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Superfund

EPA

ROD ANNUAL REPORT

FY 1992

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SECTION I

INTRODUCTION AND EXHIBITS

Superfund was created by Congress with the passage of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). On October 17, 1986, the Superfund Amendments and Reauthorization Act of 1986 (SARA) was enacted. SARA reflected EPA's experience in administering the complex Superfund program during its first six years and made several important changes and additions to the program. SARA stressed the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites; required Superfund actions to consider the standards and requirements found in other Federal and State environmental laws and regulations; provided new enforcement authorities and settlement tools; increased State involvement in every phase of the Superfund program; increased the focus on human health problems posed by hazardous waste sites; and encouraged greater citizen participation in making decisions on how sites should be cleaned up.

The Superfund remedial program has modified its approach to site cleanups to reflect the 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 reduces the volume, toxicity, or mobility of hazardous wastes as a principal element.

The Records of Decision (RODs) highlighted in this annual report document compliance with SARA mandates for the remedial program in FY 1992. Each ROD discusses the remedy decision for a site or operable unit, certifies that the remedy selection process has followed the requirements of CERCLA and the National Contingency Plan (NCP), discusses the major technical components of the remedy, and provides the public with a consolidated source of information about the site. Once the Regional Administrator or the Assistant Administrator of the Office of Solid Waste and Emergency Response signs the ROD, it is made available for information purposes and placed in the administrative record for the site. One thousand one hundred and seventeen (1,117) RODs have been signed since the Superfund program began (see Exhibit 7).

FY 1992 RODs

One hundred sixty-four (164) RODs and eight (8) ROD Amendments, including Fund-lead, Enforcement, and Federal Facility RODs were signed during FY 1992. The lead breakdown for the RODs is as follows: 53 Fund-lead plus 65 Enforcement-lead, equals 118; 118 plus 46 Federal Facility-lead equals 164 RODs. The eight Amendments consist of 3 Fund-lead and 5 Enforcement-lead RODs. The data in this annual report are based on these 172 RODs and ROD Amendments; for clarity, these are collectively referred to as RODs throughout the remainder of the report.

119 of the 172 RODs addressed source control remediation, and 28 RODs addressed ground-water-only remediation. The remaining 25 RODs were no action/no further action remedies. Of the total 119 source control RODs, 85 addressed a final source control remedy, and 34 addressed an interim source control remedy. 78 of the 119 source control RODs selected both source control and ground water remediation components.

In keeping with CERCLA Section 121 and the NCP program expectations to treat highly toxic, highly mobile wastes and contain low level wastes or large volumes of waste, 'treatment technologies' were used for 78 (66%) of the 119 source control remedies (see Exhibit 3A). 'Treatment technologies' are those selected source control technologies listed at the top of Exhibit 2, as opposed to other types of treatment. In a further breakdown, source control treatment technologies plus the other types of treatment were selected for 60 (71%) of the 85 'final' source control RODs (see Exhibit 3B). A historical overview of the increase in treatment selected for source control and 'final' source control RODs since 1982, is shown in Exhibits 3A through 3C. Exhibits 3A and 3C show the

percentages of Superfund source control remedies which have chosen all types of treatment, while Exhibit 3B shows the percentages of 'final' source control remedies since 1987 that have used treatment technologies. It was not until after SARA, in 1986, that more data on the 'final' source control remedies became available for comparison.

Exhibits

Exhibits 1-13 summarize various data from the 172 FY 1992 RODs, and similar data comparisons for all RODs signed since FY 1982. To assist in understanding the data presented in Exhibits 1 through 6, a description of each source control and ground water treatment technology is provided in Section VII.

Exhibit 1 provides an overview of the types of remedial action selected for all FY 1992 RODs. Exhibit 1A provides the same overview for all RODs FY 1987 - FY 1992.

Exhibit 2 provides a quantitative summary of remedial action components by the number of occurrences in RODs. Occurrences means the count of one or more technologies, which may be associated with a remedial action described in the ROD. For example, a ground water remedy may consist of air stripping, aeration, and carbon adsorption, as part of a treatment train, which would consist of three occurrences. This exhibit demonstrates that occurrences of the use of treatment technologies (107) for the 119 source control remedies exceeded that of containment only remedy occurrences (30) by a factor of 3.6. Of the 107 occurrences of source control treatment technologies, Immobilization (37) and In-situ Vacuum/Vapor Extraction (20) were selected most frequently, followed by both Bioremediation and other unspecified treatment technologies (13).

Exhibit 3 compares the selection of source control remedies with treatment only; treatment as a primary component with containment in separate areas; and containment as the primary component. Exhibit 3A shows the percent and total number of all source control RODs that used some type of treatment, as a percent of all the source control RODs for each year. For example, there were 119 source control RODs in FY 1992, and of those 119 RODs, 86 (72%) selected remedies with treatment only, or treatment as a primary component with containment in separate areas. The remainder (32) of the source control RODs in FY 1992 used containment or other actions for the source control remedy. Exhibit 3B shows the percent and total number of 'final' source control RODs signed from FY 1987 through FY 1992, which employed some type of treatment. Exhibit 3B shows that in FY 1992, 60 (71%) of the 'final' source control RODs (85) used treatment remedies. The remainder (25) of the 'final' source control RODs in FY 1992 used other types of remedies. Exhibit 3C shows out of all the RODs each year, what percent of remedies have used treatment technologies for source control, versus the percent utilizing containment only and other actions. Exhibits 3 through 3C indicate that the percentage of treatment technologies used for Superfund remedy selection has remained near constant for the past five years between FY 1988 and FY 1992.

Exhibit 4 illustrates the occurrences of treatment technologies in FY 1992 source control remedies by type of treatment technology. Immobilization was the main treatment technology category, followed by Separation/ Recovery technologies. Exhibit 4A shows the same data for all occurrences of technologies since FY 1982.

Exhibit 5 shows the types (110) and occurrences (179) of remedies employed in FY 1992 ground water treatment RODs. Of the 110 FY 1992 RODs addressing ground water, 78 also contained a source control component. Exhibit 5A depicts the types and occurrences of treatment technologies employed in FY 1992 ground water RODs, and Exhibit 5B compares the number and percentage of RODs that addressed a ground water remedy against the total number of RODs since 1982. The majority of ground water treatment occurrences were chemical/physical treatment technologies (78%). The most frequent occurrences (see also Exihbit 2) were for air stripping (35), carbon adsorption (24), and precipitation (21). Biological treatment was employed in 5% (10 occurrences) of the treatments, and the remaining 17% (30 occurrences) of ground water remedies used other technologies to restore ground water to its beneficial uses within a reasonable timeframe.

INTRODUCTION AND EXIBITS (Continued)

An index of site remedies for all the FY 1992 RODs is provided in Exhibit 6, which contains RODs grouped by the specific type of source control and/or non-source control remedy selected. RODs which selected two or more types of remedy technologies or measures, are listed in each respective remedy group. No Action/No Further Action RODs are listed on the last page of this exhibit.

Historical Overview FY 1982 - FY 1992

The passage of SARA strengthened and extended the Superfund program while maintaining the overall framework for implementation. These new requirements under CERCLA, as amended by SARA, were intended to ensure protective clean-up standards, permanent remedies, and the use of alternative technologies where applicable. A historical overview of FY 1982 - FY 1992 RODs is provided in Exhibits 7 through 10 to show annual progress in achieving these statutory mandates.

Exhibit 7 depicts the number of RODs signed per fiscal year, both overall and by region. Exhibit 8 is a quantitative overview of the occurrences and type of treatment technologies which have been selected in source control treatment technology RODs (FY1982 - FY1992).

Comparative data on the number of RODs and number of occurrences of treatment technologies and 'innovative' technologies selected for source control RODs (FY 1987 - FY 1992) are presented in Exhibit 9. These data demonstrate that there has been: (1) an increase since 1987 in the percentage of RODs selecting treatment as a principal remedy for source control, and (2) an increase since 1987 in the percentage of innovative treatment technologies selected. The use of innovative treatment technologies declined somewhat during FY1992.

Exhibit 10 provides a list of all source control RODs FY 1982 through FY 1992 by treatment type, and by fiscal year of ROD signature.

Exhibits 11 and 12 illustrate and list the information for FY 1992 treatment train RODs, i.e., RODs which employ a sequence of treatment technologies to address a single medium or constituent. Exhibit 13 provides a comparison of FY 1982 - FY 1992 ROD data on remedial action costs.

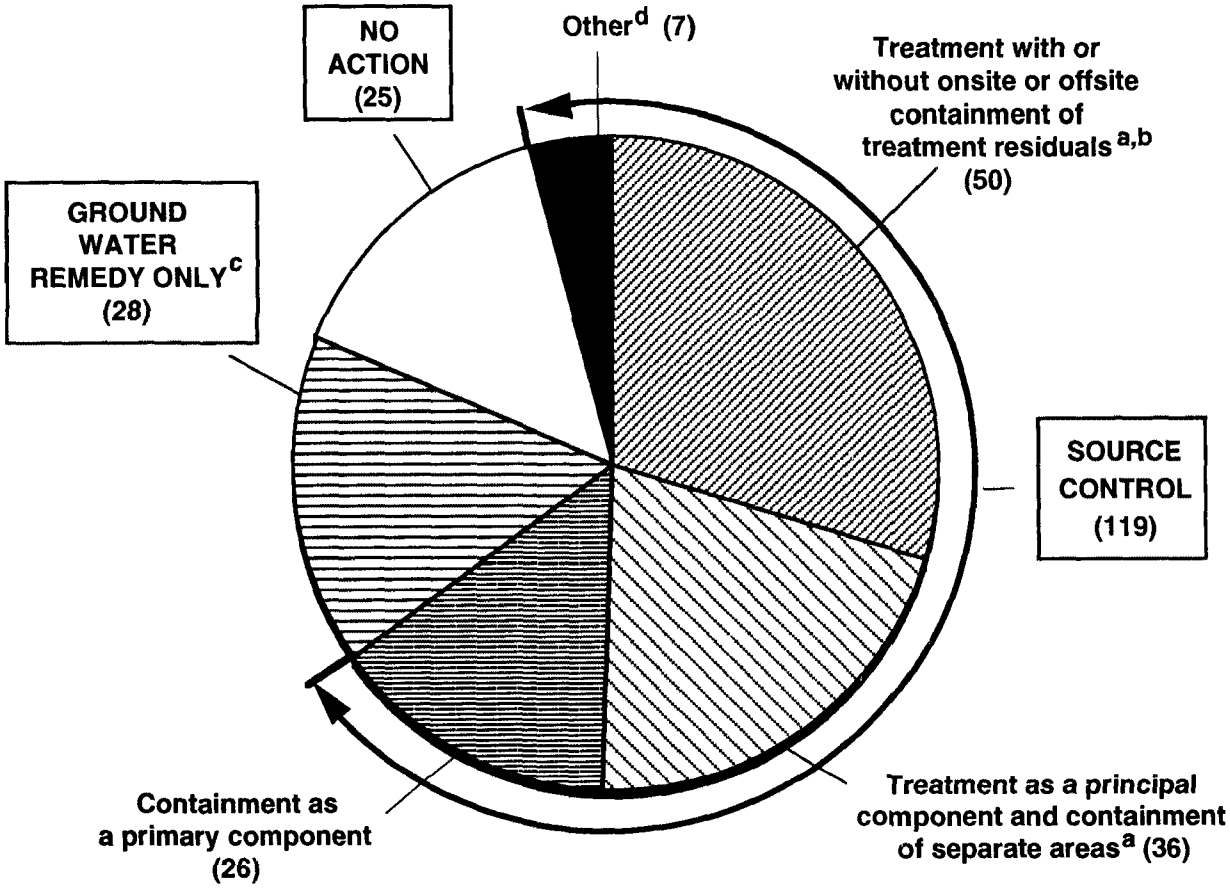
FY 1992 ROD Annual Report

The FY 1992 ROD Annual Report is designed to provide the Regions, Headquarters, and the public with summary information on the FY 1992 RODs and historical information on all of the FY 1982 - FY 1992 RODs. In addition to the above mentioned exhibits, this volume contains the FY 1992 ROD abstracts, summary table, keyword list, list of all RODs signed since FY 1982, and list of ROD Amendments and Explanations of Significant Differences (ESDs). Separate sections of the volume provide useful background information to assist the reader in technical understanding of selected remedial options (Section VII) and interpretation of commonly used Superfund acronyms (Section VIII). Please note that the combined summary tables for FY 1982 - 1990 and FY 1991 have no longer been included in the report, but are in the publication ROD Annual Report FY 1991 and the reports for each previous year.

EXHIBIT 1

FY 1992: RECORDS OF DECISION (RODs) OVERVIEW

This exhibit presents an overview of all remedial actions selected for 172 RODs signed in FY 1992, including 46 Federal Facility RODs and 8 ROD Amendments.



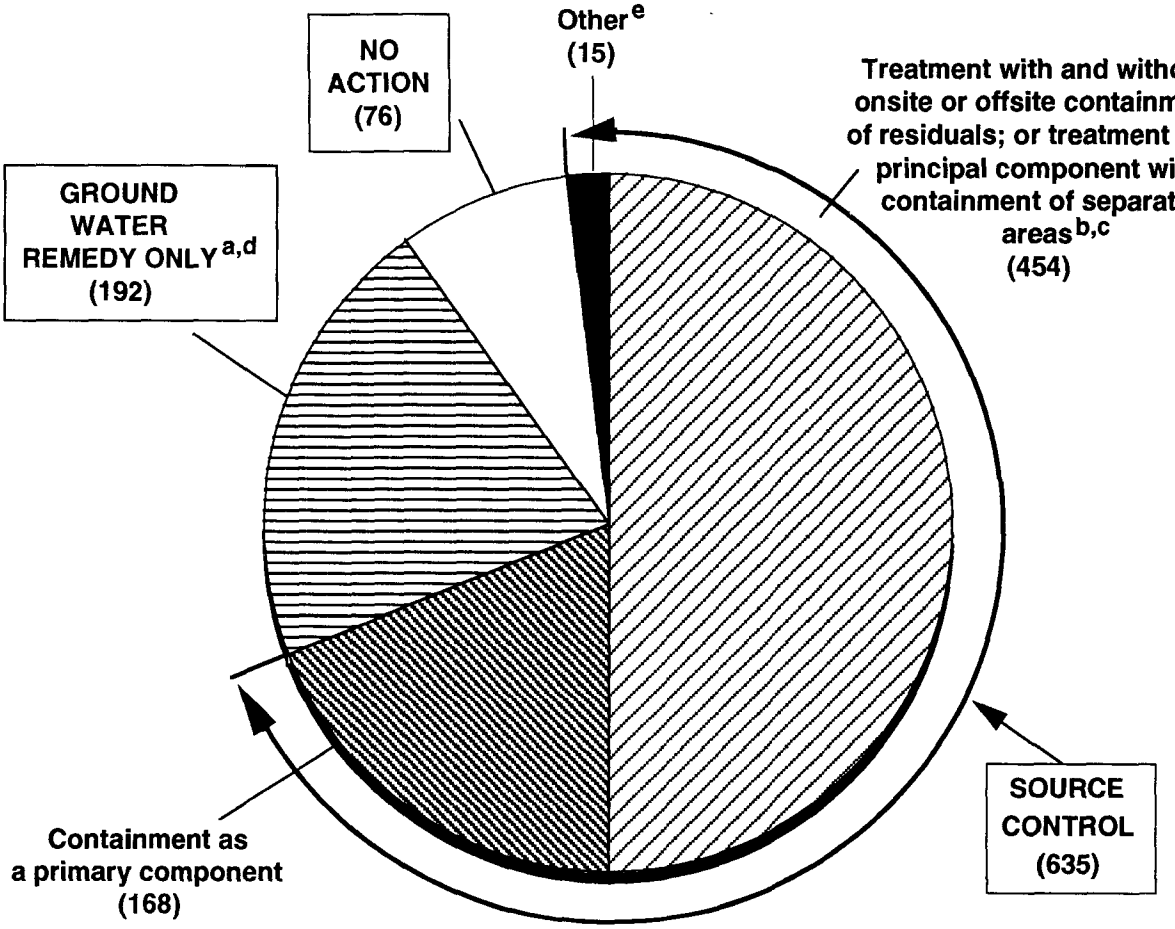
REMEDY	NUMBER	PERCENT
Source Control	119	69
Ground Water Only	28	16
No Action	25	15
TOTAL	172	100%

a Includes treatment trains for source actions.
b Many treatments yield a residual that may require further management.
c Includes containment, institutional controls, restoration, and alternate water supply remedies.
d Includes institutional controls, monitoring, or relocation remedies.

EXHIBIT 1A

FY 1987 - FY 1992: RECORDS OF DECISION OVERVIEW

This exhibit presents an overview of all remedial actions selected for RODs signed from FY 1987 through FY 1992 (post-SARA), based on a total of 903 RODs[a], including 34 ROD amendments.



REMEDY	NUMBER	PERCENT
Source Control	635	70
Ground Water Only	192	21
No Action	76	9
TOTAL	903	100%

a Total number of RODs does not include data from 2 confidential sites.
b Includes treatment trains for source actions.
c Many treatments yield a residual that may require further management.
d Includes containment institutional controls, restoration, and alternate water supply remedies.
e Includes institutional controls, monitoring, or relocation remedies.

EXHIBIT 2

FY 1992: ROD REMEDIAL ACTION SUMMARY TABLE[a]

This exhibit presents a summary of the occurrences of remedial actions for 94 final and 49 interim action RODs, 4 RODs with both final and interim components and 25 RODs that selected no action/no further action. More than one occurrence per remedial action may be associated with the primary and contingent remedies selected in a ROD.

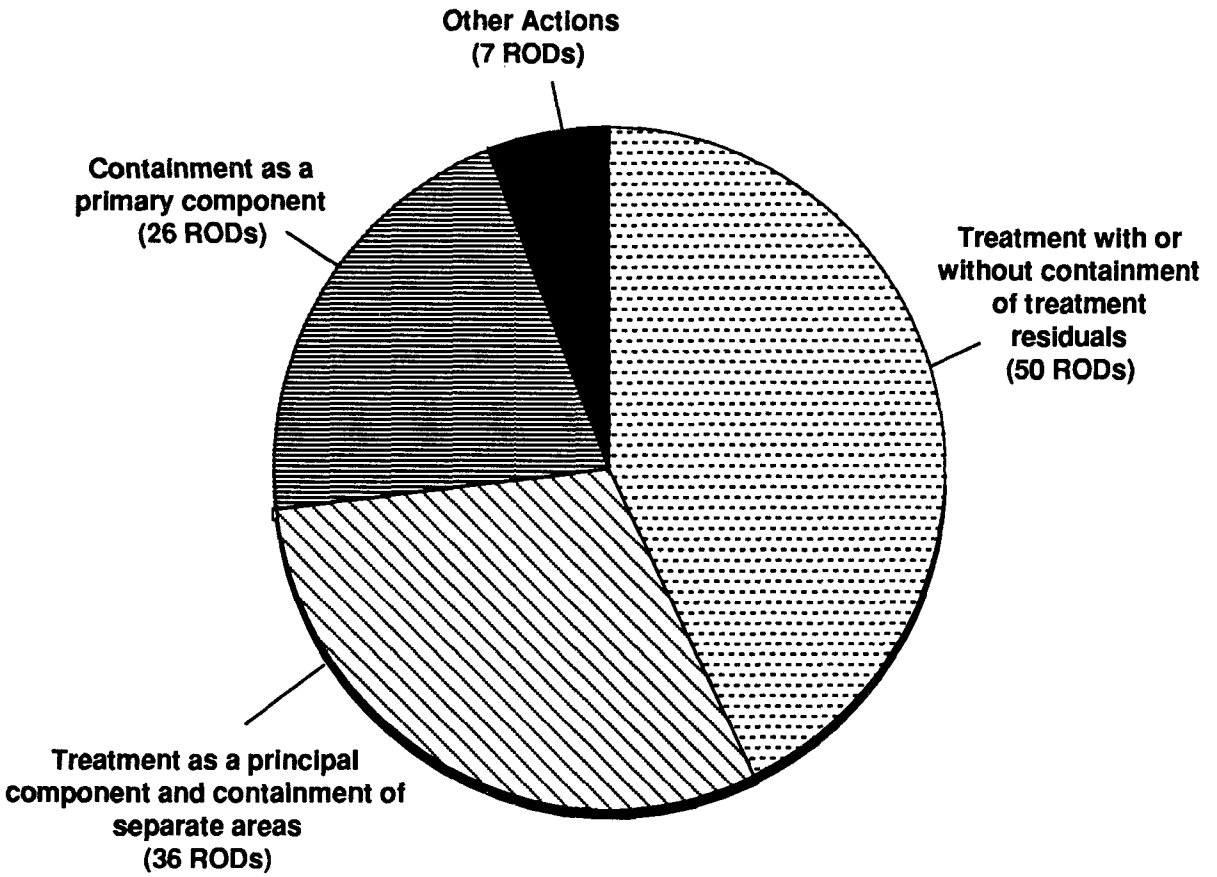
TYPE OF REMEDY	OCCURRENCES
SOURCE CONTROL REMEDIATION	
Treatment Technology[b] (Total)	**107**
Immobilization	37
In-situ Vacuum/Vapor Extraction	20
Incineration/Thermal Destruction	10
To Be Determined/Unspecified Treatment Technologies	13
Thermal Desorption	4
Bioremediation[c]	13
Dechlorination	0
Soil Flushing	4
Soil Washing	4
Volatilization/Aeration	0
In-situ Vitrification	0
Solvent Extraction	1
Chemical Treatment	1
Other Treatment (Total)	**59**
Decontamination	18
Surface Water Treatment	20
Recovery/Recycling	9
NAPLs Treatment	8
Gas Flaring	4
Containment Only (Total)[d]	**29**
Onsite	21
Offsite	8
Other Actions (e.g., Institutional Controls)	**7**
CONTAMINATED GROUND WATER REMEDIATION	
Active Restoration (Total)	**179**
Physical/Chemical	139
To Be Determined/Unspecified Treatment	18
POTW	12
Biological[c]	10
Alternate Water Supply	**7**
Leachate Treatment	**10**
Natural Attenuation	**12**
Other Actions (Institutional Controls)	**5**
Containment (includes management of migration)	**8**
NO ACTION	**25**

a Based on 172 FY 1992 RODs, including 42 federal facility RODs and 8 ROD Amendments.
b Data reflect occurrences of technologies as selected in the RODs that addressed source control.
c Includes in-situ and ex-situ processes.
d Includes three sites with both onsite and offsite containment.

EXHIBIT 3

FY 1992: SOURCE CONTROL REMEDIES

This exhibit presents an overview of 119 FY 1992 RODs that addressed source contamination as all or part of the remedial action. The exhibit compares the selection of remedies with treatment only, treatment as a principal component with containment in separate areas, and containment as the primary component for source control RODs. Treatment and/or containment may be onsite or offsite.

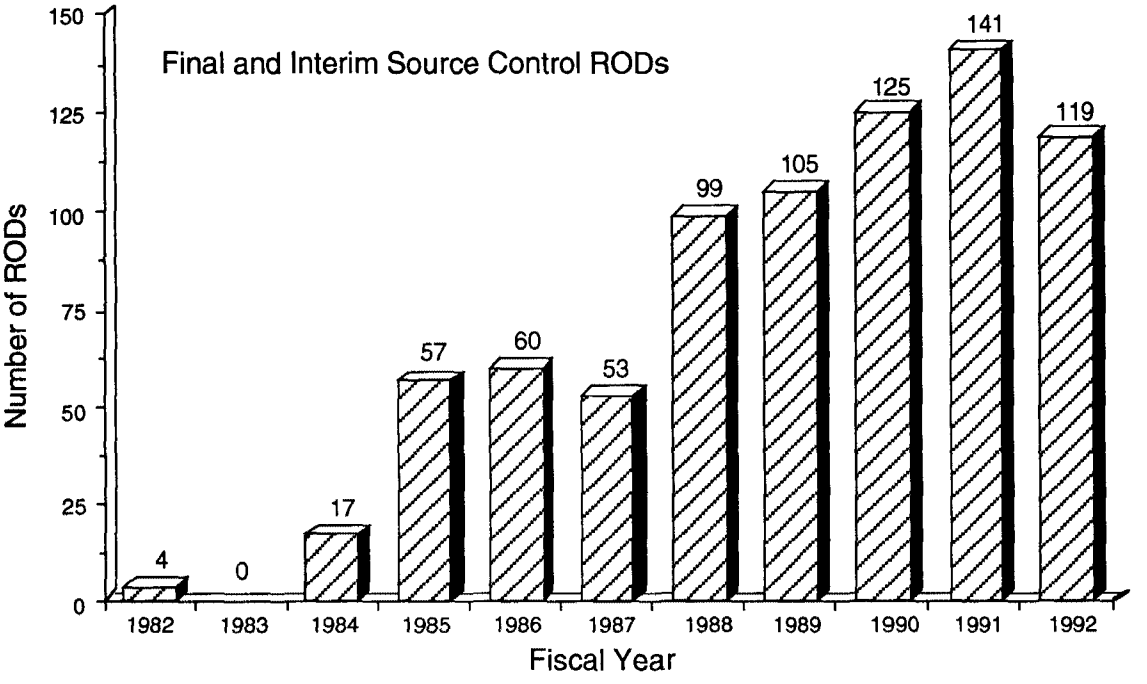


SOURCE CONTROL REMEDY	NUMBER OF RODs	PERCENT
Treatment with or without containment of treatment residuals	50	42
Treatment as a principal component and containment of separate areas	36	30
Containment as a primary component	26	22
Other actions (i.e., Institutional Controls, etc.)	7	6
TOTAL	119	100%

EXHIBIT 3A

FY 1982 - FY 1992: SOURCE CONTROL RODs USING TREATMENT TECHNOLOGIES

This exhibit displays the percentage and total number of final and interim source control RODs selecting treatment technologies. Source contamination has been addressed by treatment technologies in 478 RODs, from a total of 780 source control RODs. This represents 43% of 1,117 RODs signed.



Percentage and Total Number of RODs With A Treatment Technology

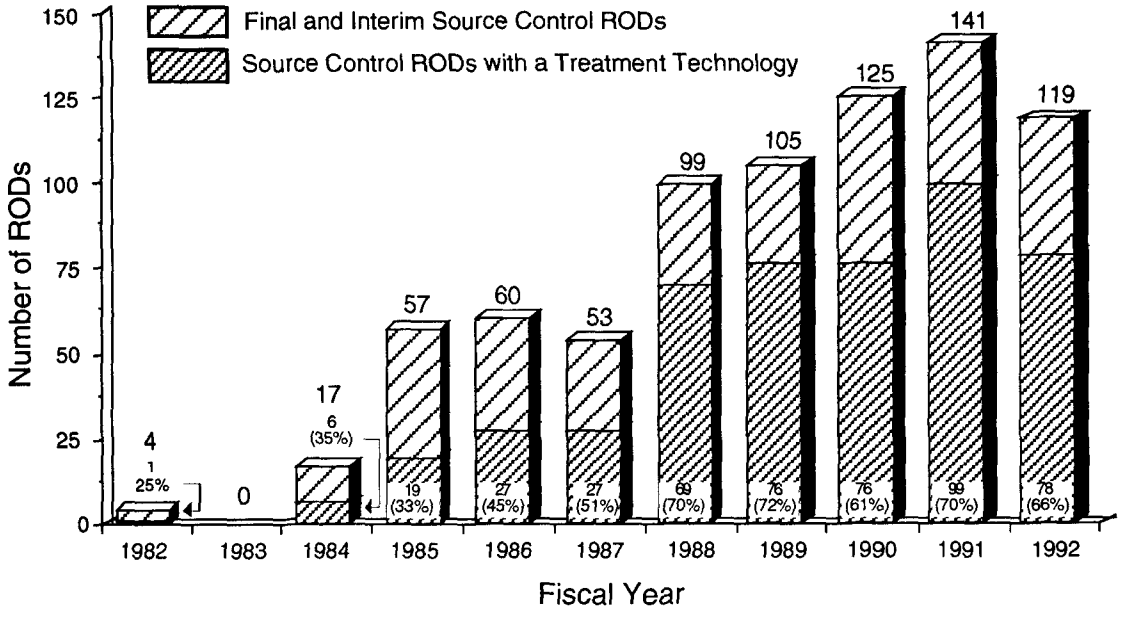
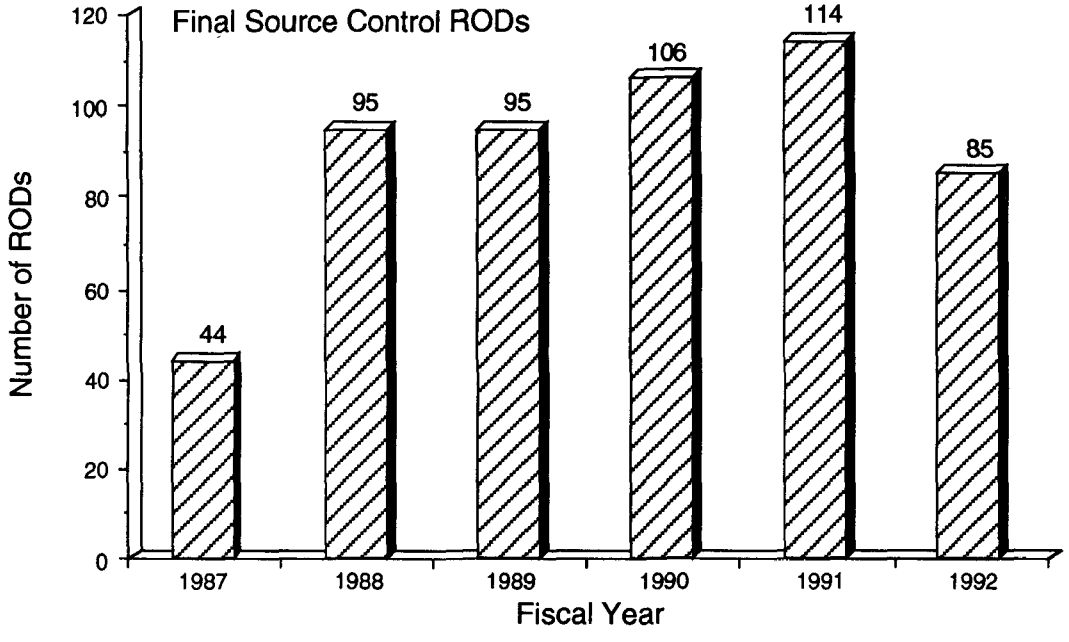


EXHIBIT 3B

FY 1987 - FY 1992: FINAL SOURCE CONTROL RODs SELECTING TREATMENT TECHNOLOGIES

This exhibit displays the percentage and total number of RODs selecting treatment technologies for final only source control RODs signed from FY 1987 through FY 1992 (post-SARA).



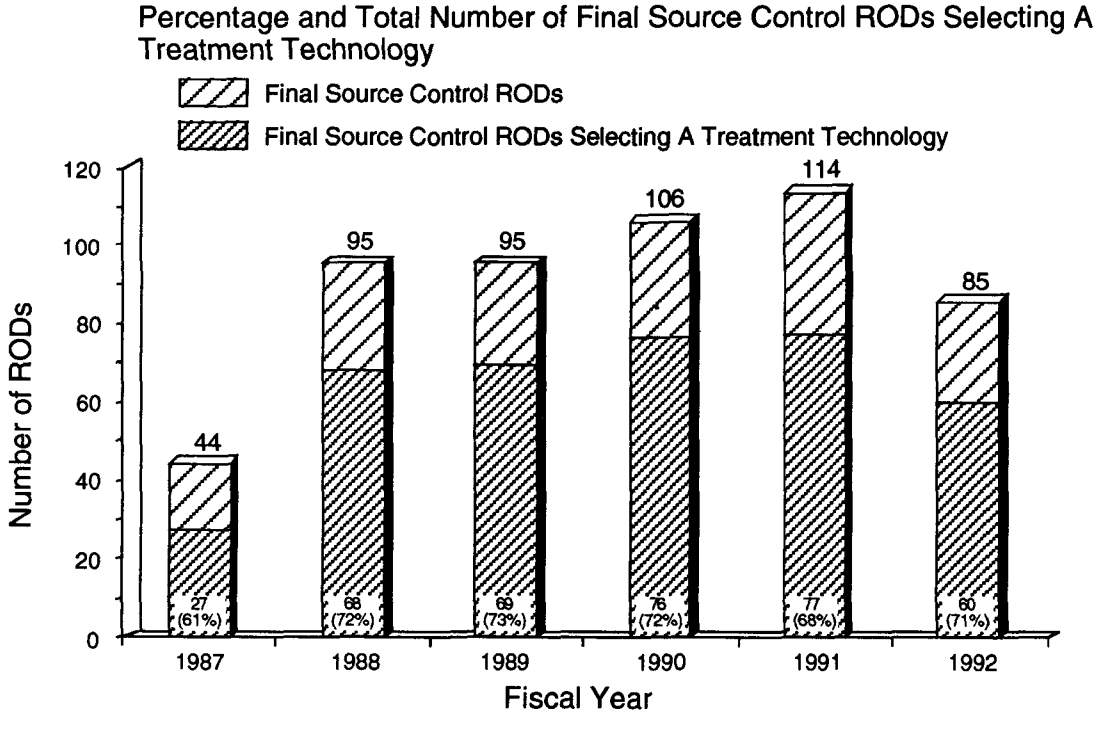
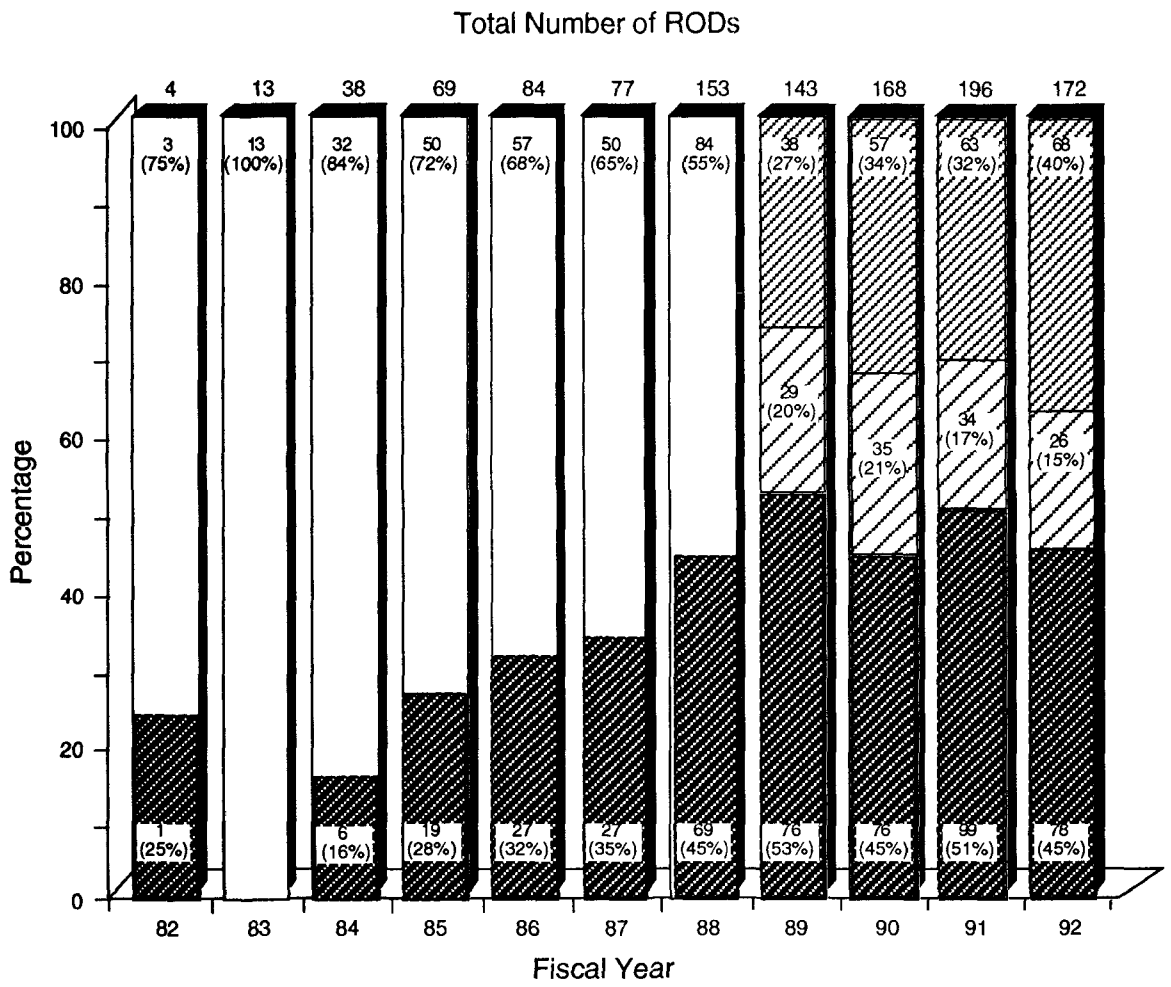


EXHIBIT 3C

FY 1982 - FY 1992: SOURCE CONTROL TREATMENT VERSUS OTHER SELECTED REMEDIES IN ALL RODs

This exhibit compares, on a percentage basis, the use of treatment technologies with the use of containment only, or other non-source control remedies in all RODs.



Treatment Technologies

Containment Only

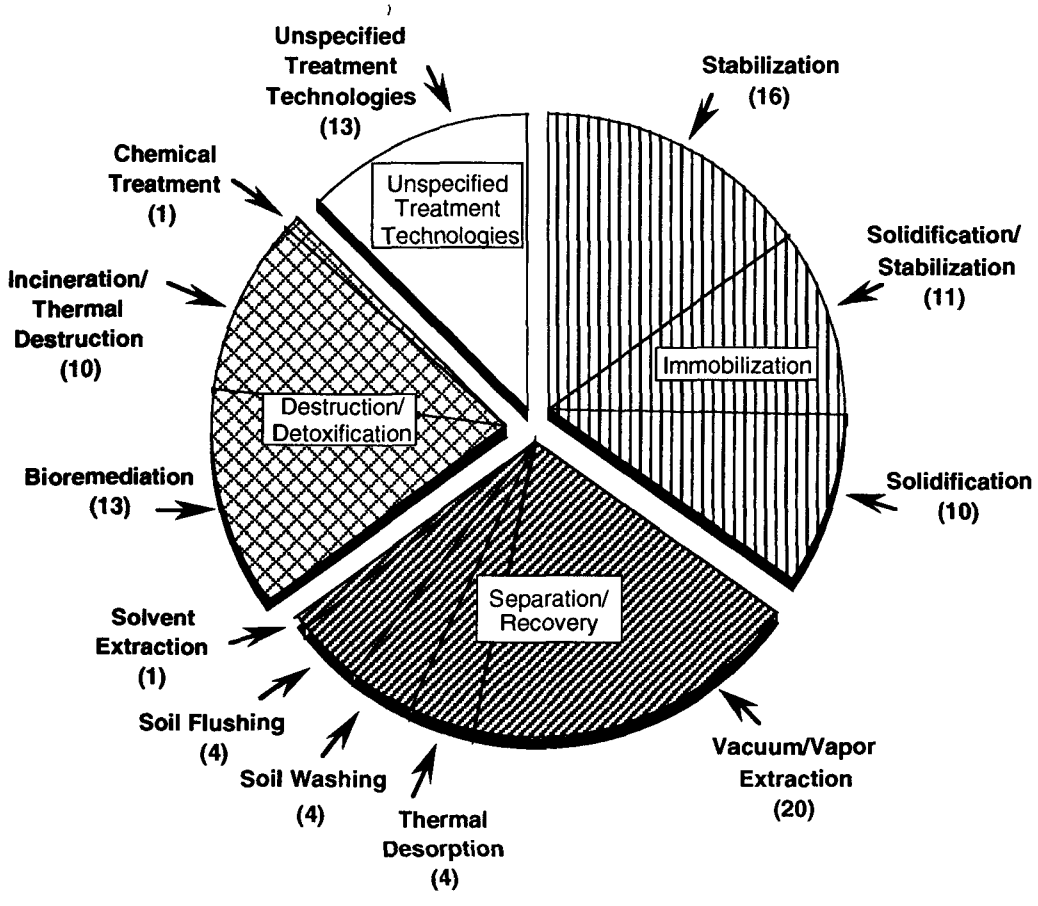
Other Remedies (Includes other non-source control remedies and other actions, including management of migration, institutional controls and monitoring)

"Containment Only" and "Other Remedies" combined. No specific data was available on whether containment plus any other other remedy was included.

EXHIBIT 4

FY 1992: TREATMENT TECHNOLOGIES IN SOURCE CONTROL REMEDIES

This exhibit displays the types and occurrences of treatment technologies selected in 119 FY 1992 final and interim source control RODs. The summary information for a total of 107 technology occurrences is presented by technology category. Total occurrences of each technology are in (). More than one technology (occurrence) may be associated with a remedy.

