, MN (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Arkwood, AR (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; French Limited, TX (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Petro-Chemical Systems, TX (VI); South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI); United Creosoting (09/29/89), TX (VI)*; Arkansas City Dump, KS (VII); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Broderick Wood Products, CO (VIII); Libby Ground Water, MT (VIII); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Martin Marietta, OR (X); Western Processing (09/25/85), WA (X)*

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

PCBs (Polychlorinated Biphenyls)

Cannon Engineering, MA (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Wells G&H, MA (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Clothier Disposal,NY (II); FAA Technical Center, NJ (II); GE Moreau, NY (II); Goose Farm, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Hudson River, NY (II); Hyde Park-EDD, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Myers Property, NJ (II); Pijak Farm, NJ (II); Renora Inc., NJ (II); Roebling Steel, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sinclair Refinery, NY (II); Solvent Savers, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal Water Supply 1-1, NY (II)*; Wide Beach, NY (II); York Oil, NY (II); Avtex Fibers, VA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III); Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Fike Chemical, WV (III); Harvey-Knott, DE (III); Kane & Lombard, MD (III); Lehigh Electric, PA (III); Millcreek, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Ordnance Works Disposal, WV (III); Osborne Landfill, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Geiger (C&M Oil), SC (IV); Jadco-Hughes, NC (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Yellow Water Road, FL (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Alsco Anaconda, OH (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Biphenyls Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Cross Brothers Pail (Pembroke), IL (V); Fisher Calo Chem, IN (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); K&L Landfill, MI (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (06/30/89), OH (V)*; Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northside Sanitary Landfill/ Environmental Conservation and Chemical Corporation, IN (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Rose Township, MI (V); Schmaltz Dump, WI (V); Springfield Township Dump, MI (V); Summit National, OH (V); University of Minnesota, MN (V); Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Bio-Ecology Systems, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR, (VI); Hardage/Criner (Amendment), OK (VI); Motco, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); Tenth Street Dump/Junkyard, OK (VI); Doepke Disposal (Holliday), KS (VII); Findett, MO (VII); Missouri Electric Works, MO (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Jibboom Junkyard, CA (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Purity Oil Sales, CA (IX); Taputimu Farm, AS (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

PCE (Tetrachloroethylene/Perchloroethylene)

Auburn Road Landfill, NH (I)*; Coakley Landfill, NH (I); Keefe Environmental Services, NH (I); Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); Old Springfield Landfill, VT(I); Old Springfield Landfill (09/29/90), VT (I)*; Picillo Farm, RI (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Brewster Well Field, NY (II); Brewster Well Field (09/29/88), NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; Clothier Disposal,NY (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; Higgins Farm, NJ (II); Katonah Municipal Well, NY (II); King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Scientific Chemical Processing, NJ (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Waldick Aerospace, NJ (II); Williams Property, NJ (II); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Butz Landfill, PA (III); Croydon TCE Spill, PA (III); Cryo-Chem, PA (III); Cryo-Chem (09/29/90), PA (III)*; Fischer & Porter, PA (III); Greenwood Chemical, VA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Keystone Sanitation Landfill, PA (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Raymark, PA (III); Tyson's Dump (Amendment), PA (III); Walsh Landfill, PA (III); Whitmoyer Laboratories, PA (III); A. L. Taylor, KY (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (06/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; Kysor Industrial, MI (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Mason County Landfill, MI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Sheridan Disposal Services, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Marshall Landfill, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal, CO

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

PCE (Tetrachloroethylene/Perchloroethylene) (continued)

(VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Applied Materials, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Lorentz Barrel & Drum, CA (IX); Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Fort Lewis Logistic Center, WA (X); Northside Landfill, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*

Pesticides

Baird & McGuire, MA (I); Baird & McGuire (09/14/89), MA (I)*; Cannon/Plymouth MA (I); Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Stamina Mills, RI (I); Wells G&H, MA (I); Chemical Control, NJ (II); Chemical Control, NJ (II)*; Chemical Insecticide, NJ (II); Diamond Alkali, NJ (II); Krysowaty Farm, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal (10/26/87), NY (II)*; Love Canal/93rd Street School (09/26/88), NY (II)*; Myers Property, NJ (II); Pijak Farm, NJ (II); Renora, Inc., NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Syncon Resins, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Douglassville Disposal, PA (III); Drake Chemical, PA (III); Leetown Pesticide, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Ciba-Geigy, AL (IV); Gallaway Ponds, TN (IV); Miami Drum Services, FL (IV); North Hollywood Dump, TN (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Chem-Dyne-EDD, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; IMC Terre Haute, IN (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Bayou Sorrel, LA (VI); Crystal City Airport, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Jacksonville Municipal Landfill, AR (VI); Old Inger, LA (VI); Rogers Road Municipal Landfill, AR (VI); Texarkana Wood Preserving, TX (VI); Aidex-IRM, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Martin Marietta, Denver Aerospace, CO (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Del Norte, CA (IX); Intersil, CA (IX); Louisiana-Pacific, CA (IX); Purity Oil Sales, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); FMC Yakima Pit, WA (X); Western Processing, WA (X)

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Phenols

Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Norwood PCBs, MA (I); Picillo Farm, RI (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Cinnaminson Groundwater Contamination, NJ (II); Clothier Disposal, NY (II); Ewan Property, NJ (II)*; Goose Farm, NJ (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Ludlow Sand & Gravel, NY (II); Mattiace Petrochemicals, NY (II); Pijak Farm, NJ (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sinclair Refinery, NY (II); Solvent Savers, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Avtex Fibers, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Keystone Sanitation Landfill, PA (III); Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Westline, PA (III); American Creosote Works, TN (IV); Cabot/Koppers, FL (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Dubose Oil Products, FL (IV); Jadco-Hughes, NC (IV); Munisport Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; Cliff/Dow Dump, MI (V); E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); K&L Landfill, MI (V); Laskin/Poplar Oil, OH (V); MIDCO I, IN (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Geneva Industries, TX (VI); Koppers/Texarkana, TX (VI); Sikes Disposal Pits, TX (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Conservation Chemical, MO (VII); Ellisville, MO (VII); Northwestern States Portland Cement, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

Radioactive Materials

Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Radium Chemical, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Lansdowne Radiation, PA (III); Lansdowne Radiation (09/22/89), PA (III)*; Moyer Landfill, PA (III); United Nuclear, NM (VI); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium ROBCO, CO (VIII)*; Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Teledyne Wah Chang Albany (TWCA), OR (X)

Solvents

Davis Liquid Waste, RI (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); McKin, ME (I)*; Pinette's Salvage Yard, ME (I); Stamina Mills, RI (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Burnt

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Solvents (continued)

Fly Bog, NJ (II); Chemical Control, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Kentucky Avenue Wellfield, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lone Pine Landfill, NJ (II); Mattiace Petrochemicals, NY (II); Montgomery Township Housing, NJ (II)*; Sarney Farm, NY (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Syosset Landfill, NY (II); Vestal, NY (II); Avtex Fibers, VA (III)*; Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Enterprise Avenue, PA (III); Greenwood Chemical, VA (III); Henderson Road, PA (III)*; Lackawanna Refuse Site, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); M.W. Manufacturing, PA (III); Osborne Landfill, PA (III); Dubose Oil Products, FL (IV); Harris/Palm Bay Facility, FL (IV); Jadco-Hughes, NC (IV); Miami Drum Services, FL (IV); A&F Materials-IRM, IL (V); Algoma Municipal Landfill, WI (V); Berlin & Farro, MI (V); Bofors Nobel, MI (V); Charlevoix, MI (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); Forest Waste Disposal, MI (V)*; Hagen Farm, WI (V); Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Master Disposal Service Landfill, WI (V); Mid-State Disposal, WI (V); New Brighton-Interim Water Treatment, MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Onalaska Municipal Landfill, WI (V); Summit National, OH (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Hardage/Criner (Amendment), OK (VI); Old Inger, LA (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Fairchild Semicond (Mt. View), CA (IX); Applied Materials, CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); Solvent Service, CA (IX); Taputimu Farm, AS (IX); Watkins Johnson (Stewart Division), CA (IX); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); Fort Lewis Logistic Center, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); Western Processing, WA (X)

TCE (Trichloroethylene)

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; McKin-IRM, ME (I); Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/22/88), VT (I)*; Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Western Sand & Gravel, RI (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Brewster Well Field, NY (II); Brewster Well Field (09/29/88), NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lang Property, NJ (II); Lone

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TCE (Trichloroethylene) (continued)

Pine Landfill, NJ (II)*; Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sarney Farm, NY (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); Syosset Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Vestal Water Supply 1-1, NY (II)*; Waldick Aerospace, NJ (II); Woodland Township Route 72, NJ (II); Bendix, PA (III); Blosenski Landfill, PA (III); Butz Landfill, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Drake Chemical, PA (III)*; Fischer & Porter, PA (III); Greenwood Chemical, VA (III); Havertown PCP, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Industrial Lane, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; Limestone Road, MD (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III)*; Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tyson's Dump (Amendment), PA (III); Walsh Landfill, PA (III); Airco, KY (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; City Industries, FL (IV); Distler Brickyard, KY (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hollingsworth, FL (IV); Jadco-Hughes, NC (IV); National Starch, NC (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Big D Campground, OH (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (06/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix (09/30/85), MI (V)*; Clare Water Supply, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Hunts Disposal, WI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; Kysor Industrial, MI (V); LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton/St. Anthony-IRM, MN (V); New Brighton-Water Supply System, MN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Seymour, IN (V); South Andover, MN (V); Springfield Township Dump, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V)*; Wausau Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Chemplex, IA (VII); Deere,

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TCE (Trichloroethylene) (continued)

John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Marshall Landfill, CO (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Wheeling Disposal Service, MO (VII); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII)*; Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ; Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel/Area I, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)

Toluene

Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Charles George, MA (I); Industri-plex, MA (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Bog Creek Farm (06/28/89), NJ (II)*; Bridgeport, NJ (II); Caldwell Trucking, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; Clothier Disposal,NY (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kin-Buc Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II)*; Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sinclair Refinery, NY (II); Syosset Landfill, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Kane & Lombard, MD (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson Dump #1, PA (III)*; A. L. Taylor, KY (IV); Airco, KY (IV); American Creosote Works, FL (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Distler Brickyard, KY (IV); Dubose Oil Products, FL

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Toluene

(IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Jadco-Hughes, NC (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Wamchem, SC (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); Master Disposal Service Landfill, WI (V); MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Republic Steel Quarry, OH (V); Seymour, IN (V); South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); Verona Well Field, MI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Bailey Waste Disposal, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Triangle Chem., TX (VI); Big River Sand, KS (VII); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Fairfield Coal Gasification Plant, IA (VII); Midwest Manufacturing/North Farm, IA (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Louisiana-Pacific, CA (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); Solvent Service, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

Xylenes

Beacon Heights Landfill, CT (I); Kellogg-Deering Well Field, CT (I)*; Old Springfield Landfill (09/29/90), VT (I)*; Sullivan's Ledge, MA (I); Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; Clothier Disposal,NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Lone Pine Landfill, NJ (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II)*; SMS Instruments, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Dover Air Force Base, DE (III); Henderson Road, PA (III)*; Sand Gravel & Stone, MD (III)*; Strasburg Landfill, PA (III); Tyson Dump #1, PA (III)*; Dubose Oil Products, FL (IV); Jadco-Hughes, NC (IV); SCRDI Bluff Road, SC (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Cliff/Dow Dump, MI

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Xylenes (continued)

(V); Cross Brothers Pail (Pembroke), IL (V); Fisher Calo Chem, IN (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); Northernaire Plating, MI (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine (Amendment), OH (V); Spiegelberg Landfill, MI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Vogel Paint & Wax, IA (VII); Fairchild Semicond (Mt. View), CA (IX); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Fairchild Semicond (S San Jose), CA (IX); Intel (Mountain View), CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Solvent Service, CA (IX)

CONTAMINATED MEDIA

Air

Beacon Heights Landfill, CT (I); Charles George Landfill 3 & 4, MA (I)*; Landfill & Resource Recovery, RI (I); McKin-IRM, ME (I); Sylvester, NH (I); Asbestos Dump, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II); Old Bethpage, NY (II); Ambler Asbestos Piles, PA (III); Heleva Landfill, PA (III); Lansdowne Radiation, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III); Wade, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine, IL (V); Verona Well Field-IRM, MI (V); Wauconda Sand & Gravel, IL (V)*; Missouri Electric Works, MO (VII); Anaconda Smelter/Mill Creek, MT (VIII); Denver Radium II, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Coalinga Asbestos Mine, CA (IX)*; Portland Cement (Kiln Dust #2 & #3), UT (VIII); Mountain View/Globe, AZ (IX); Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; San Fernando Valley (Area 1), CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Taputimu Farm, AS (IX); South Tacoma, WA (X)

Debris

Cannon Engineering, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Stamina Mills, RI (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Chemical Control, NJ (II)*; Claremont Polychemical, NY (II)*; Claremont Polychemical, NY (II)*; GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); King of Prussia, NJ (II); Love Canal, NY (II)*; Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Montclair/West Orange Radium, NJ (II); Myers Property, NJ (II); Radium Chemical, NY (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Sealand

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CONTAMINATED MEDIA

Debris

Restoration, NY (II); Solvent Savers, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III)*; C&R Battery, VA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Dover Air Force Base, DE (III); Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Havertown PCP, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Publicker/Cuyahoga Wrecking, PA (III); Southern Maryland Wood, MD (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); Amnicola Dump, TN (IV); Bypass 601 Groundwater Contamination, NC (IV); Cape Fear Wood Preserving, NC (IV); Kassouf-Kimerling Battery, FL (IV); Lewisburg Dump, TN (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Tower Chemical, FL (IV); Algoma Municipal Landfill, WI (V); Bower's Landfill, OH (V); Fisher Calo Chem, IN (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); Ionia City Landfill, MI (V); K&L Landfill, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Summit National, OH (V); University of Minnesota, MN (V); Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Arkwood, AR (VI); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Dixie Oil, TX (VI); Hardage/Criner (Amendment), OK (VI); Jacksonville Municipal Landfill, AR (VI); Odessa Chromium I, TX (VI)*; Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Fulbright/Sac River Landfill, MO (VII); Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; White Farm Equipment Dump, IA (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Monticello Vicinity Properties (09/29/89), UT (VIII); Sand Creek Industrial, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); MGM Brakes, CA (IX); South Bay Asbestos Area, CA (IX)*; FMC Yakima Pit, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Martin Marietta, OR (X)

Ground Water

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire (09/27/90), MA (I)*; Beacon Heights, CT (I); Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Charles George, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve (09/24/87), MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Sylvester, NH (I);

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Ground Water (continued)

Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Bog Creek Farm, NJ (II); Bog Creek Farm (06/28/89), NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Control, NJ (II); Chemical Control (09/23/87), NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Florence Landfill, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kentucky Avenue Wellfield (09/28/90), NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Lone Pine Landfill (09/28/90), NJ (II)*; Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township, NJ (II); Montgomery Township (06/30/88), NJ (II)*; Myers Property, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II); Price Landfill (09/29/86), NJ (II)*; Reich Farm, NJ (II); Renora, Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sarney Farm, NY (II); Scientific Chemical Processing, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Suffern Village Well Field, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Vestal Water Supply 1-1, NY (II)*; Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Army Creek Landfill (06/29/90), DE (III)*; Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon (09/29/86), PA (III)*; Butz Landfill, PA (III); Chisman Creek, VA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III); Douglassville Disposal(Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical (05/13/86), PA (III)*; East Mt. Zion, PA (III); Fischer & Porter, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Industrial Lane, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; Limestone Road, MD (III); Lord Shope Landfill, PA (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); New Castle Spill, DE (III); Osborne Landfill, PA (III); Raymark, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Sand Gravel & Stone (09/28/90), MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump, PA (III)*; Tyson Dump #1, PA (III)*; US Titanium, VA (III);

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Ground Water (continued)

Wade, PA (III); Walsh Landfill, PA (III); Westline, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote Works, FL (IV); Biscayne Aquifer Sites, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Davie Landfill, FL (IV); Distler Brickyard, KY (IV); Dubose Oil Products, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Hollingsworth, FL (IV); Independent Nail, SC (IV)*; Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Miami Drum Services, FL (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); North Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Schuylkill Metal, FL (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Varsol Spill Site, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); A&F Materials-EDD, IL (V)*; A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Byron Salvage Yard (06/30/89), IL (V)*; Charlevoix, MI (V); Charlevoix (09/30/85), MI (V)*; Chem-Dyne-EDD, OH (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V); Industrial Excess Landfill (07/17/89), OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); Marion/Bragg Landfill, IN (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton-Water Supply System, MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire, MI (V); Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Outboard Marine Corp., IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); Schmaltz Dump, WI (V)*; Seymour, IN (V); Seymour (09/25/87), IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V);

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CONTAMINATED MEDIA

Ground Water (continued)

University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel (03/31/89), IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca (03/31/87), LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit (06/26/87), TX (VI)*; Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI); Odessa Chromium I (03/18/88), TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II (03/18/88), TX (VI)*; Old Inger, LA (VI); Old Midland Products, AR (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley-IRM, NM (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI); United Nuclear, NM (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Arsenic Trioxide, ND (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Libby Ground Water, MT (VIII); Libby Ground Water (12/30/88), MT (VIII)*; Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Milltown-S, MT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ; Lorentz Barrel & Drum, CA (IX); Louisiana-Pacific, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (09/29/88), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard

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Ground Water (continued)

Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing (09/04/88), WA (X)*

Sediments (Creek/River/Stream)

Auburn Road, NH (I); Baird & McGuire, MA (I)*; Cannon/Plymouth, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Haviland Complex, NY (II); Hooker-102nd Street, NY (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II); Love Canal (10/26/87), NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Myers Property, NJ (II); Pijak Farm, NJ (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Wide Beach, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Berks Sand Pit, PA (III); Brown's Battery Breaking, PA (III); Bruin Lagoon, PA (III)*; C&R Battery, VA (III); Chisman Creek, VA (III); Douglassville Disposal, PA (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); Millcreek, PA (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III); Walsh Landfill, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works, WV (III)*; Airco, KY (IV); American Creosote Works, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; National Starch, NC (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Whitehouse Waste Oil Pits, FL (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Lake Sandy Jo, IN (V); LaSalle Electrical Utilities, IL (V)*; MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Republic

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Sediments (Creek/River/Stream) (continued)

Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V); Seymour, IN (V); Summit National, OH (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V); Wedzeb Enterprises, IN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca (03/31/87), LA (VI)*; Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Sediments (Creek/River/Geneva Industries, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Old Midland Products, AR (VI); Sikes Disposal Pits, TX (VI); South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); Fairfield Coal Gasification Plant, IA (VII); Vertac, AR (VI); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Missouri Electric Works, MO (VII); Wheeling Disposal Service, MO (VII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Denver Radium/Card Property, CO (VIII)*; East Helena, MT (VIII); Milltown, MT (VIII); Silver Bow Creek, MT (VIII); Woodbury Chemical, CO (VIII); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); MGM Brakes, CA (IX); Commencement Bay/Nearshore (09/30/89), WA (X); Gould, OR (X); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)