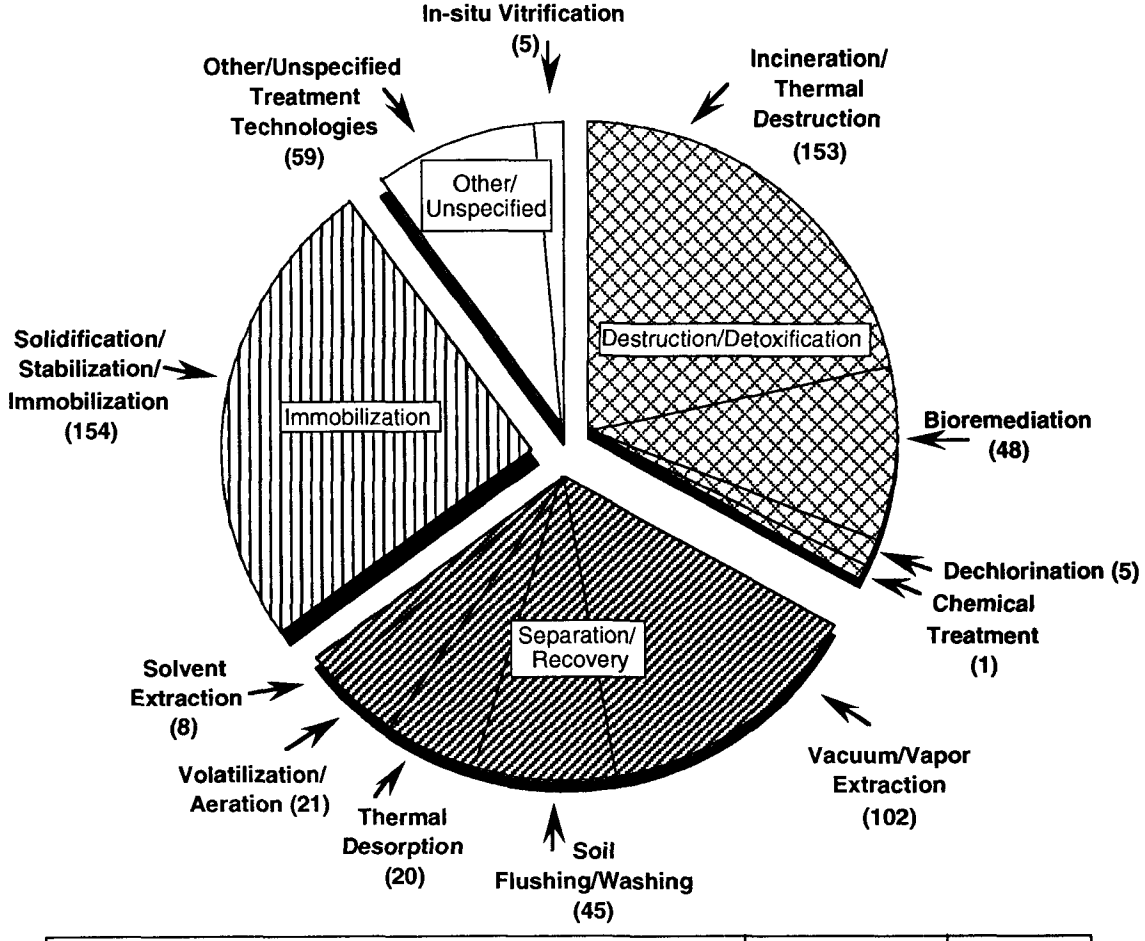


SOURCE CONTROL REMEDY	NUMBER OF OCCURRENCES	PERCENT
Immobilization	37	35
Separation/Recovery	33	31
Destruction/Detoxification	24	22
Unspecified Treatment Technologies	13	12
TOTAL	107	100%

EXHIBIT 4A

FY 1982 - FY 1992: TREATMENT TECHNOLOGIES IN SOURCE CONTROL REMEDIES

This exhibit displays the types and occurrences of treatment technologies selected in RODs from FY 1982 through FY 1992. The summary information for a total of 621 technology occurrences is presented by technology categories. Total occurrences of each technology are in (). More than one technology (occurrence) may be associated with a remedy.

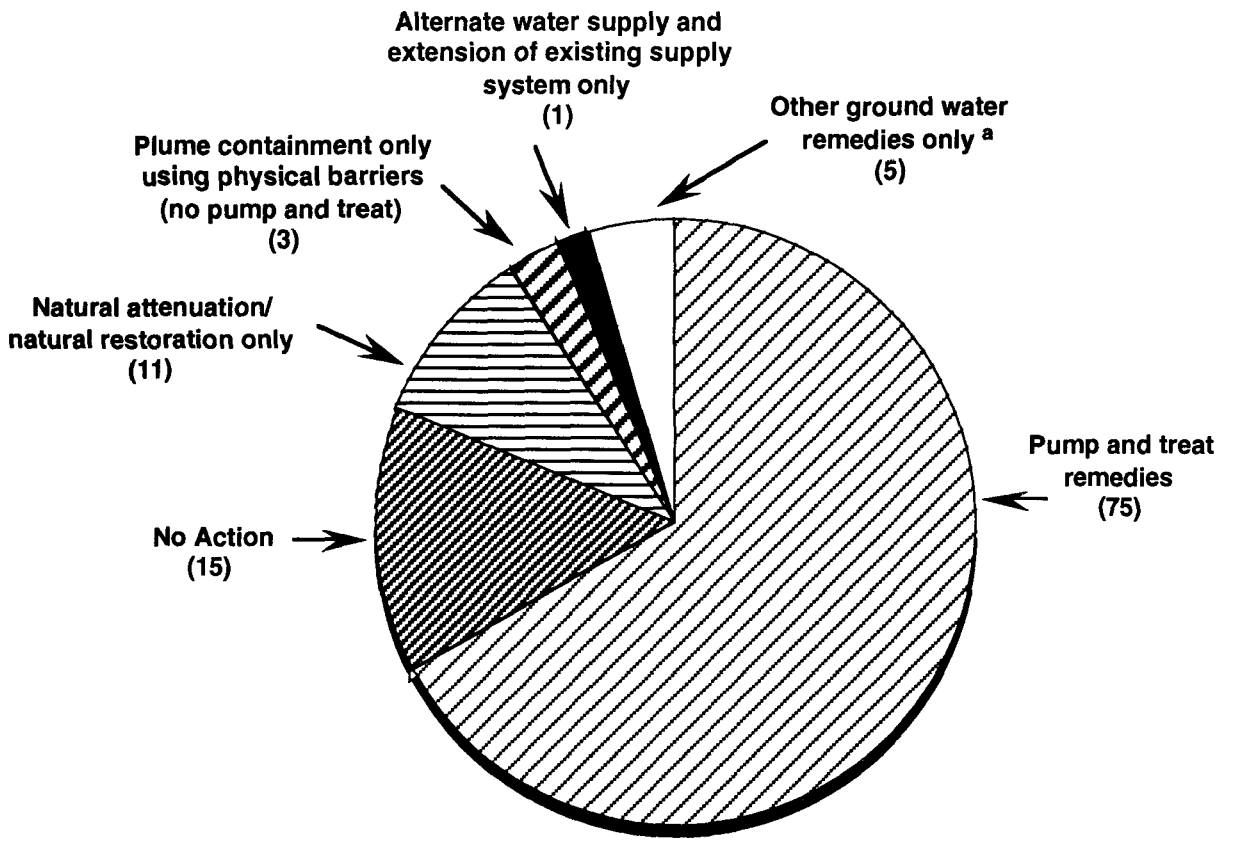


SOURCE CONTROL REMEDY	NUMBER OF OCCURRENCES	PERCENT
Destruction/Detoxification	207	33
Separation/Recovery	196	32
Immobilization	154	25
Other/Unspecified Treatment Technologies	64	10
TOTAL	621	100%

EXHIBIT 5

FY 1992: GROUND WATER REMEDIES

This exhibit displays the types of remedies selected in FY 1992 ground water treatment RODs. Of the 110 ground water remedy RODs, 78 also contained a source control component.



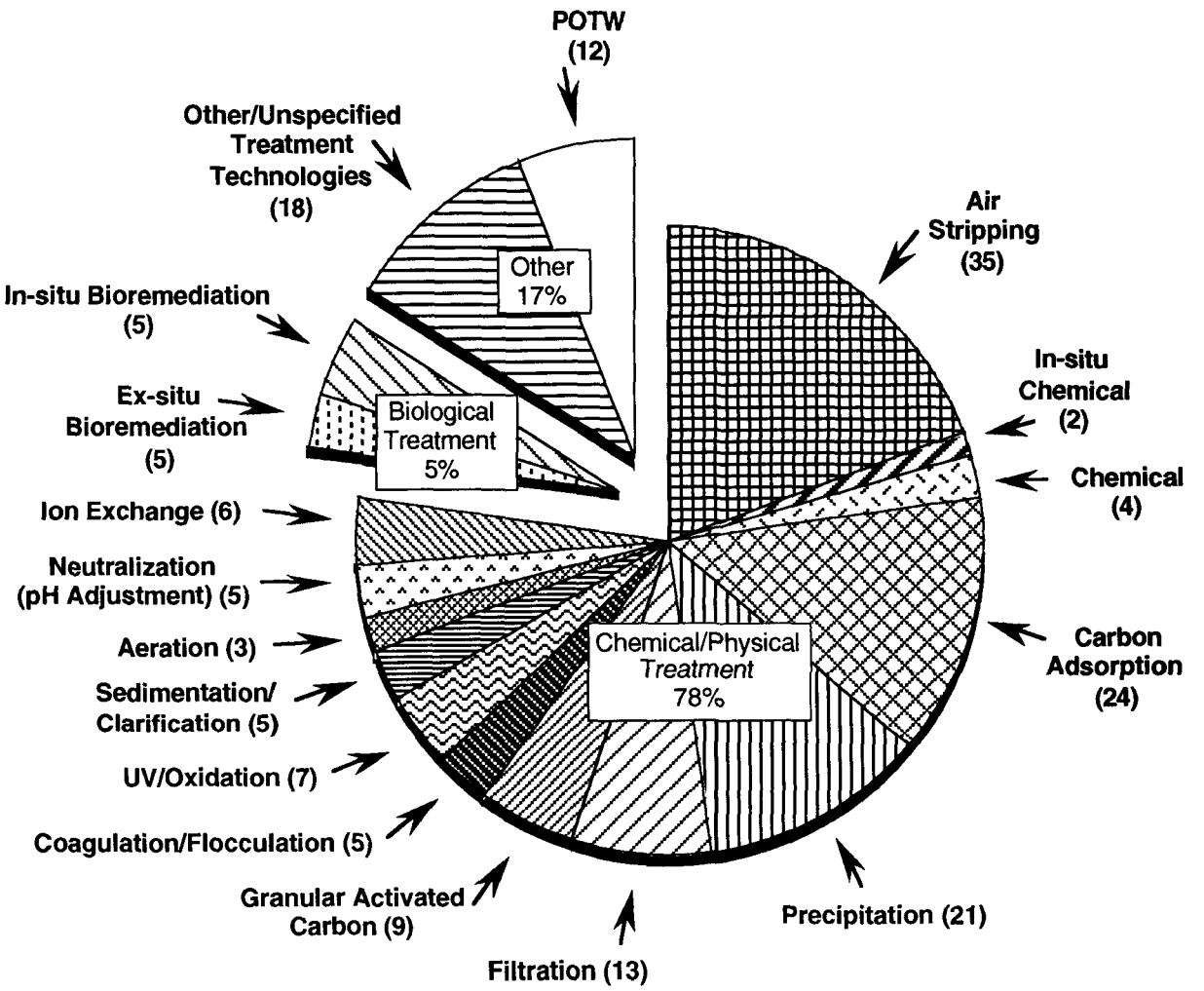
GROUND WATER REMEDY	NUMBER OF RODs	PERCENT
Pump and Treat	75	68
No Action	15	14
Natural Attenuation/Restoration Only	11	10
Plume Containment Only	3	3
Alternate Water Supply Only	1	1
Other Ground Water Remedies Only [a]	5	4
TOTAL	110	100%

[a] Other ground water remedy category includes ground water use restrictions, closing wells, ground water monitoring, and 3 FY 92 ROD Amendments with no changes in selected technology.

EXHIBIT 5A

FY 1992: TREATMENT TECHNOLOGIES IN GROUND WATER REMEDIES

This exhibit displays the types and occurrences of treatment technologies employed in 78 ground water remedy RODs. The number of RODs includes only those that specified one or more technology in the remedy. More than one technology may be associated with a remedy.

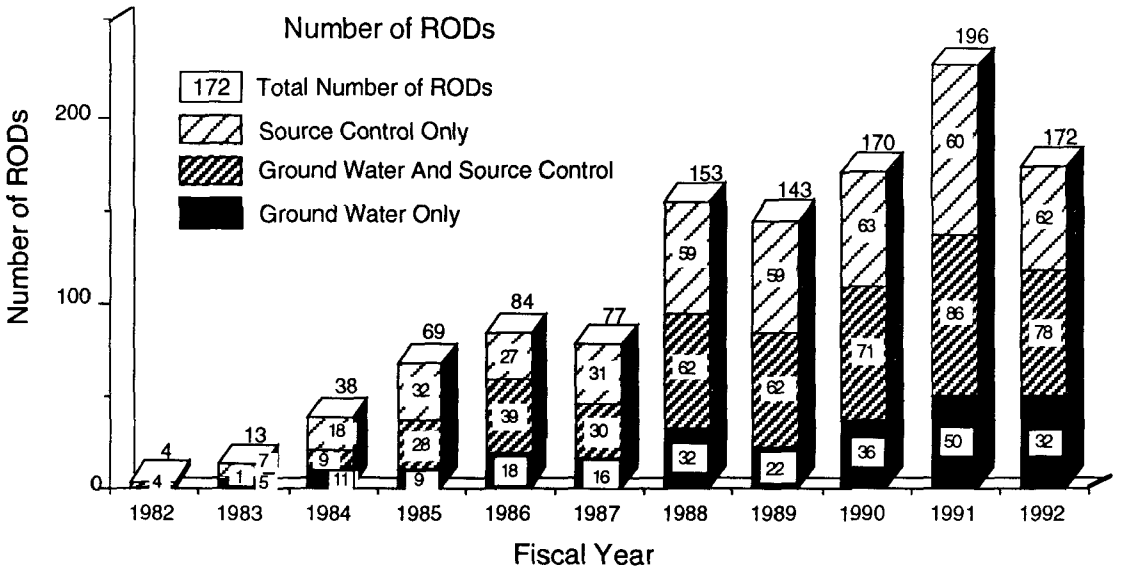


TREATMENT TECHNOLOGIES	NUMBER OF OCCURRENCES	PERCENT
Chemical/Physical	139	78
Biological	10	5
Other/Unspecified Treatment	30	17
TOTAL	179	100%

EXHIBIT 5B

FY 1982 - FY 1992: GROUND WATER RODs VERSUS TOTAL NUMBER OF RODs

This exhibit compares the number of RODs that selected a ground water remedy against 1,117 RODs signed.



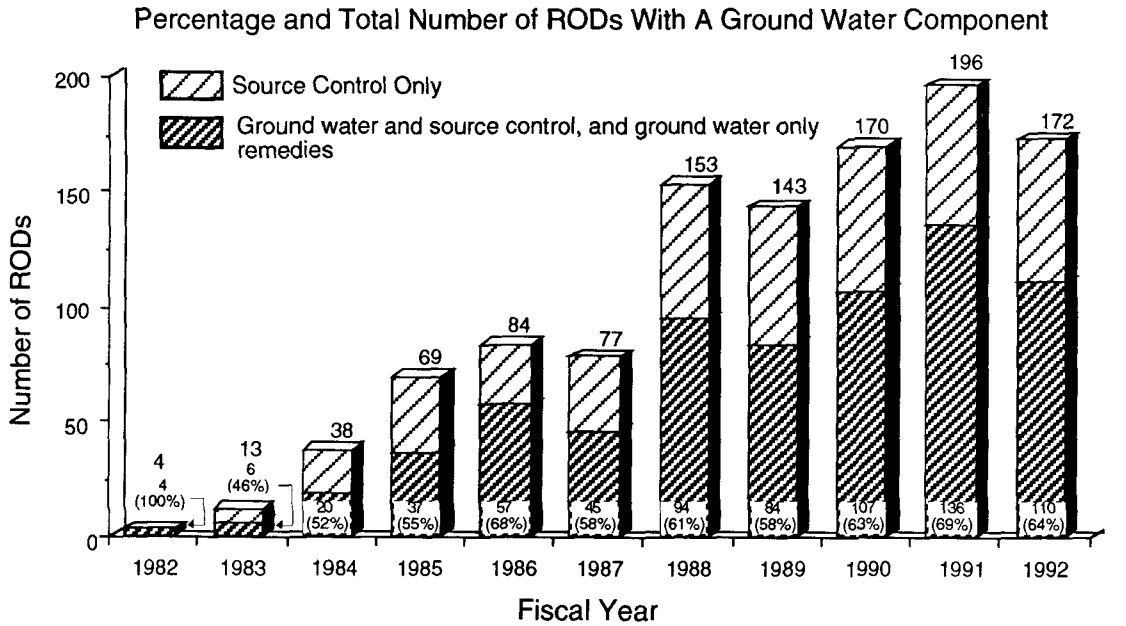


EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES

This exhibit presents an index of site remedies grouped by treatment and containment, and source control and non-source control categories. One site may be listed under several categories, because the remedies contain one or more technologies, non-technological treatments, or combinations of remedial components. The total number of sites at which the remedies were selected are in ().

TECHNOLOGIES	REGION	SITE NAME, STATE
Solidification/Stabilization/ Immobilization (37)	1	PSC Resources, MA
	2	Cosden Chemical Coatings, NJ
	2	Facet Enterprises, NY
	2	Preferred Plating, NY
	3	Abex, VA
	3	C & D Recycling, PA
	3	Fike Chemical, WV [a]
	3	Paoli Rail Yard, PA
	3	Rhinehart Tire Fire Dump, VA
	3	Tonolli, PA [a]
	4	Agrico Chemical, FL
	4	Ciba-Geigy (McIntosh Plant), AL [a]
	4	Florida Steel, FL
	4	JFD Electronics/Channel Masters, NC [a,b]
	4	Marine Corps Logistics Base, GA
	4	Savannah River (USDOE)(Operable Unit 1), SC
	4	Whitehouse Waste Oil Pits (Amendment), FL [b]
	5	Electrovoice, MI [a]
	5	H. Brown Company, MI [b]
	5	Peerless Plating, MI [a]
	5	Savanna Army Depot, IL [a]
	5	Spickler Landfill, WI
	5	Tar Lake, MI
	6	Cal West Metals, NM
	6	Double Eagle Refinery, OK [a]
	6	Fourth Street Abandoned Refinery, OK
	6	Gulf Coast Vacuum Services (Operable Unit 1), LA
	6	Oklahoma Refining, OK [a]
	8	Broderick Wood Products, CO [a]
	8	Denver Radium (Operable Unit 8), CO
	8	Portland Cement (Kiln Dust #2 & #3), UT
	8	Rocky Flats (USDOE)(Operable Unit 4), CO
	8	Silver Bow Creek/Butte Area, MT
	9	Rhone-Poulenc/Zoecon, CA
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b]
	10	Pacific Hide & Fur Recycling (Amendment), ID [a]
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 22), ID

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
Vacuum/Vapor Extraction (20)	1	Tibbetts Road, NH
	2	Pasley Solvents & Chemical, NY [a,b]
	3	Raymark, PA
	3	U.S. Defense General Supply Center (Operable Unit 5), VA
	4	Carrier Air Conditioning, TN
	5	American Chemical Services, IN [a]
	5	City Disposal Sanitary Landfill, WI
	5	Clare Water Supply, MI
	5	Electrovoice, MI [a]
	5	Muskego Sanitary Landfill, WI [a]
	5	Peerless Plating, MI [a]
	6	Prewitt Abandoned Refinery, NM [a]
	7	29th & Mead Groundwater Contamination, KS [b]
	8	Rocky Flats (USDOE)(Operable Unit 2), CO [b]
	9	Hassayampa Landfill, AZ
	9	Lawrence Livermore National Lab, CA [b]
	9	Pacific Coast Pipelines, CA
	9	Purity Oil Sales, CA
	9	Sacramento Army Depot (Operable Unit 3), CA
	10	Eielson Air Force Base, AK [a]
Incineration/Thermal Destruction (10)	2	Ellis Property, NJ [b]
	3	Fike Chemical, WV [a]
	4	Alabama Army Ammunition Plant (Operable Unit 1), AL
	5	American Chemical Services, IN [a]
	5	Savanna Army Depot, IL [a]
	6	Gulf Coast Vacuum Services (Operable Unit 1), LA
	8	Ogden Defense Depot (Operable Unit 3), UT
	9	Westinghouse Electric (Sunnyvale Plant), CA
	10	Pacific Hide & Fur Recycling (Amendment), ID [a]
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 23), ID
Unspecified Treatment Technologies (13)	2	General Motors/Central Foundry Division (Operable Unit 2), NY
	2	Preferred Plating, NY
	2	Rowe Industries Groundwater Contamination, NY [b]
	3	Eastern Diversified Metals, PA
	3	Fike Chemical, WV [a]
	4	Benfield Industries, NC [a,b]
	4	Ciba-Geigy (McIntosh Plant), AL[a]
	4	Florida Steel, FL
	4	Potter's Septic Tank Service Pits, NC [b]

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
Unspecified Treatment Technologies (13) (continued)	6	Prewitt Abandoned Refinery, NM [a]
	8	Ogden Defense Depot (Operable Unit 3), UT
	8	Ogden Defense Depot (Operable Unit 4), UT
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 5), ID
Thermal Desorption (4)	2	Industrial Latex, NJ
	3	Brown's Battery Breaking, PA [b]
	4	Potter's Septic Service Pits, NC [b]
	5	American Chemical Services, IN [a]
Bioremediation (13)	4	Benfield Industries, NC [a,b]
	4	Whitehouse Waste Oil Pits (Amendment), FL [b]
	5	South Andover (Operable Unit 2), MN
	6	Oklahoma Refining, OK [a]
	6	Prewitt Abandoned Refinery, NM [a]
	7	Pester Refinery, KS [a]
	8	Broderick Wood Products, CO [a]
	8	Idaho Pole, MT [a]
	9	Jasco Chemical, CA [a,b]
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b]
	10	Eielson Air Force Base, AK [a]
	10	McChord AFB (Wash Rack/Treatment), WA
	10	Umatilla Army Depot (Lagoons), OR
Soil Flushing (4)	1	Tibbetts Road, NH [a]
	2	Naval Air Engineering Center (Operable Unit 7), NJ [b]
	7	Pester Refinery, KS [a]
	8	Idaho Pole, MT [a]
Soil Washing (4)	4	Benfield Industries, NC [a,b]
	4	Whitehouse Waste Oil Pits (Amendment), FL [b]
	9	Sacramento Army Depot (Operable Unit 4), CA
	10	Bangor Ordnance Disposal (USN Sub Base), WA [a]
Solvent Extraction (1)	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 5), ID
Chemical Treatment (1)	4	JFD Electronics/Channel Masters, NC [a,b]

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
OTHER TREATMENT (Includes Decontamination, Gas Flaring, NAPLs Treatment, Recycling, and Surface Water Treatment) (48)	1	PSC Resources, MA
	2	Cosden Chemical Coatings, NJ
	2	General Motors/Central Foundry Division (Operable Unit 2), NY
	2	Imperial Oil/Champion Chemicals, NJ [b]
	2	Kin-Buc Landfill, NJ
	2	Naval Air Engineering Center (Operable Unit 7), NJ [b]
	3	Abex, VA
	3	C & D Recycling, PA
	3	Eastern Diversified Metals, PA
	3	Fike Chemical, WV [a]
	3	MW Manufacturing, PA [b]
	3	Paoli Rail Yard, PA
	3	Rhinehart Tire Fire Dump, VA
	3	Tonolli, PA [a]
	3	Westinghouse Elevator Plant, PA [b]
	4	Ciba-Geigy (McIntosh Plant), AL [a]
	4	Savannah River (USDOE) (Operable Unit 1), SC
	4	Savannah River (USDOE) (Operable Unit 2), SC
	4	USDOE Oak Ridge Reservation (Operable Unit 6), TN
	4	Whitehouse Waste Oil Pits (Amendment), FL [b]
	5	American Chemical Services, IN [a]
	5	City Disposal Sanitary Landfill, WI
	5	H. Brown Company, MI [b]
	5	Muskego Sanitary Landfill, WI [a]
	5	Savanna Army Depot, IL [a]
	5	Tar Lake, MI
	5	Tri County Landfill, IL
	6	Cal West, NM
	6	Double Eagle Refinery, OK [a]
	6	Gulf Coast Vacuum Services (Operable Unit 2), LA
	6	Oklahoma Refining, OK [a]
	6	Prewitt Abandoned Refinery, NM [a]
	7	Pester Refinery, KS [a]
	8	Broderick Wood Products, CO [a]
	8	Denver Radium (Operable Unit 8), CO
	8	Rocky Flats (USDOE)(Operable Unit 2), CO [b]
	8	Rocky Flats (USDOE)(Operable Unit 4), CO
	8	Silver Bow Creek/Butte Area, MT
	9	Iron Mountain Mine, CA
	9	Westinghouse Electric (Sunnyvale Plant), CA
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b]

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
OTHER TREATMENT (Includes Decontamination, Gas Flaring, NAPLs Treatment, Recycling, and Surface Water Treatment) (48) (continued)	10	Eielson Air Force Base, AK [a]
	10	Elmendorf Air Force Base, AK [b]
	10	Joseph Forest Products, OR
	10	McChord AFB (Wash Rack/Treatment), WA
	10	Pacific Hide & Fur Recycling (Amendment), ID [a]
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 2), ID
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 22), ID
CONTAINMENT ONLY		
Offsite (8)	2	Evor Phillips Leasing, NJ [b]
	4	Geigy Chemical (Aberdeen Plant), NC [b]
	4	Standard Auto Bumper, FL
	5	Butterworth #2 Landfill, MI [c]
	5	Central Illinois Public Service, IL [b]
	5	Torch Lake (Operable Units 1 and 2), MI [c]
	8	Ogden Defense Depot (Operable Unit 1), UT
	10	Wycoff/Eagle Harbor, WA
Onsite (21)	1	Brunswick Naval Air Station (Operable Unit 1), ME [b]
	2	Endicott Village Well Field, NY
	2	Islip Municipal Sanitary Landfill, NY [b]
	2	Plattsburgh Air Force Base (Operable Unit 1), NY
	2	Plattsburgh Air Force Base (Operable Unit 3), NY
	2	Ramapo Landfill, NY
	3	Lindane Dump, PA
	3	Strasburg Landfill, PA
	3	USA Aberdeen, Michaelsville, MD
	4	Madison County Sanitary Landfill, FL
	5	Bofors Nobel (Amendment), MI
	5	Butterworth #2 Landfill, MI [c]
	5	Cannelton Industries, MI
	5	Kohler Landfill, WI
	5	La Grande Sanitary Landfill, MN
	5	Torch Lake (Operable Units 1 and 2), MI [c]
	6	Crystal Chemical (Amendment), TX
	6	Mosley Road Sanitary Landfill, OK
	8	Denver Radium (Operable Unit 9), CO
	8	Hill Air Force Base, UT
	10	Wycoff/Eagle Harbor, WA

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
OTHER ACTIONS		
(Includes Institutional Controls, Monitoring, Relocation, and ROD Amendments with No Changes to Remedial Technologies) (7)	3	U.S. Defense General Supply Center (Operable Unit 1), VA
	4	New Hanover County Airport Burn Pit, NC [b]
	5	Alsco Anaconda, OH
	5	MIDCO I (Amendment), IN
	5	MIDCO II (Amendment), IN
	5	Twin Cities AF Reserve (SAR Landfill), MN
	6	Koppers (Texarkana Plant) (Amendment), TX
NON-SOURCE CONTROL		
Pump and Treat and/or In-situ Treatment in Addition to a Source Control Remedy (52)	1	Brunswick Naval Air Station (Operable Unit 1), ME [b]
	1	Tibbetts Road, NH [b]
	2	Cosden Chemical Coatings, NJ
	2	Ellis Property, NJ [b]
	2	Endicott Village Well Field, NY
	2	Evor Phillips Leasing, NJ [b]
	2	Facet Enterprises, NY
	2	General Motors/Central Foundry Division (Operable Unit 2), NY
	2	Islip Municipal Sanitary Landfill, NY [b]
	2	Naval Air Engineering Center (Operable Unit 7), NJ [b]
	2	Pasley Solvents & Chemical, NY [a,b]
	2	Ramapo Landfill, NY
	2	Rowe Industries Groundwater Contamination, NY [b]
	3	Brown's Battery Breaking, PA [b,d]
	3	Lindane Dump, PA
	3	Paoli Rail Yard, PA
	3	Strasburg Landfill (Operable Unit 3), PA
	3	Tonolli, PA [a,d]
	4	Benfield Industries, NC [a,b,d]
	4	Carrier Air Conditioning, TN
	4	Geigy Chemical (Aberdeen Plant), NC [b]
	4	JFD Electronics/Channel Masters, NC [a,b]
	4	Madison County Sanitary Landfill, FL
	4	New Hanover County Airport Burn Pit, NC [b]
	4	Potter's Septic Tank Service Pits, NC [b]
	4	Whitehouse Waste Oil Pits (Amendment), FL [b]
	5	American Chemical Services, IN [a]
	5	Bofors Nobel (Amendment), MI
	5	Central Illinois Public Service, IL [b]
	5	City Disposal Sanitary Landfill, WI

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
Pump and Treat and/or In-situ Treatment in Addition to a Source Control Remedy (52) (continued)	5	Clare Water Supply, MI
	5	Electrovoice, MI [a]
	5	H. Brown Company, MI [b]
	5	Peerless Plating, MI [a]
	6	Oklahoma Refining, OK [a,d]
	6	Prewitt Abandoned Refinery, NM [a]
	7	*29th & Mead Groundwater Contamination*, KS [b]
	8	Broderick Wood Products, CO [a,d]
	8	Idaho Pole, MT [a,d]
	8	Ogden Defense Depot (Operable Unit 1), UT
	8	Ogden Defense Depot (Operable Unit 4), UT
	8	Rocky Flats Plant (USDOE) (Operable Unit 2), CO [b]
	8	Silver Bow Creek/Butte Area, MT
	9	Hassayampa Landfill, AZ
	9	Jasco Chemical, CA [a,b]
	9	Lawrence Livermore National Lab, CA [a,b]
	9	Pacific Coast Pipelines, CA
	10	Bangor Ordnance Disposal (USN Sub Base), WA [a]
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b,d]
	10	Eielson Air Force Base, AK [a]
	10	Elmendorf Air Force Base, AK [b]
	10	McChord AFB (Wash Rack/Treatment), WA
Pump and Treat and/or In-situ Treatment Only (23)	1	Brunswick Naval Air Station (Operable Unit 2), ME [b]
	1	Newport Naval Education/Training Center, RI [b]
	1	Otis Air National Guard/Camp Edwards (Operable Unit 2), MA
	2	Dover Municipal Well 4, NJ
	2	Higgins Farm, NJ
	2	Imperial Oil/Champion Chemicals, NJ [b]
	2	Robintech/National Pipe, NY
	3	Butz Landfill, PA
	3	Chem-Solv, DE
	3	Commodore Semiconductor Group, PA [b]
	3	Dublin Water Supply (Operable Unit 1), PA [b]
	3	MW Manufacturing, PA [b]
	3	Westinghouse Elevator Plant, PA [b]
	4	Milan Army Ammunition Plant, TN
	4	National Electric Coil/Cooper Industries, KY
	4	Savannah River (USDOE)(Operable Unit 3), SC
	4	USMC Camp Lejeune Military Reservation, NC [b]
	5	Hagen Farm, WI [d]
	5	New Brighton/Arden Hills, MN [b]
	5	*Reilly Tar & Chemical (Indianapolis Plant)*, IN [b]
	5	Reilly Tar & Chemical (St. Louis Park), MN [b]

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

TECHNOLOGIES	REGION	SITE NAME, STATE
Pump and Treat and/or In-situ Treatment Only (23) (continued)	10	N.A.S. Whidbey Island - Ault Field, WA [b]
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 2), ID [b]
OTHER GROUND WATER REMEDIES		
Alternate Water Supply (7)	3	Chem-Solv, DE
	3	Commodore Semiconductor Group, PA [b]
	3	Dublin Water Supply (Operable Unit 1), PA [b]
	3	MW Manufacturing, PA [b]
	5	Central Illinois Public Service, IL [b]
	5	Skinner Landfill, OH
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b]
Leachate Treatment (10)	2	Endicott Village Well Field, NY
	2	Ramapo Landfill, NY
	3	Lindane Dump, PA
	3	Strasburg Landfill (Operable Unit 3), PA
	3	Tonolli, PA [a]
	5	Kohler Landfill, WI
	5	Spickler Landfill, WI
	5	Tri County Landfill, IL
	10	Bangor Ordnance Disposal (USN Sub Base), WA [a]
	10	Bunker Hill Mining and Metallurgical Complex, ID [a,b]
Natural Attenuation (12)	1	PSC Resources, MA
	1	Town Garage/Radio Beacon, NH
	2	Islip Municipal Sanitary Landfill, NY [b]
	2	Kin-Buc Landfill, NJ
	4	Yellow Water Road, FL
	5	Alsco Anaconda, OH
	5	Tri County Landfill, IL
	5	Twin Cities AF Reserve (SAR Landfill), MN
	6	Gulf Coast Vacuum Services (Operable Unit 1), LA
	6	Mosley Road Sanitary Landfill, OK
	7	Farmers Mutual Cooperative, IA
	8	Denver Radium (Operable Unit 8), CO
Ground Water Containment (Includes Management of Migration) (8)	1	Brunswick Naval Air Station (Operable Unit 1), ME [b]
	1	Newport Naval Education/Training Center, RI [b]
	2	General Motors/Central Foundry Division (Operable Unit 2), NY
	5	Reilly Tar & Chemical (St. Louis Park), MN [b]
	5	Tar Lake, MI
	9	Jasco Chemical, CA [a,b]

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 6

FY 1992: INDEX OF SITE REMEDIES (Continued)

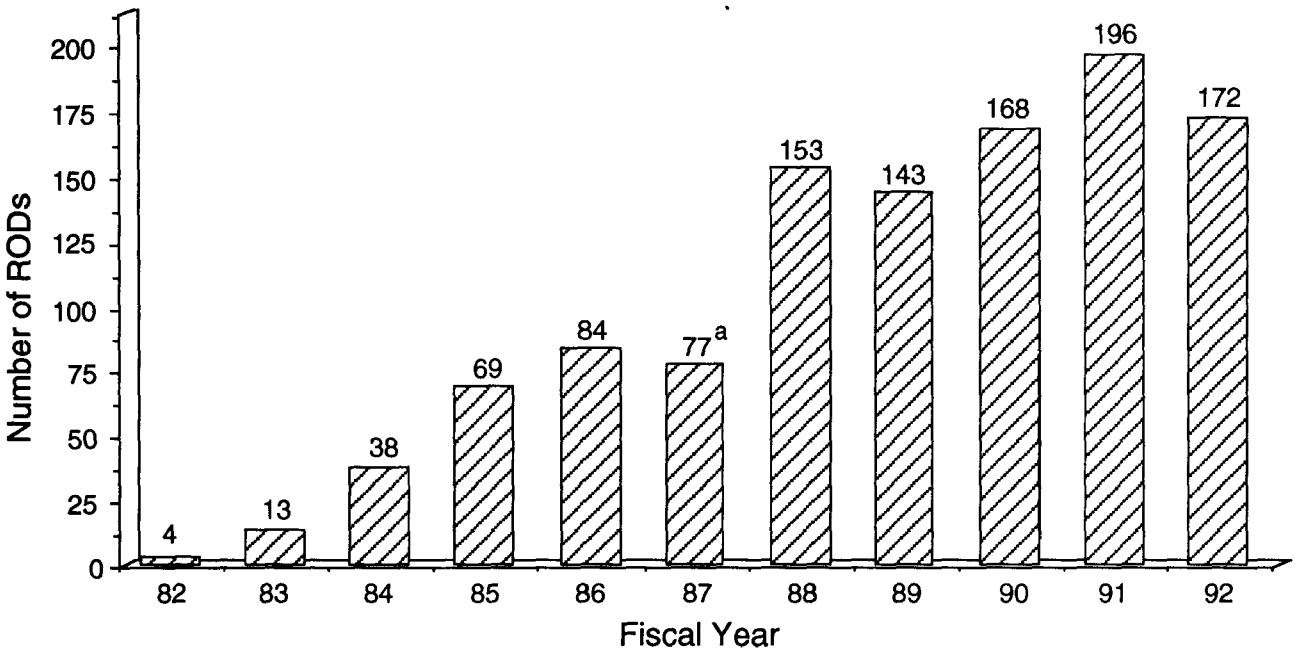
TECHNOLOGIES	REGION	SITE NAME, STATE
Ground Water Containment (Includes Management of Migration) (8) (continued)	9	Rhone-Poulenc/Zoecon, CA [a]
	9	Westinghouse Electric (Sunnyvale Plant), CA
OTHER ACTIONS		
(Includes Institutional Controls, Monitoring, Relocation and ROD Amendments with No Changes to Remedial Technologies) (5)	5	La Grande Sanitary Landfill, MN
	5	MIDCO I (Amendment), IN
	5	MIDCO II (Amendment), IN
	5	South Andover (Operable Unit 1) (Amendment), MN
	6	Koppers (Texarkana Plant) (Amendment), TX
NO ACTION/NO FURTHER ACTION (25)	1	Darling Hill Dump, VT
	1	Revere Textile Prints, CT
	2	Action Anodizing, Plating and Polishing, NY
	2	Bioclinical Laboratories, NY
	2	FAA Technical Center, NJ
	2	Naval Air Engineering Center (Operable Unit 5), NJ
	2	Naval Air Engineering Center (Operable Unit 6), NJ
	2	North Sea Municipal Landfill, NY
	2	Witco Chemical (Oakland Plant), NJ
	3	Dixie Caverns County Landfill, VA
	3	Route 940 Drum Dump, PA
	3	Suffolk City Landfill, VA
	4	Chem-form, FL
	4	USDOE Oak Ridge Reservation (Operable Unit 18), TN
	4	Wilson Concepts of Florida, FL
	4	Woodbury Chemical (Princeton Plant), FL
	5	Columbus Old Municipal Landfill, IN
	5	Grand Traverse Overall Supply, MI
	5	Metal Working Shop, MI
	7	Des Moines TCE, IA
	7	Hydro-Flex, KS
	10	Arrcom (Drexler Enterprise), ID
	10	Fort Lewis (Landfill No. 5), WA
	10	Mountain Home Air Force Base (Operable Unit 4), ID
	10	Pesticide Lab - Yakima, WA

[a] ROD selected two or more source control treatment technologies.
[b] ROD selected two non-source control measures.
[c] ROD selected onsite and offsite containment remedies.
[d] In-situ ground water treatment sites.

EXHIBIT 7

FY 1982 - FY 1992: RODs SIGNED BY FISCAL YEAR

This exhibit displays the number of RODs signed since 1982. The top graph presents the totals for each fiscal year and the bottom graph presents the fiscal year totals by region.



REGION \ FY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
1	1	3	3	7	6	4/1	11	11/1	7	10	9
2	1	2	7	13	15	15	22	23	32	36/1	27
3	1	2	5	10	15	5	26/1	18/1	23/1	34/1	23
4	1	0	0	5	13	11	12	15/1	20/3	24/2	26/1
5	0	2	9	20	16	14	25	32/3	31/1	40/5	32/4
6	0	0	4	5	6	11	21	7	11/1	2	10/2
7	0	1	2	1	2	3	12	11	12	12/1	5
8	0	0	1	2	7/1	7	4	5	18	11/1	12
9	0	2	5	3	0	6	13	18	10/1	20/1	10
10	0	1	2	3	4/1	1/1	7	3	4	7/1	18/1
TOTALS	4	13	38	69	84/2	77/2	153/1	143/6	168/7	196/13	172/8

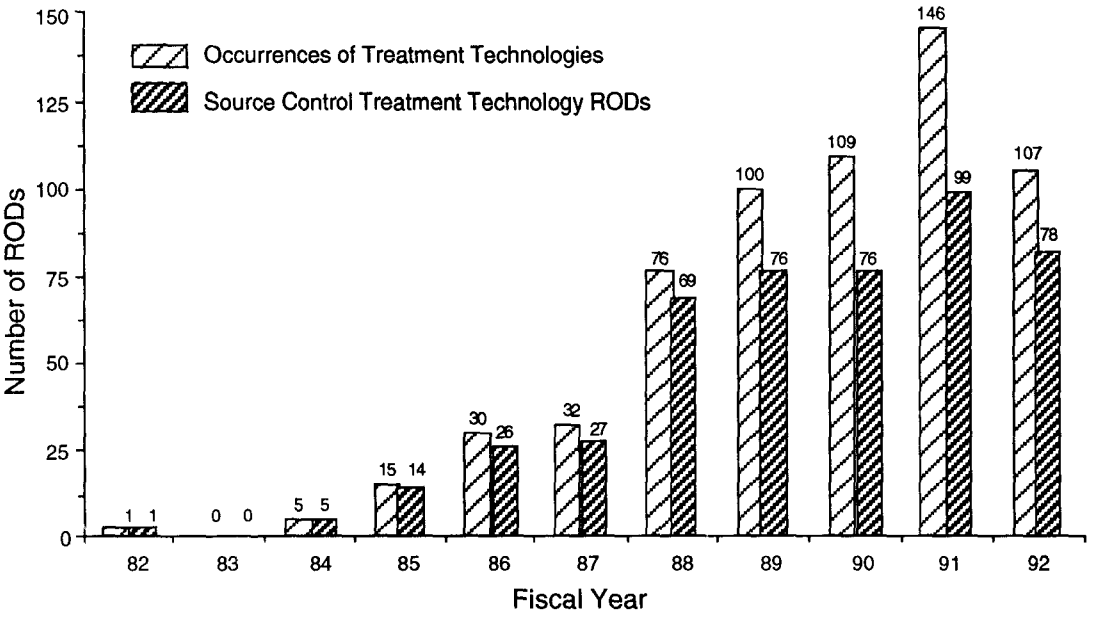
Total RODs = 1,117

18/1 ← Total number of RODs
← Number of ROD Amendments (included in total RODs)

EXHIBIT 8

FY 1982 - FY 1992: SOURCE CONTROL TREATMENT TECHNOLOGIES BY FISCAL YEAR

The top exhibit compares occurrences of source control treatment technologies against total treatment technology RODs. The lower exhibit breaks down the occurrences of individual technologies by fiscal year. More than one technology may be associated with a ROD.