Sludge

Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Nyanza Chemical, MA (I); Tinkhams Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Claremont Polychemical, NY (II)*; Florence Landfill, NJ (II); GE Moreau, NY (II); King of Prussia, NJ (II); Mattiace Petrochemicals, NY (II); North Sea Municipal Landfill, NY (II); Swope Oil, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Bruin Lagoon, PA (III); Coker's Sanitation Service Landfills, DE (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Lackawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; American Creosote Works, FL (IV); American Creosote Works, TN (IV); Brown Wood Preserving, FL (IV); Celanese/Shelby Fibers, NC (IV)*; Davie Landfill, FL (IV); Pioneer Sand, FL (IV); Zellwood, FL (IV); Alsco Anaconda, OH (V); Anderson Development, MI (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Bofors Nobel, MI (V); Burrows Sanitation, MI (V); Forest Waste IRM, MI (V); Forest Waste-IRM, MI (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Liquid Disposal, MI (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); Newlyme, OH (V); Oconomowoc Electroplating, WI (V); Wheeler Pit, WI (V); Arkwood, AR (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Gurley Pitt-Edd, AK (VI); Highlands Acid Pit, TX (VI); Mid-South Wood, AK (VI); Motco, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pitts, TX (VI); Texarkana Wood Preserving, TX (VI); Vertac, AR (VI); Arkansas City Dump, KS (VII); Des Moines TCE, IA (VII); Ellisville, MO (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; McColl, CA (IX); Purity Oil Sales, CA (IX); Queen City Farms-IRM/EDD, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

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Soil

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Beacon Heights, CT (I); Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); McKin-IRM, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve (09/24/87), MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Western Sand & Gravel, RI (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Chemical Control (09/23/87), NJ (II)*; Clothier Disposal,NY (II); Claremont Polychemical, NY (II)*; Combe Fill North Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; Florence Landfill, NJ (II); Forest Glen Subdivision, NY (II); FAA Technical Center, NJ (II); FAA Technical Center (09/24/90), NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium, NJ (II)*; Goose Farm, NJ (II); Helen Kramer, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; ; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (09/30/88), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Syosset Landfill, NY (II); Vestal, NY (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III)*; Bendix, PA (III); Blosenski Landfill, PA (III); Brown's Battery Breaking, PA (III); Bruin Lagoon, PA (III); C&R Battery, VA (III); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; Greenwood Chemical, VA (III); Harvey-Knott, DE (III); Enterprise Avenue, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III)*; Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Lackawanna Refuse Site, PA (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA, (III); Lansdowne Radiation (09/22/86), PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); Lord Shope Landfill, PA (III); Matthews Electroplating, VA (III);

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Soil (continued)

McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); M.W. Manufacturing, PA (III); Ordnance Works Disposal, WV (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); US Titanium, VA (III); Wade, PA (III); Walsh Landfill, PA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, FL (IV); American Creosote Works (09/28/89), FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Lewisburg Dump, TN (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Bros., IL (V); Cross Brothers Pail (Pembroke), IL (V); Distler Brickyard, KY (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (06/30/89), OH (V)*; Liquid Disposal, MI (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Master Disposal Service Landfill, WI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Morris Arsenic, MN (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); New Lyme, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Onalaska Municipal Landfill, WI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmaltz Dump, WI (V); Schmaltz Dump, WI (V)*; Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V); Seymour, IN (V)*; Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel (03/31/89), IL (V)*; Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca (03/31/87), LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Crystal Chemical, TX (VI); Crystal City, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; North Cavalcade Street, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Rogers Road

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CONTAMINATED MEDIA

Soil (continued)

Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI); United Creosoting (09/29/89), TX (VI)*; Vertac, AR (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach (09/28/88), MO (VII)*; Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Jibboom Junkyard, CA (IX); Litchfield Airport, AZ (IX); Louisiana-Pacific, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Mountain View/Globe, AZ (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore, WA (X); FMC Yakima Pit, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; Silver Mountain Mine, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*

Surface Water

Auburn Road, NH (I); Beacon Heights, CT (I); Beacon Heights Landfill (09/28/90), CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Keefe Environmental Services, NH (I)*;

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CONTAMINATED MEDIA

Surface Water (continued)

Laurel Park, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Tinkhams Garage, NH (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Caldwell Trucking, NJ (II); Chemical Insecticide, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Marathon Battery, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bruin Lagoon, PA (III); C&R Battery, VA (III); Chisman Creek, VA (III); Chisman Creek, VA (III)*; Douglassville Disposal, PA (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; Enterprise Avenue, PA (III); Fike Chemical, WV (III); Fischer & Porter PA (III); Harvey-Knott, DE (III); Havertown PCP, PA (III); Heleva Landfill, PA (III); Kimberton, PA (III)*; Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III)*; Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD Surface Water (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); US Titanium, VA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Dubose Oil Products, FL (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (VI); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; National Starch, NC (IV); North Hollywood Dump, TN (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); Johns-Manville, IL (V); Laskin/Poplar Oil, OH (V); Mid-State Disposal, WI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Republic Steel Quarry, OH (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Cleve Reber, LA (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI)*; Mid-South Wood, AR (VI); Motco, TX (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Tar Creek, OK (VI); Fulbright/Sac River Landfill, MO (VII); Northwestern States Portland Cement, IA (VII); Wheeling Disposal Service, MO (VII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX)*; Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits (06/25/87), CA (IX)*; Western Processing, WA (X)*

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PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Direct Contact

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Winthrop Landfill-EDD, ME (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II); Claremont Polychemical (09/28/90), NY (II)*; DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Forest Glen Subdivision, NY (II); Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; Higgins Farm, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Hudson River, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II)*; Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Montgomery Township, NJ (II); Myers Property, NJ (II); Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Port Washington Landfill, NY (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Spence Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Avtex Fibers (09/28/90), VA (III)*; Bendix, PA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C&R Battery, VA (III); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill (06/29/90), PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road (09/28/89), PA (III)*; Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; New Castle Spill, DE (III); New Castle Steel DE (III); Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton

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Zinc, PA (III)*; Publicker/Cuyahoga Wrecking, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Tyson Dump #1 (09/28/90), PA (III)*; Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Munisport Landfill, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); National Starch, NC (IV); North Hollywood Dump, TN (IV); Powersville Landfill, GA (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodeyco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Alsco Anaconda, OH (V); Algoma Municipal Landfill, WI (V); Anderson Development, MI (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste-IRM, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V); Ionia City Landfill, MI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton (TCAAP); MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Rose Township, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V); Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply (09/29/89), WI (V)*; Wedzeb Enterprises, IN (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA

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Direct Contact (continued)

(VI)*; Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/27/89), TX (VI)*; Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Vertac, AR (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII)*; Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); MGM Brakes, CA (IX); Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Silver Mountain Mine, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

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PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Public Exposure

Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Laurel Park, CT (I); New Bedford, MA (I); O'Connor, ME (I); Re-Solve, MA (I)*; Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Glen Ridge Radium, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II); Love Canal (10/26/87), NY (II)*; Ludlow Sand & Gravel, NY (II); Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Upjohn Manufacturing, PR (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Bally Groundwater Contamination, PA (III); Brown's Battery Breaking, PA (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Henderson Road, PA (III); Lansdowne Radiation, PA (III); Millcreek, PA (III); M.W. Manufacturing, PA (III); Ordnance Works Disposal, WV (III); Saltville Waste Disposal Ponds, VA (III); West Virginia Ordnance Works, WV (III)*; Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; National Starch, NC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Allied/Ironton Coke, OH (V)*; Byron Salvage Yard, IL (V)*; Eau Claire Municipal Well Field, WI (V)*; Galesburg/Koppers, IL (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V); Johns-Manville, IL (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Miami County Incinerator, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Outboard Marine (Amendment), IL (V); Rose Township, MI (V); Seymour, IN (V)*; Verona Well Field-IRM, MI (V); Crystal City Airport, TX (VI); Sheridan Disposal Services, TX (VI); South Valley/PL-83, NM (VI)*; Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Shenandoah Stables, MO (VII); Times Beach, MO (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII); Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Coalinga Asbestos Mine, CA (IX)*; Litchfield Airport, AZ (IX); McColl, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos Area, CA (IX); Tucson International Airport, AZ (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X)

REMEDY SELECTION

ARAR Waiver

Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Sullivan's Ledge, MA (I); Caldwell Trucking, NJ (II)*; Higgins Farm, NJ (II); Picatinny Arsenal, NJ (II); Ambler Asbestos Piles, PA (III); Havertown PCP, PA (III); M.W. Manufacturing, PA (III)*; Strasburg Landfill, PA (III); Kassouf-Kimerling Battery Disposal, FL (IV)*; Schuylkill Metal, FL (IV); E.H. Schilling Landfill, OH (V); Galesburg/Koppers, IL (V); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII)

Institutional Controls

Beacon Heights, CT (I); Cannon Engineering, MA (I); Iron Horse Park, MA (I); Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); New Bedford, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I);

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Institutional Controls (continued)

Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); Asbestos Dump, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Clothier Disposal, NY (II); DeRewal Chemical, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Glen Ridge Radium, NJ (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); M&T DeLisa Landfill, NJ (II); Marathon Battery, NY (II); Montclair/West Orange Radium, NJ (II); North Sea Municipal Landfill, NY (II); Olean Well Field, NY (II); Pepe Field, NJ (II); Preferred Plating, NY (II); Rocky Hill, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Syosset Landfill, NY (II); Vestal Water Supply 1-1, NY (II)*; Waldick Aerospace, NJ (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Brown's Battery Breaking, PA (III); C&R Battery, VA (III); Chisman Creek, VA (III); Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Dorney Road Landfill, PA (III); East Mt. Zion, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Hranica Landfill, PA (III); Industrial Lane, PA (III); Keystone Sanitation Landfill, PA (III); L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA (III); New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Raymark, PA (III); Saltville Waste Disposal Ponds, VA (III); Tybouts Corner, DE (III); Tyson Dump #1, PA (III)*; US Titanium, VA (III); Walsh Landfill, PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; Wildcat Landfill, DE (III); Wildcat Landfill, DE (III)*; 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Lewisburg Dump, TN (IV); National Starch & Chemical, NC (IV)*; Newport Dump Site, KY (IV); North Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V)*; Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Morris Arsenic, MN (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical, MN (V)*; Sangamo/Crab Orchard NWR

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Institutional Controls (continued)

(USDOI), IL (V)*; Seymour, IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Summit National, OH (V); Tri-State Plating, IN (V); United Scrap Lead, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Crystal Chemical, TX (VI); Dixie Oil, TX (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products; AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); Rogers Road Municipal Landfill, AR (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/27/89), TX (VI)*; South Cavalcade Street, TX (VI); South Valley/SJ-6, NM (VI)*; Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI); Vertac, AR (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deer, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Fulbright/Sac River Landfill, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Arsenic Trioxide, ND (VIII); Burlington Northern (Somers), MT (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII); Libby Ground Water (12/30/88), MT (VIII)*; Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Applied Materials, CA (IX); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/21/90), CA (IX)*; Intel (Santa Clara III), CA (IX); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); Louisiana-Pacific, CA (IX); Purity Oil Sales, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; Silver Mountain Mine, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*

Interim Remedy

New Bedford, MA (I); Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Diamond Alkali, NJ (II); Glen Ridge Radium, NJ (II); Higgins Farm, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Myers Property, NJ (II); Roebling Steel, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Upjohn Manufacturing, PR (II); Picatinny Arsenal, NJ (II); Vineland Chemical, NJ (II); Bally Groundwater Contamination, PA (III); Croydon TCE Spill, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Kane & Lombard, MD (III); Kimberton, PA (III); Middletown Airfield, PA (III); Palmerton Zinc, PA (III); Saltville Waste Disposal Ponds, VA (III); Strasburg Landfill, PA (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); Whitmoyer Laboratories, PA (III); Bypass 601 Groundwater Contamination, NC (IV); Clare Water Supply, MI (V); Master Disposal Service Landfill, WI (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Oconomowoc Electroplating, WI (V); Wausau Water Supply, WI (V); Cherokee County/Galena, KS (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Weldon Spring

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Interim Remedy (continued)

Quarry/Plant/Pits (USDOE), MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek (03/31/88), CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII)*; Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU22), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Litchfield Airport, AZ (IX); Operating Industries, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); San Gabriel Area 1, CA (IX); Silver Mountain Mine, WA (X); Stringfellow Acid Pits, CA (IX); Gould, OR (X); Teledyne Wah Chang Albany (TWCA), OR (X)

No Action Remedy

Baird & McGuire, MA (I)*; Beachwood/Berkeley Well, NJ (II); BEC Trucking, NY (II); Cooper Road, NJ (II); Friedman Property, NJ (II); M&T DeLisa Landfill, NJ (II); Pijak Farm, NJ (II); Pomona Oaks Well Contamination, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II); Price Landfill (09/29/86), NJ (II)*; Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); South Brunswick Landfill, NJ (II); Spence Farm, NJ (II); Suffern Village Well Field, NY (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Vega Alta, PR (II); Vestal, NY (II); Vineland Chemical, NJ (II); Vineland State School, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Army Creek Landfill, DE (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Middletown Road, MD (III); New Castle Steel DE (III); Presque Isle, PA (III); Reeser's Landfill, PA (III); Taylor Borough, PA (III)*; Voortman Farm, PA (III); Westline, PA (III)*; Westline (Amendment), PA (III)*; Ciba-Geigy, AL (IV); Independent Nail, SC (IV)*; Kassouf-Kimerling Battery, FL (IV); National Starch & Chemical, NC (IV)*; Tri-City Conservation, FL (IV); Varsol Spill, FL (IV); Adrian Municipal Well Field, MN (V); Cemetery Dump, MI (V); IMC Terre Haute, IN (V); Morris Arsenic, MN (V); NL/Taracorp/Golden Auto Parts, MN (V)*; Peterson Sand & Gravel, IL (V); Poer Farm, IN (V); Union Scrap Iron Metal, MN (V); Whitehall Municipal Wells, MI (V); Cecil Lindsey, AR (VI); Gurley Pit, AR (VI); Highlands Acid Pit, TX (VI)*; Homestake Mining, NM (VI); Pagano Salvage, NM (VI); Sand Springs, OK (VI)*; South Valley/Edmunds Street, NM (VI)*; Stewco, TX (VI); Arkansas City Dump, KS (VII)*; Big River Sand, KS (VII); Hastings Groundwater Contamination (FAR-MAR-CO), NE (VII); John's Sludge Pond, KS (VII); Rocky Mountain Arsenal (OU22), CO (VIII)*; Ordot Landfill, GU (IX); Toftdahl Drum, WA (X)*

O & M

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire (09/14/89), MA (I)*; Baird & McGuire (09/27/90), MA (I)*; Beacon Heights Landfill, CT (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I);

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Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; Laurel Park, CT (I); Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Clothier Disposal,NY (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II); Florence Landfill, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, KY (II); Kentucky Avenue Wellfield (09/28/90), NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Vestal Water Supply 1-1, NY (II)*; Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Army Creek Landfill, DE (III)*; Bruin Lagoon, PA (III); Bruin Lagoon (09/29/86), PA (III)*; Butz Landfill, PA (III); C&R Battery, VA (III); Chisman Creek, VA (III); Chisman Creek (03/31/88), VA (III)*; Coker's Sanitation Service Landfills, DE (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill (06/29/90), PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; East Mt. Zion, PA (III); Fike Chemical, WV (III); Havertown PCP, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA (III)*; Limestone Road, MD (III); Lord Shope Landfill, PA (III); Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Millcreek, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Raymark, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner Landfill, DE (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); US Titanium, VA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, VA (III); West Virginia Ordnance Works (09/30/88), WV (III)*;

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62nd Street Dump, FL (IV); Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); National Starch & Chemical, NC (IV)*; Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-EDD, IL (V); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Chem-Dyne-EDD, OH (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); National Presto Industries, WI (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Old Mill, OH (V); Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Onalaska Municipal Landfill, WI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V)*; Seymour, IN (V); Seymour (09/25/87), IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau

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Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI); Odessa Chromium I (03/18/88), TX (VI)*; Odessa Chromium II, TX (VI); Odessa Chromium II (03/18/88), TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/SJ-6, NM (VI)*; Tar Creek, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI); United Creosoting (09/29/89), TX (VI)*; United Nuclear, NM (VI); Vertac, AR (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Arsenic Trioxide, ND (VIII); California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII); Central City/Clear Creek, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII); Libby Ground Water (12/30/88), MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Milltown, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU19), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII)*; Applied Materials, CA (IX); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/21/90), CA (IX)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); South Bay Asbestos

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REMEDY SELECTION

O & M (continued)

Area, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX)*; Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner-IRM, WA (X); Silver Mountain Mine, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Toftdahl Drum, WA (X); United Chrome, OR (X); Western Processing, WA (X)*

ROD Amendment

Picillo Farm (Amendment), RI (I); Tinkhams Garage (Amendment), NH (I); Coleman-Evans Wood Preserving (Amendment), FL (IV); Tyson's Dump (Amendment), PA (III); Westline (Amendment), PA (III)*; Chemtronics (Amendment), NC (IV); Ordnance Works Disposal Areas (Amendment), WV (III); Hipps Road Landfill (Amendment), FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); New Brighton/Arden Hills (Amendment), MN (V); Outboard Marine (Amendment), IL (V); Pristine (Amendment), OH (V); Rose Township (Amendment), MI (V); Hardage/Criner (Amendment), OK (VI); Woodbury Chemical (Amendment), CO (VIII); Operating Industries Landfill (Amendment), CA (IX)*; Ponders Corner/Lakewood (Amendment), WA (X); Western processing (Amendment), WA (X)

WATER SUPPLY

Alternate Water Supply

Auburn Road, NH (I): Charles George, MA (I); Davis Liquid Waste, RI (I); Kellogg-Deering Well Field, CT (I)*; Winthrop Landfill-EDD, ME (I); American Thermostat, NY (II); Bridgeport, NJ (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GE Moreau, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Kentucky Avenue Well Field, NY (II); Krysowaty Farm, NJ (II); Metaltec/Aerosystems, NJ (II); Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Nascolite, NJ (II); Olean Well Field, NY (II); Price Landfill, NJ (II); Rocky Hill, NJ (II); Vega Alta, PR (II); Williams Property, NJ (II); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Butz Landfill, PA (III); Chisman Creek, VA (III); Croydon TCE Spill, PA (III); Cryo-Chem, PA (III); Fischer & Porter, PA (III); Industrial Lane, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; Matthews Electroplating, VA (III); Middletown Airfield, PA (III); Strasburg Landfill, PA (III); Walsh Landfill, PA (III); Palmetto Wood Preserving, SC (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Acme Solvents, IL (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Byron Salvage, IL (V)*; Byron Salvage (06/30/89), IL (V)*; Charlevoix, MI (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; Industrial Excess Landfill, OH (V); Kummer Landfill, MN (V); Lake Sandy Jo, IN (V); Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); National Presto Industries, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Water Supply System, MN (V)*; Old Mill, OH (V); Reilly Tar, MN (V); South Andover, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Wausau Water Supply, WI (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); South Valley-IRM, NM (VI); Cherokee County/Galena, KS (VII); Deere, John, Dubuque Works, IA (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Libby Ground Water (12/30/88),