Occurrences of Selected Source Control Treatment Technologies Per Fiscal Year

FY / REGION	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Incineration/Thermal Treatment ††	0	0	3	7	12	13	26	30	34	34	15
Immobilization	1	0	1	2	9	9	18	18	24	35	37
Vacuum/Vapor Extraction †	0	0	0	1	0	1	10	17	19	34	20
Volatilization/Aeration†	0	0	0	2	4	2	6	4	1	2	0
Soil Washing/ Soil Flushing †	0	0	0	2	2	2	6	6	10	9	8
Bioremediation Land Application †	0	0	1	1	3	1	6	10	5	8	13
Solvent Extraction †	0	0	0	0	0	0	0	6	0	1	1
Other/Unspecified ††	0	0	0	0	0	4	4	9	16	23	13
TOTALS	1	0	5	15	30	32	76	100	109	146	107

Total Occurrences = 621

† Denotes innovative technologies.
†† Denotes categories that contain both innovative and non-innovative technologies.

EXHIBIT 9

FY 1987 - FY 1992: OVERVIEW OF SOURCE CONTROL TREATMENT TECHNOLOGIES

The top chart provides the number and percentage of RODs selecting source control treatment technologies. The lower chart provides the total number of occurrences of individual technologies selected for source control.

SOURCE CONTROL RODs SELECTING TREATMENT AND INNOVATIVE TECHNOLOGIES

FY	RODs Signed	Data Represent a Subset of Previous Column: RODs Selecting One or More Treatment Technologies for Source Control		Data Represent a Subset of Previous Column: RODs Selecting Innovative Treatment Technologies for Source Control		Percentage of RODs Signed Selecting Innovative Technologies for Source Control
		Number	Percentage of RODs	Number	Percentage of Treatment Technology RODs	
87	77	27	35%	7	26%	9% (7 of 77)
88	153	69	45%	28	41%	18% (28 of 153)
89	143	76	53%	40	53%	28% (40 of 143)
90	168	76	45%	42	55%	25% (42 of 168)
91	196	99	51%	57	58%	29% (57 of 196)
92	172	78	45%	37	47%	22% (37 of 172)

SOURCE CONTROL OCCURRENCES OF TREATMENT AND INNOVATIVE TECHNOLOGIES

FY	Number of Source Control RODs	Data Represent a Subset of Previous Column: Occurrences of Treatment Technologies Selected for Source Control	Data Represent a Subset of Previous Column: Occurrences of Innovative Treatment Technologies for Source Control
87	50	32	7
88	100	76	30
89	105	100	45
90	125	109	47
91	141	146	69
92	119	107	47

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY

This exhibit presents an index of individual sites that selected treatment technologies by treatment type. The names of some technologies may have changed since the issuance of the ROD. The number of sites at which these treatments occur are in ().

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (154)	FY82	Bruin Lagoon, PA	3
	FY83	----	
	FY84	Bio-Ecology Systems, TX	6
	FY85	Wide Beach Development, NY	2
		Davie Landfill, FL	4
	FY86	Marathon Battery, NY	2
		Bruin Lagoon, PA	3
		Mowbray Engineering, AL[b]	4
		Pepper's Steel & Alloys, FL•	4
		Sapp Battery Salvage, FL	4
		Burrows Sanitation, MI	5
		Fields Brook, OH[c]	5
		Forest Waste Products, MI	5
		Queen City Farms, WA•	10
	FY87	Chemical Control, NJ	2
		Geiger (C&M Oil), SC•,[c]	4
		Gold Coast Oil, FL•	4
		Independent Nail, SC	4
		Liquid Disposal, MI	5
		Northern Engraving, WI•	5
		Gurley Pit, AR[c]	6
		Mid-South Wood Products, AR•	6
		Sand Springs Petrochemical Complex, OK[c]	6
	FY88	Love Canal (93rd Street), NY	2
		Marathon Battery, NY[c]	2
		York Oil, NY[c]	2
		Aladdin Plating, PA	3
		Fike Chemical, WV	3

• Enforcement-lead RODs

a ROD 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 ROD Amendment.

e ROD selected two or more non-source control measures.

f ROD selected two types of Incineration/Thermal Treatment.

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (154) (continued)	FY88	Chemtronics, NC•,[d]	4
		Flowood, MS•	4
		Mid-State Disposal Landfill, WI	5
		Velsicol Chemical, IL	5
		Bailey Waste Disposal, TX•	6
		Industrial Waste Control, AR•	6
		Arkansas City Dump, KS	7
		Midwest Manufacturing/North Farm, IA	7
		Selma Treating, CA•	9
		Commencement Bay-Nearshore/Tideflats (OU3), WA•	10
		Frontier Hard Chrome (12/30/87), WA	10
		Gould, OR•	10
		Pacific Hide & Fur Recycling, WA•	10
	FY89	Sullivan's Ledge, MA	1
		W.R. Grace (Acton Plant), MA•,[c]	1
		De Rewal Chemical, NJ[c]	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 Battery, FL	4
		Smith's Farm Brooks, KY[c]	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, MA[c]	1
		Roebling Steel, NJ	2
		C&R Battery, VA	3

• Enforcement-lead RODs

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (154) (continued)	FY90	Greenwood Chemical, VA[c]	3
		MW Manufacturing, PA[c]	3
		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	4
		Zellwood Groundwater Contamination (Amendment), FL	4
		Oconomowoc Electroplating, WI	5
		U.S. DOI Sangamo/Crab Orchard NWR, 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), 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
	FY91	Silresim Chemical, MA•,a,c	1
		Sullivan's Ledge, MA	1
		Union Chemical, MA•,a,c	1
		Asbestos Dump, NJ	2
		NL Industries, NJ	2
		Nascolite, NJ•,c	2
		Roebling Steel, NJ	2
		Waldick Aerospace Devices, NJa,c	2
		Eastern Diversified Metals, PA•,a,c	3
		First Piedmont Quarry 719, VA•	3
		Halby Chemical, DE	3
		Mid-Atlantic Wood Preservers, MD•,a	3

• Enforcement-lead RODs

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (154) (continued)	FY91	Saunders Supply, VA[a,c]	3
		Whitmoyer Laboratories (OU2), PA[c]	3
		Whitmoyer Laboratories (OU3), PA[a,c]	3
		Aberdeen Pesticide Dumps (Amendment), NC[c]	4
		Arlington Blending & Packaging, TN[a,c]	4
		Carolina Transformer, NC[a,c]	4
		Golden Strip Septic Tank, SC•	4
		Interstate Lead (ILCO), AL[a]	4
		Maxey Flats Nuclear Disposal, KY•	4
		Oak Ridge Reservation (USDOE) (OU3), TN[c]	4
		Smith's Farm Brooks (Amendment), KY[c]	4
		USAF Robins Air Force Base, GA [a,c]	4
		Wrigley Charcoal, TN[c]	4
		Acme Solvent Reclaiming, IL•,[a,c,f]	4
		Berlin & Farro, MI	5
		Carter Industrials, MI[c]	5
		Cimarron Mining, NM	6
		E.I. DuPont DeNemours (County Rd X23), IA•	7
		Mid-America Tanning, IA	7
		Shaw Avenue Dump, IA•	7
		Anaconda Smelter, MT•	8
		FMC (Fresno Plant), CA•,[a,c,e]	9
		Valley Wood Preserving, CA•,[a]	9
	FY92	PSC Resources, MA	1
		Cosden Chemical Coatings, NJ	2
		Facet Enterprises, NY•	2
		Preferred Plating, NY	2
		Abex, VA•	3
		C & D Recycling, PA•	3
		Fike Chemical, WV [c]	3
		Paoli Rail Yard, PA•	3
		Rhinehart Tire Fire Dump, VA	3
		Tonolli, PA•,[c]	3
		Agrico Chemical, FL•	4
		Ciba-Geigy (McIntosh Plant), AL•,[c]	4

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solidification/Stabilization/ Immobilization (154) (continued)	FY 92	Florida Steel, FL•	4
		JFD Electronics/Channel Masters, NC•,c,e	4
		Marine Corps Logistics Base, GA	4
		Savannah River (USDOE)(OU1), SC	4
		Whitehouse Waste Oil Pits (Amendment), FL[e]	4
		Electrovoice, MI•,c	5
		H. Brown Company, MI [e]	5
		Peerless Plating, MI [c]	5
		Savanna Army Depot, IL [c]	5
		Spickler Landfill, WI•	5
		Tar Lake, MI•	5
		Cal West Metals, NM	6
		Double Eagle Refinery, OK [c]	6
		Fourth Street Abandoned Refinery, OK	6
		Gulf Coast Vacuum Services (OU1), LA	6
		Oklahoma Refining, OK[c]	6
		Broderick Wood Products, CO•,c	8
		Denver Radium (OU8), CO•	8
		Portland Cement (Kiln Dust #2 & #3), UT•	8
		Rocky Flats (USDOE)(OU4), CO	8
		Silver Bow Creek/Butte Area, MT	8
		Rhone-Poulenc/Zoecon, CA•	9
		Bunker Hill Mining and Metallurgical Complex, ID•,c,e	10
		Pacific Hide & Fur Recycling (Amendment), ID[c]	10
		U.S. DOE Idaho National Engineering Lab (OU22), ID	10
Incineration/Thermal Destruction/Treatment (153)	FY82	-----	
	FY83	-----	

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (153) (continued)	FY84	Berlin & Farro, MI	5
		Laskin/Poplar Oil, OH	5
		Western Processing, WA•	10
	FY85	Bog Creek Farm, NJ	2
		Bridgeport Rental & Oil Service, NJ	2
		Swope Oil & Chemical, NJ	2
		Acme Solvent Reclaiming, IL	5
		Motco, TX	6
		Triangle Chemical, TX	6
		Woodbury Chemical, CO	8
	FY86	Baird & McGuire, MA	1
		Hooker-Hyde Park, NY•	2
		Drake Chemical, 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 Utilities, IL	5
		Metamora Landfill, MI	5
		Spiegelberg Landfill, MI	5
		Sikes Disposal Pits, TX	6
	FY87	Davis Liquid Waste, RI[c]	1
		Ottati & Goss/Kingston Steel Drum, NH•,[c]	1
		Williams Property, NJ	2
		Geiger (C&M Oil), SC•,[c]	4
		Martin Marietta-Sodyeco Division, NC•	4
		Tower Chemical, FL	4
		Laskin/Poplar Oil, OH	5
		Rose Township Dump, 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

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal *Destruction/Treatment* (153) (continued)	FY88	Rose Disposal Pit, MA•	1
		Brewster Well Field, NY	2
		Ewan Property, NJ	2
		Lipari Landfill, NJ	2
		Love Canal, NY	2
		Reich Farms, NJ[b]	2
		York Oil, NY[c]	2
		Berks Sand Pit, PA	3
		Delaware Sand & Gravel, DE	3
		Douglassville Disposal, PA	3
		Drake Chemical, PA	3
		Fike Chemical, WV[b]	3
		Ordnance Works Disposal Areas, WV•,[d]	3
		Southern Maryland Wood Treating, MD	3
		Wildcat Landfill, DE	3
		Zellwood Groundwater Contamination, FL[c]	4
		Forest Waste Products, MI	5
		Fort Wayne Reduction Dump, IN	5
		LaSalle Electrical Utilities, IL	5
		Summit National Liquid Disposal Service, OH	5
		Brio Refinery, TX•	6
		Midland Products, AR	6
		Minker/Stout/Romaine Creek, MO	7
		Syntex Facility-Products Verona, MO•	7
		Times Beach, MO	7
		Broderick Wood Products, 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
		MW Manufacturing, PA	3
		Whitmoyer Laboratories, PA[b]	3

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FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (153) (continued)	FY89	Aberdeen Pesticide Dumps (OU2), NC	4
		American Creosote Works, TN[c]	4
		Celanese Shelby Fiber Operations, NC•,[c]	4
		Newsom Brothers/Old Reichhold, MS	4
		Smith's Farm Brooks, KY[c]	4
		Alsco Anaconda, OH•,[c]	5
		Big D Campground, OH•	5
		Cliff/Dow Dump, MI•,[c]	5
		Cross Brothers Pail Recycling, 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/Johnson (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-Mission Pole, WA•	10
	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
		MW Manufacturing, PA[c]	3
		Bofors Nobel, MI[c]	5
		Fisher Calo Chem, IN[b]	5
		Pristine (Amendment), OH[c]	5

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (153) (continued)	FY90	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), 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
	FY91	Circuitron, NY[c]	2
		Curcio Scrap Metal, NJ•	2
		Mattiace Petrochemicals, NY[a,c]	2
		Brodhead Creek, PA•,[c]	3
		Dixie Caverns County Landfill, VA	3
		Eastern Diversified Metals, PA•,[a,c]	3
		Whitmoyer Laboratories (OU2), PA[c]	3
		Aberdeen Pesticide Dumps (Amendment), NC[c]	4
		Ciba-Geigy, AL•,[c]	4
		Wrigley Charcoal, TN[c]	4
		Acme Solvent Reclaiming, IL•,[a,c,f]	5
		Allied Chemical & Ironton Coke, OH•,[a,c]	5
		Main Street Well Field, IN[a,c]	5
		Summit National Liquid Disposal Service (Amendment), OH[a]	5
		Thermo Chem, MI[a,c]	5
		Ellisville Area, MO	7
		Ellisville Area (Amendment), MO	7
		Kem-Pest Laboratories, MO[a]	7
		People's Natural Gas, IA•,[a,c]	7
		Broderick Wood Products• (Amendment), CO•	8

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FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Incineration/Thermal Destruction/Treatment (153) (continued)	FY91	Hill Air Force Base, UT[a]	8
		Advanced Micro Devices 901 (Signetics)(TRW Microwave), CA•,[a]	9
		Commencement Bay-Nearshore/ Tideflats, WA•	10
		Northwest Transformers-Mission Pole (Amendment), WA	10
	FY92	Ellis Property, NJ[e]	2
		Fike Chemical, WV [c]	3
		Alabama Army Ammunition Plant (OU1), AL	4
		American Chemical Services, IN•,[c]	5
		Savanna Army Depot, IL [c]	5
		Gulf Coast Vacuum Services (OU1), LA	6
		Ogden Defense Depot (OU3), UT	8
		Westinghouse Electric (Sunnyvale Plant), CA•	9
		Pacific Hide & Fur Recycling (Amendment), ID [c]	10
		U.S. DOE Idaho National Engineering Lab (OU23), ID	10
Biodegradation/Land Application/Bioremediation (48)	FY82	-----	
	FY83	-----	
	FY84	Old Inger Oil Refinery, LA	6
	FY85	Byron Salvage Yard, IL	5
	FY86	Tinkham Garage, NH[b]	1
		Leetown Pesticide, WV	3
		Burlington Northern, MN•	5
	FY87	Renora, NJ•	2

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FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Biodegradation/Land Application/Bioremediation (48) (continued)	FY88	Iron Horse Park, MA[c]	1
		Clarke, L.A. & Son, VA	3
		Brown Wood Preserving, FL•	4
		AT&SF (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
		Cliff/Dow Dump, MI•,[c]	5
		Koppers/Galesburg, IL	5
		Sheridan Disposal Services (12/29/88), TX•	6
		Vogel Paint & Wax, IA•,[b,e]	7
		Burlington Northern (Somers Plant), MT•	8
		Libby Groundwater, 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
	FY91	Applied Environmental Services, NY•,[a]	2
		General Motors/Central Foundry Division, NY•,[a]	2
		Swope Oil & Chemical, NJ•,[c]	2
		Whitmoyer Laboratories (OU3), PA[a,c]	3
		Allied Chemical & Ironton Coke, OH•,[a,c]	5
		MacGillis & Gibbs/Bell Lumber & Pole, MN•,[a]	5
		People's Natural Gas, IA•,[a,c]	7
		Wasatch Chemical (Lot 6), UT•,[a,c]	8
	FY92	Benfield Industries, NC [c,e]	4
		Whitehouse Waste Oil Pits (Amendment), FL[e]	4
		South Andover (OU2), MN	5

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FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Biodegradation/Land Application/Bioremediation (48) (continued)	FY92	Oklahoma Refining, OK[c]	6
		Prewitt Abandoned Refinery, NM•,[c]	6
		Pester Refinery, KS [c]	7
		Broderick Wood Products, CO•,[c]	8
		Idaho Pole, MT [c]	8
		Jasco Chemical, CA•,[c,e]	9
		Bunker Hill Mining and Metallurgical Complex, ID•,[c,e]	10
		Umatilla Army Depot (Lagoons), OR	10
		McChord AFB (Wash Rack/ Treatment), WA	10
		Eielson Air Force Base, AK[c]	10
Volatilization/Soil Aeration/ Aeration (21)	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 Terminal, FL	4
	FY87	Ottati & Goss/Kingston Steel Drum, NH•,[c]	1
		Waldick Aerospace Devices, NJ•	2
	FY88	Cannon Engineering/Bridgewater, MA	1
		Marathon Battery, NY[c]	2
		Reich Farms, NJ[b]	2
		Bendix Flight Systems, PA•	3
		Wamchem, SC•	4
		Long Prarie Groundwater Contamination, MN	5

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FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Volatilization/Soil Aeration/ Aeration (21) (continued)	FY89	Fairchild Semiconductor /Mt. View (OU1), CA•,c	9
		Fairchild Semiconductor /Mt. View (OU2), CA•,c	9
		Intel (Mt. View Plant), CA•,c	9
		Raytheon, CA•,c	9
	FY90	Howe Valley Landfill, KY	4
	FY91	Monolithic Memories (Advanced Micro Devices - Arques) (National Semiconductor), CA•,a,c	9
		National Semiconductor (Monolithic Memories), CA•,a,c	9
	FY92	-----	7
Soil Washing/Flushing (45)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	Goose Farm, NJ	2
		Commencement Bay-South Tacoma Channel (OU1), WA	10
	FY86	Tinkham Garage, NH[b]	1
		United Chrome Products, OR	10
	FY87	Davis Liquid Waste, RI[c]	1
		Palmetto Wood Preserving, SC	4
	FY88	Clarke, L.A. & Son, VA[c]	3
		Zellwood Groundwater Contamination, FL	4
		United Scrap Lead, OH	5
		U.S. Aviex, MI•	5
		Koppers (Texarkana Plant), TX•	6
		South Cavalcade Street, TX•	6

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EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Soil Washing/Flushing (45) (continued)	FY89	Byron Barrel & Drum, NY	2
		Vineland Chemical, NJ[c] (Soil Flushing)	2
		Vineland Chemical, NJ[c] (Soil Washing)	2
		Cape Fear Wood Preserving, NC	4
		Cross Brothers Pail Recycling, IL[c]	5
	FY90	Koppers (Oroville Plant), CA•,[c]	9
		King of Prussia, NJ	2
		Myers Property, NJ[c]	2
		U.S. Titanium, VA	3
		Cabot/Koppers, FL[c]	4
		Coleman-Evans Wood Preserving (Amendment), FL[c]	4
		Jadco-Hughes, NC[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
	FY91	Naval Air Engineering Center (OU1), NJ[a]	2
		Naval Air Engineering Center (OU2), NJ[a]	2
		Naval Air Engineering Center (OU4), NJ[a]	2
		Brodhead Creek, PA•,[c]	3
		Rasmussen's Dump, MI[a]	5
		Zanesville Wellfield, OH•,[a,c]	5
		Lee Chemical, MO•,[a]	7
		FMC (Fresno Plant), CA•,[a,c,e]	9
		Union Pacific Railroad Yard, ID•,[a]	10

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Soil Washing/Flushing (45) (continued)	FY92	Tibbetts Road, NH[c]	1
		Naval Air Engineering Center (OU7), NJ[e]	2
		Benfield Industries, NC[c,e]	4
		Whitehouse Waste Oil Pits (Amendment), FL[e]	4
		Pester Refinery, KS [c]	7
		Idaho Pole, MT[c]	8
		Sacramento Army Depot (OU4) , CA	9
		Bangor Ordnance Disposal (USN Sub Base), WA[c]	10
Vacuum/Vapor Extraction (102)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	Verona Well Field, MI	5
	FY86	-----	
	FY87	Seymour Recycling, IN•	5
	FY88	Groveland Wells, MA	1
		Keefe Environmental Services, NH	1
		Bendix Flight Systems, PA•,[c]	3
		Tyson Dump #1 (Amendment), PA•,[d]	3
		Airco Carbide, KY•	4
		B.F. Goodrich (Calvert City), KY•	4
		South Valley (PL-83), NM•	6
		Hastings Groundwater Contamination (09/28/88), NE	7
		Hastings Groundwater Contamination (09/30/88), NE	7
		Motorola (52nd Street Plant), AZ•	9
	FY89	Kellogg-Deering Well Field, CT	1
		South Municipal Water Supply Well, NH•	1
		Wells G&H, MA[c]	1

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Vacuum/Vapor Extraction (102) (continued)	FY89	FAA Technical Center, NJ•,c	2
		Kysor Industrial, MI	5
		Miami County Incinerator, OH	5
		MIDCO I, IN•	5
		Wausau Groundwater Contamination (9/29/89), WI	5
		Hastings Groundwater Contamination, NE	7
		Sand Creek Industrial, CO•,c	8
		Fairchild Semiconductor /Mt. View (OU1), CA•,c	9
		Fairchild Semiconductor /Mt. View (OU2), CA•,c	9
		Fairchild Camera (South San Jose Plant), CA•	9
		IBM (San Jose Plant), CA•,c	9
		Intel (Mt. View Plant), CA•	9
		Phoenix-Goodyear Airport Area, AZ•	9
		Raytheon, CA•,c	9
	FY90	Stamina Mills, RI	1
		Vestal Water Supply 1-1, NY	2
		Lord Shope Landfill, PA	3
		Jadco-Hughes, NCc	4
		SCRDI Bluff Road, SC	4
		Fisher Calo Chem, INb	5
		Hagen Farm, WI	5
		Pristine (Amendment), OHc	5
		Springfield Township Dump, MIc	5
		Wayne Waste Oil, INc	5
		Hardage/Criner (Amendment), OKc	6
		Tinker AFB (Soldier Creek/Bldg. 3001), OK	6
		Lindsay Manufacturing, NE	7
		Waverly Groundwater Contamination, NE	7
		Martin Marietta, Denver Aerospace, COc	8
		Rocky Mountain Arsenal (OU18), CO	8
		Intersil, CAc	9
		Solvent Service, CA	9
		Watkins Johnson (Stewart Division), CA	9

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Vacuum/Vapor Extraction (102) (continued)	FY91	Mottolo Pig Farm, NH[a]	1
		Silresim Chemical, MA•,[a]	1
		Union Chemical, ME[c]	1
		A.O. Polymer, NJ[a]	2
		Applied Environmental Services, NY•,[a,c]	2
		Circuitron, NY[c]	2
		Garden State Cleaners, NJ[a]	2
		Genzale Plating, NY[a,c]	2
		Mattiace Petrochemicals, NY[a,c]	2
		South Jersey Clothing, NJ[a]	2
		Swope Oil & Chemical, NJ•[c]	2
		Arrowhead Associates/Scovill, VA•,[a]	3
		Cryo-Chem, PA	3
		Charles Macon Lagoon & Drum Storage, NC[a]	4
		Medley Farms, SC•,[a]	4
		USAF Robins Air Force Base, GA[a,c]	4
		Acme Solvent Reclaiming, IL•,[a,c,f]	5
		Chem-Central, MI•,[a,e]	5
		Enviro-Chem (Northside Sanitary Landfill)(Amendment), IN•	5
		Main Street Well Field, IN[a,c]	5
		Sturgis Municipal Wells, MI[a]	5
		Thermo Chem, MI[a,c]	5
		Verona Well Field, MI[a]	5
		Zanesville Well Field, OH•,[a,c]	5
		Petro-Chemical (Turtle Bayou), TX[a]	6
		Chemical Sales (New Location) (OU1), CO[a]	8
		Indian Bend Wash Area (OUs 1,4,5,6), AZ•	9
		Mesa Area Ground Water Contamination, AZ•,[a]	9
		Monolithic Memories (Advanced Micro Devices - Arques)(National Semiconductor), CA•,[a,c]	9
		National Semiconductor (Monolithic Memories), CA•,[a,c]	9
		Signetics (Advanced Micro Devices 901)(TRW Microwave), CA•,[a]	9
		Spectra-Physics (Teledyne Semiconductor), CA•,[a]	9

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Vacuum/Vapor Extraction (102) (continued)	FY92	Teledyne Semiconductor (Spectra - Physics), CA•,a	9
		Van Waters & Rogers, CA•,a	9
		Tibbetts Road, NH	1
		Pasley Solvents & Chemical, NY•,c,e	2
		Raymark, PA	3
		U.S. Defense General Supply Center (OU5), VA	3
		Carrier Air Conditioning, TN•	4
		American Chemical Services, IN•,c	5
		City Disposal Sanitary Landfill, WI•	5
		Clare Water Supply, MI•	5
		Electrovoice, MI•,c	5
		Muskego Sanitary Landfill, WI•,c	5
		Peerless Plating, MI c	5
		Prewitt Abandoned Refinery, NM •,c	6
		29th & Mead Groundwater Contamination, KS•,e	7
		Rocky Flats (USDOE)(OU2), CO e	8
		Hassayampa Landfill, AZ•	9
		Lawrence Livermore National Lab, CA e	9
		Pacific Coast Pipelines, CA•	9
		Purity Oil Sales, CA	9
		Sacramento Army Depot (OU3), CA	9
		Eielson Air Force Base, AKc	10
Solvent Extraction (8)	FY82	-----	
	FY83	-----	
	FY84	-----	
	FY85	-----	
	FY86	-----	
	FY87	-----	

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Solvent Extraction (8) (continued)	FY88	----	
	FY89	Norwood PCBs, MA	1
		O'Connor, ME•	1
		Pinette's Salvage Yard, ME[c]	1
		Ewan Property, NJ	2
		Outboard Marine/Johnson (Amendment), IL	5
		United Creosoting, TX	6
	FY90	----	
	FY91	Carolina Transformer, NC[a,c]	4
	FY92	US DOE Idaho National Engineering Lab (OU5), ID[c]	10
In-situ Vitrification (5)	FY82	----	
	FY83	----	
	FY84	----	
	FY85	----	
	FY86	----	
	FY87	----	
	FY88	----	
	FY89	----	
	FY90	Anderson Development, MI	5
		U.S. DOI Sangamo/Crab Orchard NWR, IL	5
		Crystal Chemical, TX	6
		Rocky Mountain Arsenal (OU16), CO	8
	FY91	Wasatch Chemical (Lot 6), UT•,[a,c]	8
	FY92	----	

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Dechlorination (5)	FY82	----	
	FY83	----	
	FY84	----	
	FY85	----	
	FY86	----	
	FY87	----	
	FY88	----	
	FY89	----	
	FY90	Myers Property, NJ[c]	2
		Tenth Street Dump/Junkyard, OK	6
	FY91	Saunders Supply, VA[a,c]	3
		Arlington Blending & Packaging, TN[a,c]	4
		Smith's Farm Brooks (Amendment), KY•,[c]	4
	FY92	----	
Other/Unspecified Treatment Technologies (59)	FY82	----	
	FY83	----	
	FY84	----	
	FY85	----	
	FY86	----	
	FY87	Re-Solve, MA	1
		Palmerton Zinc Pile, PA•	3
		West Virginia Ordnance, WV•	3
		Central City-Clear Creek, CO	8

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Other/Unspecified Treatment Technologies (59) (continued)	FY88	GE Wiring Devices, PR•	2
		Pristine, OH	5
		Sol Lynn/Industrial Transformers (03/25/88), TX	6
		Fulbright Landfill, MO•	7
	FY89	Saco Tannery Waste Pits, ME	1
		Claremont Polychemical, NY	2
		SMS Instruments, NY	2
		Havertown PCP, PA	3
		Publicker/Cuyahoga Wrecking Plant, PA	3
		American Creosote Works, TN[c]	4
		Alsco Anaconda, OH•,[c]	5
		Doepke Disposal (Holliday), KS•	7
		Findett, MO	7
	FY90	Kearsarge Metallurgical, NC[c]	1
		Mattiace Petrochemicals, NY[b]	2
		Radium Chemical, NY[c]	2
		Roebling Steel, NJ[c]	2
		Sarney Farm, NY[c]	2
		Solvent Savers, NY	2
		Avtex Fibers, VA	3
		Jacksonville Municipal Landfill, AR[c]	6
		Rogers Road Municipal Landfill, AR[c]	6
		Intersil, CA[c]	9
	FY91	Union Chemical, ME•,[a,c]	1
		Genzale Plating, NY[a,c]	2
		Mattiace Petrochemical, NY	2
		Nascolite, NJ•,[c]	2
		Sinclair Refinery, NY•,[a]	2
		White Chemical, NY	2
		Brodhead Creek, PA•,[c]	3
		Greenwood Chemical, VA[a]	3
		USA Letterkenny Southeast Area, PA[c]	3
		Arlington Blending & Packaging, TN[a,c]	4
		Ciba-Geigy, AL•,[c]	4

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Other/Unspecified Treatment Technologies (59) (continued)	FY91	Oak Ridge Reservation (USDOE) (OU3), TN[c]	4
		Sangamo/Twelve-Mile/Hartwell/ PCB, SC•,a,c	4
		Smith's Farm Brooks Amendment), KY•,c	4
		Carter Industrials, MI[c]	5
		Fadrowski Drum Disposal, WI •,e	5
		G&H Landfill, MI	5
		Thermo Chem, MI [c]	5
		Yakima Plating, WA	10
	FY92	General Motors/Central Foundry Division (OU2), NY•	2
		Preferred Plating, NY	2
		Rowe Industries Groundwater Contamination, NY•,e	2
		Eastern Diversified Metals, PA•	3
		Fike Chemical, WV	3
		Benfield Industries, NC	4
		Ciba-Geigy (McIntosh Plant), AL[c]	4
		Florida Steel, FL•	4
		Potter's Septic Tank Service Pits, NC [e]	4
		Prewitt Abandoned Refinery, NM•,c	6
		Ogden Defense Depot (OU3), UT	8
		Ogden Defense Depot (OU4), UT	8
		U.S. DOE Idaho National Engineering Lab (OU5), ID	10
Thermal Desorption (20)	FY82	—	
	FY83	—	
	FY84	—	
	FY85	—	
	FY86	—	
	FY87	—	

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Thermal Desorption (20) (*continued*)	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
	FY91	Union Chemical, ME•,[a,c]	1
		Waldick Aerospace Devices, NJ[a,c]	2
		Saunders Supply, VA[a,c]	3
		USA Letterkenny Southeast Area, PA[c]	3
		Aberdeen Pesticide Dumps (Amendment), NC[c]	4
		Arlington Blending & Packaging, NC[a,c]	4
		Sangamo/Twelve-Mile/Hartwell PCB, SC•,[a,c]	4
		Acme Solvent Reclaiming, IL•,[a,c,f]	5
		Anderson Development (Amendment), MI•	5
		Carter Industrials, MI[c]	5
	FY92	Industrial Latex, NJ	2
		Brown's Battery Breaking, PA [e]	3
		Potter's Septic Service Pits, NC [e]	4
		American Chemical Services, IN•,[c]	5
Chemical Treatment (1)	FY82	------	
	FY83	------	
	FY84	------	
	FY85	------	

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 10

FY 1982 - FY 1992: INDEX OF SOURCE CONTROL TREATMENT TECHNOLOGIES BY TYPE OF TECHNOLOGY (Continued)

TECHNOLOGIES[a]	FISCAL YEAR OF ROD SIGNATURE	SITE NAME, STATE	REGION
Chemical Treatment (1) (continued)	FY86	------	
	FY87	------	
	FY88	------	
	FY89	------	
	FY90	------	
	FY91	------	
	FY92	JFD Electronics/Channel Masters, NC[c,e]	4

• Enforcement-lead RODs

[a] ROD 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 ROD Amendment.

[e] ROD selected two or more non-source control measures.

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

EXHIBIT 11

FY 1992: TREATMENT TRAINS IN SOURCE CONTROL AND GROUND WATER TREATMENT RODs

This exhibit presents the number of FY 1992 source control treatment and ground water treatment RODs that selected treatment trains. A treatment train is a sequence of treatment technologies used to remediate a specific medium. Non-treatment RODs are not included in the total number.

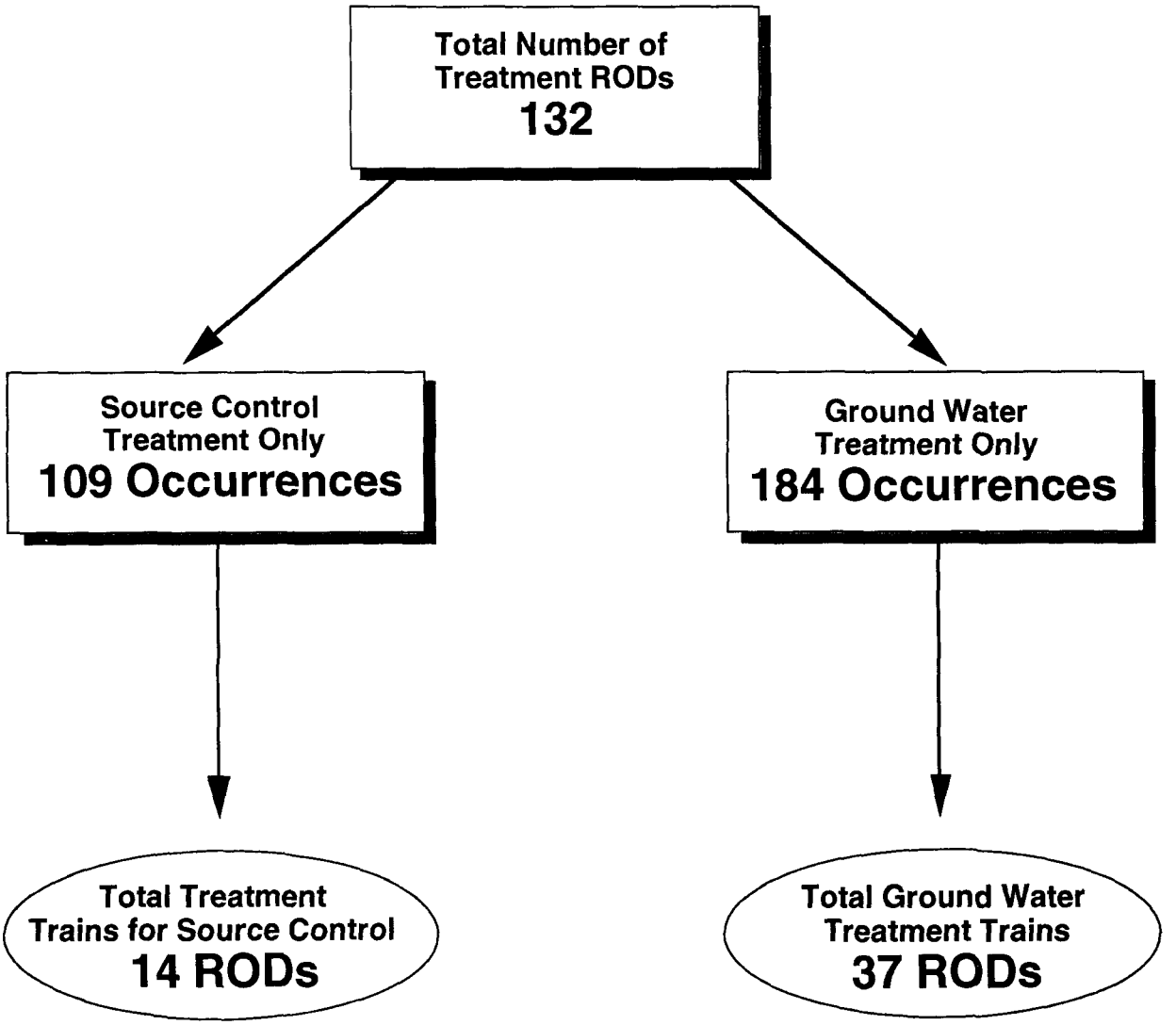

EXHIBIT 12

FY 1992: INDEX OF RODs USING TREATMENT TRAINS

This exhibit is an index of treatment trains selected in ground water and source RODs for FY 1992. Treatment trains employ a sequence of technologies to address a specific medium or constituents for source and ground water control.

SOURCE CONTROL TREATMENT TRAINS (14)	REGION	SITE NAME, STATE
	1	Tibbetts Road, NH
	3	Fike Chemical, WV
	4	Benfield Industries, NC[a]
	4	JFD Electronics/Channel Masters, NC[a]
	4	Whitehouse Waste Oil Pits (Amendment), FL[a]
	5	Electrovoice, MI[a]
	5	Peerless Plating, MI[a]
	6	Double Eagle Refinery, OK
	6	Fourth Street Abandoned Refinery, OK
	6	Gulf Coast Vacuum Service (Operable Unit 1), LA
	7	Pester Refinery, KS
	8	Idaho Pole, MT[a]
	10	Pacific Hide & Fur Recycling (Amendment), ID
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 5), ID

GROUND WATER TREATMENT TRAINS (37)	REGION	SITE NAME, STATE
	1	Brunswick Naval Air Station (Operable Unit 1), ME
	1	Brunswick Naval Air Station (Operable Unit 2), ME
	1	Newport Naval Education/Training Center, RI
	1	Tibbetts Road, NH
	2	Cosden Chemical Coatings, NJ
	2	Ellis Property, NJ
	2	Evor Phillips Leasing, NJ
	2	General Motors/Central Foundry Division (Operable Unit 2), NY
	2	Higgins Farm, NJ
	2	Imperial Oil/Champion Chemicals, NJ
	2	Naval Air Engineering Center (Operable Unit 7), NJ
	2	Pasley Solvents & Chemical, NY
	2	Rowe Industries Groundwater Contamination, NY
	3	Brown's Battery Breaking, PA
	3	MW Manufacturing, PA
	3	Paoli Rail Yard, PA
	4	Benfield Industries, NC[a]
	4	JFD Electronics/Channel Masters, NC[a]

[a] ROD selected treatment trains for both source and ground water remedies.

EXHIBIT 12

FY 1992: INDEX OF RODs USING TREATMENT TRAINS

GROUND WATER TREATMENT TRAINS (37) (continued)	REGION	SITE NAME, STATE
	4	Madison County Sanitary Landfill, FL
	4	Milan Army Ammunition Plant, TN
	4	New Hanover County Airport Burn Pit, NC
	4	Potter's Septic Tank Service Pits, NC
	4	USMC Camp Lejeune Military Reservation, NC
	4	Whitehouse Waste Oil Pits (Amendment), FL[a]
	5	Central Illinois Public Service, IL
	5	City Disposal Sanitary Landfill, WI
	5	Electrovoice, MI[a]
	5	H. Brown Company, MI
	5	New Brighton/Arden Hills, MN
	5	Peerless Plating, MI[a]
	5	Reilly Tar Chemical (Indianapolis Plant), IN
	6	Oklahoma Refining, OK
	8	Broderick Wood Products, CO
	8	Idaho Pole, MT[a]
	10	Elmendorf Air Force Base, AK
	10	N.A.S. Whidbey Island - Ault Field, WA
	10	U.S. DOE Idaho National Engineering Lab (Operable Unit 2), ID

[a] ROD selected treatment trains for both source and ground water remedies.

EXHIBIT 13

FY 1982 - FY 1992: ROD REMEDY COSTS

This exhibit provides a comparison of remedial action costs as specified in FY 1982 through FY 1992 RODs. These figures are estimates based on present worth costs, when available, at the time the ROD was written. Operation and maintenance costs are included in the present worth costs.

FISCAL YEAR / COST	0 - $2M	2.1M - $5M	5.1 - $10M	10.1 - $20M	20.1 - $30M	30.1M+	TOTAL NUMBER OF 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	23	16	11	9	4	3	69 [a]
1986	31	14	11	13	6	9	84 [a]
1987	26	22	12	6	5	5 [b]	77 [a,b]
1988	43	44	31	15	14	6	153
1989	44	23	23	20	7	19	143 [a]
1990	47	33	30	24	11	17	168 [a]
1991	51	48	33	27	14	15	196 [a,c]
1992	54	30	30	31	8	10	172 [a]
TOTAL	347	245	187	149	71	84 [b]	1,117 [a,c]

[a] Data are not available for four FY 1985 RODs, one FY 1986 ROD, one FY 1987 ROD, eight FY 1989 RODs, six FY 1990 Federal Facility RODs, four FY 1991 RODs, and nine FY 1992 RODs.

[b] Includes a combined remedial cost for the Envirochem, IN and Northside, IN, which are both presented in one ROD.

[c] Includes combined remedial costs for the following sites; Lemberger Landfill, WI and Lemberger Transport & Recycling, WI; Advanced Micro Devices 901, CA, Signetics, CA, and TRW Microwave, CA; Monolithic Memories, CA, and National Semiconductor, CA; Spectra-Physics, CA, and Teledyne Semiconductor, CA.

RECORD OF DECISION ABSTRACTS

Record of Decision (ROD) summaries are arranged alphabetically by Region; however, not every State may have a ROD signed in FY 1992.

Each ROD summary consists of the following information elements:

- **Site History/Description** — summarizing site location and background information relevant to the remedial operable unit, scope of the operable unit within the site cleanup plan, contaminated media, and key contaminants.
- **Selected Remedial Action** — providing the principal elements of the selected remedial action, present worth or capital cost, and operations and maintenance (O&M) cost.
- **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 each ROD. A quantitative list of RODs, by keyword, is presented in Section IV.

A list of RODs signed in FY 1992 and corresponding page numbers precedes the abstracts in this section.

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BRUNSWICK NAVAL AIR STATION (OPERABLE UNIT 1), ME

June 16, 1992

SITE HISTORY/DESCRIPTION:

The 3,094-acre Brunswick Naval Air Station (NAS Brunswick) site is an active military facility located south of the Androscoggin River between Brunswick and Bath, Maine. The primary mission of the Base is to operate and maintain P-3 Orion aircraft for the U.S. Navy antisubmarine warfare operations in both the Atlantic Ocean and Mediterranean Sea. Land use in the area surrounding the Base is primarily residential, with an elementary school, hospital, and college located 1 mile west of the site boundary. The southern edge of the Base borders coves and estuaries of Harpswell Cove. Ground water underlying the site is described as a potential source of drinking water, but NAS Brunswick currently is serviced by a public water supply system. NAS Brunswick, which first became active in the 1940's during World War II, has many areas onsite that were used for disposal of hazardous materials. Two former landfill areas, known as Sites 1 and 3, are in the central portion of the Base and were used for the disposal of waste oil, food waste, solvents, pesticides, petroleum products, paint wastes, and isopropyl alcohol. Site 1 was utilized from 1955 to 1975 and Site 3, from 1960 to 1973. Since 1983, the Navy and EPA have conducted several investigations regarding the past usage and disposal of hazardous substances. These revealed contamination of the soil, sediment, and ground water in Sites 1 and 3 with VOCs and metals. This ROD addresses containment of the buried wastes at the Site 1 and 3 areas and recovery of contaminated ground water to prevent further migration. Future RODs will address additional ground water plumes and other source OUs. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs, including benzene, toluene, methylene chloride, and DCE; other organics, including PAHs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes the constructing a low permeability RCRA cap over the landfills and a slurry wall around the waste to divert clean water away from the landfills; conducting treatability tests before designing the treatment system; pumping and onsite treatment approximately 16 million gallons of contaminated ground water, which is contained by the cap and slurry wall, using chemical oxidation, flocculation, clarification, and filtration to remove the metals and ultraviolet oxidation to destroy VOCs in an onsite system concurrent with the Eastern Plume ground water (discussed as part of another ROD) to be most cost effective; discharging the treated water offsite to the local POTW once the water meets pretreatment levels, and then into the Androscoggin River under a CWA NPDES permit; monitoring system ground water to confirm that the containment system is functioning properly, and implementing institutional controls including land, deed, and ground water use restrictions to prevent future use of the landfills or ground water. The estimated present worth cost for this remedial action is $7,842,000, which includes a net present worth O&M cost of $1,432,000 over a 30-year period.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil/sediment clean-up goals were not provided, as the risks presented by these media are within the acceptable range established by EPA. A target clean-up level for mercury in soil/sediment is specified at 1 mg/kg based on a food-web analysis, as mercury was the only contaminant identified which demonstrates a propensity to bioaccumulate in terrestrial food chains. Chemical-specific ground water clean-up goals are based on SDWA MCLs and include arsenic 50 ug/l; vinyl chloride 2 ug/l; methylene chloride 5 ug/l; 1,2-cis-DCE 70 ug/l; 1,2 - trans-DCE 100 ug/l; chromium (total) 100 ug/l; lead 15 ug/l (action level); and nickel 100 ug/l.

INSTITUTIONAL CONTROLS:

Deed and ground water use restrictions will be implemented at the site to prevent future use of the land or ground water affected by the former landfills.

KEYWORDS:

Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Onsite Containment; Onsite Disposal; Onsite Treatment; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Slurry Wall; Soil;

BRUNSWICK NAVAL AIR STATION (OPERABLE UNIT 1), ME (Continued)

June 16, 1992

Solvents; State Standards/Regulations; Surface Water Collection Diversion; Surface Water Monitoring; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Sediment, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim
Ground Water - Interim

BRUNSWICK NAVAL AIR STATION (OPERABLE UNIT 2), ME

June 16, 1992

SITE HISTORY/DESCRIPTION:

The 3,094-acre Brunswick Naval Air Station site (NAS Brunswick) is an active military facility located south of the Androscoggin River between Brunswick and Bath, Maine. The primary mission of the Base is to operate and maintain P-3 Orion aircraft for the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. Land use in the area surrounding the Base is primarily residential, with an elementary school, hospital, and college located 1 mile west of the site boundary. The southern edge of the Base borders coves and estuaries of Harpswell Cove. Ground water underlying the site is described as a potential source of drinking water, but currently NAS Brunswick is serviced by a public water supply system. NAS Brunswick, which first became active in the 1940's during World War II, has many areas onsite that were used for past disposal of hazardous materials. Investigations were conducted by the U.S. Navy and EPA beginning in 1983 to determine the contaminated site areas including, Site 4, an acid/caustic pit used from 1969 to 1974 for disposal of liquid wastes; Site 11, a former fire-training area, used over a 30-year period until 1990, where fuels, oils, and degreasing solvents were used in the fire-training exercises; and Site 13, the Defense Reutilization and Marketing Office (DRMO) area, consisting of three underground storage tanks containing oils, waste fuels, and solvents which were removed in the late 1980's. Extensive hydrogeological data from a 1990 study delineated a plume of VOC-contaminated ground water extending north to south along the eastern boundary of the site, known as the Eastern Plume. This ROD addresses an interim remedy for Site 2, the Eastern Plume, the source of which has been traced to Sites 4, 11, and 13. An additional 1992 ROD specified containment of onsite buried wastes and ground water plume management. A future ROD will address a final remedy for the ground water at NAS Brunswick. The primary contaminants of concern affecting the ground water are VOCs, including PCE and TCE.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes extracting and treating contaminated ground water onsite using precipitation and filtration processes to remove metals such as iron and manganese, and UV/oxidation to remove VOCs, with offsite discharge of the treated water to a local POTW for final treatment; conducting treatability tests prior to design of the treatment system; and implementing a Navy monitoring program to ensure that the system is effective. Extracted ground water for this OU will be combined with ground water from OU1, the subject of a previous ROD, and treated concurrently in a single system. The estimated present worth cost for this remedial action is $4,223,000, which includes an O&M cost of $1,845,000 over 5 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals for this site were based on SDWA MCLs and health-based standards and include 1,1,1-TCA 200 ug/l; TCE 5 ug/l; PCE 5 ug/l; trans-1,2-DCE 100 ug/l; cis-1,2-DCE 70 ug/l; 1,1-DCA 3,500 ug/l; and 1,1-DCE 7 ug/l. The interim action is intended to contain the Eastern Plume and prevent further migration to Harpswell Cove pending final remedial actions.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Carcinogenic Compounds; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; O&M; Offsite Discharge; Offsite Treatment; Onsite Treatment; PCE; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: 06/16/92
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Interim

DARLING HILL DUMP, VT

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 3.5-acre Darling Hill Dump site is an inactive solid waste disposal facility in the town of Lyndon, Caledonia County, Vermont. Land use in the area is characterized by open woodland, agricultural, and residential land. Steep slopes and the presence of wetlands makes it unlikely that the land in the immediate vicinity of the Dump will be further developed for residential uses. In addition, the site lies within the floodplain of the Passumpsic River. Approximately 3,200 residents within the area are served by the Lyndonville Municipal Well Field, located within 0.5 mile to the southwest. From 1952 to 1972, the site was operated by the Village of Lyndonville as a disposal area accepting municipal and industrial waste. During this time, the Darling Hill Dump was never formally regulated or permitted. From 1972 to 1989, Ray O. Parker and Sons operated the Darling Hill Dump and accepted primarily construction debris and white goods. Approximately 100,000 cubic yards of material are contained within the dump. As a result of detecting low levels of VOCs in the ground water at the Lyndonville Municipal Wellfield, a number of investigations were performed by EPA and the state, which revealed VOCs and metals in the ground water and soil at the site. Subsequent investigations have revealed that the pumping of the municipal wells inhibits flow of contaminants past the wellfield and that the site is neither contaminating area surface waters nor posing a significant physical hazard to area residences. This ROD addresses ground water, surface water, and sediment at the Darling Hill Dump site. The results of the RI show that the levels of organic compounds and metals do not appear to pose an unacceptable risk to human health or the environment; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes no further action because significant levels of contaminants are not present at the site. EPA, however, will continue to monitor the ground water, surface water, and sediment for a 5-year period to ensure the protectiveness of the no action remedy. The estimated net present worth for the 5-year monitoring program is $292,000, which includes an annual monitoring cost of approximately $77,000.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Floodplain; Ground Water Monitoring; No Action Remedy; O&M; Surface Water Monitoring; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

NEWPORT NAVAL EDUCATION/TRAINING CENTER, RI

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 85-acre Naval Education and Training Center (NETC) is a training facility and tank farm located on Aquidneck Island, Middletown, Rhode Island. The NETC facility is situated along 6 miles of shoreline bordering Narragansett Bay. There are currently four areas of contamination and six study areas, with NETC Newport under investigation. Tank Farm Five consists of 11 underground storage tanks (USTs), numbered 49 through 59, which were constructed between 1942 and 1943 for fuel storage and used until 1974. Between 1975 and 1982, Tanks 53 and 56 contained used oil for alternate use as heating fuel as part of an oil recovery program. In 1982, the state adopted hazardous waste regulations, which were applicable to the waste oils contained in Tanks 53 and 56. In 1983, sampling of the water, oil, and sludge in the tanks was conducted, and results indicated significant levels of lead, cadmium, chromium, barium, mercury, and silver. The water sample collected from Tank 56 contained various hydrocarbons. In 1985, analytical results collected from the monitoring wells installed in the ring drains of Tanks 53 and 56 revealed the presence of several chlorinated and aromatic hydrocarbons and traces of mercury. In 1985, the state ordered the Navy to remove and close Tanks 53 and 56. In 1990, oil was observed to be leaking out of Tank 53. Subsequently, the state required the Navy to remove the contents of Tank 53, remediate the contaminated ground water and soil surrounding the tanks, and investigate the extent of oil contamination in the vicinity of Tanks 53 and 56. Later in 1990, the Navy performed removal activities of the sludge, water, and oil layers from Tanks 53 and 56 for treatment at an offsite facility and steam-cleaned the tank walls to ensure that no contamination was left prior to tank demolition. This interim ROD addresses management of the ground water in the vicinity of Tanks 53 and 56 to control or prevent further migration of contaminated ground water and remediation to begin to reduce the concentration of contaminants until a final remedy can be chosen. Future RODs will address the final remedy for the site, including both ground water and source operable units. The primary contaminants of concern affecting the ground water are VOCs, including benzene and TCE; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes constructing an extraction system around Tanks 53 and 56 to contain the contaminated ground water plume and prevent migration and potential discharge to surface water bodies; treating ground water onsite with a precipitation process that involves a coagulation/filtration to remove metals, followed by using UV/oxidation to treat VOCs; conducting a treatability study during the final design of the UV/oxidation treatment system to determine the appropriate oxidant and concentration necessary to destroy the VOCs; disposing of the filtration solids in accordance with federal and state regulations; discharging the treated ground water offsite to either the local wastewater treatment facility, recycling treated water back into the aquifer upgradient, or onsite to surface water if the treatment facility is unable the accept the pretreated water; and monitoring ground water. The estimated present worth cost for this remedial action is $3,500,000, which includes a present worth O&M cost of $2,000,000 over 5 years.

PERFORMANCE STANDARDS OR GOALS:

Interim chemical-specific clean-up goals are based on the MCLs and MCLGs and include arsenic 50 mg/kg (MCL); benzene 5 mg/kg (MCL); chromium 100 mg/kg (MCLG); and lead 15 mg/kg (based on EPA action level).

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Disposal; Onsite Treatment; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Solvents; State Standards/ Regulations; Treatability Studies; VOCs; Water Quality Criteria.

NEWPORT NAVAL EDUCATION/TRAINING CENTER, RI (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Interim

OTIS AIR NATIONAL GUARD/CAMP EDWARDS, MA

May 20, 1992

SITE HISTORY/DESCRIPTION:

The 22,000-acre Otis National Guard/Camp Edwards site is a former military vehicle maintenance facility on Cape Cod, Massachusetts, within the Massachusetts Military Reservation (MMR). The Area of Contamination Chemical Spill Area Number 4 (AOC CS-4) plume extends 11,000 feet and is located 1.1 miles from the southern boundary of MMR. Land use surrounding MMR is predominantly residential and light industrial. Ground water beneath Cape Cod has been classified as a Class I, Sole Source Aquifer under the Safe Drinking Water Act. From 1940 to 1984, the site was used by the Federal Government for various purposes. From 1940 to 1946, the U.S. Army operated the site for maintenance of military vehicles, and from 1955 to 1973, the USAF operated the vehicle area. Wastes and equipment handled at AOC CS-4 included oils, solvents, antifreeze, battery electrolytes, paint, and waste fuels. Additionally, the northern portion of AOC CS-4 was used as a storage yard for wastes generated by shops and laboratories operating at MMR. Liquid wastes were stored in containers or underground storage tanks (USTs) in an unbermed area or deposited in USTs designated for motor gasoline. The UST waste storage contents were removed in 1984, and the AOC CS-4 site has been inactive since 1986. Since 1986, the DOD's Installation Restoration Program staff conducted several investigations at MMR, which revealed that ground water was contaminated with VOCs and may migrate off of the MMR to the south. This ROD addresses OU2, the interim action for MMR AOC CS-4 ground water to prevent further down gradient migration of the contaminants. Future RODs will address a final remedy for the AOC CS-4 plume upon completion of the AOC CS-10 ground water plume study, while contaminated soil will be addressed as part of a removal action. The primary contaminants of concern affecting the ground water are VOCs, including PCE and TCE.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes onsite pumping and treatment of 790 million gallons of contaminated ground water using carbon adsorption to remove VOCs; monitoring the influent and effluent of the carbon absorption treatment, and discharging the treated water to an onsite infiltration trench; and monitoring ground water. The estimated present worth cost for this remedial action ranges from $2,113,000 to $4,528,000, which includes a present worth O&M cost ranging from $472,000 to $1,012,000 for 5 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific clean-up goals for ground water are based on SDWA MCLs and state standards and include PCE 5 ug/l; TCE 5 ug/l; DCE 70 ug/l; and PCA 2 ug/l (10^{-6} risk-based standard).

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; MCLs; O&M; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Sole-Source Aquifer; Solvents; State Permit; State Standards/Regulations; TCE; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Interim

PSC RESOURCES, MA
September 15, 1992

SITE HISTORY/DESCRIPTION:

The 21.5-acre PSC Resources site is a former waste oil and solvent reclamation facility located in Palmer, Hampden County, Massachusetts. The PSC Resources Property is composed of approximately 20 acres of surrounding residential, commercial, recreational, woodland, and wetlands areas, including the Quaboag River. Site features include a concrete and brick frame building, a garage, multiple concrete tank cradles, storage tank pads, and a lagoon. The site is bordered by a recreational field, mixed woods and wetlands, residential and commercial property, and to the south by the Quaboag River. The PSC property is also located within the 100-year floodplain of the Quaboag River, which is part of the Chicopee River Basin. The site overlies a ground water aquifer that currently is not used for drinking water purposes. Since 1898, there have been several owners of the PSC property, most involved in oil industry functions. In 1974, PSC Resources, Inc., purchased the property to operate an oil storage and processing facility, and in 1976, the company name was changed to Ag-Met Oil Services, Inc. The company began accepting solvents and lacquers for collection and disposal. In late 1976, the company began operating under the name Newtown Refining Corporation; however, the state denied their permit renewals. Several state inspections conducted between 1974 and 1976 revealed improper maintenance along with waste oil and hazardous materials spills. In 1978, the facility was closed, and the state required Newtown Refining to begin removing 1.5 million gallons of waste oils and sludge from the site. By 1982, little of that waste had been removed and an estimated 500,000 gallons of waste remained onsite. Oil had discharged to adjacent wetlands and sampling of soil, sediment, and surface water revealed contamination by VOCs, metals, PAHs, and PCBs. In 1986, the state initiated two interim remedial measures (IRMs) to secure the property and remove oils, sludge, drums, tanks, and associated piping offsite. In 1991, EPA initiated a removal action, which involved construction of a new, full enclosure fence around the PSC property and the adjacent spill area in the wetland. This ROD addresses the final remedy for the site, which includes both source control and management of migration components. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and surface water are VOCs, including benzene, PCE, and TCE; other organics, including PAHs and PCBs; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action includes decontaminating, demolishing, and offsite disposal of debris and property structures at a RCRA landfill; consolidating the contaminated soil with lagoon and wetlands sediment onsite, and treating these materials using stabilization; constructing a permeable cap over the stabilized material; restoring affected wetlands; treating lagoon surface water onsite using filtration and a granular activated carbon (GAC) adsorption unit, followed by discharging the treated water into the Quaboag River or to an offsite facility; using natural attenuation to achieve ground water clean-up levels; monitoring ground water; conducting sediment and surface water sampling; and implementing institutional controls including deed, ground water and land use restrictions. The estimated present worth cost for this remedial action is $3,420,747, which includes an annual O&M cost of $731,913.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and sediment (lagoon only) clean-up levels are based on health-risk standards and SDWA MCLs, respectively, and include benzene 1 mg/kg/3 mg/kg; TCE 2 mg/kg/4 mg/kg; PCE 2 mg/kg/12 mg/kg; lead 500 mg/kg/15 mg/kg; total PAHs 151 mg/kg; and total PCBs 1 mg/kg. Chemical-specific wetlands sediment clean-up levels are based on health-risk standards and include total PAHs 10 mg/kg; total PCBs 1 mg/kg; arsenic 12 mg/kg; and lead 375 mg/kg. Chemical-specific ground water clean-up levels are based on SDWA MCLs and state standards and include benzene 5 ug; TCE 5 ug/l; PCE 5 ug/l; and lead 15 ug/l. An ARAR waiver will be issued for certain requirements of the chemical waste landfill regulations, which require construction of chemical waste landfills in low permeable clay conditions, the use of a synthetic membrane liner, and that the bottom of the landfill be 50 feet above the historic high water table.

PSC RESOURCES, MA (Continued)
September 15, 1992

INSTITUTIONAL CONTROLS:
Institutional controls in the form of deed, ground water, and land use restrictions will be implemented to ensure that future use of the ground water and future development of the land are prohibited until clean-up standards have been attained.

KEYWORDS:
ARAR Waiver; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Dredging; Excavation; Filling; 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; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/ Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; TCE; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Debris, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

REVERE TEXTILE PRINTS, CT
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 15-acre Revere Textile Prints site is an industrial facility, located in Sterling, Windham County, Connecticut. Land use in the area is a mix of rural residential, industrial, and agricultural, with interspersed woodlands and grassland meadows. The Moosup River and Sterling Pond are located southwest and southeast of the site, respectively. The property was originally developed in 1809 as a cotton mill and was used continually for this purpose until 1879. From 1879 to 1980, several textile processing facilities used the site to print colored and patterned fabrics, which involved using pigments, dyes, and solvents. Throughout the site's history, process rinse water and leftover printing pigments were disposed of into floor drains that drained into Moosup River. In 1980, a fire forced the facility to shut down. A subsequent state inspection revealed over 1,500 drums of waste material at the site as well as stained or colored soil near the former drum storage areas. In 1980, the state ordered the PRP to dispose of the 1,500 drums offsite along with an unspecified amount of stained soils; the action was completed in 1983. Between 1982 and 1983, W.F. Norman Company purchased the site for metal stamping operations, and subsequently abandoned the site. In 1988, the Town of Sterling acquired the site for its current use as a light industrial park. In 1990, EPA ordered the Town of Sterling to remove and dispose of several 55-gallon drums and 5-gallon cans containing waste material. This ROD addresses site soil, sediment, ground water, and surface water. The results of the RI have shown no evidence of significant site contamination, and where contaminants were detected, the levels were usually significantly below the federal MCLs. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes no further action, with implementation of a 5-year sediment and ground water monitoring program. EPA has determined that the previous interim remedial activities have eliminated the need to conduct additional remedial actions and are adequate to protect human health and the environment. The estimated net present worth of this remedial action is $263,000 for the site monitoring activities.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not applicable.

KEYWORDS:
Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

TIBBETTS ROAD, NH
September 29, 1992

SITE HISTORY/DESCRIPTION:
The 2-acre Tibbetts Road site is a former waste storage and disposal facility in Barrington, Strafford County, New Hampshire. Land use in the area is predominantly industrial with one unoccupied residence onsite and five occupied residences located within 200 feet of the site. The residents within one-half mile of the site used ground water as their primary source of drinking water. From the 1940's to present, the site was used as a storage area for industrial wastes from automobile production and painting. In 1982, state investigations revealed that improper storage techniques had led to many of the storage barrels discharging their contents to the ground, resulting in contamination of the ground water. In 1984, EPA conducted a removal action that involved removing barrels and contaminated soil from the site for offsite treatment and disposal. A second removal action was conducted by EPA in 1986, which included excavating 405 cubic yards of soil containing dioxins, PCBs, VOCs, and SVOCs, backfilling and capping the area, shipping PCB- and VOC-contaminated soil offsite, and storing dioxin-contaminated soil onsite, to be destroyed by infrared incineration at a later date. In 1987, EPA and the state constructed a drinking water treatment plant to provide an alternate water supply to local residents. This ROD addresses a final remedy for debris and ground water at the site. The primary contaminants of concern affecting the debris and ground water are VOCs including, benzene, PCE, TCE, and xylenes; other organics, including PAHs; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes removing and disposing buildings and debris offsite to access the areas of contamination more efficiently; disposing of 15 barrels of incinerator ash residue and spent carbon filters from a previous removal action offsite; using trenches or wells to intercept ground water in the bedrock aquifer; designing and constructing a ground water dewatering and extraction system in the overburden aquifer, and treating air emissions using granular activated carbon; treating the contaminated ground water in an onsite treatment plant using metals precipitation, chemical additives, and UV/oxidation, with discharge of the treated ground water to injection wells onsite to promote flushing of weathered bedrock; disposing of the resulting sludge offsite; conducting a treatability study to determine the appropriate oxidant and concentration needed to destroy VOCs; upgrading and expanding the water supply, as needed; monitoring ground water and surface water; modifying or abandoning wells, if necessary; and implementing institutional controls, including deed and ground water use restrictions to prevent the use of contaminated ground water. The estimated present worth cost for this remedial action is $3,776,000, which includes a net present worth O&M cost of $2,047,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up goals are based on SDWA MCLs and MCLGs and state standards and include PCE 5 ug/l; toluene 1,000 ug/l; naphthalene 1,460 ug/l; arsenic 50 ug/l; manganese 3,650 ug/l; bis(2-ethylhexyl)phthalate 4 ug/l; benzene 5 ug/l; xylenes 10,000 ug/l; TCE 5 ug/l; and chromium 100 ug/l.

INSTITUTIONAL CONTROLS:
Institutional controls in the form of deed and ground water use restrictions will be implemented to prevent the use of the bedrock and overburdened aquifers during the clean-up period.

KEYWORDS:
Alternate Water Supply; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCE; RCRA; Safe Drinking Water Act; State Standards/Regulations; Surface Water Monitoring; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Xylenes.

TIBBETTS ROAD, NH (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

TOWN GARAGE/RADIO BEACON, NH

September 30, 1992

SITE HISTORY/DESCRIPTION:

The Town Garage Radio Beacon, NH, site includes the Holton Circle residential development of 23 homes, a town garage area, and an undeveloped hillslope and wetlands area in Londonderry, New Hampshire. Excluding the town garage, land use in the area is predominantly residential. Drinking water is obtained via private bedrock wells, with the exception of nine residents on Holton Circle and residents of the adjacent Isabella Drive development who are connected to a public water supply. The underlying aquifer is a Class IIb aquifer, a potential source of drinking water. From 1940 to 1968, the area was owned by the Department of Defense (DOD), who reportedly used it as a radio beacon facility from 1940 and 1947. In 1968, the property was transferred to the Town of Londonderry. Eight acres of the property were used as a garage to store town vehicles, along with road sand and salt, and to perform routine maintenance on the vehicles; 12 more acres were given to the Londonderry Housing and Redevelopment Authority. Site contamination was discovered in 1984 when Holton Circle residents requested that the state sample their bedrock wells. Resulting investigations showed VOCs at levels above federal and state drinking water standards. The state has continued to monitor the wells onsite and notes that decreasing concentrations of 1,1,1-TCA and increasing concentrations of 1,1-DCE and 1,1-DCA demonstrate that a degradation process is occurring. This ROD addresses a final remedy for the contaminated ground water onsite. No other remedial actions are anticipated for the site. The primary contaminants affecting the ground water are VOCs.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes allowing the contaminated ground water in the overburden and bedrock aquifers to naturally attenuate; implementing institutional controls including deed restrictions to prevent future use of ground water; monitoring ground water; and implementing a contigency remedy to provide an alternate water supply to affected residences in the event that contaminants into the drinking water wells reverse their historical trend and concentrations begin to increase beyond the clean-up levels. There are no capital costs associated with this remedy; however the estimated present worth O&M cost for this remedial action is $1,250,000.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific interim ground water clean-up levels are based on SDWA MCLGs and state standards and include 1,1-DCE 7 ug/l; 1,1,1-TCA 200 ug/l; antimony 6 ug/l; beryllium 4 ug/l; chromium 100 ug/l; and barium 2,000 ug/l. Three years after these levels have been achieved, a risk assessment will be performed to determine whether the levels are protective and, therefore, should be final.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of property deed restrictions or local zoning ordinances will be implemented to restrict future ground water use in the town garage and undeveloped hillslope areas. A drainage restriction also will be employed at the town garage to prevent future releases to the ground water.

KEYWORDS:

Alternate Water Supply; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Controls; MCLGs; MCLs; Metals; O&M; Safe Drinking Water Act; State Standards/Regulations; VOCs; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

ACTION ANODIZING, PLATING, AND POLISHING, NY
June 30, 1992

SITE HISTORY/DESCRIPTION:

The 1-acre Action Anodizing, Plating, and Polishing (AAPP) site is an active metal finishing shop located in Babylon, Suffolk County, New York. Land use in the area is primarily residential and commercial. An estimated 1 million residents use public wells within 3 miles of the site for their drinking water supply. From 1938 to 1968, a commercial laundry facility operated onsite; subsequently, AAPP has operated at the site as a small metal-finishing plant. Site features include the AAPP operating facility, an adjacent storage area, and a residence. Onsite operations involve sulfuric acid anodizing of aluminum parts for the electronics industry, cadmium plating, chromate conversion coatings, metal dyeing, and vapor degreasing. Liquid wastes from these operations include rinses of spent caustic and acidic solutions contaminated with cadmium, chromium, zinc, and sodium cyanide. Prior to 1980, these spent solutions and rinses flowed from a concrete waste-holding trough to a septic tank and several leaching pits for tank overflow. In 1980, the county identified elevated levels of cadmium, chromium, and nickel in the onsite leaching pits. That same year at the direction of the county, AAPP removed the contaminated substances from the leaching pits, backfilled, and closed the pits. This ROD addresses OU1, which includes the whole site. Samples of ground water, soil, and sediment taken from onsite and offsite areas during the RI showed that contaminant levels were generally well below state and federal standards and risk levels. Therefore, the AAPP site does not pose an unacceptable risk to human health or the environment.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes no further action, with the implementation of a ground water monitoring program for 1 year to ensure that the remedy is protective of human health and the environment.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:
Background Levels; Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

BIOCLINICAL LABORATORIES, NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 2.6-acre Bioclinical Laboratories (BCL) site is located in Bohemia, Suffolk County, New York. BCL occupied 1 unit in a 10-unit building, leased by various tenants. Land use in the area is mixed commercial, industrial, and residential. The nearest residential development is found approximately 1,000 feet from the site, and most residents are connected to the public water supply system. The two aquifers underlying the site, the Upper Glacial and the Magothy, represent the main source of potable water for the area. From 1972 to 1984, BCL used the site to formulate and repackage industrial chemicals for wholesale distribution to manufacturers. During this process, indoor sinks that were used for washing chemical mixing vessels drained to the east sanitary sewer system. In 1981, a fire partially destroyed BCL's chemical inventory and resulted in surface water runoff of hazardous waste. The county ordered BCL to clean out the sanitary system and submit a plan for installing a ground water monitoring system; however, no wells were ever installed. In 1984, the business was sold and moved to another location; in 1990, it ceased operation entirely. An additional source of contamination has been partially attributed to another tenant at the site, the Panatone Finishing Corporation. Their metal finishing operations were connected to the west sanitary sewer system. Numerous sanitary code violations by Panatone led to a limited ground water investigation by the county in 1981 that revealed 1,1,1-TCA and 1,1-DCA at concentrations above state drinking water standards. In addition to the west sanitary sewer system, Panatone utilized a leaching pool on the north side of the building to dispose of effluent. In 1985, this leaching pool was pumped out, cleaned, and removed from service. Sampling performed by the county in 1991 revealed no contamination in the east sewer system and minor contamination in the west sewer system. In 1992, the property owner and current tenants cleaned out the contamination in the west sewer system and were ordered to halt future potentially hazardous discharges. This ROD will determine the nature and extent of contamination to ensure protection of human health and the environment and is the only OU planned for the site. As a result of previous clean-up activities, risk assessment results indicate that contaminant levels do not exceed risk-based standards; therefore, there are no contaminants of concern affecting the site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action. The risk assessment results indicate that the levels of contamination present in the soil, air, sediment, and ground water present risks which fall within or below EPA's allowable risk range. There are no costs associated with the no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

COSDEN CHEMICAL COATINGS, NJ

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 6.7-acre Cosden Chemical Coatings site is a paint formulation and manufacturing facility in Beverly, Burlington County, New Jersey. Land use in the area is predominantly residential, with some light industry. An estimated 800 people reside within a 1-mile radius of the site. During the manufacturing process, pigments were mixed with resins and solvents in both ball and sand mills prior to adding other ingredients in mixing tanks to produce the final coating products. Mixing tanks were then washed out with solvents, and the rinsate was transferred to drums. Until 1974, organic solvents used in the manufacturing process were recycled; thereafter, drums containing spent solvents were stored onsite. Some of these drums leaked onto the ground and caused soil and ground water contamination. Additionally, solvents were stored in underground storage tanks (USTs), which may have leaked. In 1980, a grass fire onsite prompted state investigations that revealed the presence of surface spills and several hundred unsecured drums. In 1985, the state ordered Cosden to clean up the site; however, Cosden abandoned clean-up efforts after 88 of 695 drums were removed. In 1986, the state undertook emergency removal of the drummed material and clean-up of surface spills around the drum storage areas. Paint manufacturing continued onsite until 1989, resulting in additional drums accumulating onsite. In 1989, EPA initiated a second removal action by constructing a fence around areas of soil contamination and removing the remaining drums, paint cans, pigment bags, mixing tanks, and UST contents. However, as the removal action neared completion in 1990, a fire occurred inside the process building, which consumed a majority of the building. This ROD addresses the final remedy for the cleanup of contaminated soil, ground water contamination in the underlying aquifer, and the Cosden building. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; metals, including arsenic, chromium, and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating 8,000 cubic yards of contaminated soil onsite using in-situ solidification, and disposing of a small pile of concentrated PCB-contaminated soil offsite; disposing of sludge generated during the treatment process offsite; decontaminating and demolishing the contaminated building onsite, and removing and/or recycling decontaminated debris and equipment offsite; removing asbestos and PCB-contaminated debris offsite for disposal in an appropriate offsite facility; treating ground water onsite using precipitation to remove inorganic contaminants, followed by air stripping to remove VOCs, with recharge of treated ground water to the underlying aquifer; treating air emissions using carbon adsorption, if determined to be necessary during remedial design; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $15,172,800, which includes an annual O&M cost of $585,500 for 1 year.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are risk-based and include PCBs 1 mg/kg; chromium 390 to 78,000 mg/kg; and lead 500 mg/kg. Chemical-specific ground water clean-up goals are based on state standards and SDWA MCLs and include toluene 1,000 ug/l; xylenes 44 ug/l; chromium 100 ug/l; and lead 15 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to prevent disturbance of the solidified soil.

KEYWORDS:

Air Stripping; Asbestos; Carcinogenic Compounds; Chromium; Clean Closure; Debris; Decontamination; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Lead; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Soil; Solidification/ Stabilization; Solvents; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Xylenes.

COSDEN CHEMICAL COATINGS, NJ (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

DOVER MUNICIPAL WELL 4, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The Dover Municipal Well 4 (DMW-4) site is located within the 500-year floodplain of the Rockaway River, in the Town of Dover, Morris County, New Jersey. Surrounding land use is mixed residential and commercial/light industrial. Ground water in the area is classified as Class II-A, a current source of drinking water. In the portion of the valley close to DMW-4, two silt layers separate permeable sands into a "shallow aquifer," an "intermediate aquifer," and a "deep aquifer," all of which are connected hydraulically. Drilled in 1962, Dover Municipal Well 4 commenced pumping in 1965, as one of the Town's primary water supply wells. In 1980, sampling and analysis of ground water from DMW-4 identified the presence of VOCs—specifically, chlorinated solvents—above federal and state drinking water standards. Subsequently, DMW-4 was voluntarily removed from service by the Town, and standby Well 3 was activated as a potable water production well. The sources of VOC contamination have been traced to the Howmet Turbine Components Corporation (Dover Casting Division) and the New Jersey Natural Gas Company, both of which are under state administrative consent orders to remediate their individual properties. This ROD addresses remediation of the contaminated ground water in the shallow, intermediate, and deep aquifers at the DMW-4 site, as OU1. Future RODs will address any additional ground water contamination onsite and the potential source(s) of contamination. The primary contaminants of concern affecting the ground water are VOCs, including benzene, PCE, and TCE; and metals, including lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes onsite pumping and treatment of contaminated ground water from both the intermediate and deep aquifers using air stripping to remove VOCs; discharging the treated water offsite to the public water supply system to be used for potable water, with reinjection of surplus quantities; performing a preliminary assessment of air stripper emissions and discharge requirements to determine if vapor phase treatment using activated carbon will be necessary, and if so, disposing of or recycling the spent carbon offsite; monitoring air emissions; and monitoring ground water to ensure effectiveness of the treatment system and to determine if pretreatment for inorganics is necessary. The estimated present worth cost for this remedial action is $1,985,000, which includes an annual O&M cost of $106,000 for 21 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up goals are based on federal and state MCLs, including PCE 1 ug/l (state); TCE 1 ug/l (state); toluene 1,000 ug/l (federal); 1,1,1-TCA 26 ug/l (state); and lead 15 ug/l (federal). Ground water will be treated to meet all applicable drinking water standards prior to offsite discharge to the public water supply. Any regulated equipment used in the selected remedy will be designed, constructed, and operated to meet state Air Pollution Control and Noise Pollution Control Act requirements.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Monitoring; Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Treatment; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Interim

ELLIS PROPERTY, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 36-acre Ellis Property site is located in Evesham Township, Burlington County, New Jersey. Land in the area immediately surrounding the site is primarily agricultural, and approximately 60 residences are located within 1 mile of the site. A wetland area is located to the east of the property, and the northeast corner of the site lies within the 100-year floodplain. Drainage from the wetland area flows to Sharps Run, which is the nearest free-flowing surface water. The site overlies part of the New Jersey Coastal Plain aquifer, which has been classified as a potential drinking water source. From 1968 to 1978, approximately 4 acres of the property were used to store and recondition drums. Site features included a two-story building, with several washing tanks and troughs, three sheds, a storage area, and a boiler. Troughs from within the building drained into ditches, then into the adjacent wetland. Site reconditioning operations ceased after a fire damaged some of the buildings; however, onsite storage of drums continued into the 1980's. State investigations in 1980 identified stained soil, areas devoid of vegetation, and hundreds of drums containing various unknown liquids, some of which had corroded and were leaking into the onsite soil. Soil sampling and analysis revealed contamination by hydrochloric acid, organic compounds, metals, grease, and PCBs. In 1983 and 1989 removal actions were conducted by EPA and the state that addressed the sources of contamination, the proper identification of wastes in drums; and removal of the drums, waste, contaminated soil, sludge, and debris offsite for appropriate disposal. This ROD addresses a final remedy for the remaining contaminated soil and ground water at the site. The primary contaminants of concern affecting the soil and ground water are VOCs, including PCE and TCE; other organics, including PCBs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating all contaminated soil, and treating metal-contaminated soil onsite or offsite using stabilization if necessary, prior to offsite disposal in a landfill; transporting organic- or PCB-contaminated soil offsite for treatment by incineration; backfilling the excavated area with clean fill; collecting ground water using interceptor trenches or extraction wells, and treating the water onsite using precipitation and ultrafiltration to remove metals, followed by air stripping to remove VOCs, with reinjection of the treated water onsite; treating air emissions if necessary; using engineering controls to mitigate any affected wetlands; and monitoring ground water. The estimated present worth cost for this remedial action is $6,653,000, which includes an annual O&M cost of $188,200 for years 0-1; $365,000 for the ground water remediation for years 1-3; and $283,000 for years 4-30.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil and ground water clean-up goals are established based on the levels specified in New Jersey's *Proposed Cleanup Standards for Contaminated Sites* (February 1992). Surface soil clean-up standards include arsenic 20 mg/kg; lead 100 mg/kg; benzene 3 mg/kg; PCE 9 mg/kg; TCE 23 mg/kg(s); and PCBs 0.45 mg/kg. The clean-up standards for sub-surface soil include arsenic 20 mg/kg; lead 1 mg/kg; PCE 1 mg/kg; TCE 1 mg/kg; and PCBs 100 mg/kg. Ground water clean-up standards include arsenic 8 ug/l; chromium 100 ug/l; PCE 1 ug/l; TCE 1 ug/l; toluene 1,000 ug/l; and lead 100 ug/l.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Stripping; Arsenic; Carcinogenic Compounds; Chromium; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Organics; PCBs; PCE; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatment Technology; VOCs; Wetlands.

ELLIS PROPERTY, NJ (Continued)
September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

ENDICOTT VILLAGE WELL FIELD, NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 16-acre Endicott Village Well Field site is an inactive landfill in the Village of Endicott, Broome County, New York. The site includes a municipal drinking water supply well, known as the Ranney well, that provides 47 percent of the total water supply to the Village, and lies on the boundaries of En-Joie Golf Course and Tri-Cities Airport. The portion of the site adjacent to the Tri-Cities Airport extends into an 8-acre area designated by the Federal Aviation Administration as a controlled activity area (CAA). Land use in the area is primarily industrial. A wetlands area is located along the east and west banks of Nanticoke Creek, north of the Susquehanna River. In addition, part of the site lies within the 100-year floodplain of the Susquehanna River. From the late 1950's to 1977, Endicott Village used the site for storing municipal solid waste, as well as residential, and industrial refuse. In May 1981, EPA detected vinyl chloride and other VOCs in the Ranney well discharge. Subsequently, the state closed the supply lines to the well and installed diffused air aeration equipment to reduce VOCs levels in the soil and ground water. As a result of additional onsite investigations, the state installed 9 monitoring wells in 1983, and in 1984, installed a purge well and additional monitoring wells. Onsite contamination was determined to be the result of a plume of contaminated ground water emanating from the onsite Landfill #1. Two prior RODs signed in 1987 and 1991, addressed ground water contamination at the Ranney public supply well, and provided for additional ground water control and treatment measures using a purge well, as OU1 and OU3, respectively. This ROD addresses the Endicott Village landfill #1, the source of the site contamination, as OU2. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including 1,2-DCE, benzene, PCE, TCE, toluene, vinyl chloride, and xylenes; other organics, including PAHs, PCBs, and pesticides; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes capping the majority of landfill #1 with a low permeability soil cap; covering the Tri-Cities Airport Controlled Activity Area and the compost facility area with a bituminous (asphalt) cap; backfilling or mitigating any affected wetlands; performing an explosive gas investigation, and installing a passive gas venting system; collecting and treating the ground water and leachate seep using an air stripper, with onsite discharge of the treated water and leachate to the Susquehana River or transporting the ground water and leachate offsite to a local POTW; maintaining the landfill cap and venting system; conducting long-term air and ground water monitoring; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action ranges from $16,684,200 to $16,889,400, which includes an annual O&M cost ranging from $248,000 to $258,900.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific goals for ground water are based on TCE 5 ug/l; chromium 5 ug/l; and lead 5 ug/l. Leachate collection, treatment, and disposal will be designed to comply with SPDES discharge requirements and air emission standards will be adhered to for the air stripper.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to control future land use of landfill # 1 and fencing will be installed to ensure protection of the landfill cap.

KEYWORDS:

Air Monitoring; Air Stripping; Benzene; Capping; Carcinogenic Compounds; Direct Contact; Floodplain; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Toluene; Venting; VOCs; Wetlands; Xylenes.