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WATER SUPPLY

Alternate Water Supply (continued)

MT (VIII)*; Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Silver Mountain Mine, WA (X)

Drinking Water Contaminants

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendmment), NH (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); American Thermostat (06/20/90), NY (II)*; Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Kentucky Avenue Wellfield, NY (II); Kentucky Avenue Well Field (09/28/90), NY (II)*; Mannheim Avenue Dump, NJ (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rockaway Borough Well Field, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Scientific Chemical Processing, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Vestal Water Supply 1-1, NY (II)*; Williams Property, NJ (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Butz Landfill, PA (III); Chisman Creek, VA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill (06/29/90), PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Delaware Sand and Gravel, DE (III); East Mt. Zion, PA (III); Fischer & Porter, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Industrial Lane, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; Middletown Airfield, PA (III); New Castle Steel DE (III); Osborne Landfill, PA (III); Raymark, PA (III); Walsh Landfill, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); City Industries, FL (IV); Geiger (C&M Oil), SC (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Jadco-Hughes, NC (IV); Lewisburg Dump, TN (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Byron Johnson Salvage Yard, IL (V)*; Byron Salvage Yard, IL (V)*; Clare Water Supply, MI (V); Eau Claire-IRM, WI (V); Eau Claire Municipal Well Field, WI (V)*; Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V); Industrial Excess Landfill (07/17/89), OH (V)*; K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Main Street Wellfield, IN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills/St. Anthony, MN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary

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WATER SUPPLY

Drinking Water Contaminants (continued)

Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical, MN (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; Tower Chemical, FL (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Verona Well Field-IRM, MI (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Arkwood, AR (VI); Crystal Chemical, TX (VI); Hardage/Criner, OK (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Odessa Chromium II (03/18/88), TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Des Moines TCE, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal, CO (VIII); Smuggler Mountain, CO (VIII); Applied Materials, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4)*, CA (IX)*; Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X)

Floodplain

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); Burnt Fly Bog, NJ (II)*; Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Clothier Disposal,NY (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Florence Landfill, NJ (II); Fulton Terminals, NY (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Myers Property, NJ (II); Renora Inc., NJ (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sharkey Landfill, NJ (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Bendix, PA (III); Brown's Battery Breaking, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III)*; Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III); Fike Chemical, WV (III); Havertown PCP, PA (III); L.A. Clarke & Son, VA (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; Tyson Dump #1, PA (III)*; US Titanium, VA (III); West Virginia Ordnance Works, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill (11/28/88), DE (III)*; American

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WATER SUPPLY

Floodplain (continued)

Creosote Works, TN (IV); American Creosote Works (01/05/89), FL (IV); Amnicola Dump, TN (IV); Bypass 601 Groundwater Contamination, NC (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Newport Dump Site, KY (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Wamchem, SC (IV); A&F Materials, IL (V); A&F Materials-EDD, IL (V)*; Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Belvidere Landfill, IL (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Clare Water Supply, MI (V); FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Miami County Incinerator, OH (V); Moss-American Kerr-McGee Oil, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; St. Louis River, MN (V); Wayne Waste Oil, IN (V); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca (03/31/87), LA (VI)*; Cleve Reber, LA (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Gurley Pit (09/26/88), AR (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit (06/26/87), TX (VI)*; Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/27/89), TX (VI)*; Sikes Disposal Pits, TX (VI); Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Triangle Chemical, TX (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County, KS (VII)*; Deere, John, Dubuque Works, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Lindsay Manufacturing, NE (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; White Farm Equipment Dump, IA (VII); Burlington Northern (Somers), MT (VIII); Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Applied Materials, CA (IX); East Helena, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Whitewood Creek, SD (VIII); Beckman Instruments/Porterville, CA (IX); Celtor Chemical, CA (IX)*; Koppers (Oroville Plant), CA (IX); Louisiana-Pacific, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Commencement Bay/Nearshore (09/30/89), WA (X); Frontier Hard Chrome (12/30/87), WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

Sole-Source Aquifer

Davis Liquid Waste, RI (I); Caldwell Trucking, NJ (II)*; Myers Property, NJ (II); Price Landfill, NJ (II); Rockaway Borough Wellfield, NJ (II); SMS Instruments, NY (II); Syosset Landfill, NY (II); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Butz Landfill, PA (III); Biscayne Aquifer Sites, FL (IV); Pioneer Sand, FL (IV); Zellwood, FL (IV); Clare Water Supply, MI (V); Master Disposal Service Landfill, WI (V); Wausau Water Supply, WI (V)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Cherokee County, KS (VII)*; Hastings Groundwater/Colorado Avenue, NE (VII); Waverly Groundwater Contamination, NE (VII); Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Northside Landfill, WA (X)

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WATER SUPPLY

Wetlands

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); New Bedford, MA (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Bog Creek Farm, NJ (II); Bog Creek Farm (06/28/89), NJ (II)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Clothier Disposal, NY (II); Combe Fill South Landfill, NJ (II); Ewan Property, NJ (II)*; Helen Kramer, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Metaltec/Aerosystems, NJ (II)*; Myers Property, NJ (II); PAS Oswego, NY (II); Renora Inc., NJ (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Wide Beach, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Bendix, PA (III); Butz Landfill, PA (III); Chisman Creek, VA (III); Chisman Creek (03/31/88), VA (III)*; Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); L.A. Clarke & Son, VA (III); Millcreek, PA (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Tyson Dump #1, PA (III)*; Westline, PA (III); West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works (09/30/88), WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Wildcat Landfill (11/28/88), DE (III)*; 62nd Street Dump, FL (IV); Cape Fear Wood Preserving, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Munisport Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Algoma Municipal Landfill, WI (V); Arrowhead Refinery, MN (V); Bofors Nobel, MI (V); Burrows Sanitation, MI (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Kummer Sanitary Landfill, MN (V)*; Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Naval Industrial Reserve Ordnance Plant, MN (V); Oak Grove Landfill, MN (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park) (09/28/90), MN (V)*; Rose Township, MI (V); Schmaltz Dump, WI (V); Schmaltz Dump, WI (V)*; Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Homestake Mining, NM (VI); Motco, TX (VI)*; Old Inger, LA (VI); Tar Creek, OK (VI); Cherokee County, KS (VII)*; Lindsay Manufacturing, NE (VII); Missouri Electric Works, MO (VII); White Farm Equipment Dump, IA (VII); East Helena, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Silver Bow Creek, MT (VIII); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Commencement Bay/Nearshore (09/30/89), WA (X)

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Hybrid/Alternate Closure

Davis Liquid Waste, RI (I); Ringwood Mines/Landfill, NY (II); C&R Battery, VA (III); Kane & Lombard, MD (III); M.W. Manufacturing, PA (III)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Johns-Mansville, IL (V) Oconomowoc Electroplating, WI (V); Velsicol Chemical, IL (V); Arkansas City Dump, KS (VII); Frontier Hard Chrome (12/30/87), WA (X)

ARARs (Used as a keyword from FY 1982 - 1988 only)

Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Asbestos Dump, NJ (II); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II)*; Ewan Property, NJ (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NY (II); Katonah Municipal Well, NY; Kin-Buc Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (09/30/88), NY (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II); Nascolite, NJ (II); Old Bethpage, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); South Brunswick Landfill, NJ (II)*; Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Chisman Creek, VA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Henderson Road, PA (III); Kane & Lombard, MD (III); Kimberton, PA (III); L.A. Clarke & Son, VA (III); Middletown Airfield, PA (III); Ordnance Works Disposal, WV (III); Palmerton Zinc, PA (III): Palmerton Zinc (06/29/88), PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Westline, PA (III)*; West Virginia Ordnance Works, WV (III); West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III); Airco, KY (IV); Alpha Chemical, FL (IV); Brown Wood Preserving, FL (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV): Goodrich, B.F., KY (IV); National Starch, NC (IV); Newport Dump Site, KY (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Powersville Landfill, GA (IV); Sodeyco, NC (IV); Tower Chemical, FL (IV); Tri-City Conservation, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Coshocton Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); IMC Terre Haute, IN (V); Johns-Manville, IL (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton (TCAAP), MN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmaltz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Bayou Bonfouca, LA (VI)*; Bayou Sorrel, LA (VI); Brio

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ARARs (Used as a keyword from FY 1982 - 1988 only) (continued)

Refining, TX (VI); Cleve Reber, LA (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood Products, AR (VI); North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); Petro-Chemical System, TX (VI); Sand Springs, OK (VI)*; Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County/Galena, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Solid State Circuits, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Broderick Wood Products, CO (VIII); Central City/Clear Creek, CO (VIII); Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium III, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Rocky Mountain Arsenal, CO (VIII); Indian Bend Wash, AZ (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX);Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); Selma Pressure Treating, CA (IX); South Bay Asbestos Area, CA (IX); Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Colbert Landfills, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X)

Clean Air Act

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Asbestos Dump, NJ (II); Chemical Leaman Tank Lines, NJ (II); Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lipari Landfill, NJ (II)*; Metaltec/Aerosystems, NJ (II)*; Myers Property, NJ (II); Picatinny Arsenal, NJ (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Sayreville Landfill, NJ (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Ambler Asbestos Piles, PA (III); Bally Groundwater Contamination, PA (III); C&R Battery, VA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Fike Chemical, WV (III); Fike Chemical, WV (III); Greenwood Chemical, VA (III); Keystone Sanitation Landfill, PA (III); Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III)*; Ordnance

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Clean Air Act (continued)

Works Disposal Areas (Amendment), WV (III); Raymark, PA (III); Tyson's Dump, PA (III)*; Airco, KY (IV); Bypass 601 Groundwater Contamination, NC (IV); Carolawn, SC (IV); Celanese/Shelby Fibers, NC (IV)*; City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); National Starch, NC (IV); SCRDI Bluff Road, SC (IV); Smith's Farm, KY (IV); Anderson Development, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Fort Wayne Reduction, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Master Disposal Service Landfill, WI (V); MIDCO I, IN (V); MIDCO II, IN (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (TCAAP), MN (V); New Brighton (TCAAP), MN (V)*; Northernaire Plating, MI (V)*; Ott/Story/Cordova Chemical, MI (V)*; Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; St. Louis River, MN (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Crystal Chemical, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Arkansas City Dump, KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Shenandoah Stables, MO (VII)*; Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); East Helena, MT (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX): Coalinga Asbestos Mine (09/28/90), CA (IX)*; Intersil, CA (IX); Koppers (Oroville Plant), CA (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Valley (Area 1), CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area (09/29/89), CA (IX)*; Stringfellow, CA (IX)*; Gould, OR (X); Northside Landfill, WA (X); Silver Mountain Mine, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

Clean Water Act

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); ; Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Chemical Control, NJ (II)*; Ciba-Geigy, NJ (II)*; Endicott Village Well Field, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Marathon Battery

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Clean Water Act (continued)

(09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II)*; Nascolite, NJ (II); Picatinny Arsenal, NJ (II); Preferred Plating, NY (II); Sarney Farm, NY (II); Scientific Chemical Processing, NJ (II); South Brunswick Landfill, NJ (II); Vega Alta, PR (II); Volney Landfill, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Butz Landfill, PA (III); Chisman Creek, VA (III)*; Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; L.A. Clarke & Son, VA (III); M.W. Manufacturing (06/29/90), PA (III)*; New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Raymark, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; Tyson Dump #1, PA (III)*; West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Allied/Ironton Coke, OH (V)*; Anderson Development, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Clare Water Supply, MI (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V); Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Ionia City Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Master Disposal Service Landfill, WI (V); Miami County Incinerator, OH (V); MIDCO II, IN (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; St. Louis River, MN (V); Summit National, OH (V); University of Minnesota, MN (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wayne Waste Oil, IN (V); Windom Dump, MN (V); Arkwood, AR (VI); Brio Refining, TX (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Arkansas City Dump, KS

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(VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Burlington Northern (Somers), MT (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Mystery Bridge at Highway 20, WY (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Litchfield Airport, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment) (09/28/90), CA (IX)*; Ordot Landfill, GU (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Colbert Landfill, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X)

Water Quality Criteria

Coakley Landfill, NH (I); New Bedford, MA (I); Re-Solve, MA (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Chemical Control, NJ (II)*; Endicott Village Well Field, NY (II); Fulton Terminals, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Marathon Battery (09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II)*; Preferred Plating, NY (II); Sayreville Landfill, NJ (II); Solvent Savers, NY (II); Army Creek Landfill, DE (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; New Castle Steel DE (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Southern Maryland Wood, MD (III); Tyson's Dump, PA (III)*; West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III)*; 62nd Street Dump, FL (IV); Airco, KY (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman Evans, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill (Amendment), FL (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Schuylkill Metal, FL (IV); Wamchem, SC (IV); Allied/Ironton Coke, OH (V)*; Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); Kysor Industrial, MI (V); Master Disposal Service Landfill, WI (V); New Brighton-Water Supply System, MN (V)*; Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Summit National, OH (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI);

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Water Quality Criteria (continued)

Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; United Creosoting, TX (VI)*; Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX) Ordot Landfill, GU (IX); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

RCRA

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Baird & McGuire (09/27/90), MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Western Sand & Gravel, RI (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Diamond Alkali, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); GE Wiring Devices, PR (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II); Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II)*; PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); South Brunswick Landfill, NJ (II)*; Syosset Landfill, NY (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III)*; Bendix, PA (III); Berks Sand Pit, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Henderson Road (06/30/88), PA (III)*; Hranica Landfill, PA (III); Keystone Sanitation Landfill, PA (III); L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; New Castle Steel DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Publicker/Cuyahoga

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RCRA (continued)

Wrecking, PA (III); Raymark, PA (III); Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); West Virginia Ordnance Works, WV (III)*; Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); American Creosote Works (09/28/89), FL (IV); Amnicola Dump, TN (IV); Biscayne Aquifer Sites, FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Newport Dump Site, KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V); Northernaire Plating (09/29/89), MI (V)*; Old Mill, OH (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Republic Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; St. Louis River, MN (V); Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Aidex, IA (VII)*; Arkansas City Dump,KS (VII); Chemplex, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII);

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RCRA (continued)

Hastings Groundwater, NE (VII); Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Silver Bow Creek, MT (VIII); Woodbury Chemical, CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (San Jose), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX) Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X)*; Commencement Bay/Tacoma, WA (X); FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*

Closure Requirements

Auburn Road Landfill, NH (I)*; Kearsarge Metallurgical, NH (I); Landfill & Resource Recovery, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Tinkhams Garage (Amendment), NH (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Brewster Well Field, NY (II); Bridgeport, NJ (II); Claremont Polychemical, NY (II)*; Combe Fill North Landfill, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Picatinny Arsenal, NJ (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Vineland Chemical, NJ (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Enterprise Avenue, PA (III); Hranica Landfill, PA (III); Kane & Lombard, MD (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal Areas (Amendment), WV (III); Tyson's Dump (Amendment), PA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Whitmoyer Laboratories, PA (III); Cape Fear Wood Preserving, NC (IV); Chemtronics (Amendment), NC (IV); Gallaway Ponds, TN (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Smith's Farm, KY (IV); Auto Ion Chemicals, MI (V); Allied/Ironton Coke, OH (V)*; Cliff/Dow Dump, MI (V); Fort Wayne Reduction, IN (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Ionia City Landfill, MI (V); K&L Landfill, MI (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Metamora Landfill, MI (V)*; NL Industries/Taracorp Lead Smelt, IL (V); Rose Township, MI (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V)*; Windom Dump, MN (V); Bayou Sorrel, LA (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); Texarkana Wood Preserving, TX (VI); Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Midwest Manufacturing/North Farm, IA (VII); Libby Ground Water, MT (VIII)*; Ogden Defense Depot, UT (VIII); Sand Creek Industrial, CO

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Closure Requirements (continued)

(VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Silver Bow Creek, MT (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Operating Industries Landfill (Amendment), CA (IX)*; Selma Pressure Treating, CA (IX); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); South Tacoma, WA (X); Western Processing, WA (X)*

Clean Closure

American Thermostat, NY (II)*; Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Wiring Devices, PR (II); King of Prussia, NJ (II); Renora Inc., NJ (II); Williams Property, NJ (II); C&R Battery, VA (III); Greenwood Chemical, VA (III); Havertown PCP, PA (III); Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Alsco Anaconda, OH (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Bayou Bonfouca, LA (VI)*; Pesses Chemical, TX (VI); Texarkana Wood Preserving, TX (VI); Vertac, AR (VI); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Sand Creek Industrial, CO (VIII); FMC Yakima Pit, WA (X)

Landfill Closure

Landfill & Resource Recovery, RI (I); W.R. Grace (Acton Plant), MA (I); Kin-Buc Landfill, NJ (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Port Washington Landfill, NY (II); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Dover Air Force Base, DE (III); Keystone Sanitation Landfill, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal (Amendment), WV (III); Tyson's Dump, PA (III); Tyson's Dump (Amendment), PA (III); US Titanium, VA (III); Chemtronics (Amendment), NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Munisport Landfill, FL (IV); Allied/Ironton Coke, OH (V)*; Bower's Landfill, OH (V); E.H. Schilling Landfill, OH (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Laskin/Poplar Oil, OH (V); Mason County Landfill, MI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Summit National, OH (V); Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Crystal Chemical, TX (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Rogers Road Municipal Landfill, AR (VI); Doepke Disposal (Holliday), KS (VII); Midwest Manufacturing/North Farm, IA (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Martin Marietta, Denver Aerospace, CO (VIII); Operating Industries Landfill (Amendment), CA (IX)*; Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X)

Safe Drinking Water Act

Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Laurel Park, CT (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard,

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Safe Drinking Water Act (continued)

ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II); Chemical Leaman Tank Lines, NJ (II); Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Hooker-102nd Street, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Solvent Savers, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Butz Landfill, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III); Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); East Mt. Zion, PA (III); Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Voortman Farm, PA (III); 62nd Street Dump, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fisher Calo Chem, IN (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Long Prairie, MN (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); MIDCO II, IN (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); Schmaltz Dump, WI (V)*;

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Safe Drinking Water Act (continued)

Seymour, IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Tri-State Plating, IN (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); Hardage/Criner (Amendment), OK (VI); French Limited, TX (VI); Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Cherokee County, KS (VII)*; Cherokee County/Galena, KS (VII); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Sand Creek Industrial, CO (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX)*; San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Silver Mountain Mine, WA (X)

MCLs

Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Kearsarge Metallurgical, NH (I); Kellogg-Deering Well Field, CT (I)*; Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II); Byron Barrel & Drum, NY (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Endicott Village Well Field,

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MCLs (continued)

NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Old Bethpage, NY (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Williams Property, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Butz Landfill, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Henderson Road, PA (III); Henderson Road, PA (III)*; Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); New Castle Steel DE (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Strasburg Landfill, PA (III); Tyson's Dump, PA (III)*; Walsh Landfill, PA (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal (03/30/90), FL (IV)*; Lewisburg Dump, TN (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Byron Salvage Yard, IL (V)*; Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); FMC Corporation, MN (V)*; Fisher Calo Chem, IN (V); Forest Waste Disposal, MI (V)*; Hedblum Industries, MI (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Rose Township, MI (V); Schmaltz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Springfield Township Dump, MI (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Windom Dump, MN (V); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Hardage/Criner (Amendment), OK (VI);

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MCLs (continued)

Highlands Acid Pit, TX (VI)*; Industrial Waste Control, AR (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI)*; Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Big River Sand, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Sand Creek Industrial, CO (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX)*; San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X); Silver Mountain Mine, WA (X)

MCLGs

Beacon Heights Landfill, CT (I); Coakley Landfill, NH (I); Kearsarge Metallurgical, NH (I); Old Springfield Landfill, VT (I); Rose Disposal Pit, MA (I); Stamina Mills, RI (I); Kentucky Avenue Wellfield, NY (II)*; Vestal Water Supply 1-1, NY (II)*; Bally Groundwater Contamination, PA (III); Drake Chemical, PA (III)*; Henderson Road, PA (III); Henderson Road (09/29/89), PA (III)*; Keystone Sanitation Landfill, PA (III); Middletown Airfield, PA (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Dubose Oil Products, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); National Starch, NC (IV); Pickettville Road Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Bofors Nobel, MI (V); Fisher Calo Chem, IN (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Metamora Landfill, MI (V)*; Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Springfield Township Dump, MI (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Wayne Waste Oil, IN (V); Cherokee County, KS (VII)*; Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Vogel Paint & Wax, IA (VII); Martin Marietta, Denver

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

MCLGs (continued)

Aerospace, CO (VIII); Rocky Flats Plant (DOE), CO (VIII); Intersil, CA (IX); J.H. Baxter, CA (IX); Solvent Service, CA (IX); Watkins Johnson (Stewart Division), CA (IX)

State Standards/Regulations/Guidance

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II); American Thermostat (06/29/90), NY (II)*; Asbestos Dump, NJ (II); Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Insecticide, NJ (II); Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); Glen Ridge Radium, NJ (II)*; Goose Farm, NJ (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kentucky Avenue Wellfield (09/28/90), NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montclair/West Orange Radium, NJ (II)*; Montgomery Township, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Swope Oil, NJ (II); Suffern Village Well Field, NY (II); Syosset Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Avtex Fibers (09/28/90), VA (III)*; Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Butz Landfill, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; East Mt. Zion, PA (III); Fike Chemical, WV (III); Greenwood Chemical, VA (III); Havertown PCP, PA (III); Henderson Road, PA (III); Hranica Landfill, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA

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State Standards/Regulations/Guidance (continued)

(III); M.W. Manufacturing, PA (III)*; New Castle, DE (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III); Palmerton Zinc, PA (III)*; Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Saltville Waste Disposal Ponds, VA (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Tyson Dump #1, PA (III)*; US Titanium, VA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Alpha Chemical, FL (IV); American Creosote Works, TN (IV); Bypass 601 Groundwater Contamination, NC (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Munisport Landfill, FL (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Tri-City Conservation, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-EDD, IL (V)*; Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Anderson Development, MI (V); Auto Ion Chemicals, MI (V); Auto Ion Chemicals (09/27/89), MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Byron Salvage Yard, IL (V)*; Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Liquid Disposal, MI (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); Moss-American Kerr-McGee Oil, WI (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); Ninth Avenue Dump, IN (V)*; NL/Taracorp/Golden Auto Parts, MN (V)*; NL Industries/Taracorp Lead Smelt, IL (V); Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical, MN (V)*; Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V)*; Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Dixie Oil, TX (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Sheridan Disposal Services, TX (VI)*; Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; United Nuclear, NM (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Cherokee County/Galena, KS (VII); Cherokee County, KS (VII)*; Conservation Chemical, MO (VII);

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State Standards/Regulations/Guidance (continued)

Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Northwestern States Portland Cement, IA (VII); Shenandoah Stables, MO (VII); Solid State Circuits,MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Monticello Vicinity Properties, UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Union Pacific, WY (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII)*; Applied Materials, CA (IX); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Iron Mountain Mine, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; San Fernando Valley (Area 1), CA (IX); Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Silver Mountain Mine, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Teledyne Wah Chang Albany (TWCA), OR (X)

Drinking Water Standards (FY 1982 - 1988 only)

Charles George Landfill 3 & 4, MA (I)*; Groveland Wells, MA (I); Old Springfield Landfill, VT (I); Yaworski Lagoon, CT (I); GE Moreau, NY (II); Marathon Battery (09/30/88), NY (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Upjohn Manufacturing, PR (II); Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Coleman Evans, FL (IV); Old Inger, LA (IV); Tri-City Conservation, FL (IV); Allied/Ironton Coke, OH (V)*; Burrows Sanitation, MI (V); IMC Terre Haute, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Atchison/Santa Fe (Clovis),

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Drinking Water Standards (FY 1982 - 1988 only) (continued)

NM (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; South Valley-IRM, NM (VI); South Valley/PL-83, NM (VI)*; United Nuclear, NM (VI); Milltown, MT (VIII); Indian Bend Wash, AZ (IX); MGM Brakes, CA (IX); Colbert Landfill, WA (X); United Chrome, OR (X)

Toxic Substances Control Act

Cannon Engineering, MA (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Sullivan's Ledge, MA (I); Wells G&H, MA (I); Burnt Fly Bog, NJ (II)*; Clothier Disposal,NY (II); FAA Technical Center, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Krysowaty Farm, NJ (II); Ludlow Sand & Gravel, NY (II); Renora Inc., NJ (II); Roebling Steel, NJ (II); Sayreville Landfill, NJ (II); Solvent Savers, NY (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III)*; Douglassville Disposal, PA (III)*; Douglassville Disposal (Amendment), PA (III); Osborne Landfill, PA (III); 62nd Street Dump, FL (IV); Cape Fear Wood Preserving, NC (IV); Chemtronics, NC (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); Yellow Water Road, FL (IV); Alsco Anaconda, OH (V); Belvidere Landfill, IL (V); Conservation and Chemical Corporation, IN (V); Cross Brothers Pail (Pembroke), IL (V); Fields Brook, OH (V); Fisher Calo Chem, IN (V); LaSalle Electrical Utilities, IL (V)*; MIDCO I, IN (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Republic Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Summit National, OH (V); U.S. Aviex, MI Control Act (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field-IRM, MI (V); Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Brio Refining, TX (VI); Crystal City Airport, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); North Calvacade Street, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); Tenth Street Dump/Junkyard, OK (VI); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Missouri Electric Works, MO (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Ordot Landfill, GU (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (07/05/88), WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X)

Public Health Advisory

Norwood PCBs, MA (I); Myers Property, NJ (II); Ambler Asbestos Piles, PA (III); Lansdowne Radiation, PA (III); Northernaire Plating, MI (V)*; Teledyne Wah Chang Albany (TWCA), OR (X) Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Iron Horse Park, MA (I); Norwood PCBs, MA (I); Bog Creek Farm, NJ (II)*; Chemical Insecticide, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Kin-Buc Landfill, NJ (II); Marathon Battery (09/29/89), NY (II)*; Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Army Creek Landfill, DE (III); Bally Groundwater Contamination, PA (III); Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Kimberton, PA (III)*; Airco, KY (IV); Celanese Fibers Operations, NC (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); Byron Salvage Yard, IL (V)*; Cross Brothers Pail (Pembroke), IL (V); Hedblum Industries, MI (V); Kysor Industrial, MI (V); MIDCO I, IN (V);

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STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Public Health Advisory (continued)

New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V); Verona Well Field-IRM, MI (V);

State Permit

Wausau Water Supply, WI (V); South Calvacade Street, TX (VI); Solid State Circuits, MO (VII); Waverly Groundwater Contamination, NE (VII); White Farm Equipment Dump, IA (VII); IBM (San Jose), CA (IX); Koppers (Oroville Plant), CA (IX); Motorola 52nd Street, AZ (IX); Commencement Bay/Nearshore (09/30/89), WA (X)

TESTING/PILOT STUDIES

Leachability Tests

Iron Horse Park, MA (I); New Bedford, MA (I); Re-Solve, MA (I); American Thermostat, NY (II)*; DeRewal Chemical, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Lone Pine Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Roebling Steel, NJ (II); Vineland Chemical, NJ (II); C&R Battery, VA (III); US Titanium, VA (III); Ciba-Geigy, AL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Flowood, MS (IV); Yellow Water Road, FL (IV); Auto Ion Chemicals, MI (V); Bofors Nobel, MI (V); Fisher Calo Chem, IN (V); K&L Landfill, MI (V); Master Disposal Service Landfill, WI (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Wayne Waste Oil, IN (V); Crystal Chemical, TX (VI); Motco, TX (VI)*; Rogers Road Municipal Landfill, AR (VI); Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI)*; Cherokee County, KS (VII)*; Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); East Helena, MT (VIII); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX)

Treatability Studies

Beacon Heights Landfill, CT (I); Davis Liquid Waste, RI (I); Landfill & Resource Recovery, RI (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Burnt Fly Bog, NJ (II)*; Chemical Control, NJ (II)*; Ewan Property, NJ (II)*; GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Mannheim Avenue Dump, NJ (II); Montclair/West Orange Radium, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); SMS Instruments, NY (II); Scientific Chemical Processing, NJ (II); Solvent Savers, NY (II); Tabernacle Drum Dump, NJ (II); Vineland Chemical, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III)*; Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III);

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TESTING/PILOT STUDIES

Treatability Studies (continued)

Palmerton Zinc, PA (III); Palmerton Zinc (06/29/88), PA (III)*; Saltville Waste Disposal Ponds, VA, (III); Southern Maryland Wood, MD (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); American Creosote Works (01/05/89), FL (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Munisport Landfill, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Yellow Water Road, FL (IV); Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Cliff/Dow Dump, MI (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Ionia City Landfill, MI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Pristine, OH (V); Pristine (Amendment), OH (V); Seymour, IN (V)*; Springfield Township Dump, MI (V); Wayne Waste Oil, IN (V); Arkwood, AR (VI); Bailey Waste Disposal, TX (VI); Crystal Chemical, TX (VI); Koppers/Texarkana, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Missouri Electric Works, MO (VII); Vogel Paint & Wax, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); Central City/Clear Creek, CO (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Sand Creek Industrial, CO (VIII); Fairchild Semicond (S San Jose), CA (IX); Intel (Santa Clara III), CA (IX); Koppers (Oroville Plant), CA (IX); Lorentz Barrel & Drum, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Fort Lewis Logistic Center, WA (X); Northwest Transformer, WA (X)

TECHNOLOGY

Aeration

Cannon Engineering, MA (I); Groveland Wells, MA (I); McKin, ME (I); Ottati & Goss/Great Lakes, NH (I); Army Creek Landfill, DE (III)*; Bendix, PA (III); Dubose Oil Products, FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Galesburg/Koppers, IL (V); K&L Landfill, MI (V); Mason County Landfill, MI (V); Onalaska Municipal Landfill, WI (V); Waite Park Wells, MN (V); South Valley/Edmunds Street, NM (VI)*; Triangle Chem., TX (VI); Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); Tucson International Airport, AZ (IX)

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Air Monitoring

Baird & McGuire, MA (I)*; Beacon Heights Landfill, CT (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Groveland Wells, MA (I); Kellogg-Deering Well Field, CT (I)*; Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Clothier Disposal, NY (II); Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II)*; Imperial Oil/Champion Chemicals, NJ (II); Glen Ridge Radium, NJ (II); King of Prussia, NJ (II); Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; North Sea Municipal Landfill, NY (II); Sayreville Landfill, NJ (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Ordnance Works Disposal, WV (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Howe Valley Landfill, KY (IV); North Hollywood Dump, TN (IV); Perdido Groundwater, AL (IV); Bofors Nobel, MI (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Forest Waste Disposal, MI (V)*; Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Mason County Landfill, MI (V); Mid-State Disposal, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Oak Grove Landfill, MN (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Brio Refining, TX (VI); Dixie Oil, TX (VI); Hardage/Criner (Amendment), OK (VI); Koppers/Texarkana, TX (VI); Texarkana Wood Preserving, TX (VI); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); J.H. Baxter, CA (IX); Operating Industries, CA (IX), Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Raytheon, CA (IX); South Bay Asbestos Area, CA (IX)*; Commencement Bay/Tacoma, WA (X); Gould, OR (X)

Air Stripping

Auburn Road Landfill, NH (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; Norwood PCBs, MA (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Wells G&H, MA (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Claremont Polychemical, NY (II)*; Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Lang Property, NJ (II); Mannheim Avenue Dump, NJ (II); Metaltec/Aerosystems, NJ (II)*; Montgomery Township Housing, NJ (II)*; Old Bethpage, NY (II); Olean Well Field, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta,

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Air Stripping (continued)

PR (II); Vestal, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Havertown PCP, PA (III); Henderson Road, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; Lord Shope Landfill, PA (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Tyson's Dump, PA (III); Tyson's Dump (09/30/88), PA (III)*; Tyson Dump #1, PA (III)*; Airco, KY (IV); Biscayne Aquifer Sites, FL (IV); Celanese Fibers Operations, NC (IV); City Industries, FL (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); SCRDI Bluff Road, SC (IV); Anderson Development, MI (V); Belvidere Landfill, IL (V); Eau Claire-IRM, WI (V); Clare Water Supply, MI (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Main Street Well Field, IN (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton (TCAAP), MN (V)*; Northernaire Plating, MI (V)*; Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Rose Township, MI (V); Seymour, IN (V); Seymour (09/25/87), IN (V)*; Spiegelberg Landfill, MI (V)*; University of Minnesota, MN (V); U.S. Aviex, MI (V); Verona Well Field-IRM, MA (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply (09/29/89), WI (V)*; Wayne Waste Oil, IN (V); Sol Lynn (09/23/88), TX (VI)*; South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Chemplex, IA (VII); Des Moines TCE, IA (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Sand Creek Industrial, CO (VIII); Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intersil, CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); Stringfellow, CA (IX)*; Ponders Corner-IRM, WA (X); Fort Lewis Logistic Center, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*

Biodegradation/Land Application

Iron Horse Park, MA (I); Tinkhams Garage, NH (I); Renora Inc. N.J. (II); L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Whitmoyer Laboratories, PA (III); American Creosote Works, FL (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Munisport Landfill, FL (IV); Byron/Johnson Salvage, IL (V); Cliff/Dow Dump, MI (V); Galesburg/Koppers, IL (V); Moss-American Kerr-McGee Oil, WI (V); Onalaska Municipal Landfill, WI (V); Atchinson/Santa Fe (Clovis), NM (VI); French Limited, TX (VI); North Cavalcade,

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Biodegradation/Land Application (continued)

TX (VI); Old Inger, LA (VI); Sheridan Disposal Services, TX (VI); Chemplex, IA (VII); Fairfield Coal Gasification Plant, IA (VII); Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX)

Capping

Auburn Road Landfill, NH (I)*; Beacon Heights, CT (I); Charles George, MA (I)*; Coakley Landfill, NH (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Laurel Park, CT (I); Nyanza Chemical, MA (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Re-Solve, MA (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Port Washington Landfill, NY (II); Sayreville Landfill, NJ (II); Sealand Restoration, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Syosset Landfill, NY (II); Volney Landfill, NY (II); Ambler Asbestos Piles, PA (III); Ambler Asbestos Piles (09/29/89), PA (III); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); East Mt. Zion, PA (III); Enterprise Avenue, PA (III); Heleva Landfill, PA (III); Henderson Road, PA (III)*; Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump, PA (III); US Titanium, VA (III); Wade, PA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; 62nd Street Dump, FL (IV); Airco, KY (IV); Alpha Chemical, FL (IV); A. L. Taylor, KY (IV); Bypass 601 Groundwater Contamination, NC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Davie Landfill, FL (IV); Flowood, MS (IV); Goodrich, B.F., KY (IV); Hipps Road Landfill, FL (IV); Lewisburg Dump, TN (IV); Newport Dump Site, KY (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Powersville Landfill, GA (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Whitehouse Waste Oil Pits, FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Belvidere Landfill, IL (V); Bower's Landfill, OH (V); Chem-Dyne-EDD, OH (V); Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); Marion/Bragg Landfill, MI (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); New Lyme, OH (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation,

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Capping (continued)

IN (V); Oak Grove Landfill, MN (V); Onalaska Municipal Landfill, WI (V); Outboard Marine (Amendment), IL (V); Pristine (Amendment), OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V)*; Seymour, IN (V)*; Summit National, OH (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bio-Ecology Systems Site, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Geneva Industries, TX, (VI); Gurley Pit, AR, (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Mid-South Wood, AR (VI); Motco, TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI); Vertac, AR (VI); Aidex, IA (VII)*; Conservation Chemical, MO (VII); Doepke Disposal (Holliday), KS (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Denver Radium III, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal (OU18), CO (VIII)*; Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Iron Mountain Mine, CA (IX); Koppers (Oroville Plant), CA (IX); Mountain View/Globe, AZ (IX); Operating Industries Landfill (Amendment), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); South Bay Asbestos Area, CA (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Silver Mountain Mine, WA (X); South Tacoma Channel-Well 12A, WA (X); Western Processing, WA (X)*

Carbon Adsorption (GAC)

Auburn Road, NH (I); Auburn Road Landfill, NH (I)*; Baird & Beacon Heights, CT (I); Coakley Landfill, NH (I); Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Kellogg-Deering Well Field, CT (I)*; McGuire, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Stamina Mills, RI (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Fulton Terminals, NY (II); Higgins Farm, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); Lone Pine Landfill, NJ (II)*; Metaltec/Aerosystems, NJ (II)*; Montclair/West Orange Radium, NJ (II); Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Solvent Savers, NY (II); Tabernacle Drum Dump, NJ (II); Vestal Water Supply 1-1, NY (II)*; Bendix, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III); Cryo-Chem (09/28/90), PA (III)*; Kimberton, PA (III); Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III)*; Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Tyson Dump #1, PA (III)*; West Virginia Ordnance Works, WV (III)*; Airco, KY (IV); American Creosote Works, TN (IV); Celanese Fibers Operations, NC (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Goodrich,