ENDICOTT VILLAGE WELL FIELD, NY (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 09/25/87, 03/29/91
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Fianl Action

EVOR PHILLIPS LEASING, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 6.5-acre Evor Phillips Leasing Company site is a former disposal facility in Old Bridge Township, Middlesex County, New Jersey. Land use in the area is predominantly industrial with four residences located northwest of the site. The Old Bridge Sand Aquifer, which underlies the site, is a major drinking water source for the region. Beginning in 1969, Evor Phillips used the site for hauling activities until leasing the property to North American Metal and Chemical Company (NAMCC) in 1971. Silver recovery operations were conducted at the site by NAMCC. Waste x-rays and other waste film were shipped to NAMCC, incinerated, and reduced to ash. Waste associated with the silver recovery operations, specifically, silver and cyanide contaminated waste waters, were reportedly discharged directly to the ground. The ash was shipped to an offsite facility for metals recovery. Additionally, the Naval Ammunition Depot Earle sent 2,000 gallons of drummed spent potassium hydroxide to the NAMCC. Drums containing chlorinated solvents, aromatic hydrocarbons, ammonia, benzene, toluene, xylene, ketones and alcohols were allegedly disposed of in a ravine at the west end of the site. In 1972, NAMCC was issued a temporary permit to operate an industrial waste treatment facility. Previously stored drums and containers remained on the property. In 1973, NAMCC and the state removed 1,100 drums and bulk liquid waste from the site and constructed two treatment ponds consisting of lined 50,000 gallon concrete tanks for neutralization of acidic and caustic wastewaters. Between 1974 and 1975, the treatment ponds were closed and all sludge was disposed of at a landfill. This ROD addresses an interim remedy for contaminated ground water at the site and a final remedy for the drum disposal areas as OU1. Future RODs will address final remedies for onsite soil and ground water. The primary contaminants of concern affecting the debris and ground water are VOCs, including benzene, toluene; other organics, including TCE, PCE, and pesticides; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:
The selected interim remedial action for this site includes excavating and overpacking approximately 30 buried drums, and removing these offsite for disposal along with an estimated 50 drums currently stored at the drum disposal area; extracting and treating contaminated ground water onsite using precipitation to remove inorganics, followed by air stripping to remove VOCs, with recharge of the treated water to the aquifer; treating air emissions using carbon absorption, prior to discharge to the atmosphere; and conducting environmental monitoring. The estimated present worth cost for this remedial action is $7,211,948 which includes an annual O&M cost of $717,996 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards including benzene 1 ug/l (state); carbon tetrachloride 2 ug/l (state); TCA 1 ug/l (state); TCE 1 ug/l (state); arsenic 50 ug/l (MCL); and lead 15 mg/l (MCL). Disposal of drums will be conducted according to RCRA requirements for offsite Treatment, Storage or Disposal (TSD) facilities.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PCE; Pesticides; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Toluene; Treatability Studies; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim
Ground Water - Interim

FAA TECHNICAL CENTER, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 5,000-acre FAA Technical Center site is located 8 miles northwest of Atlantic City, Atlantic County, New Jersey, within the Atlantic Coastal Plain. Land use in the vicinity includes forested, commercial, and residential areas. The site was first developed in the 1930s, when the Atlantic City Reservoir was created. In 1942, a Naval Air Base, including most of the existing runways, was constructed over two-thirds of the property. Interest in the property was transferred to the Federal Aviation Administration (FAA) in 1958 for use as research and development facilities and for the 1979 construction of the existing Technical/Administration Building. Atlantic City's municipal water supply is provided by nine ground water supply wells located just north of the Upper Atlantic City Reservoir on FAA property as well as by water drawn directly from the Atlantic City reservoirs. Currently, the site is composed of several installations, which include the Atlantic City International Air Terminal, New Jersey Air National Guard 177th Fighter Interceptor Group, Upper Atlantic City Reservoir, Laurel Memorial Park Cemetery, and extensive facilities of the FAA Technical Center. From 1978 to 1985, transformers containing PCB oil were stored on a 25- by 75-foot concrete pad, referred to as Area G, located at the lumber yard near building 125 in the western portion of the property. Some transformers are known to have leaked, contaminating the concrete pad and surrounding soil. Initial investigations in 1986 revealed PCB-contaminated soil and debris in Area G. During 1989, the entire concrete pad and contaminated soil were collected, excavated, and disposed of in an approved TSCA cell of a landfill. This ROD addresses principal threats to human health or the environment associated with PCB releases from the Area G transformer storage location. Based on the results of subsequent sampling, it is believed that Area G no longer poses a threat to human health or the environment; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site is no further action. Based upon the completed removal actions and risk evaluation for Area G, is determined to be protective of human health and the environment.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not applicable.

KEYWORDS:
Floodplain; No Action Remedy.

SITE SUMMARY

Date of previous RODs: 09/28/90, 09/26/89
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

FACET ENTERPRISES, NY
September 4, 1992

SITE HISTORY/DESCRIPTION:

The 31-acre Facet Enterprises site is a manufacturing facility located in the Village of Elmira Heights, Chemung County, New York. Land use in the area is primarily residential and commercial. The site overlies a Class IIa aquifer, which is a potential source of potable water. The facility, constructed in 1895, was first used by Eclipse, Inc. to manufacture bicycles. From 1900 to 1960, Eclipse manufactured motorcycles, engine and airplane parts, military support parts, ammunition, and fuel pumps. During that time, Bendix Aviation Corporation acquired control of Eclipse. From 1960 to 1975, Eclipse, then a division of Bendix, manufactured electric clutches and brakes. In 1974, Facet Enterprises was organized; then, in 1989, Purolator Products Company became the corporate successor to Facet. Over 10 different areas were used at the site for disposal of wastes, including plating wastes, oil sludge, metal hydroxide sludge, chromic acid, PCBs, grinding chips, and miscellaneous liquid wastes. These areas include an oil/water separator, ponds, lagoons, drainage ways, and several dry wells for the disposal of liquid wastes. Since 1979, several site investigations have been conducted by EPA and the state. A 1986 draft remedial investigation revealed that VOCs, PCBs, and PAHs were present in site soil and sediment, and that VOCs, organics, and inorganics were detected in ground water and surface water drainage streams at concentrations above New York State standards. Remedial measures, which were implemented at the site in 1979, included excavating surface water diversions, covering past disposal areas with soil, and constructing a leachate collection system. In 1992, Purolator excavated and removed 469 buried drums; excavated 2,250 tons of contaminated soil; and removed and sent 30,000 gallons of contaminated liquids offsite to a RCRA facility. This ROD addresses a final remedy for the onsite contaminated soil, sediment, debris, and ground water. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs, including TCE, benzene, toluene, xylenes, and PCE; other organics, including PCBs and PAHs; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating contaminated soil and sediment from the disposal areas; disposing of approximately 1,275 cubic yards of TSCA waste with PCBs concentrations greater than 50 ppm offsite in a secure double-lined landfill facility; stabilizing of all RCRA wastes to prevent leaching of metals and disposing of 2,124 cubic yards of waste in a secure offsite RCRA-lined facility; disposing of approximately 120 cubic yards of non-RCRA wastes in an offsite industrial waste landfill; extracting and storing contaminated ground water in a central onsite collection tank, followed by treatment using air stripping to remove VOCs, and filtration and precipitation to remove metals, if necessary; discharging the treated effluent onsite to the facility non-contact cooling system or to surface water; and implementing a long-term ground water monitoring program and institutional controls including land use restrictions. The estimated present worth cost for this remedial action is $4,850,656, which includes an annual O&M cost of $1,305,596 for 20 years.

PERFORMANCE STANDARDS OR GOALS:

Action levels for excavation of surface soil/sediment are health-based and include benzo(a)anthracene 20 ppm/3 ppm; benzo(b)fluoranthene 20 ppm/3 ppm; benzo(k)fluoranthene 43 ppm/7 ppm; benzo(a)pyrene 3 ppm/1 ppm; indeno(1,2,3-cd) pyrene 12 ppm/2 ppm; dibenzo(a,h) anthracene 3 ppm/1 ppm; PCBs 10 ppm/ 1 ppm; arsenic 19 ppm/7 ppm; and chromium 1110 ppm in sediment only. Action levels for excavation of subsurface soil are also health-based and include benzo(a)anthracene 54 ppm; benzo(b)fluoranthene 55 ppm; benzo(k)fluoranthene 118 ppm; benzo(a)pyrene 8 ppm; indeno(1,2,3-cd)pyrene 33 ppm; PCBs 25 ppm; and arsenic 52 ppm. Chemical-specific clean-up goals for soil and sediment are based on RCRA TCLP, Land Ban regulations, and TSCA regulations. Chemical-specific ground water clean-up goals are based on SDWA MCLs and state drinking water standards including TCE 5 ug/l; xylenes 5 ug/l; and lead 25 ug/l. Chemical-specific ARARs will be waived if it is determined by EPA that certain portions of the ground water cannot be restored for beneficial use.

INSTITUTIONAL CONTROLS:

Zoning ordinances are recommended to control any future site use that could create an exposure pathway to subsurface soil. If certain portions of the ground

FACET ENTERPRISES, NY (Continued)
September 4, 1992

water cannot be restored for beneficial use, institutional controls will be provided to restrict use of the aquifer.

KEYWORDS:
Air Stripping; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PAHs; PCBs; PCE; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

GENERAL MOTORS/CENTRAL FOUNDRY DIVISION, NY
March 31, 1992

SITE HISTORY/DESCRIPTION:
The 270-acre General Motors/Central Foundry Division site is an aluminum casting plant in Massena, St. Lawrence County, New York. The site is bordered on the north by the St. Lawrence River; on the east by the St. Regis River Mohawk Indian Reservation, which includes Turtle Creek and wetlands; on the south by the Raquette River; and on the west by a manufacturing plant. Land use in the area is mixed industrial and residential, with the nearest residence located 300 feet from the site. The site contains at least seven areas that were used previously as waste disposal areas. From 1959 to 1980, hydraulic fluids containing PCBs were used in the manufacturing process at the plant. During the 1960's and 1970's, PCB oil-laden wastewater was discharged onsite into four industrial lagoons, resulting in PCB-laden sludge. The sludge from these lagoons was removed periodically and placed in the unlined North and East Disposal Areas and in the Industrial Landfill. Solid industrial wastes were also placed in the Industrial Landfill. In 1975, a berm surrounding the East Disposal Area was breached and water and sludge flowed to the St. Regis Mohawk Indian Reservation and Turtle Creek. Visible spill material was removed from the Reservation and relocated to the site property. From 1985 to 1989, General Motors investigations detected contamination in soil, sludge, debris, sediment, and ground water and surface water. In 1988, an interim cap was placed over the industrial landfill. A 1990 ROD addressed most affected areas of the site, including the St. Lawrence River System sediment, contaminated ground water, soil on the facility and the St. Regis Mohawk Indian Reservation, and material at four lagoons and the North Disposal Area. This ROD provides the final remedy for the contaminated soil, sludge, debris, ground water, and surface water at the East Disposal Area and the Industrial Lagoon. The primary contaminants of concern affecting the soil, sludge, debris, ground water, and surface water are VOCs, including TCE; other organics, including PAHs, PCBs, phenols; and oils.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating 174,000 cubic yards of soil containing greater than or equal to 500 mg/kg PCBs, sludge, debris, and all visibly oily soil from the East Disposal Area, followed by onsite treatment using either biological, thermal destruction, or another treatment as determined by the results of treatability studies performed as part of remedy for OU1; disposing of debris offsite; consolidating and containing soil with PCB levels below 500 mg/kg in the East Disposal Area along with the treated soil and sludge, and covering the area with a composite cover; recontouring, regrading, and containing contaminated material from the Industrial Lagoon onsite with a composite cover; installing a slurry wall to control ground water migration and a runoff collection and treatment system to treat surface water, prior to onsite discharge at the East Disposal and the Industrial Lagoon areas, based on testing results; treating ground water onsite using air stripping to remove VOCs and carbon adsorption to remove PCBs, with onsite discharge to the St. Lawrence River; monitoring ground water, surface water, and air; and implementing institutional controls, including deed restrictions, to discourage use as a residential area. The estimated present worth cost for this remedial action ranges from $31,000,000 to $45,000,000, which includes an annual O&M cost of $567,000 for years 0-2 and $200,000 for years 3-28.

PERFORMANCE STANDARDS OR GOALS:
The chemical-specific clean-up goal for treated soil residuals is 10 mg/kg for PCBs, which is an onsite residual disposal ARAR waiver of the TSCA regulation concerning landfill requirements of 2 mg/kg for PCBs; for sludge with initial PCB >500 mg/kg, clean-up residual level is 2 mg/kg (TSCA). Ground water clean-up goals are based on SDWA and state standards, and include PCBs 0.1 ug/l; TCE 5 ug/l; and total phenols 1 ug/l.

INSTITUTIONAL CONTROLS:
Deed restrictions will be placed on the property to discourage future residential use.

GENERAL MOTORS/CENTRAL FOUNDRY DIVISION, NY (Continued)
March 31, 1992

KEYWORDS:
Air Monitoring; Air Stripping; ARAR Waiver; Biodegradation/Land Application; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Closure Requirements; Debris; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; O&M; Offsite Disposal; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Phenols; RCRA; Safe Drinking Water Act; Sludge; Slurry Wall; Soil; Solvents; State Standards/Regulations; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; TCE; Toxic Substances Control Act; Treatment Technology; VOCs; Wetlands.

SITE SUMMARY

Date of previous RODs: 12/17/90
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, Debris, GW, SW
Major Contaminants: VOCs, Other Organics, Oils
Category: Source Control - Final Action
Ground Water - Final Action

HIGGINS FARM, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 75-acre Higgins Farm site is a former cattle farm in Franklin Township, Somerset County, New Jersey. Land use in the area is predominantly agricultural, with two residences located onsite. The estimated 3,200 people who reside within 3 miles of the site use a municipal water supply well for their drinking water supply. During the 1960's, municipal sludge and penicillin waste were used as fertilizers on Higgins Farm. The site also contains three holding tanks and drums containing material removed from previous remedial investigations. In 1985, the city discovered and reported elevated levels of chlorobenzene in a potable well near the site. Additionally, the state investigated and discovered the presence of a drum burial dump site approximately 40 yards from the contaminated well. In 1986, the owner excavated 50 containers, including drums; however, during excavation activities, some of the containers were punctured and their contents spilled onto the ground. Later in 1986, the state sampled residential wells and discovered VOC contamination. The state also collected soil samples and analyses indicated the presence of VOCs, pesticides, metals, dioxins, and furans. In 1987, EPA responded to contamination in drinking water wells by providing bottled water to affected residents as an interim ground water remedy (OU1), and EPA assumed the lead in mitigating the site by constructing a barn of contaminated material; draining, lining, and backfilling the excavation pit; pumping treated and stored liquids into holding tanks; and fencing in the excavated pit area. In 1989, carbon filters were installed to limit ingestion of VOCs and mitigate the potential for human exposure. In 1992, EPA performed a removal action and completed the excavation of 94 drums and contaminated soil. This ROD addresses the final action for ground water to limit future migration of contaminated ground water to offsite areas, as OU2. The primary contaminants of concern affecting the ground water are VOCs, including benzene, PCE, TCE, and xylenes.

SELECTED REMEDIAL ACTION:
The final remedial action for this site includes installing ground water extraction wells around the perimeter of the site; treating the contaminated ground water onsite by processes that are expected to include precipitation, flocculation, clarification, filtration, air stripping, intermediate pH adjustment, ion exchange, and final pH adjustment, however, the exact system will be developed during the RD phase; discharging the treated ground water to onsite surface water; monitoring ground water, surface water, and onsite and offsite wells including downgradient residential wells; and performing limited investigations to ensure all sources of contamination have been identified, with removal and offsite disposal of contaminated materials that were previously remediated and are currently stored onsite. The estimated present worth cost for this remedial action ranges from $5,990,000 to $8,447,600, which includes an annual O&M cost of $384,000.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific goals for ground water clean-up, which are based on SDWA MCLs and state standards, include benzene 1 ug/l (state); chlorobenzene 4 ug/l (state); cis-1,2-dichloroethene 10 ug/l (state); vinyl chloride 2 ug/l (state); bis (2-ethyl hexyl) phthalate 6 ug/l (MCL); and xylenes 44 ug/l.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Aeration; Air Stripping; Benzene; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 09/24/90
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

IMPERIAL OIL/CHAMPION CHEMICALS, NJ

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 15-acre Imperial Oil/Champion Chemicals site is an oil blending facility in Marlboro Township, Monmouth County, New Jersey. The site is located within the Matawan watershed of the Atlantic Coastal Drainage Basin. Birch Swamp Brook, an intermittent stream, collects discharge from a fire pond located east of the berm. The site consists of a 4.2-acre oil blending facility, which includes seven production, storage, and maintenance buildings, and several oil storage tanks. Land use in the area is predominantly residential, and a wetland area is located to the north of the site. The estimated 27,000 people who reside within 1 mile of the site use the Englishtown Aquifer, which underlies the site, as their drinking water supply. From 1912 to 1950, the facility and associated land have been used for a variety of business operations under various owners. In 1950, Champion Chemicals Company acquired the property. Since 1969, the Imperial Oil Company has leased the facility to support used oil reclamation and oil blending repackaging operations. Waste products from the reclamation process included wash water, waste oils and sludge, and spent filter clay. In 1981, the state identified onsite contamination by oil and PCBs; metals in the onsite tank farm area and in soil, waste samples, and sediment; and PCBs in the adjacent Swamp Brook, which had resulted from various onsite spills during operations. State inspections of offsite areas identified oily stained soil. In 1982, a site investigation was performed that confirmed the presence of petroleum hydrocarbons, PCBs, arsenic, and VOCs in the ground water and soil, in addition to a floating product layer underneath the former waste pile and catchment area. A subsequent state investigation in 1983 confirmed the continued presence of oily stained soil in the areas that had historically exhibited visible contamination. Results of an EPA Innovative Technology Evaluation indicated that the solidification technology was effective in remediating elevated concentrations of metals in soil, but was ineffective in remediating PCBs and other organics. A 1990 ROD addressed the principal threats posed by offsite areas, including contaminated soil within the wetlands. Subsequently, in 1991, EPA installed extraction wells to remove a petroleum-like product layer from the ground to prevent a major source of ground water contamination and reduce time needed to restore the aquifer to a usable condition. This ROD addresses final remediation of contaminated ground water as OU2. Future RODs will address soil, sediment, surface water, air, and any other outstanding contamination sources. The primary contaminants of concern affecting the ground water are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes extracting and treating contaminated ground water onsite using precipitation to remove inorganic contaminants, and carbon adsorption to remove organic contaminants; discharging the treated ground water onsite to Birch Swamp; continuing the previous removal action; conducting a wetlands assessment to determine site impact; regenerating or disposing of the spent carbon; disposing of any sludge generated during the treatment process offsite; and conducting environmental monitoring to ensure the effectiveness of the remedy. The estimated present worth cost for this remedial action is $9,647,000, which includes an annual O&M cost of $515,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals, based on federal MCLs and state levels, include benzene 1 ug/l; xylenes 40 ug/l; toluene 1,000 ug/l; pyrene 200 ug/l; PCBs 5 ug/l; arsenic 8 ug/l; beryllium 20 ug/l; and lead 10 ug/l.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; Toluene; Toxic Substances Control Act; Treatability Studies; VOCs; Wetlands; Xylenes.

IMPERIAL OIL/CHAMPION CHEMICALS, NJ (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 09/26/90
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Ground Water - Final Action

INDUSTRIAL LATEX, NJ
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 9.67-acre Industrial Latex site is a chemical adhesives and natural and synthetic rubber compounds manufacturer in Wallington, Bergen County, New Jersey. Land use in the area is predominantly residential, industrial, and recreational, with a wetland area located near the northeast corner of the site. The estimated 17,500 people who reside within 1 mile of the site used four of the five public water supply wells as their drinking water supply; however, these wells have been closed since 1985 because of ground water contamination. From 1951 to 1980, the Industrial Latex Corporation manufactured both chemical adhesives and natural and synthetic rubber compounds. Adhesives were initially formulated using vegetable protein in a solvent base. Solvents used in the process included acetone, heptane, hexane, methyl ethyl ketone (MEK), and methylene chloride. To reduce flammability, PCBs were introduced as a fire retardant. In the late 1970's, solvent-based adhesives were replaced by water-based latex adhesives. Poor operational procedures and onsite waste disposal practices, including chemical dumping, resulted in widespread areas of surface and subsurface contamination. In 1980, the state conducted a site inspection and found approximately 250 leaking drums of various chemical compounds. The state discovered that VOCs and materials contaminated with PCBs were disposed of in an onsite sanitary septic system. After site operations ceased in 1983, the state conducted a second site inspection and discovered approximately 1,600 leaking and open drums. Analyses of the drums' contents revealed the presence of numerous VOCs and PCBs. In 1985, the state ordered the site owner to properly dispose of the drums; however, only about 400 drums were removed. In 1986, EPA initiated a removal action to address the remaining 1,200 drums and 22 USTs at the site. This ROD addresses the final remedy for the contamination present in the soil, sediment, buildings and equipment, drums, sludge, septic system, and hardened latex, as the first of two operable units. A future ROD will address ground water contamination, as OU2. The primary contaminants of concern affecting the soil, sediment, sludge, and debris are VOCs, including PCE, TCE, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating approximately 600 buried drums with offsite disposal or incineration; dismantling 30 production vats from their steel supports and draining any remaining material that is not hardened into drums for offsite disposal or incineration; disposing of the vats in an offsite landfill; removing the floor drains and demolishing 41,000 square feet of the onsite buildings with offsite disposal; excavating the septic system along with 800 gallons of associated liquids and 6 cubic yards of sludge with offsite disposal; excavating and treating onsite an estimated 34,700 cubic yards of contaminated soil and sediment using low thermal desorption; testing soil to determine the need for stabilization prior to disposal, and backfilling treated material onsite; transporting residuals generated during the treatment process offsite for disposal or treatment; treating offgases using carbon adsorption or another appropriate treatment; monitoring air; assessing the wetland area and performing additional ground water investigations during the remedial design phase; implementing institutional controls, if necessary and site access restrictions including fencing. The estimated present worth cost for this remedial action is $17,883,600, which includes an annual O&M cost of $4,848,700 for 1 year.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals, which are based on the EPA Risk Assessment Guidance for Superfund (RAGS), include PCBs 1 mg/kg; heptachlor epoxide 0.1 mg/kg; benzo(a)anthracene 0.4 mg/kg; chrysene 13 mg/kg; bis (2-ethylhexyl) phthalate 46 mg/kg; indeno (1,2,3-cd) pyrene 0.2 mg/kg; arsenic 3.6 mg/kg; and lead 500 mg/kg. Building material contaminated with PCBs greater than 50 mg/kg will be disposed of in accordance with TSCA/RCRA requirements.

INSTITUTIONAL CONTROLS:
Institutional controls may be implemented onsite, if deemed necessary.

KEYWORDS:
Air Monitoring; Arsenic; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Excavation; Incineration/Thermal Destruction; Institutional

INDUSTRIAL LATEX, NJ (Continued)

September 30, 1992

Controls; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Phenols; RCRA; Sediment; Sludge; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sedment, Sludge, Debris
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action

ISLIP MUNICIPAL SANITARY LANDFILL, NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 107.5-acre Islip Municipal Sanitary Landfill site is located in Hauppauge, Town of Islip, Suffolk County, New York. Land use in the surrounding area is predominantly residential, with a day care center and an apartment complex located adjacent to the northern edge of the landfill. The Glacial and Magothy aquifers underlying the site are a primary source of potable water in the region, and five public supply wells are located within a 2-mile radius of the site. Two perennial surface water bodies, the Connetquot Brook and the North Branch of the Nissequogue River, are located nearby and are used for recreational purposes. From 1963 to 1990, the site was operated as a municipal landfill; an incinerator, which was constructed onsite, operated from 1963 to 1968. Landfilling activities have occurred in phases. Encompassing 55.4 acres, Phase I (unlined area) and Phase II (lined area) of the landfill received waste from the early 1960's through the early 1980's. It is believed that in 1978, sixty to seventy 55-gallon drums of waste dry-cleaning solvent were disposed of in these areas. The 13.4 acres planned for Phase III will be used for disposal of clean fill, and the remainder of the property is used for temporary storage of ash fill, sand storage and borrow areas, setback/buffer zones, vehicle storage, and other support uses. In 1979, the Town purchased two houses adjacent to the site because of high concentrations of methane detected in their basements. An active gas-collection system was installed to control migration of explosive gases beyond the site boundary. Ground water investigations, which were conducted in 1980, revealed VOC contamination in private wells. Public water mains or alternative water supplies were extended to affected residents. During 1987, the unlined area was capped, and a liner/leachate collection system was installed over the cell for vertical expansion of landfilling operations. In 1990, the state required the site to stop receiving municipal waste and begin implementing a complete closure program of the entire landfilled area. This ROD addresses a final remedy for the contaminated soil, debris, and ground water at the site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, PCE, TCE, and toluene; other organics; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a modified geosynthetic membrane cap over 52 acres of the landfill; constructing a stormwater system to direct and control runoff from the site to recharge basins; allowing ground water with total VOC concentrations less than 50 ug/l to naturally attenuate; extracting and onsite treatment of ground water with total VOC concentrations greater than 50 ug/l using aeration, with discharge of the treated water onsite to a recharge basin; determining if carbon absorption will be required as a polishing treatment step to ensure compliance with state discharge limits; conducting a treatability study to determine the effectiveness of aeration in precipitating metals from the ground water, and providing for a contingency remedy that treats ground water using chemical precipitation and air stripping; evaluating the ground water treatment system to determine whether an air pollution control device is necessary; monitoring ground water and air; and implementing institutional controls including deed and ground water restrictions to prevent the installation of drinking water wells in impacted areas. The estimated present worth cost for this remedial action is $17,942,025, which includes a present worth O&M cost of $4,588,875 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals, which are based on SDWA MCLs and state standards, include benzene 5 ug/l (MCL); PCE 5 ug/l (MCL); TCE 5 ug/l (MCL); toluene 5 ug/l (MCL); arsenic 0.025 mg/l (state); chromium 50 ug/l; and lead 0.02 mg/l (state).

INSTITUTIONAL CONTROLS:

This remedy includes recommendations that deed and well restrictions be imposed to prevent the installation of drinking water wells in impacted areas.

KEYWORDS:

Aeration; Air Monitoring; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge;

ISLIP MUNICIPAL SANITARY LANDFILL, NY (Continued)

September 30, 1992

Onsite Disposal; Onsite Treatment; Organics; PCE; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Surface Water Collection/Diversion; TCE; Toluene; Treatability Studies; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

KIN-BUC LANDFILL, NJ
September 28, 1992

SITE HISTORY/DESCRIPTION:
The 200-acre Kin-Buc Landfill consists of several inactive disposal areas and is located in Edison Township, Middlesex County, New Jersey. Land use in the area is predominantly industrial and commercial, with some residences within 2 miles north of the site. No drinking water supply wells are located within a 2-mile radius of the site. The Kin-Buc site includes three landfill mounds: Kin-Buc I, Kin-Buc II (directly north of Kin-Buc I), and Mound B (southwest of Kin-Buc I and adjacent to the Raritan River). Additionally, the low-lying Edmonds Creek/Marsh area is situated between Kin-Buc I and the adjacent Edison Landfill and a wetlands area. Portions of the Kin-Buc site lie within both the 100-year floodplain of the Raritan River and a coastal zone. From 1947 to 1977, Kin-Buc accepted industrial and municipal waste, including solvents, waste oils, paint sludge, cyanides, metal stripping wastes, and paint thinners. An estimated 70 million gallons of liquid waste and at least 1 million tons of solid waste were disposed of at Kin-Buc between 1973 and 1976 alone. As a result of an oil spill in 1976, EPA conducted an investigation of the property. In 1980, clean-up activities were initiated under the Clean Water Act and included removal, treatment, and disposal of leachate and drummed waste. Also in 1980, Kin-Buc was ordered to cap Kin-Buc I and II. A 1988 ROD addressed source control remediation in mounds I and II, the low-lying area, and Pool C as OU1. This ROD addresses a final remedy for OU2 which includes sediment and ground water in the Edmonds Creek wetlands area, Mill Brook/Martins Creek, Mound B, and the low-lying area. The primary contaminants of concern affecting the sediment, ground water, and surface water are VOCs, including benzene and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating 2,200 cubic yards of contaminated sediment with PCB levels above 5 mg/kg using excavation methods selected to control surface water flow and minimize impact to wetlands; dewatering, consolidating, and disposing of the sediment onsite within the OU1 containment area; actively restoring 1.36 acres of affected wetlands in Edmonds Creek/Marsh using a program to be developed during the RD stage; maintaining the Mound B cover; allowing natural attenuation to reduce contaminant concentrations in the ground water to acceptable levels; and conducting long-term monitoring of ground water and surface water. If EPA determines that disposal of OU2 sediment in the OU1 containment area will delay construction of the OU1 remedy, a contingency remedy will be implemented, which provides for offsite disposal of sediment at a chemical waste facility. The estimated present worth cost for this remedial action is $4,314,900, which includes an annual O&M cost of $67,100 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific excavation goals for sediment are based on EPA's evaluation of bioavailability, Office of Water methods, and remediation goals at other Superfund sites and include PCBs at 5 mg/kg. EPA believes that a PCB-driven remedial action will also affect reduction of the other contaminants onsite, such as metals and PAHs.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Arsenic; Benzene; Carcinogenic Compounds; Clean Water Act; Contingent Remedy; Direct Contact; Dredging; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; PAHs; PCBs; RCRA; Sediment; Solvents; State Standards/Regulations; Surface Water; Surface Water/Diversion Collection; Surface Water Monitoring; Surface Water Treatment; Toxic Substances Control Act; VOCs; Wetlands; Xylenes.

KIN-BUC LANDFILL, NJ (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: 09/30/88
Lead: Federal Enforcement
Contaminated Media: Sediment, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

NAVAL AIR ENGINEERING CENTER (OPERABLE UNIT 5), NJ

January 3, 1992

SITE HISTORY/DESCRIPTION:

The 7,400-acre Naval Air Engineering Center (NAEC) site is located in Jackson and Manchester Townships, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean. Surrounding land use is primarily undeveloped woodlands and open areas, with the closest residential area, the Borough of Lakehurst, located southeast of the facility. The NAEC, which lies within the Toms River Drainage Basin, contains over 1,300 acres of flood-prone areas. In the vicinity of NAEC, drinking water is generally supplied to the populace by municipal supply wells. Some private wells exist, but these are used primarily for irrigation purposes. The U.S. Navy assumed control of the property in 1919, and it was formally commissioned Naval Air Station (NAS) Lakehurst in 1921. The NAEC was moved from the Naval Base, Philadelphia to NAS Lakehurst in 1974. The NAEC's mission is to conduct research, development, engineering, testing and system integration, limited production, and procurement for aircraft and airborne weapons systems. Historically, various operations at NAEC have required the use, handling, storage, and occasional onsite disposal of hazardous substances. During the operational period of the facility, there have been reported and suspected releases of these substances into the environment. The U.S. Air Force's Installation Restoration Program (IRP) has identified 44 potentially contaminated sites at NAEC, 16 of which have warranted further investigation to assess potential impacts. IRP investigations revealed three of these sites, Sites 5, 19, and 21, as having evidence of petroleum hydrocarbon contamination. From 1958 to 1980, Site 5, the Arresting Engine RSTS Track No. 2/Building 371, was used for the surface storage of small amounts of liquid waste, such as cleaning solvents, hydraulic fluid, and propylene glycol. Leakage from stored materials at Site 5 has resulted in visible soil discoloration. Site 19, the SATS Catapult (7401 Test Site), was abandoned in the 1960's and 1970's, after which it became a minor storage area for 55-gallon drums of waste material, such as clutch and lubricating oils and jet fuel. In the early 1980's, twenty-two 55-gallon drums that had potentially contaminated the soil were removed from the site for offsite disposal. From 1958 to 1981, solvents and jet fuel were stored at Site 21, the Jet-Car Maintenance Shop. In 1983, stained soil areas prompted NAEC to set up a hazardous waste drum accumulation area with secondary containment at the site. As part of a 1991 removal action at each of these three sites, NAEC excavated and removed offsite for disposal, a total of 76 cubic yards of soil with petroleum hydrocarbon concentrations greater than 1,000 mg/kg. This ROD addresses any potential remaining petroleum hydrocarbon contamination at Sites 5, 19, and 21, as OU5. Future RODs will address other OUs at NAEC. EPA has determined that the previously implemented removal actions have eliminated the need to conduct additional clean-up activities at these sites; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action because previously implemented removal actions have eliminated the need to conduct additional remedial action at sites 5, 19, and 21. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Floodplain; No Action Remedy.

SITE SUMMARY

Date of previous RODs: 02/04/91, 02/04/91 09/30/91, 09/30/91, 12/31/91
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

NAVAL AIR ENGINEERING CENTER (OPERABLE UNIT 6), NJ

December 31, 1991

SITE HISTORY/DESCRIPTION:

The 7,400-acre Naval Air Engineering Center (NAEC) site is located in Jackson and Manchester Townships, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean. Surrounding land use is primarily undeveloped woodlands and open areas, with the closest residential area, the Borough of Lakehurst, located southeast of the facility. The NAEC, which lies within the Toms River Drainage Basin, contains over 1,300 acres of flood-prone areas. Drinking water in the vicinity of the site is generally supplied to the residents by municipal supply wells. Some private wells exist, but these are used primarily for irrigation purposes. The U.S. Navy assumed control of the property in 1919, and it was formally commissioned Naval Air Station (NAS) Lakehurst in 1921. The NAEC was moved from the Naval Base, Philadelphia to NAS Lakehurst in 1974. The NAEC's mission is to conduct research, development, engineering, testing and system integration, limited production, and procurement for aircraft and airborne weapons systems. Historically, various operations at NAEC have required the use, handling, storage, and occasional onsite disposal of hazardous substances. During the operational period of the facility, there have been reported and suspected releases of these substances into the environment. The U.S. Air Force's Installation Restoration Program (IRP) has identified 44 contaminated sites at NAEC, 16 of which have warranted further investigation to assess potential impacts. One of these sites, Site 44, was used over a 34-year period for testing and storage of PCB-containing electrical transformers. As part of past operating procedures at the site, a 3-ounce sample of transformer oil was tested yearly and disposed of onto the ground outside Building 191. An estimated total of 26 gallons of PCB oil has been disposed of in this manner. IRP investigations at Site 44 revealed elevated levels of PCBs in soil. In a 1991 removal action, NAEC excavated approximately 13 cubic yards of PCB-contaminated soil at concentrations greater than 5 mg/kg and transported the soil offsite for incineration. This ROD addresses any remaining contaminated soil at Site 44, as OU6. Subsequent RODs will address other OUs at NAEC. Post-excavation sampling has confirmed that the previously implemented removal action has accomplished the primary objective of remediating the site; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action because the previously implemented removal action has eliminated the need to conduct additional clean-up activities. Recently conducted environmental investigations show no evidence of any significant contamination remaining at Site 44. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Floodplain; No Action Remedy.

SITE SUMMARY

Date of previous RODs: 02/04/91, 09/04/91, 09/30/91, 09/30/91
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

NAVAL AIR ENGINEERING CENTER (OPERABLE UNIT 7), NJ

March 16, 1992

SITE HISTORY/DESCRIPTION:

The 7,400-acre Naval Air Engineering Center (NAEC) site is located in Jackson and Manchester Townships, Ocean County, New Jersey, approximately 14 miles inland from the Atlantic Ocean. Surrounding land use is primarily undeveloped woodlands and open areas, with the closest residential area, the Borough of Lakehurst, located southeast of the facility. The NAEC, which lies within the Toms River Drainage Basin, contains over 1,300 acres of flood-prone areas. In the vicinity of NAEC, drinking water is generally supplied to the populace by municipal supply wells. Some private wells exist, but these are primarily used for irrigation purposes. The U.S. Navy assumed control of the property in 1919, and it was formally commissioned Naval Air Station (NAS) Lakehurst in 1921. The NAEC was moved from the Naval Base, Philadelphia to NAS Lakehurst in 1974. NAEC's mission is to conduct research, development, engineering, testing and system integration, limited production and procurement for aircraft and airborne weapons systems. Historically, various operations at NAEC have required the use, handling, storage, and occasional onsite disposal of hazardous substances. The U.S. Air Force's Installation Restoration Program (IRP) has identified 44 potentially contaminated sites at NAEC, 16 of which have warranted further investigation to assess potential impacts. Several of these sites are located within Areas A and B of the northeastern section of NAEC, where ground water has been found to be contaminated with VOCs. Area A is subdivided into two sections: Area A-East, including Sites 14, 29, and 37; and Area A-West, including Sites 12, 33, and 42. A wetland area is adjacent to the northern edge of Area A. Area B, located immediately south of Area A, includes Sites 9, 13, 36, and 39 as well as Hangars 1, 2, and 3. Several reported or potential contaminant sources may have contributed to the ground water contamination beneath Areas A-East and B, including releases of mixed liquid wastes from fire-fighting pits during training activities (A-East), surface disposal of jet fuel and gasoline (A-East), spills and leaks at former drum storage area (A-East), leakage and spills from former underground storage tanks (Area B), and releases from a dry well receiving unknown liquids at northeast corner of Hangar 1 (Area B). Reported or potential contaminant sources at the sites in Area A-West include leakage from two former underground storage tanks (Site 12), releases from a former dry cleaning facility (Site 12), discharges from a dry well that received mixed liquid waste (Site 33), and surface disposal of mixed wastes in a landfill (Site 42). Six previous RODs have addressed other OUs at NAEC. This ROD addresses an interim remedy for the principal threat at the site, migration of the contaminated groundwater plume from Areas A and B. A future ROD will address a final remedy for ground water and any other areas of contamination in Areas A and B. The primary contaminants of concern affecting the soil and ground water at the site are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; and metals.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes extracting and pretreating contaminated ground water from six recovery wells to remove metals, solids, and free product; transporting the free product offsite for recycling or disposal; treating ground water onsite using air stripping and granular activated carbon to remove VOCs, with discharge of the treated water onsite to the aquifer through an irrigation and infiltration system; spray irrigating the treated water over areas of subsurface soil contamination to facilitate soil flushing and removal of soil contaminants; treating air emissions from the air stripping process using granular activated carbon, prior to discharge to the atmosphere; testing residual sludge from the pretreatment processes for hazardous waste characteristics and sending this offsite for appropriate disposal; and returning spent carbon offsite to the vendor for regeneration. The estimated present worth cost for this remedial action is $4,015,000, which includes an annual O&M cost of $400,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical specific clean-up levels for ground water and soil have not been identified because of the interim nature of this remedial action. Clean-up goals will be established when a final remedial action is chosen. Treatment residuals will be tested to determine whether RCRA Land Disposal Restrictions apply.

NAVAL AIR ENGINEERING CENTER (OPERABLE UNIT 7), NJ (Continued)

March 16, 1992

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Deferred Decision; Direct Contact; Floodplain; Ground Water; Ground Water Treatment; Interim Remedy; Metals; O&M; Offsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; RCRA; Soil; Soil Washing/Flushing; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: 02/04/91, 02/04/91, 09/30/91, 09/30/91, 12/31/91, 01/03/92
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim
Ground Water - Interim

NORTH SEA MUNICIPAL LANDFILL, NY

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 131-acre North Sea Municipal Landfill site is an active landfill that is owned and operated by the Town of Southampton in Suffolk County, New York. Land use in the area is predominantly residential, with approximately 15 homes located within a one-quarter mile radius of the site. The site overlies a fresh water aquifer, which overlies a deeper saltwater aquifer. Most of the adjacent homes obtain their drinking water from private domestic wells, which tap into the fresh water Upper Glacial aquifer. Fish Cove, a body of saltwater with marshes connected via a tidal inlet to the North Sea Harbor, is located 1,500 feet northwest of the landfill. In 1963, a landfill was constructed for the disposal of municipal solid waste, refuse, debris, and septic system wastes from residential, industrial, and commercial sources. There are three main landfill areas: a 13 acre area encompassing Cell #1 and related septic sludge lagoons, which received septic system sludge in the early 1960's in addition to municipal solid waste; Cell #2, which is 7 acres in size and was closed in 1990; and Cell #3, which is currently active, and accepts 80,000 tons of municipal waste annually. In 1986, the septic sludge lagoons were decommissioned, and sludge and 2 feet of soil were removed. A ground water monitoring program, which has been conducted by the Town of Southampton since 1979, revealed a large ground water plume containing heavy metals that was migrating from Cell #1 toward Fish Cove. As a result, several drinking water wells were closed in 1981, and the town connected all residents in the area to a public water supply. A 1989 ROD addressed onsite source contamination as OU1 and provided for capping Cell #1 to reduce the potential threat to human health and the environment by reducing the risk of contaminant migration. This ROD addresses onsite ground water, as OU2. Studies conducted during the risk assessment for OU2 confirmed that the risks to human health are within EPA's acceptable risk range; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action, with air and ground water monitoring. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Monitoring; Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: 09/29/89
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

PASLEY SOLVENTS & CHEMICAL, NY
April 24, 1992

SITE HISTORY/DESCRIPTION:
The approximately 0.5-acre Pasley Solvents and Chemical site is a former oil, solvent, and chemical storage tank farm located in the Town of Hempstead, Nassau County, New York. Land use in the area is predominantly industrial, with some commercial and residential areas within one-fourth mile of the site. The only drinking water source in the area consists of aquifers; four public water supply wellfields are located within 2 miles of the site. Prior to 1969, Commander Oil Corporation distributed fuel oil at the site. From 1969 to 1982, Pasley Solvents and Chemicals Company distributed chemicals and used the site for storage of waste and sludge scavenger (Pasley) operations. In 1980, after Pasley requested a chemical storage and removal permit, a state inspection revealed soil contamination with VOCs beneath the above-ground storage tanks and recommended a remedial investigation and clean-up plan. In 1981, ground water monitoring wells were installed and revealed that the ground water was also contaminated with VOCs. All operations onsite ceased in 1982. In 1988, all 12 above-ground storage tanks were removed by the site owners under EPA supervision. A separate site, upgradient from the Pasley facility, was shown to be contributing to the background contamination of the ground water. This ROD addresses contaminated surface soil and ground water as a final remedy. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes treating 13,000 cubic yards of contaminated soil onsite using vacuum extraction to remove aliphatic hydrocarbons and soil flushing, as necessary, to remove VOCs, followed by disposal of treatment residuals at an offsite RCRA facility; ground water pumping and onsite treatment using precipitation, clarification, and filtration to remove heavy metals, followed by treatment with air stripping to remove VOCs; treating the liquid phase using granular activated carbon as a final polishing step, with recharge onsite into the aquifer or to infiltration trenches; treating offgases from the air stripping process using vapor phase activated carbon; disposing of residual carbon and sludge generated during the treatment processes offsite; and monitoring soil and ground water. The estimated present net worth cost for this remedial action is $13,744,000, which includes an annual O&M cost of $1,236,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are based on SDWA MCLs to protect ground water by the reduction of mobility and volume of contaminants and include PCE 1.4 mg/kg; TCE 0.7 mg/kg; toluene 1.5 mg/kg; and xylenes 1.2 mg/kg. Chemical-specific ground water clean-up goals may be waived because of the presence of an upgradient contamination source from another site. Clean-up goals are based on the upgradient concentrations of certain contaminants. When the upgradient source has been remediated, drinking water standards, such as SDWA MCLs and state ground water quality regulations, will be assigned.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Stripping; ARAR Waiver; Background Levels; Carbon Adsorption (GAC); Carcinogenic Compounds; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; Safe Drinking Water Act; Soil; Soil Washing/Flushing; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

PLATTSBURGH AIR FORCE BASE (OPERABLE UNIT 1), NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The Plattsburgh Air Force Base (AFB) site is located south of the City of Plattsburgh, Clinton County, New York. Surrounding land use is primarily residential and light industrial. Ground water beneath the site is not used as a drinking water source. Plattsburgh AFB has historically been engaged in numerous operations that have required the use, handling, storage, and disposal of hazardous materials. The U.S. Air Force's Installation Restoration Program (IRP) has identified 39 sites at Plattsburgh AFB as having suspected contamination by hazardous materials. One of these sites, the 10.1-acre LF-023 landfill, is located approximately 300 feet from the Plattsburgh AFB western boundary, and 600 feet northeast of a small mobile home development. From 1966 to 1981, the landfill received domestic wastes for disposal. Daily operations consisted of digging 25-foot-deep trenches, spreading and compacting the trash (typically bagged household garbage), and backfilling with 6-inch layers of sandy soil. Hazardous wastes were not routinely disposed of in this landfill; however, hazardous materials may have been deposited. Secondary growth has begun to cover the landfill, allowing a northern section of the site to be utilized as an exercise training/obstacle course. Air Force site investigations have revealed soil, sediment, surface water, and ground water contamination. This ROD addresses a final source control remedy for the contaminated soil, sediment, ground water, and surface water at the site, as OU1. Future RODs are planned to address other OUs at the Base. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs, including benzene and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes clearing and grubbing the site; establishing a low-permeability vegetated cover system over the landfill; diverting the surface water runoff to minimize erosion of the cover and maintenance requirements; installing a gas detection and monitoring system; developing a post-closure plan to monitor, maintain, and inspect the site; monitoring ground water and surface water; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $4,574,000, which includes an estimated present worth O&M cost of $988,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil, sediment, and surface water clean-up goals were not developed for the LF-023 source control action because discrete source areas were not found. Clean-up levels for other contaminated media associated with the site will be established in a subsequent ROD, if necessary.