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Carbon Adsorption (GAC) (continued)

B.F., KY (IV); Jadco-Hughes, NC (IV); National Starch, NC (IV); Perdido Groundwater, AL (IV); SCRDI Bluff Road, SC (IV); Big D Campground, OH (V); Wamchem, SC (IV); Anderson Development, MI (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton-Interim Water Treatment, MN (V)*; Northernaire Plating, MI (V)*; New Lyme, OH (V); Oconomowoc Electroplating, WI (V); Outboard Marine (Amendment), IL (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Outboard Marine (Amendment), IL (V); Pristine (Amendment), OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Spiegelberg Landfill, MI (V)*; Velsicol Chemical, IL (V); Wausau Water Supply, WI (V)*; Windom Dump, MN (V); Arkwood, AR (VI); Koppers/Texarkana, TX (VI); Old Inger, LA (VI); Old Midland Products, AR (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); South Valley/PL-83, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Solvent Service, CA (IX); Stringfellow Acid Pits, CA (IX)*; Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Tucson International Airport, AZ (IX); Northside Landfill, WA (X)

Decontamination

Cannon Engineering, MA (I); Iron Horse Park, MA (I); Norwood PCBs, MA (I); American Thermostat, NY (II)*; Byron Barrel & Drum, NY (II)*; Claremont Polychemical, NY (II)*; Diamond Alkali, NJ (II) Ewan Property, NJ (II); Marathon Battery (09/30/88), NY (II)*; Myers Property, NJ (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Vineland Chemical, NJ (II); Avtex Fibers, VA (III)*; Brown's Battery Breaking, PA (III); Dover Air Force Base, DE (III); Fike Chemical, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Whitmoyer Laboratories, PA (III); American Creosote Works, TN (IV); Cape Fear Wood Preserving, NC (IV); Laskin/Poplar Oil, OH (V); Ninth Avenue Dump, IN (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); United Scrap Lead, OH (V); Arkwood, AR (VI); Brio Refining, TX (VI); Dixie Oil, TX (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Fairfield Coal Gasification Plant, IA (VII); Shenandoah Stables, MO (VII)*; Vogel Paint & Wax, IA (VII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX)

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Dredging

Hocomonco Pond, MA (I); New Bedford, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); American Thermostat, NY (II)*; Hooker-102nd Street, NY (II); Hudson River, NY (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II); Marathon Battery, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Vineland Chemical, NJ (II); L.A. Clarke & Son, VA (III); Southern Maryland Wood, MD (III); Cape Fear Wood Preserving, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; North Hollywood Dump, TN (IV); Anderson Development, MI (V); Industrial Excess Landfill, OH (V)*; Ninth Avenue Dump, IN (V)*; Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Atchison/Santa Fe (Clovis), NM (VI); Tar Creek, OK (VI); Commencement Bay/Nearshore (09/30/89), WA (X)

Excavation

Baird & McGuire, MA (I); Baird & McGuire, MA (I)*; Beacon Heights, CT (I); Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Ottati & Goss/Great Lakes, NH (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II); Bog Creek Farm (03/31/89), NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog (09/29/88), NJ (II)*; Caldwell Trucking, NJ (II); Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property (09/28/89), NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; Helen Kramer, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II); Ludlow Sand & Gravel, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Myers Property, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III); Avtex Fibers (09/28/90), VA (III)*; Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Greenwood Chemical, VA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); Henderson Road (06/30/88), PA (III)*; Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); L.A. Clarke & Son, VA (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Sand, Gravel & Stone, MD (III); Southern Maryland Wood, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Tybouts Corner, DE (III); US Titanium, VA (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); 62nd Street Dump, FL (IV); Aberdeen

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Excavation (continued)

Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, FL (IV); American Creosote Works (09/28/89), FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Hollingsworth, FL (IV); Howe Valley Landfill, KY (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Palmetto Wood Preserving, SC (IV); Pickettville Road Landfill, FL (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Alsco Anaconda, OH (V); Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Auto Ion Chemicals, MI (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cliff/Dow Dump, MI (V); Cross Bros., IL (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); Hunts Disposal, WI (V); Ionia City Landfill, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Schmaltz Dump, WI (V); Seymour, IN (V)*; Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Waste Disposal Engineering, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI); Bayou Bonfouca (03/31/87), LA (VI)*; Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Geneva Industries, TX (VI); Dixie Oil, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Jacksonville Municipal Landfill, AR (VI); Highlands Acid Pit, TX (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX(VI); Mid-South Wood, AR (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; Old Inger, LA (VI); Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI); United Creosoting (09/29/89), TX (VI)*; Vertac, AR (VI); Aidex, IA (VII)*; Cherokee County, KS (VII)*; Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Kem-Pest Laboratory, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII); Times Beach (09/28/88), MO (VII)*; Vogel Paint & Wax, IA (VII); Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Broderick Wood Products, CO (VIII); Burlington Northern

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Excavation (continued)

(Somers), MT (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Sapce, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Atlas Asbestos Mine, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/28/90), CA (IX)*; Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); IBM (San Jose), CA (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Jibboom Junkyard, CA (IX); Koppers (Oroville Plant), CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); Raytheon, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); FMC Yakima Pit, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); Silver Mountain Mine, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Teledyne Wah Chang Albany (TWCA), OR (X); United Chrome, OR (X); Western Processing, WA (X)*

Filling

Baird & McGuire, MA (I)*; Iron Horse Park, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); GE Wiring Devices, PR (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; King of Prussia, NJ (II); Marathon Battery (09/30/88), NY (II)*; Montclair/West Orange Radium, NJ (II); Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Vineland Chemical, NJ (II); Aladdin Plating, PA (III); Drake Chemical, PA (III)*; Greenwood Chemical, VA (III); Lehigh Electric, PA (III); Taylor Borough, PA (III); Wade, PA (III); Wildcat Landfill, DE (III)*; Airco, KY (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); A&F Materials-EDD, IL (V)*; Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Big D Campground, OH (V); Coshocton Landfill, OH (V); Laskin/Poplar Oil, OH (V); Miami County Incinerator, OH (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Velsicol Chemical, IL (V); Atchison/Santa Fe (Clovis), NM (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI); Tar Creek, OK (VI); Tenth Street Dump/Junkyard, OK (VI); United Creosoting, TX (VI)*; Midwest Manufacturing/North Farm, IA (VII); Syntex Verona, MO (VII); Monticello Vicinity Properties, UT (VIII); Sand Creek Industrial, CO (VIII); Woodbury Chemical, CO (VIII), Woodbury Chemical (09/29/89), CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); MGM Brakes, CA (IX); Raytheon, CA (IX); Martin Marietta, OR (X); Northwest Transformer, WA (X)

Ground Water Monitoring

Auburn Road Landfill, NH (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Groveland Wells, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kearsarge

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Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field (09/29/89), CT (I)*; Landfill & Resource Recovery, RI (I); Laurel Park, CT (I); McKin, ME (I); Norwood PCBs, MA (I); Nyanza Chemical, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I);Old Springfield Landfill (09/29/90), VT (I)*; Ottati & Goss/Great Lakes, NH (I); Picillo Farm, RI (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Saco Tannery Waste Pits, ME (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); W.R. Grace (Acton Plant), MA (I); Yaworski Lagoon, CT (I); American Thermostat, NY (II)*; Asbestos Dump, NJ (II); BEC Trucking, NY (II); Burnt Fly Bog, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Caldwell Trucking (09/28/89), NJ (II)*; Chemical Control, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); Friedman Property, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); Haviland Complex, NY (II); Higgins Farm, NJ (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II); Kentucky Avenue Well Field (09/28/90), NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montgomery Township, NY (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); North Sea Municipal Landfill, NY (II); Old Bethpage, NY (II); PAS Oswego, NY (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Pomona Oaks Well Contamination, NJ; Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Ringwood Mines/Landfill, NY (II); Rocky Hill, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Solvent Savers, NY (II); South Brunswick Landfill, NJ (II)*; Suffern Village Well Field, NY (II); Syosset Landfill, NY (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Vineland State School, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III); Army Creek Landfill (06/29/90), DE (III)*; Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; C&R Battery, VA (III); Chisman Creek, VA (III); Clothier Disposal,NY (II); Coker's Sanitation Service Landfills, DE (III); Croydon TCE Spill, PA (III); Croydon TCE Spill (06/29/90), PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; East Mt. Zion, PA (III); Henderson Road, PA (III); Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; L.A. Clarke & Son, VA (III); Limestone Road, MD (III); Middletown Airfield, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); M.W. Manufacturing, PA (III)*; New Castle Spill, DE (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Raymark, PA (III); Reeser's Landfill, PA (III); Saltville Waste Disposal Ponds, VA (III); Sand Gravel & Stone, MD (III)*; Taylor Borough, PA (III)*; Tybouts Corner, DE (III); Tyson's Dump, PA (III)*; Tyson's Dump (Amendment), PA (III); Tyson Dump #1, PA (III)*; Voortman Farm, PA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Westline, PA (III)*; Wildcat Landfill, DE (III); Wildcat Landfill, DE

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Ground Water Monitoring (continued)

(III)*; 62nd Street Dump, FL (IV); Airco, KY (IV); Alpha Chemical, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Pepper's Steel-EDD, FL (IV); Pickettville Road Landfill, FL (IV); Pioneer Sand, FL (IV); Powersville Landfill, GA (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); Smith's Farm, KY (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); A&F Materials-EDD, IL (V)*; Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron Salvage, IL (V)*; Byron Salvage (06/30/89), IL (V)*; Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Coshocton Landfill, OH (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); IMC Terre Haute, IN (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Kummer Sanitary Landfill (09/29/90), MN (V)*; Kysor Industrial, MI (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Long Prairie, MN (V); Marion/Bragg Landfill, IN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); National Presto Industries, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump (06/30/89), IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Novaco Industries, MI (V); Oak Grove Landfill, MN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical, MN (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Republic Steel Quarry, OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V)*; Seymour, IN (V)*; South Andover, MN (V); Spiegelberg Landfill, MI (V)*; Summit National, OH (V); Tri-State Plating, IN (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wauconda Sand & Gravel, IL (V)*; Wausau Water Supply, WI (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); Dixie Oil, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Highlands Acid Pit (06/26/87), TX (VI)*; Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Mid-South Wood, AR

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(VI); Motco, TX (VI)*; Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Pagano Salvage, NM (VI); Rogers Road Municipal Landfill, AR (VI); Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI); Sheridan Disposal Services (09/28/90), TX (VI)*; Sikes Disposal Pits, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; South Valley/SJ-6, NM (VI)*; Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Aidex, IA (VII)*; Arkansas City Dump, KS (VII); Big River Sand, KS (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Fulbright/Sac River Landfill, MO (VII); Hastings Groundwater, NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Solid State Circuits, MO (VII); Todtz, Lawrence Farm, IA (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Arsenic Trioxide, ND (VIII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU22), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Applied Materials, CA (IX); Atlas Asbestos Mine, CA (IX); Beckman Instruments/Porterville, CA (IX); Coalinga Asbestos Mine, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Louisiana-Pacific, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Gould, OR (X); FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Queen City Farms-IRM/EDD, WA (X); Silver Mountain Mine, WA (X); Toftdahl Drum, WA (X)

Ground Water Treatment

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Industri-plex, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I); Kellogg-Deering Well Field, CT (I)*; McKin, ME (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal

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Ground Water Treatment (continued)

Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Sylvester, NH (I); Sylvester-S, NH (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); Winthrop Landfill-EDD, ME (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Brewster Well Field, NY (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Combe Fill South Landfill, NJ (II); DeRewal Chemical, NJ (II); Diamond Alkali, NJ (II); D'Imperio Property, NJ (II); Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); GE Moreau, NY (II); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Haviland Complex, NY (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lang Property, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Mannheim Avenue Dump, NJ (II); Metaltec/Aerosystems, NJ (II)*; Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Old Bethpage, NY (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Reich Farm, NJ (II); Rockaway Borough Wellfield, NJ (II); Rocky Hill, NJ (II); Sharkey Landfill, NJ (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Syncon Resins, NJ (II); Tabernacle Drum Dump, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal, NY (II); Vineland Chemical, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Blosenski Landfill, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Drake Chemical, PA (III)*; Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Leetown Pesticide, WV (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); Millcreek, PA (III); Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Strasburg Landfill, PA (III); Tybouts Corner, DE (III); Tyson Dump #1, PA (III)*; US Titanium, VA (III); West Virginia Ordnance Works, WV (III)*; 62nd Street Dump, FL (IV); Airco, KY (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Distler Brickyard, KY (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Hollingsworth, FL (IV); Jadco-Hughes, NC (IV); Munisport Landfill, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Schuylkill Metal, FL (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Whitehouse Waste Oil Pits, FL (IV); Zellwood, FL (IV); Allied/Ironton Coke, OH (V)*; Arrowhead Refinery, MN (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Chem-Dyne-EDD, OH (V); Clare Water Supply, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; Fisher Calo Chem, IN (V); FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kummer

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Ground Water Treatment (continued)

Sanitary Landfill, MN (V)*; Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; LeHillier/Mankato, MN (V); Liquid Disposal, MI (V); Long Prairie, MN (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; New Lyme, OH (V); Ninth Avenue Dump, IN (V)*; Novaco Industries, MI (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Rose Township, MI (V); Seymour, IN (V); Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Verona Well Field, MI (V)*; Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply (09/28/89), WI (V)*; Wayne Waste Oil, IN (V); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Geneva Industries, TX (VI); Gurley Pit, AR (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Old Midland Products, AR (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Des Moines TCE, IA (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); White Farm Equipment Dump, IA (VII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); Libby Ground Water, MT (VIII)*; Marshall Landfill, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal, CO (VIII); Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Silver Bow Creek, MT (VIII); Union Pacific, WY (VIII); Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Del Norte, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Area 1, CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow, CA (IX)*; Stringfellow Acid Pits, CA (IX); Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X); Commencement Bay/Tacoma, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Martin Marietta, OR (X); Northside Landfill, WA (X); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*

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Incineration/Thermal Destruction

Baird & McGuire, MA (I); Baird & McGuire (09/14/89), MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Kearsarge Metallurgical, NH (I); Landfill & Resource Recovery, RI (I); New Bedford, MA (I); O'Connor, ME (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II); Bog Creek Farm (06/28/89), NJ (II)*; Brewster Well Field, NY (II); Bridgeport, NJ (II); Chemical Leaman Tank Lines, NJ (II); Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II); FAA Technical Center, NJ (II); Fulton Terminals, NY (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal, NY (II)*; Mattiace Petrochemicals, NY (II); Reich Farm, NJ (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Swope Oil, NJ (II); Williams Property, NJ (II); York Oil, NY (II); Berks Sand Pit, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Drake Chemical (09/29/88), PA (III)*; Fike Chemical, WV (III); Greenwood Chemical, VA (III); Lackawanna Refuse Site, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal, WV (III); Southern Maryland Wood, MD (III); Westline, PA (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman Evans, FL (IV); Geiger (C&M Oil), SC (IV); Mowbray Engineering, AL (IV); SCRDI Bluff Road, SC (IV); Smith's Farm, KY (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); Zellwood, FL (IV); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Fields Brook, OH (V); Fisher Calo Chem, IN (V); Fort Wayne Reduction, IN (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (06/30/89), OH (V)*; Metamora Landfill, MI (V); Moss-American Kerr-McGee Oil, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Outboard Marine (Amendment), IL (V); Pristine (Amendment), OH (V); Rose Township, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Spiegelberg Landfill, MI (V); Springfield Township Dump, MI (V); St. Louis River, MN (V); Summit National, OH (V); University of Minnesota, MN (V); Waste Disposal Engineering, MN (V); Wedzeb Enterprises, IN (V); Arkwood, AR (VI); Bayou Bonfouca, LA (VI)*; Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Jacksonville Municipal Landfill, AR (VI); Motco, TX (VI); Motco, TX (VI)*; Rogers Road Municipal Landfill, AR (VI); Sikes Disposal Pits, TX (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Shenandoah Stables, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Broderick Wood Products, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Ogden Defense Depot, UT (VIII); Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Woodbury Chemical, CO (VIII); Woodbury Chemical, CO (VIII)*; Operating Industries Landfill (Amendment), CA (IX)*; FMC Yakima Pit, WA (X); Western Processing, WA (X)

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Leachate Collection/Treatment

Beacon Heights, CT (I); Beacon Heights Landfill (09/28/90), CT (I)*; Charles George Landfill 3 & 4, MA (I)*; Charles George, MA (I)*; Laurel Park, CT (I); Old Springfield Landfill, VT (I); Picillo Farm, RI (I); Stamina Mills, RI (I); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Pepe Field, NJ (II); Price Landfill, NJ (II)*; Volney Landfill, NY (II); Henderson Road, PA (III)*; Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Tyson's Dump (Amendment), PA (III); US Titanium, VA (III); Airco, KY (IV); American Creosote Works, FL (IV); Cabot/Koppers, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); Pioneer Sand, FL (IV); Smith's Farm, KY (IV); Allied/Ironton Coke, OH (V)*; Coshocton Landfill, OH (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); Mid-State Disposal, WI (V); New Lyme, OH (V); Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Velsicol Chemical, IL (V); Wauconda Sand & Gravel, IL (V); Wauconda Sand & Gravel, IL (V)*; Hardage/Criner, OK (VI); Petro-Chemical Systems, TX (VI); Vogel Paint & Wax, IA (VII); J.H. Baxter, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Ordot Landfill, GU (IX); Martin Marietta, OR (X); United Chrome, OR (X)

Levees

Baird & McGuire, MA (I); Douglassville Disposal, PA (III); American Creosote Works, TN (IV); Hunts Disposal, WI (V); Old Inger, LA (VI) Sheridan Disposal Services, TX (VI); Times Beach, MO (VII)*; South Bay Asbestos Area, CA (IX)

Offsite Discharge

Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); Kellogg-Deering Well Field, CT (I)*; Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Stamina Mills, RI (I); Tinkhams Garage (Amendment), NH (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II)*; GE Moreau, NY (II); GE Wiring Devices, PR (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Ludlow Sand & Gravel, NY (II); Myers Property, NJ (II); Reich Farm, NJ (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vineland Chemical, NJ (II); York Oil, NY (II); Drake Chemical, PA (III)*; Henderson Road, PA (III); Sand Gravel & Stone, MD (III)*; US Titanium, VA (III); 62nd Street Dump, FL (IV); Airco, KY (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Carolawn, SC (IV); Ciba-Geigy, AL (IV); City Industries, FL (IV); Goodrich, B.F., KY (IV); Jadco-Hughes, NC (IV); National Starch, NC (IV); Schuylkill Metal, FL (IV); Wamchem, SC (IV);Belvidere Landfill, IL (V); Eau Claire Municipal Well Field, WI (V)*; FMC Corporation, MN (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Kysor Industrial, MI (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Long Prairie, MN (V); Miami County Incinerator, OH (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (TCAAP), MN (V); Northernaire Plating, MI (V)*; Onalaska Municipal Landfill, WI (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Summit National, OH (V); Tri-State Plating, IN (V); U.S. Aviex, MI (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Cimarron Mining, NM (VI); Crystal Chemical, TX