INSTITUTIONAL CONTROLS:

Institutional controls for this site will be incorporated into the Plattsburgh AFB Comprehensive Plan to ensure that future owners will be made aware of the landfill location, and to ensure that the integrity of the liners and final cover will not be compromised.

KEYWORDS:

Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Ground Water Monitoring; Hybrid/Alternate Closure; Institutional Controls; Metals; O&M; Onsite Containment; Onsite Disposal; Organics; PAHs, PCBs; Soil; Solvents; State Standards/Regulations; Surface Water Collection/Diversion; Surface Water Monitoring; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Sediment, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim

PLATTSBURGH AIR FORCE BASE (OPERABLE UNIT 3), NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The Plattsburgh Air Force Base (AFB) site is located south of the City of Plattsburgh, Clinton County, New York. Surrounding land use is primarily residential and light industrial. Although two aquifers underlie the site, ground water is not used as a drinking water source. Plattsburgh AFB has historically been engaged in numerous operations that have required the use, handling, storage, and disposal of hazardous materials. The U.S. Air Force's Installation Restoration Program (IRP) has identified 39 sites at Plattsburgh AFB as having suspected contamination by hazardous materials. One of these sites, the 13-acre LF-022 landfill, is located on the western side of the Base, 1,350 feet north of a small mobile home development. From 1959 to 1966, the landfill received domestic wastes from Plattsburgh AFB for disposal. Daily operations consisted of digging 25-foot-deep trenches, spreading and burning the trash in the trenches, and covering it with sandy soil. Appropriate methods for hazardous waste disposal were available at the Base during the operating period of the landfill; therefore, it is unlikely that LF-022 received any hazardous waste. Air Force site investigations revealed surface and subsurface soil contamination as well as limited ground water contamination. This ROD addresses the contaminated soil at the site, as OU3, to minimize potential current and future ecological risks associated with exposure to pesticides in surface soil. Future RODs are planned to address other OUs at the Base. The primary contaminants of concern affecting the soil and debris are VOCs; other organics, including pesticides; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes clearing and grubbing the landfill site; diverting surface water runoff to minimize erosion of the cover and minimize maintenance requirements; covering the landfill with a 12-inch soil cover; revegetating the area to minimize erosion and enhance evapotranspiration; developing a post-closure plan to monitor, maintain, and inspect the site; monitoring ground water; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $2,114,000, which includes a present worth O&M cost of $866,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and ground water clean-up levels were not developed because none of the contaminants of concern identified in the baseline risk assessment were found to pose an unacceptable risk to either human health or the environment.

INSTITUTIONAL CONTROLS:

Institutional controls for the site will be incorporated into the Plattsburgh AFB Comprehensive Plan to ensure that future owners are aware of the landfill location and that the integrity of the final cover will not be compromised.

KEYWORDS:

Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Direct Contact; Ground Water Monitoring; Hybrid/Alternate Closure; Institutional Controls; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Organics; Pesticides; Soil; State Standards/ Regulations; Surface Water Collection/Diversion; VOCs.

SITE SUMMARY

Date of previous RODs: 09/30/92
Lead: Federal Facility
Contaminated Media: Soil, Debris
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim

PREFERRED PLATING, NY
September 28, 1992

SITE HISTORY/DESCRIPTION:
The 0.88-acre Preferred Plating site is a former metal plating facility in Farmingdale, Town of Babylon, Suffolk County, New York. Land use in the area is mixed, with commercial and light industrial use to the east and west, a residential area and U.S. Army facility to the south, and a wooded area to the north. An estimated 10,000 people who live within a 3-mile radius of the site use ground water as the principal source of drinking water. The naturally occurring surface soil type is a sandy loam, which promotes rapid infiltration to the ground water. From 1951 to 1976, Preferred Plating Corporation (PPC) operated a metal plating facility that degreased, cleaned, and finished metal parts. This process resulted in the onsite generation, storage, and disposal of hazardous waste. Untreated wastewater was discharged to four onsite concrete waste storage pits. In 1953, the County found that the waste pits were cracked and leaking and detected metals in ground water at the site. In 1975, an SPDES permit was issued to PPC to treat and then remove the wastewater. However, the facility never complied with permit requirements. In 1976, PPC declared bankruptcy: subsequent owners have not conducted similar operations onsite. A 1989 ROD addressed the VOCs and metal-contaminated ground water onsite and upgradient. A subsequent RI/FS detected VOCs and metals in subsurface soil around the waste storage pits, the former sanitary leaching pool, and the former steam condensate leaching pool and line. This ROD addresses subsurface soil contamination contributing to the ground water problem attributable to the site. A future OU will address the potentially contaminated upgradient ground water as the final site remedy. The primary contaminants of concern affecting the soil are VOCs, including benzene, PCE, TCE, toluene, and xylenes; metals, including arsenic, chromium, and lead; and inorganics, including cyanide.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes jet grouting of the building's foundation to stabilize the foundation during excavation; excavating approximately 700 cubic yards of contaminated soil from the waste storage pit area and approximately 350 cubic yards of contaminated soil from within, around, and beneath the former sanitary leaching pool and former steam condensate leaching pool and line areas; treating the soil offsite using solidification/ stabilization or another appropriate technology still to be determined, with offsite disposal at a RCRA-permitted facility; and backfilling the excavated areas with clean soil. The estimated present worth cost for this remedial action is $1,423,700. No O&M costs are associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:
Prior to disposal, the contaminated soil will be treated to comply with RCRA LDRs. Chemical-specific soil clean-up levels were not provided.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Deferred Decision; Direct Contact; Excavation; Filling; Inorganics; Lead; Metals; Offsite Disposal; Offsite Treatment; Organics; PCE; RCRA; Soil; Solidification/Stabilization; Solvents; TCE; Treatment Technology; VOCs.

SITE SUMMARY

Date of previous RODs: 09/22/89
Lead: Fund
Contaminated Medium: Soil
Major Contaminants: VOCs, Metals, Inorganics
Category: Source Control - Final Action

RAMAPO LANDFILL, NY
March 31, 1992

SITE HISTORY/DESCRIPTION:

The 60-acre former landfill site is located on a 96-acre tract in the Town of Ramapo, Rockland County, New York, about 35 miles northwest of New York City. Utility corridors lie on three sides of the site, including high-voltage power transmission lines. A high-pressure gas line is to the south; a pistol range, northeast; and a power substation, north of the site. Surface water bodies in the site area include the Ramapo River, Torne Brook, and Candle Brook. The Ramapo River may be used as a drinking water source, and Torne Brook is suitable for primary contact recreation. The landfill consists of two major lobes that are steeply sloped toward the Ramapo River and Torne Brook. Ground water is withdrawn from the area south and west of the site for residential use. Ten water supply wells, operated by the Spring Valley Water Supply Company and serving a population of over 200,000, are located along the Ramapo River both upstream and downstream of the site. Several of these wells are located within 1,500 feet of the landfill; the closest lies approximately 500 feet west of the site. Prior to landfill operations in the 1950's and 1960's, portions of the site were excavated as a gravel source, and in 1971, the Rockland County Department of Health granted a permit to the Town of Ramapo for the operation of the sanitary landfill. Until 1984, municipal waste was accepted in the landfill, and construction and demolition debris was accepted at the site until 1989. An offsite leachate collection system, constructed in 1984, currently discharges an average flow of 80,000 gallons per day to the Village of Suffern Wastewater Treatment Plant. The site is currently being used as a compaction and transfer facility by the Town of Ramapo. Trash and debris are weighed at a weigh station/guardhouse, compacted at a baler facility in the northeastern corner of the site, and transferred to the Al Turi Landfill in Goshen, New York. This ROD represents the entire remedial action for the site by controlling source of contamination and the generation of leachate, and treatment of contaminated ground water. The primary contaminants of concern affecting the soil, debris, ground water, and surface water are VOCs, including benzene and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a multi-media cap over the 60-acre landfill; improving the existing leachate collection system; diverting surface water drainage; and relocating and/or raising Torne Valley Road to allow for filling; installing ground water extraction wells to supplement the existing leachate collection system, and treating the extracted ground water and leachate offsite at the Suffern Wastewater Treatment Plant; conducting long-term ground water, surface water, and perimeter air monitoring with venting or control, as required; implementing institutional controls, including deed restrictions; and providing for a contingency remedy to provide preliminary design of the alternate water supply system, and ground water pretreatment and landfill gas treatment systems, if necessary. The estimated present worth cost for this remedial action ranges from $19,890,000 to $26,423,000, which includes an annual O&M cost ranging from $319,800 to $678,600 for 30 years. The present worth cost for the contingency remedy ranges from $24,890,000 to $30,880,000, which includes an annual of $319,600 to $622,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific goals for leachate and shallow ground water clean-up are based on the more stringent New York State Water Quality Criteria standards. Surface water standards are based on the more stringent of human and aquatic ARARs.

INSTITUTIONAL CONTROLS:

Deed and access restrictions, including posting and fencing the landfill will prevent any activities which may compromise the integrity of the cap.

KEYWORDS:

Air; Air Monitoring; Alternate Water Supply; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Debris; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection/Treatment; Lead; Metals; O&M; Offsite Treatment; Onsite Containment; PAHs; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/

RAMAPO LANDFILL, NY (Continued)
March 31, 1992

Regulations; Surface Water; Surface Water Collection/ Diversion; Surface Water Monitoring; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

ROBINTECH/NATIONAL PIPE, NY
March 31, 1992

SITE HISTORY/DESCRIPTION:
The 12.7-acre Robintech/National Pipe Company site is a light industrial facility located in the Town of Vestal, Broome County, New York. The facility is situated in a regionally important industrial center adjacent to Binghamton, NY, where an estimated 5,500 people live within 1 mile of the site. Two distinct aquifers, which underlie the facility, provide 250,000 gallons of water per day for 10 onsite production wells to meet requirements for cooling water in the pipe production process. There are no private drinking water wells in the vicinity of the site. All residents are supplied with drinking water by the Vestal well fields. In 1966, Robinson Technical Products, later renamed Robintech Inc., constructed the main building that currently exists onsite. The first floor of the building was used to manufacture aircraft engine mounts and automobile accelerator cables; the second floor housed the assembly area for electronic cable. In 1970, the first floor activities were replaced with polyvinyl chloride (PVC) pipe extrusion operations. Since that time, several successive site owners have continued PVC pipe production at the site. During site operations, cooling waters from the PVC operations were discharged to an onsite settling tank to reduce particulate matter before entering the storm sewer. In 1984, a routine state permit discharge compliance sample found organic constituents not included in the permit. Further investigation resulted in the conclusion that ground water contamination beneath the site originated from reinjection of wastewater into the PW-2 production well. This ROD is the first of two operable units planned for the site and addresses remediation of the contaminated ground water. A future ROD will address suspected lead contamination of onsite soil as OU2. The primary contaminants of concern affecting the ground water are VOCs, including 1,1-DCE, 1,2-DCE, 1,1,1-TCA, TCE, vinyl chloride, and xylenes.

SELECTED REMEDIAL ACTION:
The remedial action for this site includes onsite pumping and treatment of contaminated ground water from the bedrock and overburden aquifers using air stripping to remove VOCs, followed by discharge of the treated water to the permitted effluent discharge point or, depending on plant requirements, use of the treated water in the plant process; utilizing air emission controls, if determined to be necessary during the RD phase; conducting a semi-annual monitoring program for 10 wells and the effluent discharge to track the migration and concentration of contaminants; invoking an ARAR waiver as contingency measure, if the continued monitoring and adjustments to the treatment system indicate that portions of the aquifer cannot be restored to beneficial use; and implementing institutional controls including onsite and offsite deed restrictions to restrict ground water use. The estimated present worth cost for this remedial action is $2,255,877, which includes an annual O&M cost of $242,286 for 15 to 30 years.

PERFORMANCE STANDARDS OR GOALS:
The selected remedy will achieve chemical-specific ARARs based on SDWA MCLs and state equivalents for the site, including TCE 5 ug/l; 1,1-DCE 5 ug/l; 1,2-DCE 5 ug/l; 1,1,1-TCA 5 ug/l; and vinyl chloride 2 ug/l. Air emissions from the stripping treatment operations will comply with state requirements for air resources.

INSTITUTIONAL CONTROLS:
Deed restrictions will be recommended to appropriate authorities in order to prevent extraction of contaminated ground water for potable purposes.

KEYWORDS:
Air Stripping; ARAR Waiver; Carcinogenic Compounds; Contingent Remedy; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

ROWE INDUSTRIES GROUNDWATER CONTAMINATION, NY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 8.5-acre Rowe Industries Groundwater Contamination site is located in the Town of Sag Harbor, Suffolk County, New York. Land use in the surrounding area is mixed industrial, commercial, and residential. Approximately 6,000 people within a 3-mile radius of the site use ground water as their primary drinking water source. Site features include a building that covers 1 acre of the site, and two ponds located 300 and 700 feet to the northeast of the building. Additionally, there is a wetland area onsite. From the 1950's to the 1960's, Rowe Industries occupied the site and manufactured small electric motors and transformers. Chlorinated solvents were used to degrease oil-coated metals, and waste solvents were discharged from two tanks in the building into cesspools or to an open field 75 to 100 feet east of the building. A series of dry wells was used to dispose of organic solvents while Rowe Industries was in operation. From the late 1960's until 1974, the property was used by two other companies, Rowe Industries-Aurora Plastics, Inc., and Nabisco, Inc. In 1980, the site was sold to Sag Harbor Industries, which currently uses the property as a facility to manufacture electronic devices. VOC-contaminated ground water was first discovered by the County in 1983, when several local private wells were sampled. In 1985, EPA undertook a removal action to provide an alternate water supply to residents in the vicinity of the ground water plume. This ROD addresses a final remedy for the contamination in soil and ground water attributable to the site. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, PCE, TCE, toluene, and xylenes; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating 365 cubic yards of contaminated soil, treating the soil offsite using incineration or another equivalent technology to meet LDR disposal standards, then disposing the soil at an offsite RCRA landfill; conducting soil sampling to confirm that all soil contaminated above clean-up levels has been removed; pumping and onsite pretreatment of contaminated ground water to remove iron and manganese, followed by filtration to remove metals and air stripping to remove VOCs, with offsite discharge to surface water; treating air emissions, if necessary; and implementing a long-term ground water monitoring program. The estimated present worth cost for this remedial action is $6,187,000, which includes an annual O&M cost of $254,000 for 15 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil excavation goals are established to ensure that soil contaminants do not contribute to ground water contamination, and include benzene 0.5 mg/kg; PCE 1.5 mg/kg; TCE 1 mg/kg; toluene 1.5 mg/kg; and xylenes 1.2 mg/kg. Additionally, excavated soil sent for offsite disposal will be treated, if necessary, according to RCRA LDR standards. Chemical-specific ground water clean-up goals are based on SDWA MCLs and MCLGs, including arsenic 25 ug/l; chloroform 7 ug/l; PCE 5 ug/l; TCE 5 ug/l; toluene 5 ug/l; and xylenes 5 ug/l. Treated ground water discharged to Sag Harbor Cove will meet state discharge requirements.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Metals
Category: Source Control - Final Action
Ground Water - Final Action

WITCO CHEMICAL (OAKLAND PLANT), NJ

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 9-acre Witco Chemical (Oakland Plant) site, a former technical research facility for the development of specialty chemicals, is located in Oakland, Bergen County, New Jersey. The Borough of Oakland has a population of approximately 13,000 people, and with the exception of one residential well, the area downgradient from the site is supplied by a municipal water supply system. From 1966 to 1984, the Witco Chemical Corporation (Witco) neutralized laboratory wastewater in a 2,000-gallon underground acid neutralizing tank, and then discharged it to a series of underground seepage pits. In 1982, the state inspected the facility to review operations and wastewater management practices for compliance with the State Water Pollution Control Act. The investigation revealed that Witco had conducted unpermitted discharge of industrial wastewater to ground water at the site. In 1982, the state ordered Witco to take measures to cease unpermitted discharges. In response to state directives, Witco initiated a hydrogeological investigation in 1982 and determined that site soil, sludge, and ground water contained various organic compounds. Witco then replaced its underground seepage pit with a 6,000-gallon capacity fiberglass tank. In 1985, EPA evaluated the potential contamination attributed to Witco's previous operation of the underground seepage pit system and detected several chemicals of concern, including 2-butanone and the pesticides DDT and dieldrin. From 1987 to 1988, Witco voluntarily disposed of approximately 720 cubic yards of soil and other debris and fourteen 55-gallon drums of sludge that were shown to contain greater than 100 ppm of petroleum hydrocarbons; and collected and analyzed ground water samples from monitoring wells at the facility. This ROD addresses any remaining soil and ground water contamination resulting from site activities. Based on the results of remedial investigations, the removal of the seepage pits and surrounding soil by Witco during 1987 has effectively remediated the contamination at the site. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action, with ground water monitoring. Results of the RI indicated that there are no significant concentrations of hazardous substances remaining onsite. The estimated present worth cost for this remedial action is $8,660, which includes an annual O&M cost of $2,000 for 5 years.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Ground Water Monitoring; No Action Remedy; O&M.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

ABEX, VA
September 29, 1992

SITE HISTORY/DESCRIPTION:
The Abex site is a former brass and bronze foundry in Portsmouth, Virginia. Land use in the surrounding area is mixed residential, commercial, and light industrial. The site is located approximately one-half mile west of Elizabeth River, within the 500-year floodplain for the South branch of the River. The Elizabeth River Basin is heavily industrialized and receives wastewater discharges from U.S. Naval facilities, heavy industry, treatment facilities, urban runoff, and boating and docking facilities. From 1928 to 1978, Abex operated a facility that melted used railroad car journal bearings into sand molds to cast new railroad car bearings. The sand casts became laden with metals such as lead, antimony, copper, tin, and zinc. The foundry operations also produced stack emissions of fine particulate matter. During Abex's operations, waste sand was disposed of in a 1-acre area immediately north of the foundry. In 1984, Holland Investment and Manufacturing Corporation purchased the portion of the Abex site that contains the former foundry, which included five buildings and is referred to as the Holland Property. In 1986, EPA discovered high levels of lead in the foundry waste within the Abex Lot and in the soil of many neighboring residential lots. That same year, Abex performed a removal action to excavate and remove lead-contaminated soil from residential areas around the Abex lot, and to pave and fence the Abex and McCready Lots. In 1992, Abex excavated and removed additional contaminated soil from adjacent properties. This ROD addresses contamination in soil and waste materials on the Holland Property, Abex Lot, and McCready Lot and in the surrounding properties within a 700-foot radius of the foundry facility, as OU1. Future RODs will further investigate ground water, ecological impacts, and additional remediation of the soil for OU2. The primary contaminants of concern affecting the soil are organics, including PAHs and PCBs; and metals, inlcuding chromium and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes demolishing all foundry operations buildings, with removal and decontamination of associated equipment and demolition debris at an offsite landfill; temporarily relocating residents during soil excavation; removing and disposing of offsite any asphalt and concrete from paved areas prior to soil removal; excavating surface soil with lead concentrations greater than 500 mg/kg and subsurface soil with concentrations of lead exceeding 1,000 mg/kg from non-residential areas, from around foundations, and under residences in affected residential areas; temporarily storing these onsite prior to treatment; testing, then treating any soil that exhibits TCLP toxicity onsite using stabilization; retesting the treated materials to ensure they meet RCRA LDR requirements, followed by transporting and disposing of treated and untreated soil and waste materials offsite at a RCRA landfill; disposing of water generated during the treatment processes offsite at a POTW; backfilling all excavated areas with clean fill; installing erosion and sediment control measures; and monitoring air for dust and lead during remedial activities. The estimated present worth cost for this remedial action is $28,891,243. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil excavation goals in residential areas down to the water table, which are based on EPA's policies for soil clean-up levels per OSWER Directive #9355.4-02, include lead 500 mg/kg for surface soil to one foot below surface and 1,000 mg/kg for subsurface soil from one foot below surface to the water table. All excavated soil and waste material will be tested using the TCLP method and, if they exhibit toxicity, they will be stabilized onsite to meet RCRA LDR standards prior to offsite disposal.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Monitoring; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Excavation; Floodplain; Lead; Metals; Offsite Discharge; Offsite Disposal; Onsite Treatment; Organics; PAHs, PCBs; Publicly Owned Treatment Works (POTW); RCRA; Relocation; Soil; Solidification/Stabilization; State Standards/Regulations; Temporary Storage; Treatability Studies; Treatment Technology; Wetlands.

ABEX, VA (Continued)
September 29, 1992

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris
Major Contaminants: Organics, Metals
Category: Source Control - Interim

BROWN'S BATTERY BREAKING, PA

July 2, 1992

SITE HISTORY/DESCRIPTION:

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 and Mill Creek. The entire site lies within the 100-year floodplain of the Schuylkill River. From 1961 to 1971, the facility recovered lead-bearing materials from automobile and truck batteries by breaking the battery casings, draining the acid, and recovering the lead alloy, grids, plates, and plugs. During this time, battery acid and rinse water from recovery activities were dumped onto the soil, and crushed casings were disposed of onsite or used as a substitute for road gravel. During the 1980's, state onsite and offsite investigations identified lead concentrations in excess of acceptable limits in residents' blood levels, livestock, soil, and surface waters. A 1983 EPA investigation also revealed extensive lead contamination in onsite soil and sediment located in the Schuylkill River. As a result of the investigations, EPA initiated a removal action that relocated three families, and excavated and consolidated 13,000 cubic yards of contaminated soil and battery casings into an onsite containment area, which was capped with a low permeability cap. In 1990, a second removal temporarily relocated all onsite residents and implemented institutional controls. A 1990 ROD addressed implementation of deed restrictions and relocation of affected residents. This ROD addresses the remediation of onsite soil, battery casings, and ground water as a final action at the site. The primary contaminants of concern affecting the soil, debris, and ground water are metals, including lead and nickel; and inorganics, including sulfate.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and treating 67,000 cubic yards of soil and battery casings offsite using an innovative thermal treatment technology, followed by offsite disposal; constructing two vertical limestone barriers in the shallow aquifer to neutralize lead levels; pumping and treatment of contaminated ground water in the bedrock aquifer using pH adjustment, precipitation, and ion exchange, with onsite discharge; transporting sludge generated during the treatment process offsite for disposal at a POTW; monitoring ground water; and implementing institutional controls, including deed restrictions to limit site use; providing for a contingent remedy, which allows for stabilization/solidification of the soil and casings, followed by offsite disposal of the stabilized mass, if the selected innovative alternative cannot be implemented. The estimated present worth cost for this remedial action is $12,316,000. No O&M costs were specified in this ROD.

PERFORMANCE STANDARDS OR GOALS:

Clean-up levels for lead-contaminated soil are based on present EPA policy. An ARAR waiver has been issued on the basis that EPA will achieve an Equivalent Standard of Performance in the protection of human health and the environment. The recommended action level for residential areas is between 500 and 1,000 mg/kg, but no criterion for industrial areas has been established. EPA, therefore, has determined 1,000 mg/kg as the clean-up level for the lead-contaminated soil. Ground water clean-up goals for the shallow bedrock aquifer are based on CWA WQC and state standards. Chemical-specific clean-up goals for this site are background levels except for manganese, which must be cleaned to 50 mg/l (state). Other ground water goals include beryllium 0.19 ug/l (WQC); cadmium 0.88 ug/l (WQC); lead <3 ug/l (WQC); manganese 50 ug/l (state); nickel 2.9 ug/l (WQC); and sulfate 27 ug/l (WQC).

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented limit the site to industrial use only.

KEYWORDS:

ARAR Waiver; Background Levels; Carcinogenic Compounds; Clean Water Act; Contingent Remedy; Debris; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; Metals; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Public Exposure; Publicly Owned Treatment Works (POTW); Soil; Solidification/ Stabilization; State Standards/Regulations; Treatability Studies; Treatment Technology.

BROWN'S BATTERY BREAKING, PA (Continued)

July 2, 1992

SITE SUMMARY

Date of previous RODs: 09/28/90
Lead: Fund
Contaminated Media: Soil, Debris, GW
Major Contaminants: Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

BUTZ LANDFILL, PA
June 30, 1992

SITE HISTORY/DESCRIPTION:
The Butz Landfill is an inactive landfill in Jackson Township, Monroe County, Pennsylvania. The 1.5-square-mile site extends into Pocono Township and includes the known extent of contamination and the 8.5-acre landfill. The sole source aquifer underlying the site supplies drinking water for approximately 3,300 people who live within 3 miles of the site and an additional 3,000 people during summer tourist seasons. In 1963, the property was purchased by the Butz family for landfill development. Beginning in 1965, municipal waste, sewage sludge/liquids, and possibly some industrial wastes were accepted at the landfill. During the years that the landfill 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. In 1986, additional onsite investigations 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. The same year, 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. A 1990 ROD addressed the first of two operable units, establishing an alternate water supply. This ROD addresses OU2, designed to prevent human exposure to contaminated ground water. The primary contaminants of concern affecting the ground water are VOCs, including benzene, PCE, and TCE.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes installing ground water extraction wells immediately downgradient from the landfill in the area of suspected ground water and DNAPLs contamination; extracting and transporting ground water to an appropriate treatment facility and treating the extracted water using either chemical precipitation, followed by air stripping with vapor phase carbon units to control emissions or granular activated carbon, as determined during the RD phase; discharging the treated ground water onsite to surface water; and disposing of residuals produced during the treatment process offsite. The estimated present worth cost for this remedial action ranges from $11,012,000 to $14,495,000, (depending on the final treatment selected during the RD), which includes an annual O&M cost ranging from $561,000 to $861,000 for up to 10 years.

PERFORMANCE STANDARDS OR GOALS:
Clean-up goals for ground water are based on SDWA MCLs and state standards designed to achieve background levels for all of the VOCs in the ground water, thereby restoring the ground water to its beneficial use as a drinking water source. Background concentrations will be determined by EPA based on contaminant concentrations in upgradient monitoring wells.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Background Levels; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Sole-Source Aquifer; Solvents; State Standards/Regulations; TCE; VOCs.

SITE SUMMARY

Dates of previous RODs: 09/28/90
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

C&D RECYCLING, PA
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 110-acre C&D Recycling site is a former metals recycling facility located along Brickyard Road in Foster Township, Luzerne County, Pennsylvania. Land use in the area is predominantly agricultural and residential, with fields and wooded areas to the west and north of the site and a residential development located northeast of the site. Mill Hopper Creek, a small stream, is located on the property and flows into a man-made pond to the south of the site. Ground water underlying the property is used for drinking water purposes. From 1963 to 1978, Lurgan Corporation operated a metals reclamation business, which recovered copper and/or lead from cable or scrap metal transported to the site. Five onsite furnaces were used to burn and process the cable, and these activities resulted in extensive contamination of the surrounding soil and sediment. Based on site documentation and reports by local residents, burning also took place in onsite pits. Lurgan Corporation drawings indicate that water used in the metals processing area was collected in a trench drain and directed to a leach pit (dry well). In 1979, the business was conveyed to C&D Recycling, who continued to operate the facility until 1984, when operations ceased. In 1984, the state collected soil and ash samples, which identified elevated levels of both lead and copper. In 1985, the state and C&D Recycling arranged for the excavation and offsite recycling of 134,200 pounds of lead-contaminated ash and soil at a lead refining center. In 1987, EPA required AT&T Nassau Metals Corporation, a potentially responsible party, to consolidate and cover piles of ash onsite and to construct sedimentation and erosion controls to minimize soil migration from the site in surface water runoff. Two underground storage tanks were also removed, decontaminated, and disposed. This ROD addresses a final remedy for the onsite contaminated soil, sediment, and debris. The primary contaminants of concern affecting the soil, sediment, and debris are metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and stabilizing onsite 20,565 cubic yards of contaminated soil and sediment with lead levels greater than 500 mg/kg, along with the onsite ash, followed by disposal in an offsite landfill; decontaminating and/or demolishing contaminated buildings and structures with offsite disposal or decontamination and recycling of dismantled material and equipment; conducting post-excavation/removal sampling to confirm that clean-up levels are met; removing any casings and wire for offsite disposal or recycling; abandoning wells that serve no useful long-term purpose; grading and revegetating excavated areas; monitoring air, ground water, and surface water; and implementing institutional controls, including deed restrictions. If, within 180 days of the issuance of this ROD, EPA receives information that indicates an onsite containment cell may be designed and constructed, then the stabilized and decontaminated materials may be disposed of onsite. The estimated present worth cost for this remedial action is $11,985,717, which includes an annual O&M cost of $25,390.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil excavation goals and debris decontamination goals are based on health-risk levels and include lead 500 mg/kg; copper 3,300 mg/kg; antimony 35 mg/kg. Excavation goals for sediment include lead 500 mg/kg; copper 2,900 mg/kg; antimony 35 mg/kg. All soil, sediment, and ash will be stabilized to below RCRA TCLP levels prior to disposal. Building surfaces will be decontaminated to the following: lead 50 ug/m^3; copper 1,000 ug/m^3; and antimony 500 ug/m^3.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of deed restrictions will be implemented for buildings and structures that were constructed prior to 1963 and are not dismantled and decontaminated, as well as the soil beneath them that is left in place, to ensure public knowledge of the location of contaminated materials and prevent land use.

KEYWORDS:

Air Monitoring; Arsenic; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Onsite Treatment; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/

C&D RECYCLING, PA (Continued)

September 30, 1992

Regulations; Surface Water Monitoring; Treatability Studies; Treatment Technology; Wetlands.

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris
Major Contaminants: Metals
Category: Source Control - Final Action

CHEM-SOLV, DE
March 31, 1992

SITE HISTORY/DESCRIPTION:
The Chem-Solv site, located in Cheswold, Kent County, Delaware, occupies approximately one-third of a 1.5-acre property and consists of a one-story concrete building, a distillation process building, and a concrete pad used for drum storage. Surrounding land use is mixed agricultural, residential, and commercial strip development. In the vicinity of the site, the Columbia Formation functions as a thin water-table aquifer and is a potential source of drinking water in the area. From 1981 to 1984, Chem-Solv, Inc., used the facility to purify spent industrial solvents and store the distillation residues, known as "still bottoms," for offsite disposal as hazardous waste. After an explosion and fire at the facility in 1984, during which stored solvents ran off the concrete pad, a state investigation concluded that this incident and prior hazardous waste handling violations had resulted in soil and possible ground water contamination of the site with VOCs. After Chem-Solv failed to comply with a state order, the state removed 1,300 cubic yards of contaminated soil and a portion of the storage pad and implemented a ground water treatment system that operated from 1985 until 1988. This ROD addresses the ground water contamination in the Columbia aquifer. The primary contaminants of concern affecting the ground water are VOCs, including benzene and TCE; and manganese, a metal.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes ground water pumping and offsite discharge to a POTW for treatment, or as a contingency if an agreement with the POTW cannot be reached, onsite treatment using filtration, and air stripping with onsite discharge to surface water; conducting ground water monitoring and providing an alternate water supply, including wellhead treatment to affected residences if ground water monitoring detects contamination in existing residential wells; removing existing recovery wells; and implementing institutional controls, including deed and ground water use restrictions. The present worth cost for the selected remedial action ranges from $660,000 to $686,000, which includes an annual O&M cost ranging from $57,000 to $148,000. Present worth costs for the contingency remedy would be $688,000, which include an annual O&M cost ranging from $148,000 to $189,000.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up goals are based on SDWA MCLs or risk-based levels, including benzene 5 ug/l (MCL); and TCE 5 ug/l (MCL); manganese 3,000 ug/l (risk-based).

INSTITUTIONAL CONTROLS:
A ground water restriction zone will be instituted and deed restrictions will be placed on all properties within the restriction zone until ground water clean-up levels are achieved throughout the contaminated area.

KEYWORDS:
Air Stripping; Alternate Water Supply; Benzene; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Discharge; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Final Action

COMMODORE SEMICONDUCTOR GROUP, PA
September 29, 1992

SITE HISTORY/DESCRIPTION:
The 14-acre Commodore Semiconductor Group (CSG) site is a manufacturing facility in Norristown, Montgomery County, Pennsylvania. Land use in the area is residential, commercial, and industrial with a wetland area located within 1 mile from the site. The site overlies a Class IIA aquifer that is used as a source of drinking water. From 1969 to present, the owners, including CGS, used the site to manufacture semiconductor chips. A concrete underground storage tank was installed adjacent to the southeast side of the building to store a waste solution known to contain TCE and other solvents generated from the manufacturing process. The concrete tank was reported to have leaked in 1974. As a result, an unlined steel tank was installed next to the concrete tank. Use of the concrete tank was discontinued. In 1978, a local water supplier detected TCE in two of its wells adjacent to the site. The state identified the CSG site as a possible TCE contaminant source. Subsequently, in 1979, the underground storage tanks were excavated and replaced with a waste solvent collection system. In 1981, CSG also eliminated use of TCE in their manufacturing process. From 1981 to 1984, to address the TCE contamination, CSG pumped and spray irrigated water from a public supply well, purchased and installed an air stripper for treating contaminated ground water, implemented a residential sampling program, and installed carbon filter systems at affected residences. In 1984, further state and EPA investigations confirmed contaminants onsite in ground water and drinking water. This ROD addresses the contamination of onsite ground water and drinking water. The primary contaminants of concern affecting the ground water are VOCs, including PCE and TCE.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes extending the public water supply lines and connecting affected residences located in areas south of the CSG facility; abandoning contaminated wells; continued maintenance of existing residential carbon units, with disposal or recycling of the spent carbon filters as determined during the remedial design phase; installing additional ground water extraction wells, air strippers, and vapor phase carbon units, to treat the contaminated ground water onsite with discharge to a public water system or reuse by the CSG facility, with overflow discharge offsite to a POTW; sampling ground water and treated water; and implementing institutional controls, including ground water well restrictions. The estimated present worth cost for this remedial action is $5,573,700, which includes an annual O&M cost of $446,500 for years 0-2, and $404,300 for years 3-30.

PERFORMANCE STANDARDS OR GOALS:
Ground water clean-up goals are based on background levels as established by SDWA MCLs or health-based levels, whichever are more stringent. Chemical-specific ground water goals include 1,2-DCB 75 ug/l; 1,2-DCA 810 ug/l; PCE 5 ug/l; TCA 200 ug/l; TCE 5 ug/l; and vinyl chloride 2 ug/l.

INSTITUTIONAL CONTROLS:
Ground water use restrictions on installing new wells shall be implemented in areas where MCLs are exceeded.

KEYWORDS:
Air Stripping; Alternative Water Supply; 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 Discharge; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Publicly Owned Treatment Works (POTW); PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs; Wetlands.

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

DIXIE CAVERNS COUNTY LANDFILL, VA

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 39-acre Dixie Caverns County Landfill is a former municipal landfill in Roanoke County, Virginia. The surrounding land is rural, with the nearest residence located one-half mile from the site. The site is situated on a steep ridge between two valleys surrounded by heavily forested mountains traversed by small streams. Two unnamed headwater streams receive surface water runoff from the site and discharge to the Roanoke River, which is located 2 miles south/southeast. The landfill is currently owned and was operated by the County of Roanoke from 1965 until its closure in 1976. During operation, the landfill accepted an estimated 440,000 cubic yards of municipal and industrial wastes, including refuse, scrap metal, fly ash, and sludge. In 1983, EPA investigations identified several disposal areas, including a discarded drum area, a sludge pit, and a large fly ash pile, which contained elevated levels of metals. In 1987, EPA conducted a removal action that addressed the drum and sludge areas, but recommended that removal of the fly ash be postponed. A 1991 ROD addressed the fly ash pile as OU1 and provided for excavation and transportation of approximately 9,000 cubic yards of fly ash to an EPA-approved high-temperature metals recovery facility for treatment and subsequent re-use. In 1992, a second EPA removal action addressed the northern drainage area and the soil in the vicinity of and directly beneath the fly ash pile. This ROD addresses areas at the site that were not previously addressed by OU1 or by the 1992 removal order, as OU2. Previous and ongoing removal and remedial actions have addressed or will address all risks posed by the site; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action. There are no costs associated with the no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Dates of previous RODs: 09/30/91
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

DUBLIN WATER SUPPLY, PA
December 30, 1991

SITE HISTORY/DESCRIPTION:
The 4.5-acre Dublin Water Supply is a former manufacturing facility located in Dublin Borough, Bucks County, Pennsylvania. The site consists of a one-story tower building and parking lot. The surrounding area is mixed commercial and residential, with a fruit orchard bordering the site to the north and west. Ground water beneath the site contributes to the aquifer by providing a drinking water source to area residents. The ground water flows toward residential and commercial wells in the Dublin Borough and is believed to be predominantly controlled by bedrock fractures. Surface drainage, which flows in a northward direction, is absorbed by the fruit orchard or discharges to a tributary of Morris Run located northwest of the site. Since the 1930s, the site has been used for various industrial purposes and has had several owners. From the early 1930's to 1956, the site operated as a hosiery mill. In 1956, Home Window Company of Pennsylvania used the property for the manufacture of aluminum doors and windows. In 1959, the property was purchased by Kollsman Motors Corporation (KMC) and used to manufacture mechanical and electromechanical components that are utilized in aircraft and missiles. During this time, TCE was used onsite and spent product was either poured onto the ground or stored in perforated drums. In 1973, Athlone Industries purchased the property for cleaning, stamping, and packaging softballs. TCE solvents were used as degreasing agents to assemble stamping machines. In 1986, the current owner purchased the site for antique car restoration. A portion of the site is currently leased to Laboratory Testing, Inc., for metallurgical testing. During a routine drinking water survey in 1986, the state discovered elevated levels of TCE affecting approximately 170 area homes. Under EPA's direction, the owner supplied carbon filtration units to affected residential water supplies and installed ground water monitoring wells, which indicated ground water contamination with several VOC compounds. This early action ROD addresses the provision of a permanent clean drinking water supply to affected area residents and businesses. An additional RI/FS, which commenced in 1991, will focus on remediation of the soil, ground water, and surface water in a separate clean-up action. The primary contaminants of concern affecting the ground water are VOCs, including TCE and PCE.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes installing and operating a new water supply well, or operation of the existing well within the plume, construction and operation of an onsite air stripping and vapor phase carbon adsorption treatment system, or other appropriate technology for the well; discharging the treated water to the municipal water supply system; expanding the Dublin Borough public distribution system to supply well and treated water to affected residences; and monitoring the residential and commercial wells not serviced by the public distribution system. The estimated present worth cost for this remedial action is $5,000,000, which includes an annual O&M cost of $300,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water standards are based on SDWA MCLs including TCE 5 ug/l, PCE 5 ug/l; vinyl chloride 2 ug/l; cis-1,2-DCE 70 ug/l; trans-1,2-DCE 100 ug/l; 1,1-DCE 7 ug/l; and 1,1,1-TCA 200 ug/l. Performance standards for air emissions from the ground water stripping unit shall comply with the National Ambient Air Quality Standard (NAAQS) under CAA, and disposal standards for spent carbon filters shall meet RCRA requirements.

INSTITUTIONAL CONTROLS:
Not provided.