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Offsite Discharge (continued)

(VI); French Limited, TX (VI); Industrial Waste Control, AR (VI); Chemplex, IA (VII); Conservation Chemical, MO (VII); Deere, John, Dubuque Works, IA (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Central City/Clear Creek, CO (VIII); East Helena, MT (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Applied Materials, CA (IX); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Litchfield Airport, AZ (IX); Litchfield Airport (09/26/89), AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Purity Oil Sales, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Frontier Hard Chrome (07/05/88), WA (X)*; Northside Landfill, WA (X)

Offsite Disposal

Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Cannon/Plymouth, MA (I); Coakley Landfill, NH (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I); McKin-IRM, ME (I); McKin, ME (I)*; O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; Chemical Control, NJ (II); Chemical Leaman Tank Lines, NJ (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; D'Imperio Property, NJ (II); Ewan Property, NJ (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); Glen Ridge Radium, NJ (II); Glen Ridge Radium (06/01/90), NJ (II)*; Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Metaltec/Aerosystems (09/27/90), NJ (II)*; Montclair/West Orange Radium, NJ (II); Montclair/West Orange Radium (06/01/90), NJ (II)*; Myers Property, NJ (II); Pepe Field, NJ (II); Pijak Farm, NJ (II); Preferred Plating, NY (II); Price Landfill, NJ (II)*; Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Ringwood Mines/Landfill, NY (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Aladdin Plating, PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III)*; Berks Sand Pit, PA (III); Bruin Lagoon, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Douglassville Disposal, PA (III)*; Dover Air Force Base, DE (III); Enterprise Avenue, PA (III); Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III); Greenwood Chemical, VA (III); Havertown PCP, PA (III);Harvey-Knott, DE (III); Hebelka Auto Salvage Yard, PA (III); Keystone Sanitation Landfill, PA (III); Lackawanna Refuse Site, PA (III);

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Offsite Disposal (continued)

Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Osborne Landfill, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Saltville Waste Disposal Ponds, VA (III); Sand, Gravel & Stone, MD (III); Strasburg Landfill, PA (III); Taylor Borough, PA, (III); Westline, PA (III); West Virginia Ordnance Works, WV (III); Whitmoyer Laboratories, PA (III); Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); American Creosote Works, TN (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cape Fear Wood Preserving, NC (IV); Distler Brickyard, KY (IV); Howe Valley Landfill, KY (IV); Miami Drum Services, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); North Hollywood Dump, TN (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); SCRDI Bluff Road, SC (IV); SCRDI Dixiana, SC (IV); Schuylkill Metal, FL (IV); Soydeco, NC (IV); Tower Chemical, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V)*; Acme Solvents, IL (V); Alsco Anaconda, OH (V); Arcanum Iron & Metal, OH (V); Auto Ion Chemicals, MI (V); Berlin & Farro, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste, MI (V)*; Hedblum Industries, MI (V); Johns-Manville, IL (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V)*; Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; MIDCO I, IN (V); NL Industries/Taracorp Lead Smelt, IL (V); Ninth Avenue Dump, IN (V)*; Northernaire, MI (V); Oconomowoc Electroplating, WI (V); Old Mill, OH (V); Onalaska Municipal Landfill, WI (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Republic Steel Quarry, OH (V); Rose Township, MI (V); Schmaltz Dump, WI (V); Seymour, IN (V)*; St. Louis River, MN (V); University of Minnesota, MN (V); Wauconda Sand & Gravel, IL (V); Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Arkwood, AR (VI); Bayou Bonfouca, LA (VI); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Cecil Lindsey, AR (VI); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); Dixie Oil, TX (VI); Geneva Industries, TX (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI); Jacksonville Municipal Landfill, AR (VI); Motco, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sheridan Disposal Services, TX (VI); South Calvacade Street, TX (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI)*; Aidex-IRM, IA (VII); Aidex, IA (VII)*; Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Fulbright/Sac River Landfill, MO (VII); Kem-Pest Laboratory, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII)*; Syntex Verona, MO (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Denver Radium Site Streets, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium/12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space, CO (VIII)*; Denver Radium/ROBCO, CO (VIII)*; East Helena, MT (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Ogden Defense Depot, UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII); Whitewood Creek, SD (VIII); Woodbury Chemical, CO (VIII); Woodbury Chemical (09/29/89), CO (VIII)*; Beckman Instruments/Porterville, CA (IX); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del

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Offsite Disposal (continued)

Norte CA (IX); Intersil, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); MGM Brakes, CA (IX); South Bay Asbestos Area, CA (IX)*; Stringfellow Acid Pits-IRM, CA (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Tacoma, WA (X); Commencement Bay/Nearshore (09/30/89), WA (X); FMC Yakima Pit, WA (X); Gould, OR (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Teledyne Wah Chang Albany (TWCA), OR (X); United Chrome, OR (X); Western Processing, WA (X); Western Processing (09/25/85), WA (X)*

Offsite Treatment

Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Kearsarge Metallurgical, NH (I); Laurel Park, CT (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Tinkhams Garage (Amendment), NH (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Claremont Polychemical, NY (II)*; Claremont Polychemical (09/28/90), NY (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; GE Moreau, NY (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Kin-Buc Landfill, NJ (II); Mattiace Petrochemicals, NY (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Roebling Steel, NJ (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Upjohn Manufacturing, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Williams Property, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Avtex Fibers, VA (III)*; Bendix, PA (III); Berks Sand Pit, PA (III); C&R Battery, VA (III); Craig Farm Drum, PA (III); Douglassville Disposal, PA (III)*; Fike Chemical, WV (III); Fike Chemical (09/28/90), WV (III)*; Greenwood Chemical, VA (III); Havertown PCP, PA (III); M.W. Manufacturing, PA (III); Publicker/Cuyahoga Wrecking, PA (III); Rhinehart Tire Fire, VA (III); Sand Gravel & Stone, MD (III)*; Strasburg Landfill, PA (III); Tyson's Dump, PA (III)*; Whitmoyer Laboratories, PA (III); American Creosote Works, TN (IV); Sodyeco, NC (IV); Tower Chemical, FL (IV); Alsco Anaconda, OH (V); Auto Ion Chemicals, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Hunts Disposal, WI (V); Laskin/Poplar Oil, OH (V)*; Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); Outboard Marine (Amendment), IL (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Tri-State Plating, IN (V); Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Cimarron Mining, NM (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); North Cavalcade Street, TX (VI); Rogers Road Municipal Landfill, AR (VI); South Calvacade Street, TX (VI); United Creosoting, TX (VI)*; Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII)*; Syntex Verona, MO (VII); Vogel Paint & Wax, IA (VII); Martin Marietta, Denver Aerospace, CO (VIII); Ogden Defense Depot, UT (VIII); Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Woodbury Chemical, CO (VIII)*; Commencement Bay/Tacoma, WA (X)

Onsite Containment

Auburn Road Landfill, NH (I)*; Coakley Landfill, NH (I); Iron Horse Park, MA (I); Landfill & Resource Recovery, MA (I); Old Springfield Landfill, VT (I); Re-Solve, MA (I); Wells G&H, MA (I);

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Onsite Containment (continued)

W.R. Grace (Acton Plant), MA (I); Asbestos Dump, NJ (II); Burnt Fly Bog, NJ (II)*; Byron Barrel & Drum, NY (II)*; GE Moreau, NY (II); Hooker-102nd Street, NY (II); Hudson River, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Pepe Field, NJ (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Sealand Restoration, NY (II); Syosset Landfill, NY (II); Upjohn Manufacturing, PR (II); Ambler Asbestos Piles, PA (III); Coker's Sanitation Service Landfills, DE (III); Delaware Sand and Gravel, DE (III); Dorney Road Landfill, PA (III); Drake Chemical, PA (III); East Mt. Zion, PA (III); Enterprise Avenue, PA (III); Henderson Road, PA (III)*; Hranica Landfill, PA (III); Kane & Lombard, MD (III); Keystone Sanitation Landfill, PA (III); Millcreek, PA (III); Ordnance Works Disposal, WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Walsh Landfill, PA (III); West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III); 62nd Street Dump, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Airco, KY (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Davie Landfill, FL (IV); Dubose Oil Products, FL (IV); Goodrich, B.F., KY (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Lewisburg Dump, TN (IV); National Starch, NC (IV); North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Tower Chemical, FL (IV); Yellow Water Road, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; Bofors Nobel, MI (V); E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Hagen Farm, WI (V); Hunts Disposal, WI (V); Janesville Ash Beds, WI (V); Janesville Old Landfill, WI (V); K&L Landfill, MI (V); Lake Sandy Jo, IN (V); Liquid Disposal, MI (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Moss-American Kerr-McGee Oil, WI (V); NL Industries/Taracorp Lead Smelt, IL (V); New Lyme, OH (V); Ninth Avenue Dump, IN (V); Outboard Marine Corp., IL (V); Outboard Marine (Amendment), IL (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; St. Louis River, MN (V); Summit National, OH (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Windom Dump, MN (V); Arkwood, AR (VI); Bayou Sorrel, LA (VI); Bio-Ecology Systems, TX (VI); Crystal Chemical, TX (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Motco, TX (VI)*; Rogers Road Municipal Landfill, AR (VI); South Cavalcade Street, TX (VI); South Valley/Edmonds Street, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI); Vertac, AR (VI); Arkansas City Dump, KS (VII); Cherokee County, KS (VII)*; Doepke Disposal (Holliday), KS (VII); Ellisville Site Area, MO (VII)*; Findett, MO (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); Times Beach, MO (VII); Wheeling Disposal Service, MO (VII); White Farm Equipment Dump, IA (VII); Anaconda Smelter/Mill Creek, MT (VIII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Silver Bow Creek, MT (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/28/90), CA (IX)*; J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Operating Industries Landfill (Amendment), CA (IX)*; South Bay Asbestos Area, CA (IX); Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore (09/30/89), WA (X); Commencement Bay/Tacoma, WA (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Pacific Hide and Fur, ID (X); Silver Mountain Mine, WA (X); Western Processing, WA (X)*

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Onsite Discharge

Auburn Road Landfill, NH (I)*; Beacon Heights Landfill, CT (I); Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Stamina Mills, RI (I); Wells G&H, MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Havertown PCP, PA (III); Haviland Complex, NY (II); Hooker-102nd Street, NY (II); Kentucky Avenue Wellfield, NY (II)*; Lone Pine Landfill, NJ (II)*; Mannheim Avenue Dump, NJ (II); Metaltec/Aerosystems, NJ (II)*; Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Syosset Landfill, NY (II); Vineland Chemical, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Bally Groundwater Contamination, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Fike Chemical, WV (III); Havertown PCP, PA (III); Henderson Road, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III)*; Osborne Landfill, PA (III); Raymark, PA (III); Sand Gravel & Stone, MD (III)*; Tyson Dump #1, PA (III)*; US Titanium, VA (III); West Virginia Ordnance Works, WV (III)*; Wildcat Landfill, DE (III)*; 62nd Street Dump, FL (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Munisport Landfill, FL (IV); Newsome Brothers/Old Reichhold, MS (IV); Perdido Groundwater, AL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Zellwood, FL (IV); Big D Campground, OH (V); Bofors Nobel, MI (V); Clare Water Supply, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Janesville Ash Beds, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; Liquid Disposal, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Ninth Avenue Dump, IN (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); University of Minnesota, MN (V); Wausau Water Supply, WI (V); Wayne Waste Oil, IN (V); Arkwood, AR (VI); Crystal Chemical, TX (VI); Hardage/Criner (Amendment), OK (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Sheridan Disposal Services, TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Fairfield Coal Gasification Plant, IA (VII); Fulbright/Sac River Landfill, MO (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Northwestern States Portland Cement, IA (VII); White Farm Equipment Dump, IA (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Silver Bow Creek, MT (VIII); Fairchild Semicond (Mt. View), CA (IX); IBM (San

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Onsite Discharge (continued)

Jose), CA (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Lorentz Barrel & Drum, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Fort Lewis Logistic Center, WA (X); Martin Marietta, OR (X)

Onsite Disposal

Baird & McGuire, MA (I)*; Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Hocomonco Pond, MA (I); Iron Horse Park, MA (I); Laurel Park, CT (I); Norwood PCBs, MA (I); Picillo Farm, RI (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; DeRewal Chemical, NJ (II); Ewan Property, NJ (II)*; Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Hooker-102nd Street, NY (II); King of Prussia, NJ (II); Love Canal, NY (II); Love Canal/93rd Street School, NY (II)*; Ludlow Sand & Gravel, NY (II); Marathon Battery (09/30/88), NY (II)*; Myers Property, NJ (II); Old Bethpage, NY (II); Sarney Farm, NY (II); Solvent Savers, NY (II); Vineland Chemical, NJ (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III)*; Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Henderson Road, PA (III)*; Keystone Sanitation Landfill, PA (III); Ordnance Works Disposal Areas (Amendment), WV (III); Southern Maryland Wood, MD (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, FL (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Bypass 601 Groundwater Contamination, NC (IV); Cabot/Koppers, FL (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Gallaway Ponds, TN (IV); Goodrich, B.F., KY (IV); Howe Valley Landfill, KY (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal (03/30/90), FL (IV)*; North Hollywood Dump, TN (IV); Pickettville Road Landfill, FL (IV); Sapp Battery, FL (IV); SCRDI Dixiana, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Yellow Water Road, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Anderson Development, MI (V); Arcanum Iron & Metal, OH (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Cliff/Dow Dump, MI (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Fort Wayne Reduction, IN (V); Hagen Farm, WI (V); IMC Terre Haute, IN (V); LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Liquid Disposal, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Outboard Marine (Amendment), IL (V); Pristine (Amendment), OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Schmaltz Dump, WI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bayou Bonfouca, LA (VI)*; Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); Crystal City Airport, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; Pesses Chemical, TX (VI); Petro-Chemical Systems, TX (VI); Sheridan Disposal Services, TX (VI); Sikes Disposal Pits, TX (VI); Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); United Creosoting, TX (VI)*;

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Onsite Disposal (continued)

Vertac, AR (VI); Aidex, IA (VII)*; Hastings Groundwater Contamination (East Industrial Park), NE (VII); Missouri Electric Works, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Burlington Northern (Somers), MT (VIII); Denver Radium III, CO (VIII)*; Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sharon Steel (Midvale Tailings), UT (VIII); Silver Bow Creek, MT (VIII); Smuggler Mountain, CO (VIII); Atlas Asbestos Mine, CA (IX); Coalinga Asbestos Mine, CA (IX); Coalinga Asbestos Mine (09/21/90), CA (IX)*; Fairchild Semicond (Mt. View), CA (IX); Intel (Mountain View), CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Mountain View/Globe, AZ (IX); Raytheon, CA (IX); Commencement Bay/Nearshore (09/30/89), WA (X); FMC Yakima Pit, WA (X); Gould, OR (X); Martin Marietta, OR (X); Northwest Transformer, WA (X); Silver Mountain Mine, WA (X); Western Processing, WA (X)*

Onsite Treatment

Auburn Road Landfill, NH (I)*; Baird & McGuire, MA (I)*; Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Bog Creek Farm, NJ (II)*; Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Control, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; Cinnaminson Groundwater Contamination, NJ (II); Claremont Polychemical, NY (II)*; DeRewal Chemical, NJ (II); Endicott Village Well Field, NY (II); Ewan Property, NJ (II)*; FAA Technical Center, NJ (II); Fulton Terminals, NY (II); GE Moreau, NY (II); GE Wiring Devices, PR (II); Haviland Complex, NJ (II); Hooker-102nd Street, NY (II); Katonah Municipal Well, NY (II); Kentucky Avenue Wellfield, NY (II)*; Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Lone Pine Landfill, NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Metaltec/Aerosystems, NJ (II)*; Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Nascolite, NJ (II); Pepe Field, NJ (II); Picatinny Arsenal, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Rocky Hill, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Solvent Savers, NY (II); Upjohn Manufacturing, PR (II); Vega Alta, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Volney Landfill, NY (II); Waldick Aerospace, NJ (II); Williams Property, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III)*; Avtex Fibers, VA (III); Avtex Fibers (09/28/90), VA (III)*; Bally Groundwater Contamination, PA (III); Bendix, PA (III); Berks Sand Pit, PA (III); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Delaware Sand and Gravel, DE (III); Douglassville Disposal (Amendment), PA (III); Dover Air Force Base, DE (III); Drake Chemical, PA (III)*; Fike Chemical, WV (III); Havertown PCP, PA (III); Hebelka Auto Salvage Yard, PA (III); Henderson Road, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III); Kimberton, PA (III)*; L.A. Clarke & Son, VA (III); Lord Shope Landfill, PA (III); Middletown Airfield, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal,

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WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Osborne Landfill, PA (III); Palmerton Zinc, PA (III); Palmerton Zinc (09/29/90), PA (III)*; Raymark, PA (III); Saltville Waste Disposal Ponds, VA (III); Sand Gravel & Stone, MD (III)*; Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; Tyson Dump #1, PA (III)*; US Titanium, VA (III); West Virginia Ordnance Works, WV (III)*; 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); Airco, KY (IV); American Creosote Works, TN (IV); American Creosote Works, FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese Fibers Operations, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); City Industries, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Goodrich, B.F., KY (IV); Harris/Palm Bay Facility, FL (IV); Hipps Road Landfill (Amendment), FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal (03/30/90), FL (IV)*; Munisport Landfill, FL (IV); National Starch, NC (IV); Palmetto Wood Preserving, SC (IV); Perdido Groundwater, AL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Allied/Ironton Coke, OH (V)*; Anderson Development, MI (V); Belvidere Landfill, IL (V); Big D Campground, OH (V); Bofors Nobel, MI (V); Clare Water Supply, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); Eau Claire Municipal Well Field, WI (V)*; E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste Disposal, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Ionia City Landfill, MI (V); Janesville Ash Beds, WI (V); K&L Landfill, MI (V); Kummer Sanitary Landfill, MN (V)*; LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar Oil, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Liquid Disposal, MI (V); Long Prairie, MN (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Moss-American Kerr-McGee Oil, WI (V); New Brighton/Arden Hills/St. Anthony, MN (V)*; New Brighton (TCAAP), MN (V)*; New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Northernaire Plating, MI (V)*; Northside Sanitary Landfill/Environmental Conservation and Chemical Corporation, IN (V); Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V)*; Spiegelberg Landfill, MI (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Velsicol Chemical, IL (V); Waite Park Wells, MN (V); Waste Disposal Engineering, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Gurley Pit, AR (VI); Hardage/Criner, OK (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI)*; North Cavalcade Street, TX (VI); Odessa Chromium I, TX (VI)*; Odessa Chromium II, TX (VI)*; Pesses Chemical, TX (VI); Sol Lynn (03/25/88), TX (VI); Sol Lynn (09/23/88), TX (VI)*; South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier