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

DUBLIN WATER SUPPLY, PA (Continued)

December 30, 1991

SITE SUMMARY

Dates of previous RODs: None
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Interim

EASTERN DIVERSIFIED METALS, PA

July 2, 1992

SITE HISTORY/DESCRIPTION:

The 25-acre Eastern Diversified Metals site is a former metal processing plant located in a sparsely populated area in Rush Township, Schuylkill County, Pennsylvania. Land use in the area is predominantly open land with mixed residential, commercial, and industrial use. From 1966 to 1977, Eastern Diversified Metals operated a processing plant that reclaimed copper and aluminum from wire and cable. An estimated 150 million pounds of waste insulation material, or fluff, was disposed onsite in a swale behind the plant. This fluff, which contains polyvinyl chloride, polyethylene insulation chips, fibrous material, paper, soil, and metals, is contained in a 7.5-acre pile onsite. In 1971, in response to an application for an industrial landfill permit, a state inspection revealed leachate from the waste pile flowing to the Little Schuylkill River. In 1974, a leachate collection and treatment system was installed onsite. In 1979 and 1980, residents complained of odors and expressed health concerns over conditions at the site. In 1985, an investigation detected PCBs and lead in the waste pile and metals in a downgradient monitoring well. In 1987, a security fence was installed around the property. A previous ROD addressed areas of fluff, soil, sediment, and ground water contaminated with PCBs, dioxin, and metals. This ROD addresses a final remedy for the remainder of the fluff onsite. Future RODs will address soil contamination following analysis of soil samples taken as part of this remedy and deep ground water contamination. The primary contaminants of concern for leaching from the fluff are organics, including dioxin and PCBs; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes onsite recycling of fluff into one of two forms—a "Final Product" that requires no further offsite processing, or a "Non-Final Product," such as plastic pellets, which will undergo further offsite processing; testing recycling residuals for RCRA hazardous waste characteristics, with offsite disposal of non-RCRA wastes and onsite treatment of RCRA wastes using a technology to be determined based on a treatability study; disposing of the treated wastes offsite; testing soil underlying the fluff; and implementing erosion and sedimentation controls. The estimated total present worth cost for this remedial action ranges from $13,100,000 to $21,900,000, which includes a total O&M cost of $6,900,000.

PERFORMANCE STANDARDS OR GOALS:

There are no specific performance standards for any of the contaminants. The recycling products and the residuals will be tested for RCRA hazardous waste characteristics prior to use of the product or disposal of non-recyclable residuals.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carcinogenic Compounds; Clean Water Act; Debris; Dioxin; Direct Contact; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PCBs; RCRA; State Standards/Regulations; Treatability Studies.

SITE SUMMARY

Date of previous RODs: 03/29/91
Lead: Federal Enforcement
Contaminated Medium: Debris
Major Contaminants: Organics, Metals
Category: Source Control - Interim

FIKE CHEMICAL, WV
March 31, 1992

SITE HISTORY/DESCRIPTION:

The 11.9-acre Fike Chemical site is a former chemical manufacturing plant and associated wastewater treatment facility located in Nitro, West Virginia. Land use in the area is predominantly industrial, with the Kanawha River located approximately one-half mile from the site. The estimated 2,500 people who reside within 1 mile of the site obtain drinking water from a treatment plant located 15 miles upstream, which uses the Elk River as a source of water. The facility is situated on the site of a World War I munitions plant. In 1951, the original chemical plant was constructed and began operating. From 1978 to 1988, Fike Chemical manufactured more than 60 chemicals at the site and disposed of drummed and containerized wastes in pits and trenches located throughout the facility until the facility was abandoned in mid-1988. There are no known records regarding the contents of the drums and containers or details of their disposal at the site. As a result of previous state and federal environmental enforcement actions, EPA conducted numerous investigations that revealed VOCs, other organics, metals, and other inorganics in buried drums and containers. Previous RODs addressed the removal of bulk chemicals stored in surface drums and tanks as well as the dismantling, decontamination, and disposal of tanks, equipment, and structures located onsite. This interim remedy ROD addresses the removal of buried drums and containers as OU3 to eliminate future or continued contamination of soil, ground water, surface water, and the atmosphere. Future actions will address continued investigation and possible remediation of soil, ground water, surface water and the existing sewer system. The primary contaminants of concern in the buried waste pits are VOCs, including PCE; other organics, including dioxins, pesticides, and phenols; metals; acids; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating between 7,000 and 17,000 buried drums and containers; using a self-supported portable structure to enclose active excavation areas and to minimize organic vapor and dust emissions and treating air emissions using an air filter and vapor phase carbon adsorption, with offsite disposal or incineration of the spent carbon and filters; sampling, testing, repackaging, and shipping of drummed waste offsite; using offsite incineration or other equivalent treatment technologies to treat drums containing solids and liquids; decontaminating empty drums onsite prior to offsite disposal of treatment liquids and metals; stabilizing/neutralizing acidic wastes prior to offsite incineration; onsite storage of dioxin-contaminated drummed wastes and dioxin-contaminated soil and sludge identified during excavation for future treatment; treating cylinders onsite using a cylinder recovery vessel, or repackaging for offsite disposal; backfilling excavated areas; employing storm water management or erosion controls to divert surface water from the site; monitoring air; and treating any ground water collected during the excavation at the cooperative sewage treatment plant. The estimated present worth cost for this remedial action is $16,059,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Although this interim action does not provide for chemical-specific clean-up standards, it does provide for the removal of source contamination in accordance with state and federal requirements. Performance standards will be established in future OUs addressing site media contamination.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Acids; Air Monitoring; Asbestos; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Dioxin; Direct Contact; Excavation; Filling; Incineration/Thermal Destruction; Inorganics; Interim Remedy; Metals; Offsite Disposal; Offsite Treatment; Organics; PCE; Pesticides; Phenols; RCRA; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Temporary Storage; Treatment Technology; VOCs.

FIKE CHEMICAL, WV (Continued)
March 31, 1992

SITE SUMMARY

Dates of previous RODs: 09/29/88, 09/28/90
Lead: Fund
Contaminated Medium: Debris
Major Contaminants: VOCs, Other Organics, Metals, Inorganics, Acids
Category: Source Control - Interim

LINDANE DUMP, PA
March 31, 1992

SITE HISTORY/DESCRIPTION:

The 61.8-acre Lindane Dump is located in the Allegheny River Valley in Harrison Township, near Natron, Pennsylvania. Land use in the area is mixed residential, commercial, recreational, manufacturing, and special use. The site is divided into both upper and lower project areas separated by steeply sloping areas. The majority of both the upper and lower areas have been graded and form terraces on the hillside extending from the residential areas, located north and northeast of the project site. The upper area consists of fill and waste materials. The Allegheny River, which is the major surface water stream in the area, provides the public drinking water supply for the Township. From 1850 to 1980, the lower portion of the site, the 47.5 acres owned by the Allegheny Ludlum Corporation, was used for waste disposal. The area beneath the site was mined extensively for coal from the latter part of the 19th century to the first half of the 20th century. In 1985, Pennsylvania Salt Manufacturing Company (later known as Pennsalt, then Pennwalt) used the site for waste disposal of mining tailings and cinders. Tailings from the mining operations and cinders (bottom ash) from steam and electrical power generation at the plant were placed onsite, and sulfuric acid was produced at the Pennsalt plant. This operation was discontinued prior to 1920 and resultant cinder and slag, along with cryolite ore tailings, BHC (Lindane) filter cake residuals containing pesticides, and waste sulfuric acid containing DDT were disposed of onsite. In 1965, after the property was sold to Allegheny Ludlum Corporation, other wastes—including construction wastes, industrial waste treatment plant sludge, coke, rubber tires, and slag—were disposed of onsite. During 1976 and 1977, the Alsco Community Park was constructed by the Harrison Township on a 14.3-acre tract of the upper site area that had been previously used as a waste disposal site. In addition, fill material from an unknown source was placed and graded into the park. This ROD addresses onsite contaminated soil and controlling ground water and surface water contamination. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs, including benzene; other organics including pesticides such as DDT, Lindane, and phenols; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a multi-layer cap where side slopes are stabilized; constructing a combination clay and soil cap where site slopes are unstable, and vegetating the capped areas; upgrading the existing leachate/shallow ground water collection system, and treating leachate and shallow ground water using air stripping, with onsite discharge to the Allegheny River; disposing of sludge generated during the treatment process offsite at an approved facility; constructing and maintaining a perimeter fence; monitoring ground water and surface water; restoring the Alsco Community park; and implementing institutional controls, including deed restrictions. The estimated present worth cost for this remedial action is $14,122,500, which includes an annual O&M cost ranging from $634,000 to $634,700 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific goals for leachate and shallow ground water clean-up goals are based on the more stringent Pennsylvania state water quality criteria standards or SDWA MCLs, and include gamma BHC (Lindane) 0.2 ug/l and benzene 5 ug/l. An ARAR waiver is being issued for ground water based on technical impracticability of capturing all ground water due to the complex hydrogeologic conditions at the site, the possibility of subsidence and site damage due to extensive pumping, and the potential for migration during the pumping.

INSTITUTIONAL CONTROLS:

Institutional controls including deed restrictions will be implemented to prevent any activities that may compromise the integrity of the cap.

KEYWORDS:

Air Stripping; ARAR Waiver; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachate Collection/Treatment; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; Pesticides; Phenol; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/ Regulations; Surface Water Monitoring; VOCs.

LINDANE DUMP, PA (Continued)

March 31, 1992

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

MW MANUFACTURING, PA
June 30, 1992

SITE HISTORY/DESCRIPTION:
The 15-acre MW Manufacturing Site is a former copper recovery facility in Monitor County, Pennsylvania. Land use in the area is mixed farmland and residential with a wetlands area, Amuses Creek, located 700 feet west of the site. The estimated 5,200 people who reside within 1/4 mile of the site use private ground water wells as their drinking water source. From 1969 to 1972, MW Manufacturing Company, which is a subsidiary of Nile Corporation, used the site for copper recovery from scrap wire, using both mechanical and chemical processes. During this time generated carbon wastes by the chemical process and generated fluff material (fibrous insulation materials contaminated with metals and solvents) were dumped onsite, and spent solvents were allegedly disposed of onsite. In 1972, MW Manufacturing filed for bankruptcy and the Philadelphia National Bank acquired the property by default. In 1976, Warehouse 81, Inc., acquired the site and unsuccessfully attempted to recover copper from the large waste piles of fluff material. In 1982, the state performed an initial remedial investigation that 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. Based on this investigation, the site has been divided into three OUs to address cleanup of all contaminated media. A 1989 ROD (OU1) addressed the carbon waste pile by excavating the carbon waste pile and incinerating the waste offsite. A 1990 ROD (OU2) addressed treating the fluff waste, contaminated soil, drums, tanks, and the lagoon. This ROD provides a final remedy for the contaminated of the ground water and the adjacent wetland areas as OU3. The primary contaminants of concern affecting the ground water are VOCs, including benzene, PCE, and TCE; other organics, including PAHs, pesticides, and phenols; and metals.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes constructing a public water supply system to supply drinking water to present and future affected residences; extracting contaminated ground water and treating the water onsite using chemical precipitation to remove inorganics, and air stripping to remove VOCs; treating effluent from the air stripping process using carbon adsorption to remove organics, followed by onsite discharge to surface water; treating air emissions from the air stripping process using thermal destruction, and recycling the residual carbon waste offsite; disposing of any collected free product offsite; dewatering and disposing of sludge generated during the treatment process offsite at a RCRA landfill; and implementing a ground water monitoring program. If it is determined by EPA and the state that certain portions of the aquifer cannot be restored to background levels, the ROD specifies modification of the selected remedy, which include engineering controls; physical barriers, or long-term pumping to contain contamination; institutional controls to limit access; and waiver of chemical-specific ARARs for portions of the aquifer where further contaminant reduction is impracticable. The estimated present worth cost for this remedial action is $37,402,000, which includes an annual O&M cost of $1,568,000 for 30 years, with $20,000 additional every 5 years.

PERFORMANCE STANDARDS OR GOALS:
Ground water clean-up goals are based on state standards, SDWA MCLs and MCLGs under SDWA, CWA, Pennsylvania Clean Streams Law, and background levels. The clean-up goals will attain background concentrations that will be determined during the remedial design. In the event that the background concentration of the contaminant is not detected, the most stringent chemical-specific ground water clean-up goal will be met.

INSTITUTIONAL CONTROLS:
As part of a contingency, institutional controls may be implemented if necessary to restrict access to portions of the aquifer.

KEYWORDS:
Air Stripping; Alternate Water Supply; ARAR Waiver; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingency Remedy; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; MCLGs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCE; Pesticides; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs; Wetlands.

MW MANUFACTURING, PA (Continued)

June 30, 1992

SITE SUMMARY

Dates of previous RODs: 03/31/89, 06/29/90
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Ground Water - Final Action

PAOLI RAIL YARD, PA
July 21, 1992

SITE HISTORY/DESCRIPTION:

The 428-acre Paoli Rail Yard site is a maintenance, storage, and repair facility located north of Paoli in Chester County, Pennsylvania. The site consists of the 28-acre rail yard and the surrounding 400-acre watershed. The site, which is mainly wooded, is bordered to the north by residential areas and to the south by commercial developments. Since 1915, the rail yard has provided general maintenance and repair support for rail cars. The site operates five track areas used for multiple rail lines, a power house, a freight house, and a repair shop. Prior to 1968, the site was owned by Pennsylvania Railroad, after which it changed hands several times. Contamination of the soil in and around the car shop is attributed to releases of fuel oil and PCB-laden transformer fluid from rail cars during maintenance and repair activities. In 1985, EPA identified PCB contamination in soil and sediment, and on building surfaces. The rail companies agreed to address site clean-up activities, including erosion, sedimentation, and storm water characteristics and control, decontamination, soil sampling, excavation of 3,500 cubic yards residential soil and implementation of worker protection measures. Further EPA investigations identified soil samples in and around the car shop, parallel to the rail tracks, and 10 feet below the facility that were contaminated by fuel oil in the form of benzene, toluene, ethylbenzene, and xylenes (BTEX). Sediment samples taken from the three creeks that drained the general rail area also showed PCB contamination decreasing further from the rail yard. Soil samples taken from residences lying adjacent to the facility identified topsoil contamination presumably resulting from soil erosion from the rail yard. This ROD provides a final remedy for contaminated soil (from the rail yard and residences), sediment, and structures at the Paoli Rail Yard, and contaminated ground water. The primary contaminants of concern affecting the soil, sediment, debris, and ground water are VOCs, including benzene, toluene, and xylenes; and other organics, including PCBs.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and onsite treatment of approximately 28,000 cubic yards of contaminated soil with PCB concentrations of 25 mg/kg or greater, 3,000 cubic yards of previously excavated contaminated residential soil currently stored in an onsite containment cell with PCBs greater than 2 mg/kg, and stream sediment with PCB concentrations exceeding 1 mg/kg using solidification/stabilization processes, followed by disposal of the solidified mass in an onsite containment cell, with an impermeable cap; onsite decontamination of 35,000 square feet of high contact surfaces in the rail yard buildings and structures with PCB concentrations in excess of 10 ug/100 cm^2; mitigating impacts to wetland areas from the sediment excavation; pumping and onsite treatment of fuel-oil contaminated ground water; recovering the oil using a fuel oil recovery system and disposing of the recovered oil offsite at a RCRA facility, treating the ground water using filtration and activated carbon with onsite discharge through a subsurface infiltration gallery, with offsite disposal of the spent carbon; implementing erosion controls to manage sediment and storm water run-off; backfilling and regrading, and revegetating excavated areas; monitoring soil, sediment, ground water and air; and implementing institutional controls including deed, land, and ground water use restrictions. The estimated present worth cost for this remedial action is $28,268,000, which includes an O&M cost of $494,000 for years 0-2 and $258,250 for the remaining 7.5 years.

PERFORMANCE STANDARDS OR GOALS:

Soil clean-up standards at the rail yard are based on health-based levels, including PCB 25 mg/kg for soil onsite and 2 mg/kg for residential areas. Chemical-specific ground water clean-up goals are based on the more stringent of state standards or SDWA MCLs, and include benzene 5 ug/l. An ARAR waiver will also be issued for certain management controls at the TSCA waste landfill under CERCLA 121(d)(4).

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented onsite to protect the integrity of the remedy, and to prevent further development of the land or use of ground water for domestic purposes.

KEYWORDS:

ARAR Waiver; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Decontamination; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water

PAOLI RAIL YARD, PA (Continued)
July 21, 1992

Treatment; Institutional Controls; MCLs; O&M; Offsite Disposal; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Toluene; Toxic Substances Control Act; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action
Ground Water - Final Action

RAYMARK, PA
December 30, 1991

SITE HISTORY/DESCRIPTION:
The 7-acre Raymark site is an active metal manufacturing and electroplating plant in the Borough of Hatboro, Montgomery County, Pennsylvania. The site, located in an industrial area, 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. Facility documents indicate that piping may have directed waste from the degreasing unit to four small lagoons, which contained effluent from an onsite wastewater treatment building. The lagoons were subsequently cleaned and backfilled in the 1970;s. In 1979, when EPA discovered TCE in the Hatboro public water supply wells, the Hatboro Borough Water Authority removed the 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 concluded that site contaminants were a contributing source of contamination in the downgradient public water supply wells. 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. EPA site investigations also revealed high concentrations of TCE and lower levels of PAHs and PCBs in soil. In 1990, a pilot scale treatability study was conducted to evaluate the effectiveness of Soil Vapor Extraction (SVE) as a remedial technology for the site soil and underlying bed rock. A 1990 ROD addressed contamination of the drinking water and risks posed by ground water as OU2 and OU3, respectively. This ROD addresses the soil/source of contamination as the final action at the site, as OU1. The primary contaminants of concern affecting the soil/source are VOCs, including 1,2-DCE, PCE, and TCE.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes constructing, operating, and maintaining a soil vapor extraction system to remove VOCs from soil and unsaturated bedrock; treating air emissions from the extraction process using vapor phase carbon adsorption; constructing and maintaining a low permeability cap over the treated soil to minimize infiltration; conducting additional sampling of surface soil; and implementing institutional controls including deed restrictions, and site access restrictions. The estimated present worth cost for this remedial action is $3,654,400, which includes an annual O&M cost of $1,220,600 for 20 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical and location-specific performance goals are based on federal and state standards. VOCs will be removed from the soil/source such that TCE in subsurface soil does not exceed 50 ug/l. VOCs will be removed from subsurface soil so that leaching of TCE from subsurface soil will not exceed SDWA ground water MCLs. Organic emissions will be minimized from the vapor extraction system such that the maximum rate of organic emission does not exceed 3 pounds per hour or 15 pounds per day. Infiltration of contaminants through the low permeability cap shall not exceed 9 cubic feet per day. Water potentially generated during the SVE process will be treated to meet CWA levels, as stated in the ROD for OUs 2 and 3. The excess cancer risk resulting from site-related contamination will be reduced to a 10^{-6} level and the HI will equal 1.

INSTITUTIONAL CONTROLS:
Institutional controls will be implemented, including deed restrictions to restrict access to the contaminated soil, to prevent disturbance to the cap and ensure the integrity of the selected remedy.

KEYWORDS:
Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Institutional Controls; MCLs; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

RAYMARK, PA (Continued)

December 30, 1991

SITE SUMMARY

Dates of previous RODs: 09/28/90
Lead: Fund
Contaminated Medium: Soil
Major Contaminants: VOCs
Category: Source Control - Final Action

RHINEHART TIRE FIRE DUMP, VA
September 29, 1992

SITE HISTORY/DESCRIPTION:
The Rhinehart Tire Fire Dump site is located in a 22-acre drainage area of a sparsely populated rural area in western Frederick County, Virginia. Surface water runoff flows into a north-south tributary that discharges to Hogue Creek, which is 4,000 feet downstream. Bedrock is noted to be highly fractured, and the ground water flow in the overburden aquifer is toward Massey Run. From 1972 to 1983, the site owner conducted a tire disposal operation, which consisted of transporting discarded tires from various locations and storing them on a 5-acre wooded slope behind his home. An estimated 5 to 7 million tires that had been accumulated caught on fire in October 1983 and burned until July 1984. As a result of the fire, a free-flowing oily-tar, which contained anthracene, benzene, cadmium, chromium, ethylbenzene, napthalene, nickel, pyrene, toluene, and zinc, began to seep out of the tire pile into Massey Run and on to Hogue Creek. In late 1983, EPA's emergency response team constructed a secondary lined containment basin, known as "Dutchman's Pond," downslope of the fire area to contain water generated by the early fire-fighting efforts and oil products from the burning tires. The oily-tar waste stream exhibited properties similar to heating oil; therefore, approximately 800,000 gallons could be collected, removed offsite, and recycled into fuel oils. EPA directed the site owner to construct ditches and dikes for drainage control. In 1984, ground water studies by EPA concluded that ground water contamination was limited to the Massey Run drainage basin. A 1988 ROD addressed the migration of contaminants offsite via surface water runoff, as OU1, and included construction of an onsite wastewater treatment plant. This ROD provides for an early remedial action for the soil, sediment, debris, and surface water associated with the onsite containment basin known as "Dutchman's Ponds" as OU2. A future ROD will address OU3, which includes the remainder of site contamination, and sludge generated from the treatment processes. The primary contaminants of concern affecting the soil, sediment, debris, and surface water are metals, including arsenic, lead, and zinc.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating approximately 1,125 cubic yards of contaminated soil with zinc concentrations greater than 50 mg/kg from the pond area; sampling, excavating, and dewatering pond sediment using solidification with a solid reagent; testing the soil and sediment for hazardous characteristics and transporting these offsite for appropriate disposal; removing the synthetic liner within the pond, with offsite disposal; treating approximately 200,000 gallons of contaminated surface water from the pond using the existing oil/water separator; directing the water to Rhinehart's Pond for treatment in the existing wastewater treatment plant using chemical precipitation and filtration to remove solids, with discharge of the treated water onsite to Massey Run; backfilling Dutchman's Pond, and any surrounding soil that may be excavated with clean soil; and implementing soil erosion controls. The estimated present worth cost for this remedial action is $1,300,000, which includes an estimated annual O&M cost of $12,000 for 2 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil excavation goals are based on background and aquatic toxicity levels and include zinc 50 mg/kg. Chemical-specific surface water discharge limits are based on state standards and include aluminum 87 ug/l; arsenic 360 ug/l; copper 9.2 ug/l; iron 1,000 ug/l; lead 34 ug/l; nickel 1,100 ug/l; silver 0.12 ug/l; and zinc 180 ug/l.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Arsenic; Background Levels; Carcinogenic Compounds; Clean Closure; Debris; Direct Contact; Dredging; Excavation; Filling; Lead; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Surface Water; Surface Water Treatment; Treatment Technology.

RHINEHART TIRE FIRE DUMP, VA (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: 06/30/88
Lead: Fund
Contaminated Media: Soil, Sediment, Debris, SW
Major Contaminants: Metals
Category: Source Control - Interim

ROUTE 940 DRUM DUMP, PA

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 2.5-acre Route 940 Drum Dump site is a grass-covered clearing in the Tobyhanna Township, Monroe County, Pennsylvania. This site and adjacent land area is presently zoned as a commercial/light-industrial area. The site is currently inactive with some stockpiles of soil and several open excavations on the surface. The site is bordered on all four sides by a pine-oak woodland with few nearby residences; however, based on aerial surveys, approximately 4,000 people who live within a 3-mile radius of the site use the aquifer beneath the site as their source of potable water. Between 1974 and 1978, approximately 600 drums of unknown contents from an unknown source were stored in the southeast corner of the site. In 1978, approximately 2 years after the sale of the site by the J.E.M. Partnership to LandMark, one of the partners of the J.E.M. Partnership arranged for the removal of the drums from the site at the request of LandMark. From 1983 to 1987, several investigations, monitoring events, and interim measures were completed at the site. It was concluded that some drums may have been buried onsite and that the contents of some of the drums stored there previously may have been dumped onto the ground. Current onsite investigations revealed that any previously identified site contaminants now have been reduced to levels that no longer pose a significant direct health threat or any threat from potential migration in ground water; and thus, the site does not warrant any further remediation. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no action with future ground water monitoring. There are no costs provided for this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Ground Water; Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

STRASBURG LANDFILL, PA
March 31, 1992

SITE HISTORY/DESCRIPTION:
The 22-acre Strasburg Landfill site is an inactive landfill located within a 220-acre tract of land in Newlin and West Bradford Townships, Chester County, Pennsylvania. The site is characterized by hills draining toward Brandywine Creek and its floodplain, which form the southern and western site boundaries. The nearest wetland is the Briar Run watershed, located 600 feet east/southeast of the site. Land use in the area is primarily suburban residential, with some residual agricultural areas. The 201 single-family residences that surround the site use ground water as a drinking water source. Prior to 1973, the site was used as farmland. Landfilling permits were granted, and from 1979 to 1983, the landfill accepted more than 3 million cubic yards of industrial and heavy metals waste and sewage treatment plant sludge, including over 1,000 cubic yards of polyvinyl chloride (PVC). In 1979, state investigations determined that landfill operations had resulted in excessive siltation of Briar Run, and in 1980, the state permanently prohibited the landfill from receiving additional industrial waste. In 1983, after the owners were cited for failure to correct onsite violations, the state ordered the landfill closed. As a result of improper landfill closure efforts, over 15 leachate seeps have increased cap erosion and flowed into adjacent ground water and surface water, including Briar Creek. In 1983, state studies detected VOCs and organics in both onsite monitoring wells and offsite residential wells. The state initiated an interim action to control the leachate flow in which surface water runoff and leachate were directed into unlined sediment ponds. A 1989 ROD, OU1, addressed contaminated residential wells and exposure pathways, and provided an interim remedy to limit site access. A 1991 ROD addressed site access and security, and provided for the construction of a security fence and additional warning signs, as OU2. This ROD addresses OU3, the landfill surface, including the integrity of the cap, nearby surface streams, air in and around the landfill, the surficial aquifer, and protection of ground water from further contamination. Ground water remediation will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil, debris, and air are VOCs, including benzene, TCE, toluene, and xylenes.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating and removing the existing landfill cover, regrading the slopes of the landfill to conform with the PA and RCRA performance requirements, and replacing the existing landfill cap with a multi-layer cap; installing a gas venting system to operate as either an active or passive system, depending upon the measured gas emissions; installing a leachate collection trench around the eastern, southern, and western perimeters of the landfill to collect leachate migrating into the surfical aquifer; treating the leachate using a UV/ozone treatment system, based on the results of a pilot test, followed by onsite discharge to an onsite surface stream; monitoring ground water and air; and implementing site access restrictions. The estimated present worth cost for this remedial action ranges from $10,397,070 to $11,306,460, which includes an annual O&M cost of $312,471 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Site-specific clean-up goals will meet state and closure ARARs.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air; Air Monitoring; Benzene; Capping; Carcinogenic Compounds; Debris; Direct Contact; Excavation; Floodplain; Ground Water Monitoring; Landfill Closure; Leachate Collection/Treatment; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Venting; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 06/28/89, 06/29/91
Lead: Fund
Contaminated Media: Soil, Debris, Air
Major Contaminants: VOCs
Category: Source Control - Final Action
Ground Water - Interim

SUFFOLK CITY LANDFILL, VA

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 67-acre Suffolk City Landfill site is an unlined sanitary landfill located in Suffolk, Virginia. Land use in the area is predominantly agricultural and residential and the 40 to 45 residences located within 1 mile of the site use the ground water as their primary source of drinking water. From 1967 to 1985, the City of Suffolk operated the landfill, which received municipal solid waste from both the city and Nansemond County. Wastes were disposed of onsite by the trench and fill method, compacted by lifts above grade, and then covered with approximately 2 feet of clean soil from an onsite borrow area. In 1983, when the permit for the operation of the landfill was reissued, it required the city to close the landfill once the regional landfill became operational and to implement a closure plan, which had been submitted to the state. While preparing to implement the closure plan, the city discovered documentation that indicated that, in 1970, 20 tons of pesticide-contaminated debris had been disposed of in the landfill. A 1970 state memorandum documented that the pesticides were treated with lime and covered with 2 feet of soil to promote hydrolytic processes that break down the pesticides. In early 1989, the city placed an impermeable tarpaulin plastic liner over the pesticide disposal area to prevent surface water infiltration through the soil cover. In mid-1989, the state required the city to implement a temporary leachate collection system, and the collected leachate was sampled periodically and transported to an offsite sewage treatment plant. This ROD addresses the onsite landfill area. Based on findings during the RI, EPA and the state have determined that the site does not pose an unacceptable risk to either human health or the environment, and thus no remedial action is required. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action with ground water monitoring, since sampling results indicate that the site poses no risk to human health or the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

TONOLLI, PA
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 30-acre Tonolli site is located in Nesquehoning Borough, Carbon County, Pennsylvania. Land use in the area is predominantly industrial and residential, with 20 residences located within one-quarter mile of the site. Two aquifers, an overburden aquifer and a bedrock aquifer, are found below the site, the latter being a current source of drinking water. Site-related impacts appear to be confined to the overburden aquifer only. From 1974 to 1986, the Tonolli Corporation operated a battery recycling and secondary lead smelting plant onsite. Operations included storage, breaking, processing, and smelting of used batteries, battery components, and other lead-bearing materials. The site consists of a battery receiving and storage area, crushing operation, smelter, refinery, wastewater treatment plant, above-ground 500,000-gallon wastewater storage tank, a rubber-lined waste lagoon, and a 10-acre rubber-lined solid waste landfill. Four primary waste streams were generated from site operations and included slag from the secondary lead smelting process, which was disposed of in the landfill; calcium sulfate sludge from air pollution control scrubbers, which was pumped to the landfill; plastic battery casings and bakelite chips, which were disposed of in the landfill; and excess process water, battery acid, and stormwater runoff, which went to the wastewater lagoon to be neutralized and recirculated back into the lime slurry air scrubbers. From 1974 to 1989, the state, EPA, and Tonolli Corporation conducted various sampling investigations that showed elevated levels of lead and other heavy metals in the soil, air, surface water, and ground water. In 1985, Tonolli filed for bankruptcy and abandoned the site. In 1989, EPA's Emergency Response Program completed stabilization activities, which included pumping and onsite treatment of lagoon wastewater, pumping and offsite disposal of wastewater in the above-ground storage tank, excavating and stabilizing lagoon sludge, removing the lagoon liner, excavating the soil beneath the lagoon, backfilling and grading an illegal diversion ditch and the lagoon, repairing the perimeter fencing, and installing a mobile onsite treatment system for contaminated surface water. In 1991, EPA issued a UAO to 46 PRPs to operate and maintain the automated onsite water treatment plant to address the contaminated surface water that continues to flow across the site during precipitation events. This ROD addresses a final remedy for all the contaminated media present onsite, including battery piles, onsite structures, soil, sediment, ground water, and surface water. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and surface water are metals, including arsenic, cadmium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes transporting and treating offsite approximately 13,000 cubic yards of battery wastes, including battery casings, iron oxide, sump sediment, and dust by resource recovery at a secondary lead smelter; conducting additional sampling and characterization of other waste pile materials effectively via excavating and characterization of all sediment and battery fragments in stormwater collection piping and onsite dumps, or consolidation within the onsite landfill; excavating and consolidating approximately 39,000 cubic yards of soil with lead levels above 1,000 mg/kg within the onsite landfill; stabilizing onsite approximately 7,300 cubic yards of soil with lead levels over 10,000 mg/kg, with consolidation of the treated soil into the onsite landfill; excavating soil situated in the residential area to the immediate west of the property boundary containing greater than lead 500 mg/kg; collecting confirmatory samples, consolidating soil into the onsite landfill, and backfilling both onsite and offsite excavated areas with clean soil; sampling to define the area and volume of soil potentially impacted by the site activities and requiring remediation; consolidating and, if necessary, treating approximately 2,020 cubic yards of treated sludge, 250 drums of melted plastic, and 210 cubic yards of excavated lagoon soil in the onsite landfill prior to closure; conducting additional sampling and completion of bioassays for contaminated sediment in Bear and Nesquehoning Creeks during the RD to develop appropriate clean-up levels, and excavating all sediment above the set levels from the creek(s) with consolidation within the onsite landfill; closing the onsite landfill in accordance with the federally authorized state requirements for hazardous waste, including removal of standing water from the landfill; upgrading the leachate collection system, consolidating materials generated during the remedial action within the landfill to meet the minimum grading requirements;

TONOLLI, PA (Continued)
September 30, 1992

application of the properly designed layer of agricultural limestone, and covering over the landfill with a low permeability cap; conducting a treatability study to evaluate the optimal application rate of agricultural limestone to provide maximum pH buffering capacity to the consolidated soil for this in-situ passive treatment method; maintaining the cap and dewatering system, and monitoring ground water; collecting and treating approximately 2 million gallons of landfill leachate decontamination fluids generated during remediation, and approximately 16 gallons per year of contaminated stormwater using the existing onsite treatment system, prior to onsite discharge to Nesquehoning Creek; using monitoring data collected from the treatment system to determine appropriate discharge levels; decontaminating onsite buildings, dismantling of nonstructural components, with removal of equipment and debris offsite; disposing of drained nickel/iron batteries offsite; monitoring air; implementing measures to prevent runoff of surface waters, sediment, and/or contaminated soil or battery wastes into Nesquehoning or Bear Creeks; evaluating underground storage tanks during remedial design, any tanks that will impede the completion of the selected remedy (especially contaminated soil) will be addressed during remediation; treating the contaminated overburdened ground water by constructing a vertical chemical barrier, with possible injection of pH-adjusted water to enhance ground water flow rates; using gradient controls to prevent infiltration of contaminants into the bedrock aquifer; monitoring the effectiveness of the vertical chemical barrier and/or injection of the pH adjusted fluids; and implementing institutional controls, including deed restrictions to prevent excavation of the landfill and limit site use, and site access restrictions. The estimated present worth cost for this remedial action is $16,616,000, which includes an estimated annual O&M cost ranging from $35,300 to $35,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil excavation levels are based on health-risk calculations and include onsite lead 1,000 mg/kg and offsite lead 500 mg/kg. Soil will be stabilized onsite to meet RCRA TCLP levels, such as lead 5 mg/l, prior to disposal. Chemical-specific sediment clean-up levels will be determined during the remedial design stage. Chemical-specific surface water and ground water clean-up levels will also be determined during the remedial design stage and will be based on allowable NPDES discharge parameters and state-specified background levels, respectively.

INSTITUTIONAL CONTROLS:
Institutional controls in the form of deed restrictions will be implemented to limit the use of the land to industrial applications and prevent excavation or construction on the closed landfill.

KEYWORDS:
Air Monitoring; Arsenic; Capping; Carcinogenic Compounds; Clean Air Act; Debris; Decontamination; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Solidification/ Stabilization; State Standards/Regulations; Surface Water; Treatability Studies; Treatment Technology.

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW, SW
Major Contaminants: Metals
Category: Source Control - Final Action
Ground Water - Final Action

U.S. DEFENSE GENERAL SUPPLY CENTER (OPERABLE UNIT 1), VA

May 15, 1992

SITE HISTORY/DESCRIPTION:

The 640-acre U.S. Defense General Supply Center (DGSC) is a military support, service, and storage facility located approximately 11 miles south of the City of Richmond, Virginia. Land use in the area is predominantly residential and wooded, with the James River located approximately 1 mile east of the site. Although the site overlies a shallow aquifer, residences in the area are serviced by a municipal drinking water facility. From the 1940's to 1970's, DGSC provided multiple support functions for the U.S. Army. Operational areas consisted of indoor and outdoor material storage areas, a motor pool facility, a National Guard training area, fire training areas, and various acid neutralization pits. Materials that were stored in Open Storage Areas (OSA) consisted mainly of petroleum, oils, and lubricants although, in the past, there were reported pesticide and herbicide spills. Soil contamination at the OSA source area resulted from improper chemical handling and storage activities conducted during this time. In 1986, as part of a RCRA Corrective Action permit for the facility, remedial investigations revealed contamination by VOCs, other organics, metals, and inorganics in both the soil and ground water throughout the facility. As a result, remediation of DGSC has been divided into eight operable units (OUs). This ROD addresses the interim remediation of OU1, the contaminated soil at OSA. Future RODs will address onsite contaminated media at the remaining seven areas as OU2 through OU8. The primary contaminants of concern affecting the soil are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs, pesticides, and phenols; metals, including arsenic, chromium, and lead; acids; and oils.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes implementing institutional controls and site access restrictions, including fencing of the storage area. The present worth cost for this remedial action is $15,000. No O&M costs are applicable to this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to limit future development of the area.

KEYWORDS:

Acids; Arsenic; Carcinogenic Compounds; Chromium; Direct Contact; Institutional Controls; Interim Remedy; Metals; Oils; Organics; PAHs; Pesticides; Soil; Solvents; Toluene; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 03/25/92
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: VOCs, Other Organics, Metals, Acids, Oils
Category: Source Control - Interim

U.S. DEFENSE GENERAL SUPPLY CENTER (OPERABLE UNIT 5), VA

March 25, 1992

SITE HISTORY/DESCRIPTION:

The 640-acre U.S. Defense General Supply Center (DGSC) is a military support, service, and storage facility located approximately 11 miles south of the City of Richmond, Virginia. Land use in the area is predominantly light industrial and residential with surrounding woodlands. Although the site lies above a shallow aquifer, most residences in the area are served by a municipal drinking water system. From the 1940's to the 1970's, DGSC provided multiple support functions for the U. S. Armed Forces and several federal civilian agencies. Operation areas consist of indoor and outdoor material storage areas, a motor pool facility, a National Guard training area, a firefighting training area, and two acid neutralization pits. Studies conducted by the Army in 1984 led to initiating site clean-up activities. Results of remedial investigations revealed VOCs, other organics, and metal contamination in soil and ground water samples at sites throughout the facility. As a result, remediation of DGSC has been divided into eight operable units to address site contamination issues. These include an open storage source area, National Guard source area, a fire training source area, Area #50 source area, an acid neutralization pit source area, a firefighting training ground water area, an acid neutralization pit ground water area, and Area #50/open storage area/National Guard ground water area. The acid neutralization pit (ANP) area, located in the northern section of DGSC, was in operation from 1958 to the early 1980's. During the time of operation, caustic and acid wastes were collected from onsite metal-cleaning operations in large outdoor 14,000- and 3,000-gallon capacity concrete-lined basins. Periodically, spent cleaning solutions were discharged to the settling pits where they were neutralized and suspended solids were allowed to settle out. The neutralized wastewater was then discharged offsite in either a sanitary or storm sewer. Sludges were also disposed of off-site in a nearby landfill. In 1985, the pits were closed and remedial actions began. After cleaning the pits and prior to filling them with clean fill, cracks in the sides and bottom of the pits were observed, indicating possible routes of contamination of the surrounding soil and ground water. Ground water monitoring around the ANP revealed ground water contamination in the uppermost aquifer. Another 1992 ROD has addressed the mitigation of the open storage area where institutional controls were applied to reduce exposure to the public. This ROD addresses the interim remediation of contaminated soil surrounding the ANP as OU5. A future ROD will address the remediation of ground water associated with the acid neutralization pits. Other RODs will address remediation activities for the remaining contamination areas at the site. The primary contaminants affecting the soil are VOCs, including benzene and PCE; and arsenic, a metal.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating contaminated soil onsite using a vacuum extraction system, and controlling air emissions using carbon adsorption; constructing concrete covers over the pits to prevent their further use and infiltration of rainwater; disposing of or recycling the spent carbon offsite at a RCRA facility; and sampling soil at the end of the clean-up period to evaluate the effectiveness of the remedy. The estimated present worth cost for this remedial action is $115,607, which includes an annual O&M cost of $ 16,000 for 4 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil action levels are based on health-based criteria and include MCLs established for arsenic 5.7 mg/kg; benzene 0.001 mg/kg; PCE 1.5 mg/kg; DCE 0.015 mg/kg; TCE 0.036 mg/kg; toluene 2,400 mg/kg; and xylenes 24,000 mg/kg. Soil action levels will protect ground water at the site from further contamination.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Interim Remedy; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Disposal; Onsite Treatment; PCE; RCRA; Solvents; State Standards/Regulations; Treatment Technology; Vacuum Extraction; VOCs.

U.S. DEFENSE GENERAL SUPPLY CENTER (OPERABLE UNIT 5), VA
(Continued)
March 25, 1992

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: VOCs, Metals
Category: Source Control - Interim

USA ABERDEEN, MICHAELSVILLE, MD

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 20-acre USA Aberdeen, Michaelsville Landfill is a municipal landfill located along the Chesapeake Bay in Harford County, Maryland. The site is in the northern portion of the Aberdeen Proving Ground (APG) in the Aberdeen Area (AA) between Michaelsville Road and Trench Warfare Road. Land use in the area is predominantly industrial and residential, with a wetland area located south and east of the site. In 1970, operations at the landfill began and continued until its closure in 1980. Previous studies of the landfill operations indicated that trench and fill methods were used to dispose of wastes in the landfill. The majority of materials reportedly disposed of at the site included domestic trash, trash from nonindustrial sources at APG, solvents, waste motor oils, PCB transformer oils, wastewater treatment sludges, pesticides containing thallium, insecticides containing selenium, and rodenticides containing antimony. From 1981 to 1991, the county, state agencies, U.S. Army Environmental Hygiene Agency (AEHA), and U.S. Army Corps of Engineers Waterways Experiment Station (WES) periodically inspected the site. In 1981, the county recommended that the landfill be capped. In 1983, the state inspected the installed cover and advised the APG personnel to repair two "leachate outbreaks." In 1985, the AEHA discovered that the landfill cover was not functioning properly and suggested that an impervious cap be placed on the landfill. From 1987 to 1990, WES conducted an analysis of ground water from the monitoring wells surrounding the site and concluded that the landfill contributed chemicals to the uppermost aquifer. In early 1991, the state observed several additional "leachate outbreaks" onsite. In mid-1991, a removal action was conducted onsite by APG, which included installing a leachate collection system to control and collect leachate. This ROD addresses protection of the ground water by minimizing leachate flow and preventing current or future exposure to waste materials as the first of two OUs planned for the site. A future ROD will address sediment, surface water, and ground water at and near the site to determine the need, if any, of further remediation at the site. The primary contaminants of concern affecting the soil are VOCs; other organics, including pesticides; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes replacing the existing cover with a multi-layer cap in accordance with state requirements for sanitary landfills; covering the cap with an earthen cover and revegetating the area; installing a methane gas venting system within the cap system to minimize the migration or accumulation of gases generated by the landfill wastes; and installing surface water controls to accommodate seasonal precipitation. The present worth cost for this remedial action is $9,207,200, which includes an annual O&M cost of $27,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

The soil clean-up goals for capping the site are established in accordance with state requirements for sanitary landfill and RCRA subtitle C requirements.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Landfill Closure; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Organics; Pesticides; RCRA; Soil; Solvents; State Standards/Regulations; Surface Water Collection/Diversion; Venting; Wetlands.