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Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Arkansas City Dump, KS (VII); Chemplex, IA (VII); Deere, John, Dubuque Works, IA (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Hastings Groundwater, NE (VII); Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Midwest Manufacturing/North Farm (09/27/90), IA (VII)*; Missouri Electric Works, MO (VII); Northwestern States Portland Cement, IA (VII); Solid State Circuits, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); White Farm Equipment Dump, IA (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); California Gulch, CO (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Mill Tailings (DOE), UT (VIII); Mystery Bridge at Highway 20, WY (VIII); Ogden Defense Depot, UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/29/90), CO (VIII)*; Silver Bow Creek, MT (VIII); Beckman Instruments/Porterville, CA (IX); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); IBM (San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intel (Santa Clara III), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); MGM Brakes, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); Sacramento Army Depot, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1) (06/30/89), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow Acid Pits, CA (IX); Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Colbert Landfill, WA (X) FMC Yakima Pit, WA (X); Fort Lewis Logistic Center, WA (X); Frontier Hard Chrome (07/05/88), WA (X)*; Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Martin Marietta, OR (X); Northside Landfill, WA (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Teledyne Wah Chang Albany (TWCA), OR (X)

Plume Management

Auburn Road Landfill, NH (I)*; Groveland Wells, MA (I); Kearsarge Metallurgical, NH (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Old Springfield Landfill (09/29/90), VT (I)*; Pinette's Salvage Yard, ME (I); Rose Disposal Pit, MA (I); South Municipal Water Supply, NH (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); Yaworski Lagoon, CT (I); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II)*; Chemical Leaman Tank Lines, NJ (II); Ciba-Geigy, NJ (II)*; FAA Technical Center, NJ (II); GE Moreau, NY (II); Haviland Company, NY (II); Hooker-102nd Street, NY (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II)*; King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Myers Property, NJ (II); Old Bethpage, NY (II); Picatinny Arsenal, NJ (II); SMS Instruments, NY (II); Scientific Chemical Processing, NJ (II); Vineland Chemical, NJ (II); Craig Farm Drum, PA (III); Croydon TCE Spill, PA (III)*; Cryo-Chem, PA (III)*; Delaware Sand and Gravel, DE (III); Havertown PCP, PA (III); Henderson Road, PA (III)*; Lord Shope Landfill, PA (III); Osborne Landfill, PA (III); Price Landfill, NJ (III); Tyson Dump #1, PA (III)*; Cape Fear Wood Preserving, NC (IV); City Industries, FL (IV); Munisport Landfill, FL

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(IV); Pickettville Road Landfill, FL (IV); Algoma Municipal Landfill, WI (V); Bofors Nobel, MI (V); Bower's Landfill, OH (V); Burrows Sanitation, MI (V); Clare Water Supply, MI (V); Cross Brothers Pail (Pembroke), IL (V); Galesburg/Koppers, IL (V); Hedblum Industries, MI (V); Industrial Excess Landfill, OH (V)*; Kummer Sanitary Landfill, MN (V)*; Master Disposal Service Landfill, WI (V); MIDCO II, IN (V); Naval Industrial Reserve Ordnance Plant, MN (V); Northernaire Plating, MI (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Ott/Story/Cordova Chemical, MI (V); Ott/Story/Cordova Chemical (09/29/90), MI (V)*; Reilly Tar & Chemical (St. Louis Park), MN (V)*; Seymour, IN (V); Spiegelberg Landfill, MI (V)*; U.S. Aviex, MI (V); Verona Well Field-IRM, MI (V); Waite Park Wells, MN (V); Wausau Water Supply, WI (V); Wausau Water Supply, WI (V)*; Cleve Reber, LA (VI); Hardage/Criner (Amendment), OK (VI); Motco, TX (VI)*; Sheridan Disposal Services, TX (VI)*; South Valley/Edmunds Street, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Nuclear, NM (VI); Chemplex, IA (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Solid State Circuits, MO (VII); Waverly Groundwater Contamination, NE (VII); Wheeling Disposal Service, MO (VII); Burlington Northern (Somers), MT (VIII); Libby Ground Water, MT (VIII)*; Mystery Bridge at Highway 20, WY (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU19), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Silver Bow Creek, MT (VIII); Applied Materials, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Purity Oil Sales, CA (IX); San Fernando Valley (Area 1), CA (IX); San Fernando Valley (Area 1), CA (IX); Stringfellow, CA (IX)*; Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Tacoma, WA (X)

Publicly Owned Treatment Works (POTW)

Beacon Heights Landfill, CT (I); Kearsarge Metallurgical, NH (I); Laurel Park, CT (I); Old Springfield Landfill, VT (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); GEMS Landfill, NJ (II); GE Wiring Devices, PR (II); Helen Kramer, NJ (II); Katonah Municipal Well, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Lipari Landfill (07/11/88), NJ (II)*; Vega Alta, PR (II); Drake Chemical, PA (III)*; Rhinehart Tire Fire, VA (III); Tybouts Corner, DE (III); 62nd Street Dump, FL (IV); Bypass 601 Groundwater Contamination, NC (IV); Cape Fear Wood Preserving, NC (IV); City Industries, FL (IV); Jadco-Hughes, NC (IV); National Starch, NC (IV); Schuylkill Metal, FL (IV); Clare Water Supply, MI (V); FMC Corporation, MN (V); Galesburg/Koppers, IL (V); K&L Landfill, MI (V); Miami County Incinerator, OH (V); Moss-American Kerr-McGee Oil, WI (V); Naval Industrial Reserve Ordnance Plant, MN (V); New Brighton/Arden Hills (TCAAP), MN (V); Outboard Marine (Amendment), IL (V); Reilly Tar & Chemical (St. Louis Park), MN (V)*; Seymour, IN (V); Spiegelberg Landfill, MI (V)*; University of Minnesota, MN (V); Wedzeb Enterprises, IN (V); Brio Refining, TX (VI); Cimarron Mining, NM (VI); Crystal Chemical, TX (VI); Dixie Oil, TX (VI); Pesses Chemical, TX (VI); Sol Lynn (03/25/88), TX (VI); Doepke Disposal (Holliday), KS (VII); Fairfield Coal Gasification Plant, IA (VII); Findett, MO (VII); Midwest Manufacturing/North Farm, IA (VII); Missouri Electric Works, MO (VII); Solid State Circuits, MO (VII); Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); East Helena, MT (VIII); Del Norte, CA (IX); Litchfield Airport, AZ (IX); MGM Brakes, CA (IX); Operating Industries (11/16/87), CA (IX)*; Operating Industries (09/30/88), CA (IX)*; San Gabriel Area 1, CA (IX); Stringfellow Acid Pits, CA (IX)*; Stringfellow, CA (IX)*; Commencement Bay/Tacoma, WA (X); Western Processing, WA (X)*

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Relocation

Forest Glen Subdivision, NY (II); DeRewal Chemical, NJ (II); Brown's Battery Breaking, PA (III); Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Waste Disposal Engineering, MN (V); Koppers/Texarkana, TX (VI); Petro-Chemical Systems, TX (VI); United Creosoting, TX (VI); Times Beach, MO (VII); Times Beach, MO (VII)*; Anaconda Smelter/Mill Creek, MT (VIII); Mountain View/Globe, AZ (IX)

Solvent Extraction

Norwood PCBs, MA (I); O'Connor, ME (I); Pinette's Salvage Yard, ME (I); Ewan Property, NJ (II)*; Outboard Marine (Amendment), IL (V); United Creosoting, TX (VI)*

Slurry Wall

Sylvester, NH (I); Diamond Alkali, NJ (II); Florence Landfill, NJ (II); GE Moreau, NY (II); Helen Kramer, NJ (II); Hooker-102nd Street, NY (II); Kin-Buc Landfill, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Scientific Chemical Processing, NJ (II); Volney Landfill, NY (II); Kane & Lombard, MD (III); Osborne Landfill, PA (III); Southern Maryland Wood, MD (III); Whitehouse Waste Oil Pits, FL (IV); Allied/Ironton Coke, OH (V)*; E.H. Schilling Landfill, OH (V); Forest Waste Disposal, MI (V)*; Hunts Disposal, WI (V); Liquid Disposal, MI (V); Ninth Avenue Dump, IN (V); Outboard Marine (Amendment), IL (V); Schmaltz Dump, WI (V)*; Summit National, OH (V); Waste Disposal Engineering, MN (V); Bayou Sorrel, LA (VI); Geneva Industries, TX (VI); Industrial Waste Control, AR (VI); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU20), CO (VIII)*; Rocky Mountain Arsenal (OU23), CO (VIII)*; Union Pacific, WY (VIII)

Soil Washing/Flushing

Re-Solve, MA (I)*; Byron Barrel & Drum, NY (II)*; Ewan Property, NJ (II)*; King of Prussia, NJ (II); Myers Property, NJ (II); Solvent Savers, NY (II); Vineland Chemical, NJ (II); L.A. Clarke & Son, VA (III); US Titanium, VA (III); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Jadco-Hughes, NC (IV); Cross Brothers Pail (Pembroke), IL (V); Fisher Calo Chem, IN (V); Moss-American Kerr-McGee Oil, WI (V); Ninth Avenue Dump, IN (V)*; United Scrap Lead, OH (V); U.S. Aviex, MI (V); Wayne Waste Oil, IN (V); Arkwood, AR (VI); Koppers/Texarkana, TX (VI); South Calvacade Street, TX (VI); Sand Creek Industrial, CO (VIII); Koppers (Oroville Plant), CA (IX)

Solidification/Stabilization

Charles George Landfill 3 & 4, MA (I)*; New Bedford, MA (I); O'Connor, ME (I); Re-Solve, MA (I); Sullivan's Ledge, MA (I); W.R. Grace (Acton Plant), MA (I); Chemical Control, NJ (II)*; DeRewal Chemical, NJ (II); Love Canal/93rd Street School, NY (II)*; Marathon Battery (09/30/88), NY (II)*; Roebling Steel, NJ (II); York Oil, NY (II); Aladdin Plating, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon (09/29/86), PA (III)*; C&R Battery, VA (III); Craig Farm Drum, PA (III); Douglassville Disposal (Amendment), PA (III); Fike Chemical, WV (III); Greenwood Chemical, VA (III); Hebelka Auto Salvage Yard, PA (III); M.W. Manufacturing, PA (III)*; Ordnance Works Disposal Areas (Amendment), WV (III); Publicker/Cuyahoga Wrecking, PA (III); 62nd Street Dump, FL (IV);

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Amnicola Dump, TN (IV); Cabot/Koppers, FL (IV); Celanese/Shelby Fibers, NC (IV)*; Chemtronics, NC (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Flowood, MS (IV); Geiger (C&M Oil), SC (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Mowbray Engineering, AL (IV); Pepper's Steel, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Tower Chemical, FL (IV); Yellow Water Road, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Alsco Anaconda, OH (V); Burrows Sanitation, MI (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Liquid Disposal, MI (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Oconomowoc Electroplating, WI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Springfield Township Dump, MI (V); Velsicol Chemical, IL (V); Wayne Waste Oil, IN (V); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Cleve Reber, LA (VI); Gurley Pit, AR (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Mid-South Wood, AR (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Arkansas City Dump, KS (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Midwest Manufacturing/North Farm, IA (VII); Shenandoah Stables, MO (VII)*; Denver Radium/ROBCO, CO (VIII); Martin Marietta, Denver Aerospace, CO (VIII); Rocky Mountain Arsenal (OU17), CO (VIII)*; J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Purity Oil Sales, CA (IX); Selma Pressure Treating, CA (IX); Commencement Bay/Nearshore, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Pacific Hide andFur, ID (X); Queen City Farms-IRM/EDD, WA (X); Queen City Farms, WA (X); Teledyne Wah Chang Albany (TWCA), OR (X);

Surface Water Diversion/Collection

Charles George, MA (I)*; McKin, ME (I)*; Nyanza Chemical, MA (I); Sullivan's Ledge, MA (I); Burnt Fly Bog, NJ (II)*; Chemical Insecticide, NJ (II); Blosenski Landfill, PA (III); Chisman Creek, VA (III)*; Dorney Road Landfill, PA (III); East Mt. Zion, PA (III); Greenwood Chemical, VA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Henderson Road, PA (III)*; Kane & Lombard, MD (III); Kimberton, PA (III)*; Leetown Pesticide, WV (III); Moyer Landfill, PA (III); Palmerton Zinc, PA (III)*; Rhinehart Tire Fire, VA (III); Saltville Waste Disposal Ponds, VA (III); Taylor Borough, PA (III); Dubose Oil Products, FL (IV); Howe Valley Landfill, KY (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Tower Chemical, FL (IV); Industrial Excess Landfill, OH (V)*; Mid-State Disposal, WI (V); United Scrap Lead, OH (V); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Sheridan Disposal Services, TX (VI); Cherokee County, KS (VII)*; California Gulch, CO (VIII); Central City/Clear Creek, CO (VIII)*; Monticello Mill Tailings (DOE), UT (VIII); Coalinga Asbestos Mine, CA (IX)*; Stringfellow Acid Pits, CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); Queen City Farms-IRM/EDD, WA (X)

Surface Water Monitoring

Baird & McGuire, MA (I)*; Old Springfield Landfill, VT (I); Pinette's Salvage Yard, ME (I); Saco Tannery Waste Pits, ME (I)*; Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage (Amendment), NH (I); BEC Trucking, NY (II); Chemical Insecticide, NJ (II); Clothier Disposal,NY (II); FAA Technical Center, NJ (II); King of Prussia, NJ (II); Lone Pine Landfill, NJ (II)*; Ludlow Sand & Gravel, NY (II); Mannheim Avenue Dump, NJ (II); North Sea Municipal Landfill, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Scientific Chemical Processing, NJ (II); Vineland Chemical, NJ (II); Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II);

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Surface Water Monitoring (continued)

Ambler Asbestos Piles, PA (III); Army Creek Landfill, DE (III)*; Bally Groundwater Contamination, PA (III); Berks Sand Pit, PA (III); C&R Battery, VA (III); Coker's Sanitation Service Landfills, DE (III); Havertown PCP, PA (III); Hranica Landfill, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; New Castle Steel DE (III); New Castle Spill, DE (III); Palmerton Zinc, PA (III)*; Alpha Chemical, FL (IV); Cabot/Koppers, FL (IV); Chemtronics, NC (IV); Chemtronics (Amendment), NC (IV); Jadco-Hughes, NC (IV); National Starch, NC (IV); North Hollywood Dump, TN (IV); Big D Campground, OH (V); Bofors Nobel, MI (V); Byron Salvage Yard, IL (V)*; Coshocton Landfill, OH (V); Hunts Disposal, WI (V); Industrial Excess Landfill, OH (V)*; Johns-Manville, IL (V); K&L Landfill, MI (V); Master Disposal Service Landfill, WI (V); Miami County Incinerator, OH (V); New Brighton/Arden Hills (TCAAP), MN (V); Oconomowoc Electroplating, WI (V); Ott/Story/Cordova Chemical, MI (V); Peterson Sand & Gravel, IL (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Spiegelberg Landfill, MI (V)*; United Scrap Lead, OH (V); Waite Park Wells, MN (V); Wauconda Sand & Gravel, IL (V)*; Wayne Waste Oil, IN (V); Arkwood, AR (VI); Hardage/Criner (Amendment), OK (VI); Highlands Acid Pit, TX (VI)*; Sand Springs, OK (VI)*; Sheridan Disposal Services, TX (VI)*; Fulbright/Sac River Landfill, MO (VII); Solid State Circuits, MO (VII); Wheeling Disposal Service, MO (VII); Monticello Mill Tailings (DOE), UT (VIII); Silver Bow Creek, MT (VIII); Whitewood Creek, SD (VIII); Coalinga Asbestos Mine, CA (IX)*; J.H. Baxter, CA (IX); Gould, OR (X)

Surface Water Treatment

C&R Battery, VA (III); Havertown PCP, PA (III); M.W. Manufacturing, PA (III)*; Cape Fear Wood Preserving, NC (IV); Schuylkill Metal, FL (IV); Anderson Development, MI (V); Industrial Excess Landfill, OH (V)*; Oconomowoc Electroplating, WI (V); Outboard Marine (Amendment), IL (V); Hardage/Criner (Amendment), OK (VI); East Helena, MT (VIII); Silver Bow Creek, MT (VIII)

Temporary Storage

New Bedford, MA (I); Ciba-Geigy, NJ (II)*; Ewan Property, NJ (II); FAA Technical Center, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Picatinny Arsenal, NJ (II); Roebling Steel, NJ (II); Fike Chemical, WV (III); Publicker/Cuyahoga Wrecking, PA (III); Strasburg Landfill, PA (III); Airco, KY (IV); Brown Wood Preserving, FL (IV); Goodrich, B.F., KY (IV); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Petro-Chemical Systems, TX (VI); Rogers Road Municipal Landfill, AR (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Minker/Stout/Romaine Creek, MO (VII); Minker Stout/Stout, MO (VII); Minker/Stout/Romaine Creek, MO (VII)*; Shenandoah Stables, MO (VII); Syntex Verona, MO (VII); Times Beach, MO (VII)*; Weldon Spring Quarry/Plant/Pits (USDOE), MO (VII)*; Broderick Wood Products, CO (VIII); Denver Radium III, CO (VIII)*; Denver Radium/11th & Umatilla, CO (VIII)*; Denver Radium 12th & Quivas, CO (VIII)*; Denver Radium/Card Property, CO (VIII)*; Denver Radium/Open Space Property, CO (VIII)*; Denver Radium ROBCO, CO (VIII)*; Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (DOE), CO (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Sharon Steel (Midvale Tailings), UT (VIII)

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Treatment Technology

Baird & McGuire, MA (I); Baird & McGuire (09/14/89), MA (I)*; Beacon Heights Landfill, CT (I); Cannon Engineering, MA (I); Charles George Landfill 3 & 4, MA (I)*; Coakley Landfill, NH (I); Davis Liquid Waste, RI (I); Groveland Wells, MA (I); Iron Horse Park, MA (I); Kearsarge Metallurgical, NH (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; Landfill & Resource Recovery, RI (I); New Bedford, MA (I); Norwood PCBs, MA (I); O'Connor, ME (I); Old Springfield Landfill, VT (I); Ottati & Goss/Great Lakes, NH (I); Pinette's Salvage Yard, ME (I); Re-Solve, MA (I)*; Rose Disposal Pit, MA (I); Stamina Mills, RI (I); Sullivan's Ledge, MA (I); Tinkhams Garage, NH (I); Tinkhams Garage (Amendment), NH (I); Wells G&H, MA (I); W.R. Grace (Acton Plant), MA (I); American Thermostat, NY (II)*; Brewster Well Field, NY (II); Brewster Well Field (09/29/88), NY (II); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Byron Barrel & Drum, NY (II)*; Caldwell Trucking, NJ (II); Chemical Control, NJ (II)*; Claremont Polychemical, NY (II)*; Ewan Property, NJ (II); Ewan Property (09/29/89), NJ (II)*; FAA Technical Center, NJ (II); FAA Technical Center (09/28/90), NJ (II)*; Fulton Terminals, NY (II); GE Wiring Devices, PR (II); Goose Farm, NJ (II); Hooker Chemical/Ruco Polymer, NY (II); Hooker-102nd Street, NY (II); Kin-Buc Landfill, NJ (II); King of Prussia, NJ (II); Lipari Landfill (07/11/88), NJ (II)*; Love Canal/93rd Street School, NY (II)*; Love Canal, NY (II)*; Marathon Battery, NY (II); Marathon Battery (09/30/88), NY (II)*; Marathon Battery (09/29/89), NY (II)*; Mattiace Petrochemicals, NY (II); Metaltec/Aerosystems, NJ (II); Montgomery Township Housing, NJ (II)*; Myers Property, NJ (II); Pepe Field, NJ (II); Port Washington Landfill, NY (II); Preferred Plating, NY (II); Radium Chemical, NY (II); Reich Farm, NJ (II); Renora Inc., NJ (II); Roebling Steel, NJ (II); SMS Instruments, NY (II); Sarney Farm, NY (II); Sayreville Landfill, NJ (II); Sealand Restoration, NY (II); Solvent Savers, NY (II); Syncon Resins, NJ (II); Upjohn Manufacturing, PR (II); Vestal Water Supply 1-1, NY (II)*; Vineland Chemical, NJ (II); Wide Beach, NY (II); Williams Property, NJ (II); York Oil, NY (II); Ambler Asbestos Piles, PA (III); Avtex Fibers, VA (III); Avtex Fibers (09/28/90), VA (III)*; Bendix, PA (III); Berks Sand Pit, PA (III); Bruin Lagoon, PA (III)*; C&R Battery, VA (III); Craig Farm Drum, PA (III); Delaware Sand and Gravel, DE (III); Douglassville Disposal, PA (III)*; Drake Chemical, PA (III)*; Fike Chemical, WV (III); Greenwood Chemical, VA (III); Kimberton, PA (III); Kimberton (06/30/89), PA (III)*; L.A. Clarke & Son, VA (III); Leetown Pesticide, WV (III); Lord Shope Landfill, PA (III); M.W. Manufacturing, PA (III); M.W. Manufacturing (06/29/90), PA (III)*; Ordnance Works Disposal, WV (III); Ordnance Works Disposal Areas (Amendment), WV (III); Palmerton Zinc, PA (III)*; Southern Maryland Wood, MD (III); Tyson's Dump (Amendment), PA (III); Tyson's Dump, PA (III)*; US Titanium, VA (III); West Virginia Ordnance Works, WV (III); Whitmoyer Laboratories, PA (III); 62nd Street Dump, FL (IV); Aberdeen Pesticide/Fairway Six, NC (IV); American Creosote Works, TN (IV); American Creosote Works (01/05/89), FL (IV); Amnicola Dump, TN (IV); Brown Wood Preserving, FL (IV); Cabot/Koppers, FL (IV); Cape Fear Wood Preserving, NC (IV); Celanese/Shelby Fibers, NC (IV)*; Celanese Fibers Operations, NC (IV); Coleman Evans, FL (IV); Coleman-Evans Wood Preserving (Amendment), FL (IV); Dubose Oil Products, FL (IV); Geiger (C&M Oil), SC (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Kassouf-Kimerling Battery, FL (IV); Kassouf-Kimerling Battery Disposal, FL (IV)*; Mowbray Engineering, AL (IV); Newsome Brothers/Old Reichhold, MS (IV); Palmetto Wood Preserving, SC (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); SCRDI Bluff Road, SC (IV); Schuylkill Metal, FL (IV); Smith's Farm, KY (IV); Sodyeco, NC (IV); Stauffer Chemical (Cold Creek), AL (IV); Stauffer Chemical (LeMoyne Plant), AL (IV); Tower Chemical, FL (IV); Wamchem, SC (IV); Yellow Water Road, FL (IV); Zellwood, FL (IV); Zellwood Groundwater Contamination (Amendment), FL (IV); Allied/Ironton Coke, OH (V)*; Alsco Anaconda, OH (V); Anderson Development, MI (V); Arrowhead Refinery, MN (V); Bayou Bonfouca, LA (VI); Big D Campground, OH (V); Bofors

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Treatment Technology (continued)

Nobel, MI (V); Burrows Sanitation, MI (V); Cliff/Dow Dump, MI (V); Cross Brothers Pail (Pembroke), IL (V); E.H. Schilling Landfill, OH (V); Fisher Calo Chem, IN (V); Forest Waste, MI (V)*; Fort Wayne Reduction, IN (V); Galesburg/Koppers, IL (V); Hagen Farm, WI (V); Ionia City Landfill, MI (V); Kysor Industrial, MI (V); LaSalle Electrical, IL (V); LaSalle Electrical Utilities, IL (V)*; Laskin/Poplar, OH (V); Laskin/Poplar Oil (09/30/87), OH (V)*; Liquid Disposal, MI (V); Miami County Incinerator, OH (V); MIDCO I, IN (V); MIDCO II, IN (V); Mid-State Disposal, WI (V); Moss-American Kerr-McGee Oil, WI (V); New Brighton/Arden Hills (TCAAP), MN (V); Ninth Avenue Dump, IN (V)*; Oconomowoc Electroplating, WI (V); Onalaska Municipal Landfill, WI (V); Outboard Marine (Amendment), IL (V); Pristine, OH (V); Pristine (Amendment), OH (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Seymour, IN (V)*; Springfield Township Dump, MI (V); Summit National, OH (V); U.S. Aviex, MI (V); United Scrap Lead, OH (V); University of Minnesota, MN (V); Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Wedzeb Enterprises, IN (V); Arkwood, AR (VI); Atchison/Santa Fe (Clovis), NM (VI); Bailey Waste Disposal, TX (VI); Brio Refining, TX (VI); Crystal Chemical, TX (VI); French Limited, TX (VI); Hardage/Criner (Amendment), OK (VI); Industrial Waste Control, AR (VI); Jacksonville Municipal Landfill, AR (VI); Koppers/Texarkana, TX (VI); Motco, TX (VI); Motco (09/27/89), TX (VI)*; North Cavalcade Street, TX (VI); Oil Mid-South Wood, AR (VI); Old Midland Products, AR (VI); Pesses Chemical, TX (VI); Rogers Road Municipal Landfill, AR (VI); Sikes Disposal Pits, TX (VI); Sheridan Disposal Services, TX (VI); Sol Lynn (03/25/88), TX (VI); South Calvacade Street, TX (VI); South Valley/Edmunds Street, NM (VI)*; South Valley/PL-83, NM (VI)*; Tenth Street Dump/Junkyard, OK (VI); Texarkana Wood Preserving, TX (VI); Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); United Creosoting, TX (VI)*; Vertac, AR (VI); Arkansas City Dump, KS (VII); Fairfield Coal Gasification Plant, IA (VII); Hastings Groundwater, NE (VII); Hastings Groundwater Contamination (East Industrial Park), NE (VII); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Midwest Manufacturing/North Farm, IA (VII); Minker/Stout/Romaine Creek, MO (VII)*; Missouri Electric Works, MO (VII); Shenandoah Stables, MO (VII)*; Syntex Verona, MO (VII); Times Beach, MO (VII)*; Vogel Paint & Wax, IA (VII); Waverly Groundwater Contamination, NE (VII); Broderick Wood Products, CO (VIII); Burlington Northern (Somers), MT (VIII); East Helena, MT (VIII); Libby Ground Water, MT (VIII)*; Martin Marietta, Denver Aerospace, CO (VIII); Monticello Vicinity Properties, UT (VIII); Ogden Defense Depot, UT (VIII); Rocky Mountain Arsenal (OU16), CO (VIII)*; Rocky Mountain Arsenal (OU17), CO (VIII)*; Rocky Mountain Arsenal (OU18), CO (VIII)*; Sand Creek Industrial, CO (VIII); Sand Creek Industrial (09/28/90), CO (VIII)*; Woodbury Chemical, CO (VIII)*; Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Indian Bend Wash, AZ (IX); Intel (Mountain View), CA (IX); Intersil, CA (IX); J.H. Baxter, CA (IX); Koppers (Oroville Plant), CA (IX); Litchfield Airport, AZ (IX); Lorentz Barrel & Drum, CA (IX); Motorola 52nd Street, AZ (IX); Operating Industries (09/30/88), CA (IX)*; Operating Industries Landfill (Amendment), CA (IX)*; Purity Oil Sales, CA (IX); Raytheon, CA (IX); San Fernando Valley (Area 1), CA (IX); San Gabriel Valley (Areas 1, 2 & 4), CA (IX)*; Selma Pressure Treating, CA (IX); Solvent Service, CA (IX); Stringfellow Acid Pits, CA (IX)*; Stringfellow, CA (IX)*; Tucson International Airport, AZ (IX); Watkins Johnson (Stewart Division), CA (IX); Commencement Bay/Nearshore, WA (X); Commencement Bay/Tacoma, WA (X); FMC Yakima Pit, WA (X); Frontier Hard Chrome (12/30/87), WA (X); Gould, OR (X); Northwest Transformer, WA (X); Pacific Hide and Fur, ID (X); Teledyne Wah Chang Albany (TWCA), OR (X); Triangle Chemical, TX (VI); United Chrome, OR (X); Western Processing, WA (X)*

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Vacuum Extraction

Groveland Wells, MA (I); Keefe Environmental Services, NH (I)*; Kellogg-Deering Well Field, CT (I)*; South Municipal Water Supply, NH (I); Stamina Mills, RI (I); Tinkhams Garage (Amendment), NH (I); FAA Technical Center, NJ (II); Pepe Field, NJ (II); Port Washington Landfill, NY (II); SMS Instruments, NY (II); Solvent Savers, NY (II); Vestal Water Supply 1-1, NY (II)*; Bendix, PA (III); Lord Shope Landfill, PA (III); Tyson's Dump (Amendment), PA (III); Airco, KY (IV); Goodrich, B.F., KY (IV); Jadco-Hughes, NC (IV); SCRDI Bluff Road, SC (IV); Fisher Calo Chem, IN (V); Hagen Farm, WI (V); Kysor Industrial, MI (V); Miami County Incinerator, OH (V); Pristine (Amendment), OH (V); Seymour, IN (V); Springfield Township Dump, MI (V); Verona Well Field, MI (V)*; Wausau Water Supply, WI (V)*; Wayne Waste Oil, IN (V); Hardage/Criner (Amendment), OK (VI); South Valley/PL-83, NM (VI)*; Tinker AFB (Soldier Creek/Bldg. 3001), OK (VI); Hastings Groundwater/Colorado Avenue, NE (VII); Hastings Groundwater/FAR-MAR-CO, NE (VII)*; Lindsay Manufacturing, NE (VII); Waverly Groundwater Contamination, NE (VII); Martin Marietta, Denver Aerospace, CO (VIII); Rocky Mountain Arsenal (OU18), CO (VIII)*; Sand Creek Industrial, CO (VIII); Intersil, CA (IX); Litchfield Airport, AZ (IX); Motorola 52nd Street, AZ (IX); Solvent Service, CA (IX); Watkins Johnson (Stewart Division), CA (IX)

Venting

Beacon Heights, CT (I); Beacon Heights Landfill, CT (I); Charles George, MA (I)*; Coakley Landfill, NH (I); Old Springfield Landfill, VT (I); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Kentucky Avenue Wellfield, NY (II)*; Port Washington Landfill, NY (II); Syosset Landfill, NY (II); East Mt. Zion, PA (III); Heleva Landfill, PA (III); Moyer Landfill, PA (III); Jadco-Hughes, NC (IV); Pickettville Road Landfill, FL (IV); Algoma Municipal Landfill, WI (V); Allied/Ironton Coke, OH (V)*; IMC Terre Haute, IN (V); K&L Landfill, MI (V); Long Prairie, MN (V); Mason County Landfill, MI (V); Master Disposal Service Landfill, WI (V); Metamora Landfill, MI (V)*; New Lyme, OH (V); Onalaska Municipal Landfill, WI (V); Wayne Waste Oil, IN (V); Wheeler Pit, WI (V); Bayou Sorrel, LA (VI); Brio Refining, TX (VI); Hardage/Criner, OK (VI), Operating Industries (09/30/88), CA (IX)*; Martin Marietta, OR (X)

Volatilization/Soil Aeration

Wells G&H, MA (I); American Thermostat, NY (II)*; Claremont Polychemical, NY (II)*; Miami County Incinerator, OH (V); Fairchild Semicond (Mt. View), CA (IX); Fairchild Semicond (S San Jose), CA (IX); Intel (Mountain View), CA (IX); Raytheon, CA (IX)

Vitrification

Anderson Development, MI (V); Ionia City Landfill, MI (V); Sangamo/Crab Orchard NWR (USDOI), IL (V)*; Crystal Chemical, TX (VI); Rocky Mountain Arsenal (OU16), CO (VIII)*; Northwest Transformer, WA (X)

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MISCELLANEOUS

Municipally-Owned Site

Kellogg-Deering Well Field, CT (I)*; Winthrop Landfill-EDD, ME (I); North Sea Municipal Landfill, NY (II); Pepe Field, NJ (II); Port Washington Landfill, NY (II); Rockaway Borough Wellfield, NJ (II); Volney Landfill, NY (II); Army Creek Landfill, DE (III); Enterprise Avenue, PA (III); Newport Dump Site, KY (IV); Powersville Landfill, GA (IV); Ionia City Landfill, MI (V); New Brighton/Arden Hills (Amendment), MN (V); Wausau Water Supply, WI (V)*; Crystal City Airport, TX (VI); Fulbright/Sac River Landfill, MO (VII); John's Sludge Pond, KS (VII); Denver Radium Site Streets, CO (VIII), Ordot Landfill, GU (IX)

Woodlands (FY 1982 - 1988 only)

Old Springfield Landfill, VT (I); Tinkhams Garage, NH (I); Reich Farm, NJ (II); Lansdowne Radiation, PA (III); Palmerton Zinc, PA (III); Forest Waste Disposal, MI (V)*; Mason County Landfill, MI (V); United Scrap Lead, OH (V); Old Inger, LA (VI)

HISTORICALLY SIGNIFICANT

ACL

Saco Tannery Waste Pits, ME (I)*; Sylvester, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Yaworski Lagoon, CT (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Marathon Battery (09/30/88), NY (II)*; Vineland Chemical, NJ (II); Blosenski Landfill, PA (III); Douglassville Disposal (Amendment), PA (III); Harvey-Knott, DE (III); Henderson Road, PA (III); Henderson Road, PA (III)*; West Virginia Ordnance Works, WV (III)*; Airco, KY (IV); Alpha Chemical, FL (IV); Goodrich, B.F., KY (IV); Newport Dump Site, KY (IV); Pickettville Road Landfill, FL (IV); SCRDI Dixiana, SC (IV); Byron Salvage Yard, IL (V)*; E.H. Schilling Landfill, OH (V); Fort Wayne Reduction, IN (V); Velsicol Chemical, IL (V); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Old Mill, OH (V); Martin Marietta, OR (X); Western Processing, WA (X)*

Background Levels

Coakley Landfill, NH (I); Nyanza Chemical, MA (I); Glen Ridge Radium, NJ (II); Montclair/West Orange Radium, NJ (II); Vestal Water Supply 1-1, NY (II)*; Woodland Township Route 72, NJ (II); Woodland Township Route 532, NJ (II); Croydon TCE Spill, PA (III)*; East Mt. Zion, PA (III); Hranica Landfill, PA (III); Industrial Lane, PA (III); Keystone Sanitation Landfill, PA (III); Kimberton, PA (III)*; Osborne Landfill, PA (III); Palmerton Zinc, PA (III)*; Raymark, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Aberdeen Pesticide/Fairway Six, NC (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Jadco-Hughes, NC (IV); Schuylkill Metal, FL (IV); Metamora Landfill, MI (V)*; Reilly Tar, MN (V); Springfield Township Dump, MI (V); United Scrap Lead, OH (V); Wauconda Sand & Gravel, IL (V)*; Triangle Chemical, TX (VI); United Nuclear, NM (VI); Aidex, IA (VII)*; Hastings Groundwater Contamination (East Industrial Park), NE (VII); Anaconda Smelter/Mill Creek, MT (VIII); Arsenic Trioxide, ND (VIII); Whitewood Creek, SD (VIII); Koppers (Oroville Plant), CA (IX); Toftdahl Drum, WA (X)

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Deferred Decision

Cannon/Plymouth, MA (I); Glen Ridge Radium, NJ (II); Lipari Landfill (09/30/85), NJ (II)*; Montclair/West Orange Radium, NJ (II); Scientific Chemical Processing, NJ (II); Swope Oil, NJ (II); Douglassville Disposal, PA (III); McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Tyson's Dump, PA (III); American Cresote, FL (IV); Davie Landfill, FL (IV); New Brighton/Arden Hills/St. Anthony, MN (V)*; Bayou Bonfouca, LA (VI); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*

Initial Remedial Measure (IRM)

New Brighton/Arden Hills (Amendment), MN (V); Intel (Santa Clara III), CA (IX)

Temporary Remedial Measure (FY 1982 - 1988 only)

Hudson River, NY (II); Byron Salvage Yard, IL (VI)*; Denver Radium/ROBCO, CO (VIII); Denver Radium/Card Property, CO (VIII)*; Union Pacific, WY (VIII)

Contingent Remedy

Saco Tannery Waste Pits, ME (I)*; Byron Barrel & Drum, NY (II)*; Imperial Oil/Champion Chemicals, NJ (II); Mannheim Avenue Dump, NJ (II); Myers Property, NJ (II); Preferred Plating, NY (II); SMS Instruments, NY (II); City Industries, FL (IV); Howe Valley Landfill, KY (IV); Jadco-Hughes, NC (IV); Vestal Water Supply 1-1, NY (II)*; Osborne Landfill, PA (III); NL Industries/Taracorp Lead Smelt, IL (V); St. Louis River, MN (V); Windom Dump, MN (V); East Helena, MT (VIII); Koppers (Oroville Plant), CA (IX)

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