SITE SUMMARY

Dates of previous RODs: 09/27/91
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim

WESTINGHOUSE ELEVATOR PLANT, PA

June 30, 1992

SITE HISTORY/DESCRIPTION:

The approximately 90-acre Westinghouse Elevator Plant is a manufacturing plant for elevator and escalator components in Cumberland Township, Adams County, Pennsylvania. The surrounding land is mixed residential and small commercial properties with the Gettysburg Battlefield National Park to the south. The site is located within the watershed of Rock Creek, a small stream that receives discharge from the northern tributary that traverses the site. Ground water is the only source of potable water and area residents near the site rely on municipal or private wells for drinking supply. Prior to its current use, most of the property consisted of farm land. From 1968 to the present, the facility has used degreasing solvents, paints, and cutting and lubricating oils in the manufacturing process for elevator and escalator components. Waste solvents, paint sludge, oils, and greases were stored in various areas at the site for offsite disposal. In 1983, after complaints from local residents, the state initiated an investigation that revealed soil, sediment, and widespread ground water contamination with VOCs. In November 1983, Westinghouse removed a total of 43 drums of contaminated soil from two areas of the site. In 1984, Westinghouse installed an air stripping tower to treat contaminated ground water and constructed water mains to provide affected residents with access to the public water supply. Since 1984, Westinghouse has installed several public water main extensions for affected residences and also installed monitoring wells in the area. In 1987, EPA ordered Westinghouse to perform an RI/FS at the site. Schindler Elevator Corporation has leased and operated the plant building since 1989. In 1991, there was a TCA spill at the site, which was then, and is currently owned by Westinghouse Elevator. This ROD addresses remediation of dense non-aqueous phase liquids (DNAPLs) in the fractured bedrock and the highly contaminated ground water resulting from contact with DNAPLs. Additional soil investigations are necessary because of the recent TCA spill; and this will be addressed in a subsequent ROD. The primary contaminants of concern affecting the ground water are VOCs, including TCA, TCE, and 1,1-DCE.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes pumping and treatment of ground water using air stripping from both the onsite area, in the center of the contamination plume in contact with the DNAPLs; and the offsite area, downgradient from the center of the plume, to control migration of dissolved contaminants; discharging the treated water offsite to surface surface water; treating air emissions using carbon adsorption, and recycling and/or disposal of the spent carbon offsite at a RCRA facility; monitoring ground water and residential wells; and implementing institutional controls including deed restrictions to restrict the use of onsite ground water. The estimated present worth cost for this remedial action is $4,400,000, which includes an annual O&M cost of $142,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific clean-up goals for ground water are based on SDWA MCLs and non-zero MCLGs for VOCs, including TCE 5 ug/l; TCA 200 mg/l; and 1,1-DCE 7 ug/l; and State Water Quality Criteria for discharge to surface water. The state standard for ground water cleanup to background levels is waived due to technical impracticability. Emission reduction from the air stripper/adsorber will be reduced to the minimum obtainable levels through the use of best available technologies.

INSTITUTIONAL CONTROLS:

Deed restrictions will be placed on the Westinghouse Plant property to prevent any use of the ground water until EPA and the state have determined that cleanup goals have been met from monitoring results.

KEYWORDS:

Air Stripping; ARAR Waiver; 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 Discharge; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs.

WESTINGHOUSE ELEVATOR PLANT, PA (Continued)

June 30, 1992

SITE SUMMARY

Dates of previous RODs: None
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Final Action

AGRICO CHEMICAL, FL
September 29, 1992

SITE HISTORY/DESCRIPTION:
The 35-acre Agrico Chemical site is a former fertilizer manufacturing facility located in Pensacola, Escambia County, Florida. Land use in the area is mixed residential, municipal, commercial, and industrial. From 1889 to 1920, sulfuric acid was produced onsite from pyrite. In 1920, the production of superphosphate fertilizer began. The source rock used in the process was fluorapatite, which also contained silica and trace levels of aluminum and uranium. Four unlined ponds used at the site for wastewater discharge are referred to as PFP I through PFP IV. By early 1957, city officials shut down a public supply well because analyses indicated declining pH values and elevated levels of fluoride and sulfate in the ground water. In 1983, EPA conducted an investigation that indicated that the onsite soil and surface water were contaminated with elevated levels of fluoride and lead. In January 1987, the state conducted a ground water assessment at the site that revealed that site contaminants, primarily fluoride and sulfate, had polluted the ground water. This ROD addresses a final remedy for contaminated soil and sludge at the site as OU1 to prevent current or future exposure. Future RODs will address the treatment of contaminated ground water as OU2 and will include the results of a bayou impacts study being conducted by the PRPs on the Bayou Texar. The primary contaminants of concern affecting the soil and sludge are VOCs; other organics, including PAHs and pesticide residues; metals, including arsenic and lead; and radioactive materials.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating an estimated 32,500 cubic yards of contaminated soil with concentrations above 1,463 mg/kg fluoride from PFP I, III, and IV, and dewatering the excavated areas; excavating, solidifying, and stabilizing all soil with lead concentrations above 500 mg/kg and arsenic levels above 16 mg/kg from PFP IV; excavating and stabilizing contaminated sludge from all ponds; consolidating the excavated soil and sludge from all areas into PFP II; constructing a slurry wall around PFP II, and covering the area with a RCRA cap; monitoring ground water; and implementing institutional controls including deed restrictions, and site access restrictions such as security fencing. The estimated present worth cost for this remedial action is $10,731,013, which includes a present worth O&M cost of $384,313.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil excavation goals are based on protection of ground water and include fluoride 1,463 mg/kg. The excavation goals established for lead and arsenic are based on health-based soil exposure scenarios, including lead 500 mg/kg and arsenic 16 mg/kg.

INSTITUTIONAL CONTROLS:
Deed restrictions and fencing will be implemented to prevent public access.

KEYWORDS:
Arsenic; Capping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Lead; MCLGs; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; Radioactive Materials; RCRA; Safe Drinking Water Act; Sludge; Slurry Wall; Soil; Solidification/Stabilization; State Standards/Regulations; Treatability Studies; Treatment Technology; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge
Major Contaminants: VOCs, Other Organics, Metals, Radioactive Materials
Category: Source Control - Final Action

ALABAMA ARMY AMMUNITION PLANT, AL
December 31, 1991

SITE HISTORY/DESCRIPTION:
The 2,200-acre Alabama Army Ammunition Plant (AAAP) site is located in Talledega County, Alabama, near the junction of Talledega Creek and the Coosa River. Land use surrounding AAAP is mixed recreational and industrial. The majority of the surface runoff from AAAP drains west or southwest into the Coosa River. Prior to construction of AAAP, the area consisted of farms, woodlands, and wetlands. AAAP was built in 1941 as a government-owned/contractor-operated facility that produced nitrocellulose, nitroaromatic explosives, and 2,4,6-trinitrophenylmethylnitramine. Support of chemical manufacturing included the use of sulfuric acid; aniline; N,N-dimethylaniline; and diphenylamine. Operations at AAAP were terminated in August 1945, and in 1973 several parcels of the original 13,233-acre property were sold. In 1978, the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), managing the Army's Installation Restoration Program (IRP), identified soil, sediment, and ground water potentially contaminated by explosives, asbestos, and lead as a result of past site operations. During the RI/FS, the facility was divided into two general areas: the eastern area (Area A) and the western area (Area B). In 1985, investigations identified soil contamination by explosives, asbestos, and lead in Area A, and ground water contamination by these materials in Area B. In 1986, the Army conducted clean-up activities at Area A, which included building decontamination and demolition, soil excavation, and stockpiling. Soil excavated from Area A was stockpiled in Area B in two covered buildings and on a concrete slab, which was subsequently covered with a membrane liner. A 1991 characterization study of Area B concluded that explosives, lead, and asbestos contamination were present above regulatory limits. This ROD addresses a final action for the contaminated soil in the Stockpile Soils Area (Area B). A final remedy for the remainder of the AAAP facility will be proposed by the U.S. Army following completion of the RI/FSs currently in progress. The primary contaminants of concern affecting the soil and debris are explosives, including 2,4,6-TNT, 2,4-DNT, 2,6-DNT, and tetryl; metals, including lead; and asbestos, an inorganic.

SELECTED REMEDIAL ACTION:
The selected remedial action for the stockpiled soil in Area B includes separating between 24,300 and 25,650 cubic yards of contaminated soil and between 1,350 and 2,700 cubic yards of asbestos-containing material; incinerating onsite contaminated soil; testing the treated soil for explosives and lead to verify compliance with the treatment criteria and stabilizing the soil or ash, if necessary, to meet LDR's, followed by disposing of the treated soil and stabilized material onsite at designated backfill area; and containerizing asbestos-containing material, followed by either onsite or offsite disposal at a regulated facility depending on the quantity of material to be disposed of and the availability of disposal facilities. The total present worth cost for this remedial action ranges from $10,991,900 to $17,055,600 (including asbestos disposal), which includes a total O&M cost ranging from $8,782,800 to $14,846,500 for 9 to 12 months, depending on the type of incinerator used.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil and debris clean-up goals are based on federal standards, including explosives 1 ug/g of 2,4,6-TNT (RCRA) and lead 5 mg/l in the TCLP extract (RCRA).

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Asbestos; Carcinogenic Compounds; Clean Air Act; Debris; Direct Contact; Incineration/Thermal Destruction; Inorganics; Lead; Metals; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; Organics; RCRA; Soil; Solidification/Stabilization; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology.

ALABAMA ARMY AMMUNITION PLANT, AL (Continued)

December 31, 1991

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Debris
Major Contaminants: Explosives, Metals, Inorganics
Category: Source Control - Final Action

BENFIELD INDUSTRIES, NC

July 31, 1992

SITE HISTORY/DESCRIPTION:

The 3.5-acre Benfield Industries site is a former bulk chemical mixing and repackaging plant in Hazelwood, Haywood County, North Carolina. Land use in the area is mixed, with surrounding light industrial, commercial, and residential areas. The estimated 3,258 area residents use ground water as their sole source of drinking water, and approximately 2,056 people in Hazelwood are connected to the local public water supply system. From 1904 until Benfield Industries purchased the property in 1976, site ownership changed several times and was used for furniture manufacture and sewing operations. Products handled and stored at the facility by Benfield Industries included paint thinners; solvents; sealants; cleaners; de-icing solutions; and wood preservers, including creosote. During site operations, complaints from citizens concerning the improper disposal of hazardous waste prompted initial site investigations by the state. On April 21, 1982, a series of explosions at the Benfield site started a fire that destroyed most of the onsite facilities and resulted in permanent closure of the Benfield Industries plant. None of the onsite tanks or gas cylinders ruptured during the fire; however, dense toxic fumes emanating from the site resulted in the temporary evacuation of nearly 2,000 area residents. Investigations conducted by EPA, state, local agencies, and academic institutions revealed a wide range of organic and inorganic contaminants, including elevated levels of lead and chromium. Following the fire, the state ordered the site owner to remove all fire debris, chemicals, and creosote storage tanks from the site. This ROD addresses the remediation of contaminated soil and ground water. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene; other organics, including PAHs; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for the site includes excavating, separating, sizing, and treating the contaminated soil using onsite soil washing; transferring the smaller soil particles to an ex-situ slurry biological treatment system; replacing coarse soil fraction and the treated soil fines in the onsite excavations, and grading and revegetating the area; treating and/or disposing of any remaining hazardous waste residual offsite; extracting and pretreating ground water onsite using aeration to remove iron and manganese, followed by treatment using ion exchange to remove heavy metals; ex-situ biotreatment using a submerged fixed-film bioreactor; and a polishing step using granular activated carbon; reintroducing the nutrient-enriched water into the onsite aquifer to facilitate in-situ biodegradation, or if necessary offsite discharge to a POTW. The estimated present worth cost for this remedial action is $3,079,900, which includes a present worth O&M cost of $424,360 for 5 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards, including benzene 5 ug/l; antimony 6 ug/l; barium 1,000 ug/l; beryllium 4 ug/l; and lead 15 ug/l. Chemical-specific soil clean-up goals are based on SDWA MCLs and state standards, including benzo(a)anthracene 0.8 mg/kg; chrysene 1.6 mg/kg; naphthalene 10 mg/kg; and benzo(a)pyrene 0.3 mg/kg (health-based).

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Aeration; Arsenic; Biodegradation/Land Application; Carbon Absorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; Soil Washing/Flushing; Solvents; State Standards/ Regulations; Treatment Technology; VOCs.

BENFIELD INDUSTRIES, NC (Continued)

July 31, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

CARRIER AIR CONDITIONING, TN

September 3, 1992

SITE HISTORY/DESCRIPTION:

The 135-acre Carrier Air Conditioning site is an active manufacturing facility in the Town of Collierville, Shelby County, Tennessee. Land use in the area is predominantly industrial, with the nearest residential area approximately 100 feet north of the site boundary. Two aquifer units have been identified at the site: a shallow class IIIa aquifer, which is not used as a drinking water source; and the Memphis Sand, a class IIa aquifer, which lies below the shallow aquifer and is currently used as a drinking water source. The Town of Collierville purchased the site property and installed a well field for potable water on the northwest corner of the site, known as Water Plant 2, which currently provides up to 1.4 million gallons per day of potable water to the Town of Collierville. In 1967, Collierville leased the site property, buildings, and equipment to Carrier to manufacture residential heating and air-conditioning units. During the manufacturing process, aluminum sheeting is stamped and assembled with copper tubing to form air heat exchangers. Stamping and forming oils and dirt are removed prior to assembly. Until recently, trichloroethylene (TCE) was used onsite as the primary solvent for degreasing and cleaning parts. In 1979, a TCE release from a storage area resulted in the removal of asphalt pavement and underlying soil from the parking area, which was affected by the spill. It also was discovered that an onsite wastewater lagoon had accepted waste contaminated with TCE and zinc. In response to a second release in 1985, both a massive soil excavation and disposal action were conducted to remove TCE contamination. Monitoring wells also were installed at the facility. In 1986, one of the wells from Water Plant 2 was found to be contaminated with low levels of TCE. In 1987, Carrier purchased the site property, except for the municipal well area. In 1990, Carrier installed air strippers at Water Plant 2 to remove TCE and its degradation products. This ROD addresses a final remedy for the contaminated soil, sludge, and ground water at the Carrier facility and is the only ROD planned for the site. The primary contaminants of concern affecting the soil, sludge, and ground water are VOCs, including TCE and PCE; and metals, including lead and zinc.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating an estimated 76,500 cubic yards of contaminated soil/sludge and shallow ground water in the old lagoon and main plant source areas using soil vapor extraction (SVE); extracting and containing ground water from the Memphis Sand aquifer using the existing and supplemental extraction wells with treatment using the air strippers at Water Plant 2, followed by discharge of the treated ground water to the municipal water supply, a local POTW, surface water, or reinjecting it to the Memphis Sand aquifer; treating any air emissions from the SVE or the air stripping processes using granular activated carbon, thermal treatment, or photolytic oxidation, if necessary; implementing institutional controls deed restrictions to limit well construction and water use near the site; and conducting periodic monitoring. The estimated present worth cost for this remedial action ranges from $5,700,000 to $7,900,000, which includes a total O&M cost of $5,489,334 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

The chemical-specific soil clean-up level is 533 ug/kg for TCE, based on fate and transport modeling for TCE leachate, which would not contaminate the ground water above the maximum concentration level for TCE established under the SDWA. The ability to achieve 533 ug/kg cannot be determined until after the extraction system has been implemented. EPA may set an alternate clean-up level when it is determined that contaminant levels have ceased to decline over time and are remaining constant at some statistically significant level above remediation levels, as verified by soil sampling. The chemical-specific ground water clean-up levels are based on SDWA MCLs, MCLGs, and UIC regulations; CWA Discharge Limitations and Pretreatment standards; and/or the Tennessee Water Quality Act. These levels include TCE 5 ug/l; cis-DCE 70 ug/l; trans-DCE 100 ug/l; PCE 5 ug/l; vinyl chloride 2 ug/l; zinc 5,000 ug/l; and lead 15 ug/l or background levels.

INSTITUTIONAL CONTROLS:

Local ordinances or deed restrictions will be placed on well construction in the general area of the site and restrict the use of ground water.

CARRIER AIR CONDITIONING, TN (Continued)

September 3, 1992

KEYWORDS:
Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; MCLGs; Metals; Offsite Discharge; Onsite Discharge; Onsite Disposal; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sludge; Soil; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, GW
Major Contaminants: VOCs, Metals
Category: Source Control - Final Action
Ground Water - Interim Action

CHEM-FORM, FL
September 22, 1992

SITE HISTORY/DESCRIPTION:
The 4-acre Chem-Form site is a former electrochemical machine design, manufacturing, and marketing facility in Pompano Beach, Broward County, Florida. Land use in the area is predominantly industrial, with residential areas located within 2 miles east of the site. The Pompano-Cypress Creek Canal lies about 3,000 feet south of the site and flows east into Biscayne Bay. The estimated 72,400 residents of Pompano Beach use the underlying sole source Biscayne aquifer as their primary source of drinking water. From 1967 to 1985, Chem-Form used the site as a certified repair station for refurbishing turbine engine components related to the aerospace industry, and they also provided services to utility companies that used turbine power plants. Additionally, they were involved in the design, manufacture, and marketing of electrochemical machines for other industries involved in the fabrication of metal parts. These operations resulted in substantial waste generation. Spent cutting oils were stored in stainless-steel vats and were routinely collected by reprocessing contractors. Organic solvents were used for metal cleaning and painting operations. Process wastewaters were discharged to an onsite septic tank/drain field system. Other wastewaters were discharged to an open trench. Prior to 1975, about 50 gallons of wastewater per day were disposed of in this manner. As a result of EPA investigations, a removal action was performed to remove approximately 3,000 cubic yards of soil from the field and trench areas at the site. A 1985 EPA site screening investigation reported that a total of 66 drums containing oils and sludge were being stored onsite and that two of the drums were leaking. A second removal action was conducted in 1990 to remove these drums and investigate metal concentrations in the ground water. In 1991, EPA also ordered the PRPs to remove contaminated soil that may potentially affect the ground water. Future RODs will address the contaminated onsite soil. This ROD addresses a final remedy for the ground water at the site, as OU1. Previous removal actions have now reduced contamination in ground water to below significant levels; therefore there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site is no action, with quarterly ground water monitoring for no less than 1 year. The estimated total cost for this remedial action is $104,000, which includes an O&M cost of $80,000 for a 1-year period.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Ground Water Monitoring; No Action Remedy; O&M; Sole-Source Aquifer.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

CIBA-GEIGY (McINTOSH PLANT), AL
July 14, 1992

SITE HISTORY/DESCRIPTION:

The 1,500-acre Ciba-Geigy (McIntosh Plant) site is an active chemical manufacturer in an industrial area in McIntosh, Washington County, Alabama. A wetlands area borders the site property, and part of the site lies within the floodplain of the Tombigbee River. From 1952 to 1965, Ciba-Geigy, formerly Geigy Chemical Corporation, manufactured primarily DDT and BHC. After 1965, when the production of DDT and BHC was ceased, Ciba-Geigy began to manufacture laundry products, herbicides, insecticides, agricultural chelating agents, sequestering agents, plastic resins and additives, antioxidants, and specialty chemicals. In 1982, during an investigation of an adjacent chemical company, EPA identified onsite contamination in a drinking water well on the Ciba-Geigy property. In 1985, EPA issued a RCRA permit that included a corrective action plan requiring Ciba-Geigy to remove and treat ground water and surface water contamination at the site. Further investigations by EPA revealed 11 former waste management areas of potential contamination onsite. These areas contain a variety of waste, debris, pesticide by-products and residues. In 1987, Ciba-Geigy installed an additional wastewater treatment system and four ground water monitoring wells. Two previous RODs in 1989 and 1991 addressed the contaminated shallow alluvial aquifer and contaminated sludge and soil at 10 of the 11 former waste management areas. This ROD addresses a final remedy for OU4, which includes contaminated soil and sludge in former waste management Area 8 and the upper dilute ditch. A future ROD will address OU3, the contamination within the floodplain and lower portions of the dilute ditch. The primary contaminants of concern affecting the soil, sludge, and debris are VOCs, including benzene, toluene, and xylenes; other organics, including pesticides; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes removing and decontaminating nonchemical construction/demolition debris from the surface of Area 8; excavation and offsite disposal of approximately 63,000 cubic yards of contaminated soil and sludge from the area as possible, to a depth of 20 feet, or until concrete structures, the water table, or the iron slurry waste are encountered; solidifying and stabilizing onsite approximately 46,000 cubic yards of contaminated soil that contain less than 2,500 mg/kg total organics and no gamma-BHC; treating approximately 17,000 cubic yards of soil, sludge, and other waste, which is not amenable to other treatment using an innovative thermal technology to be decided during the RD phase; treating approximately 46,000 cubic yards of iron slurry waste in-situ using fixation/stabilization; backfilling and establishing a vegetative cover over excavated areas; disposing all treated soil, sludge, slurry waste, and debris residuals onsite in a RCRA landvault; monitoring air emissions and ground water; and implementing institutional controls, including land and ground water use restrictions. In areas where clean-up levels are not attained, but no further excavation can occur, the technology(s) to be used will be based on treatability and leachability studies to be conducted during the RD stage, but may include using in-situ soil flushing alone or in combination with vacuum extraction or bioremediation to remediate areas where risk-based levels are not reached before excavation is terminated. The estimated present worth cost for this remedial action is $49,723,000, which includes an unspecified O&M cost for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and sludge clean-up goals are based on health-risk levels to assure that drinking water MCLs would not be exceeded in the ground water as a result of contaminants leaching through soil or sludge. Actual clean-up levels to be used will be determined for atrazine, diazinon, prometon, simazine, 4,4-DDD, 4,4-DDT, 4,4-DDE, and bladex using the summers and pestan models, and based on the proximity of the waste to the ground water table. It is anticipated that site contaminants that do not have specified clean-up levels in this ROD will be reduced to acceptable levels when established clean-up levels are met for the most toxic and mobile contaminants.

INSTITUTIONAL CONTROLS:

Institutional controls, such as land and ground water use restrictions, will be implemented if subsurface soil is left in place above clean-up levels to ensure that any future excavations of that soil will be handled in

CIBA-GEIGY (McINTOSH PLANT), AL (Continued)

July 14, 1992

accordance with the treatments specified in the selected remedy.

KEYWORDS:
Air Monitoring; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Debris; Decontamination; Deferred Decision; Direct Contact; Excavation; Filling; Floodplain; Incineration/Thermal Destruction; Inorganics; Institutional Controls; Leachability Tests; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Safe Drinking Water Act; Sludge; Soil; Soil Washing/Flushing; Solidification/Stabilization; Solvents; Solvent Extraction; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 09/28/89, 09/30/91
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, Debris
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action

FLORIDA STEEL, FL
June 30, 1992

SITE HISTORY/DESCRIPTION:

The 150-acre Florida Steel site is located 2 miles northwest of Indiantown, Martin County, Florida. Surrounding land used is mixed industrial and agricultural. The site is located within the Indian River Lagoon Drainage Basin System, and adjacent property is a mixture of uplands and wetlands. Several private residences are within 1 mile downgradient of the site. In 1969, the Indiantown site was acquired by Florida Steel Corporation (FSC) for the purpose of constructing a steel mill using electric arc furnace technology for recycling scrap steel, primarily junk automobiles, into new steel products. The mill operated from 1970 until 1982, at which time it was shut down because of depressed economic conditions. Three types of by-products were produced at the mill: mill scale, which is oxidized iron that sloughs of hot steel as it is being cooled by water; slag formed on top of the steel in the furnace, which contains barium, chromium, and lead; and emission control (EC) dust from the electric ar furnace, which contains iron, zinc, and lead oxides. The EC dust was collected in a baghouse system and deposited in two onsite disposal areas until 1980, when EC dust became listed as a RCRA hazardous waste (K061) and had to be manifested offsite for disposal. In 1983, state investigations revealed PCB contamination of soil in the area of a recirculating reservoir and in the EC disposal areas. In 1985, the state required FSC to remove approximately 8,000 tons of EC dust from the disposal areas and send it to an offsite recycling facility for zinc recovery. A second removal action, conducted in 1986, involved excavating 11,200 cubic yards of contaminated soil, sediment, and EC dust containing PCBs greater than 50 mg/kg and temporarily storing the materials in an onsite storage vault, as well as implementing an onsite ground water monitoring program. The stored PCB-contaminated soil was later incinerated onsite under a consent order with EPA in 1987, and ash from this incineration onsite under a consent order with EPA in 1987, and ash from this incineration was consolidated within the ash retention building pending final deposition. This ROD addresses the remaining contaminated onsite soil, sediment, and debris as OU1. The primary contaminants of concern affecting the soil, sediment, and debris are organics, including PCBs; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and disposing offsite 600 cubic yards of soil and sediment contaminated with PCB levels equal to or greater than 50 mg/kg; excavating and onsite solidification of 37,000 cubic yards of EC dust and metals-contaminated ash and soil, including soil with lead concentrations above 600 mg/kg and/or PCB concentrations between 25 and 50 mg/kg; temporarily storing the excavated materials onsite pending final treatment in a manner that will prevent PCB contamination through surface water run-off, and disposing of the solidified materials in an onsite double-lined landfill with a RCRA cap; controlling surface water run-off from the site by routing it to the onsite surface water retention pond; periodic monitoring of surface water for at least 2 years after construction is completed; continuing ground water quality monitoring; and implementing institutional controls, including deed restrictions. The estimated present worth cost for this remedial action is $7,004,750, which includes an annual O&M cost of $18,200 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil excavation goals are based on health risk levels and the leachability of lead from soil into the underlying ground water, including lead in soil 600 mg/kg; PCBs 25 mg/kg; and slag, which contains lead 1360 mg/kg. The slag level was developed to be protective of human health in an industrial setting, and additional TCLP testing will be conducted during the RD stage to confirm its protectiveness. Compliance with the RCRA land disposal treatment standards for EC dust will be attained by meeting levels specified in the treatability variance for contaminated soil and debris.

INSTITUTIONAL CONTROLS:

Deed restrictions, which limit the use of the site to mostly industrial or commercial activities, have been filed with the Martin County Clerk of the Circuit Court and will remain in effect regardless of the clean-up activities that occur.

KEYWORDS:

Capping; Carcinogenic Compounds; Clean Air Act; Debris; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Landfill Closure;

FLORIDA STEEL, FL (Continued)

June 30, 1992

Leachability Tests; Lead; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/ Regulations; Surface Water Collection/Diversion; Temporary Storage; Toxic Substances Control Act; Treatment Technology.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris
Major Contaminants: Organics, Metals
Category: Source Control - Interim

GEIGY CHEMICAL (ABERDEEN PLANT), NC

August 27, 1992

SITE HISTORY/DESCRIPTION:

The 1-acre Geigy Chemical (Aberdeen Plant) site is a former agricultural chemical distribution center in Aberdeen, Moore County, North Carolina. Land use in the area is predominantly mixed business, residential, and agricultural. The estimated 355 families who reside within 1 mile of the site use the second of three underlying confined aquifers as their primary source of drinking water. From 1947 to 1967, the site changed hands numerous times but was always used for pesticide mixing and formulation, not for pesticide manufacturing. From 1985 to 1989, the site was leased to Lebanon Chemical Corporation for use as an agricultural pesticide and fertilizer retail distribution center. The site is currently unoccupied; however, the Aberdeen and Rockfish railroad that traverses the southern portion of the site is still active. In 1988, site investigations conducted by EPA revealed lead and pesticide contamination in the soil, and pesticide and other organic contamination in the ground water. In 1989, an initial soil excavation and disposal was conducted for 462 tons of visually contaminated soil. In 1991 an additional 2,000 tons of contaminated soil were removed. Three PRPs performed the RI/FS. This ROD addresses the soil and ground water contamination as a final action. No future RODs are planned. The primary contaminants of concern affecting the soil and ground water are pesticides, including aldrin, dieldrin, toxaphene, DDD, DDE, and DDT.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and disposing of an estimated 1,000 cubic yards of contaminated soil offsite at a RCRA-approved landfill, or an incinerator; backfilling the excavated areas with clean soil and revegetating the area; onsite pumping and treatment of contaminated ground water using a system to be developed during the RD phase, but will include a series of carbon filters; discharging the treated water to an infiltration gallery or offsite to a POTW; transporting the spent carbon offsite for disposal, destruction, or reactivation; implementing any of the following contingency remedies, if it is determined that certain portions of the aquifer cannot be restored to their beneficial use: installing physical barriers or long-term gradient controls; waiving chemical-specific ARARs; monitoring specific wells; re-evaluating remediation technologies for ground water restoration; and implementing institutional controls and site access restrictions including fencing. The estimated present worth cost for this remedial action ranges from $2,810,000 to $4,650,000, based upon final technologies selected during the RD, which includes a present worth O&M cost of $1,680,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Soil and ground water clean-up standards are based on the more stringent of state or federal MCLs, and will attain a 10^{-6} risk level. Chemical-specific goals for soil include aldrin 0.113 mg/kg; dieldrin 0.13 mg/kg; toxaphene 2 mg/kg; DDD 7.6 mg/kg; DDE 5.5 mg/kg; and DDT 4.75 mg/kg; aldrin 0.05 ug/l; dieldrin 0.01 ug/l; and toxaphene 1 ug/l.

INSTITUTIONAL CONTROLS:

Not specified.

KEYWORDS:

ARAR Waiver; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Disposal; Onsite Treatment; Organics; Pesticides; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Soil; State Standards/Regulations; TCE; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: Pesticides
Category: Source Control - Final Action
Ground Water - Final Action

JFD ELECTRONICS/CHANNEL MASTER, NC
September 10, 1992

SITE HISTORY/DESCRIPTION:
The 13.09-acre JFD Electronics/Channel Master site is a former television antenna production and satellite assembly system facility in Oxford, Granville County, North Carolina. Two onsite buildings are used by two companies as distribution centers. Land use in the area is predominantly residential and business. Fishing Creek lies 1.7 miles south of the site and receives runoff and drainage from the facility. An estimated 164 people per square mile use municipal water as their drinking water supply. From 1961 to 1979, JFD Electronics used the site to manufacture television antennas. From 1964 to 1965, an unlined lagoon, with a liquid capacity of 800,000 to 1,000,000 gallons, received wastewater from a chromate conversion process and a copper/nickel electroplating process. From 1980 to 1984, Channel Master owned the site and produced satellite systems, antennas, amplifiers, and boosters. Organic solvents were reportedly used onsite to clean tools and antenna elements prior to sending them offsite for electroplating. A 1987 state inspection detected VOCs and metals in the lagoon sludge, adjacent soil, and ground water. In 1987, Channel Master excavated and disposed of 17,000 cubic yards of contaminated sludge/soil at a permitted waste disposal facility. In addition, 2,000 cubic yards of VOC-contaminated soil was excavated and thermally treated onsite. In 1988, Channel Master excavated and disposed of two fuel oil tanks and one concrete waste oil tank. An EPA investigation in 1989 concluded that contaminated soil and ground water still existed at the site. This ROD addresses the contaminated soil/sludge and ground water as a final remedy. The primary contaminants of concern affecting the soil, sludge, and ground water are VOCs, including benzene and TCE; other organics; metals, including chromium, nickel, and antimony; and inorganics, including cyanide.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating, consolidating, and treating onsite an estimated 3,000 cubic yards of contaminated soil and sludge using oxidation-reduction to destroy inorganics, followed by onsite stabilization of the treated soil and sludge; backfilling the stabilized material onsite and capping the area with either a RCRA-approved or non-RCRA cap, based on the results of a treatability study; extracting and treating contaminated ground water onsite using alkaline chlorination to remove cyanide and VOCs; precipitation/filtration to remove metals; and air stripping and carbon adsorption to remove VOCs, followed by either onsite discharge to surface water or offsite discharge to a POTW; disposing of the spent carbon from the treatment processes in accordance with ARARs; and conducting ground water monitoring. The present worth cost for this remedial action is $6,392,000, which includes a total O&M cost of $2,804,000 over a period of at least 5 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil/sludge clean-up goals are based on health-based levels and include chromium 310 mg/kg; nickel 1,110 mg/kg; and antimony 25 mg/kg. Chemical-specific ground water clean-up goals are based upon health-based levels, and include benzene 5 ug/l; 1,2-dichloroethane 0.38 ug/l; 1,1-dichloroethene 7 ug/l; 1,2-dichloroethene 70 ug/l; 1,1,1-TCA 200 ug/l; TCE 2.8 ug/l; vinyl chloride 0.015 ug/l; barium 1,000 ug/l; chromium 50 ug/l; copper 1,000 ug/l; lead 20 ug/l; nickel 100 ug/l; zinc 500 ug/l; and cyanide 154 ug/l.

INSTITUTIONAL CONTROLS:
Not Provided.

KEYWORDS:
Air Stripping; Arsenic; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; MCLs; Metals; O&M; Offsite Discharge; Onsite Discharge; Onsite Disposal; Onsite Treatment; PCE; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sludge; Soil; Solidification/ Stabilization; Solvents; State Standards/Regulations; TCE; Treatment Technology; VOCs; Xylenes.

JFD ELECTRONICS/CHANNEL MASTER, NC (Continued)

September 10, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, GW
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

MADISON COUNTRY SANITARY LANDFILL, FL

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 90-acre Madison County Sanitary Landfill is an active landfill area located in Madison, Madison County, Florida. Adjacent to the site is other county land, including the County Department of Transportation and the County's aviation hangar and landing strip. The landfill surface is covered with native soil that was originally excavated from the trenches in preparing cells to receive waste. Vegetative cover is absent over most of the inactive or recently closed waste cells; however, over older closed cells, vegetative cover is present. In 1970, the City of Madison began operating the Madison County Landfill as a sanitary landfill. The landfill, which was operated as an unlined trench and fill operation, was divided into several areas. The Yard Trash Area, located in the southeastern portion of the landfill, was primarily used to dispose of large bulk debris usually associated with construction and demolition activities as well as drums containing industrial wastes. The alleged Acid Disposal Area, located in the southern portion of the property, was reportedly used to dispose of acid wash water. From 1971 to 1980, domestic waste from the city and surrounding area as well as local industrial wastes were disposed of in the landfill. During that time, the ITT Thompson Industries (formerly a division of ITT Corporation) disposed of waste in the landfill, including 55-gallon drums filled with waste polishing/buffer compounds at the site, but the exact location of disposal is not known. From 1971 to 1974, ITT Thompson arranged for the disposal of acid, which was reportedly taken to the landfill. The type of wastes disposed of included acid wash water that may have contained chromic acid with maximum concentrations of chromium 50 ug/l. No information on the pH of the acid wash water or the quantity disposed was available. No other known wastes were disposed of in that area. Currently, approximately 40 tons of waste per day are disposed into the one group of remaining active onsite waste cells; however the state is in the process of closing the landfill to any receipts of waste. As part of the landfill closure activities, Madison County will construct an earthen/clay cap over the site. This ROD addresses both the onsite and offsite contaminated ground water in an effort to minimize the migration of contamination from the landfill to the surrounding community, to restore the ground water to drinking water quality for the chemicals of concern, and to monitor ground water in a manner that will verify the effectiveness of the selected remedy. The primary contaminants of concern affecting the soil and ground water are VOCs; other organics; and metals.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a multi-layer clay cap over the landfill; installing a stormwater runoff system including dikes, impoundments, and drainage ditches to control cap runoff; pumping and treatment of contaminated ground water onsite using air stripping and carbon adsorption, reinjection of the treated ground water offsite, or if infeasible, evaluating other disposal options including infiltration, irrigation, or direct discharge; monitoring ground water; implementing institutional controls including deed, land, and ground water use restrictions, and site access restrictions including fencing; and providing a contingency for installation of a passive gas and collection and control system, if methane is detected. The present worth cost for this remedial action is $5,191,000, which includes an annual O&M cost ranging from $109,000 to $409,000 for 25 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical specific ground water clean-up goals are based on the federal and state MCLs.

INSTITUTIONAL CONTROLS:

Institutional controls include, but are not limited to, access restrictions in the form of fences and signs around the site; restrictions on future use of the site to prevent construction of water supply wells and construction onsite that would require excavation; land use ordinances or other measures restricting construction of water supply wells offsite in the vicinity of the landfill; and ground water monitoring.

KEYWORDS:

Air Stripping; Capping; Carbon Adsorption (GAC); Clean Air Act; CleanWater Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Offsite Discharge; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; RCRA; Safe Drinking Water Act; Soil; State Guidance; State Permit; State Standards/Regulations; VOCs.

MADISON COUNTRY SANITARY LANDFILL, FL (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

MARINE CORPS LOGISTICS BASE, GA

August 14, 1992

SITE HISTORY/DESCRIPTION:

The 3,200-acre Marine Corps Logistics Base (MCLB) site is an active military facility in Albany, Georgia. Land use in the area surrounding the Base is agricultural or recreational to the south and east, with residential and commercial areas to the north and west. The site currently serves as a center to control acquisition and distribution of combat and support materials for the U.S. Marine Corps. In addition, the Base is used as a training facility for military personnel and other functions of the Marine Corps. During operations, MCLB has generated various types of solid and liquid wastes on site, including refuse and hazardous wastes. The hazardous wastes include electroplating residues containing heavy metals, organic solvents from stripping and cleaning operations, and waste fuel oil. Because of suspected contamination from site operations, the Navy conducted several site investigations between 1985 and 1989. Twelve potential sources of contamination, which were identified for the RI/FS, were divided subsequently into five operable units for remedial activities. This interim ROD addresses OU3, which is composed of two potential sources of contamination: a former leaking transformer location (PSC 16), and a chrome-plating waste spill area (PSC 17). Both areas are located in the west-central portion of the Base. Surface soil from PSC 16 was removed in a prior action to a 44-inch depth and was replaced with clean soil. Future RODs will address OUs 1, 2, 4, and 5 at the site, as well as all related ground water contamination. The primary contaminants of concern affecting the surface and subsurface soil and sediment of PSC 16 and 17 are organics, including PCBs and PAHs; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes covering PSC 16 with a multi-layer cap; excavating and disposing of sediment from within the catch basin adjacent to PSC 16 offsite; excavating and transporting hazardous soil from PSC 17 offsite for stabilization and disposal; backfilling excavated areas with clean soil and revegetating the area; installing ground water monitoring wells; and implementing institutional controls including land use restrictions on future activities within the source areas, as well as site access restrictions such as fencing. The estimated total present worth cost for this remedial action is $717,200, of which $242,200 is allocated for PSC 16, including an estimated first-year O&M cost of $41,500; and $475,000 is allocated for PSC 17, with no O&M costs.

PERFORMANCE STANDARDS OR GOALS:

The proposed remedy for PSC 16 will meet ARARs; however, because capping is not a treatment technology, no health-risk based clean-up goals will be achieved. Contaminated soil from PSC 17 will be stabilized offsite in accordance with RCRA land disposal standards. Although these actions are intended to be final for soil, ground water contamination at OU3 will be investigated under a separate ROD, at which time the ultimate level of remediation to be attained will be determined.

INSTITUTIONAL CONTROLS:

Land use restrictions for future activities will be implemented.

KEYWORDS:

Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Interim Remedy; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Disposal; Organics; PAHs; PCBs; RCRA; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Toxic Substances Control Act; Treatment Technology.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Sediment
Major Contaminants: Organics, Metals
Category: Source Control - Interim

MILAN ARMY AMMUNITION PLANT, TN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 22,436-acre Milan Army Ammunition Plant (MAAP) is located in western Tennessee, 5 miles east of Milan, Tennessee. The facility was constructed in 1941 to produce and store fuses, boosters, and small- and large-caliber ammunition. The site is located in a primarily rural area where land use is predominantly agricultural, and there are scattered residences to the north and east of the facility boundary. The Memphis Sand aquifer of the Claiborne Group is used as the major source of potable water in this area. The site lies within the coastal plain province of the Mississippi Embayment. Of the original 13 onsite process areas, only seven are in use today. One of these is the O-line area at MAAP, which was built in 1941. Its major function since then has been to remove explosives from bombs and projectiles by injecting high pressure streams of hot water and steam into the shells of the munitions. The types of explosives handled at the facility include 2,4,6-trinitrotoluene (TNT) and RDX. Wastewater, contaminated with explosives, was discharged from the washout operations through a series of baffled concrete sumps where cooling caused significant amounts of explosives to precipitate out of the waste stream. Effluent from the sumps was initially discharged to an open ditch, which ran through the O-line area. In 1942, eleven individual surface impoundments with a total capacity of 5.5 million gallons were excavated to receive the effluent before discharge to the open ditch. In 1978, during several investigations, the Army observed that all of the wastewater ponds were full and overflowing into onsite soil, and that 3 of the 11 water supply wells sampled were contaminated with explosives. After onsite ground water contamination was determined to be a direct result of the improper use of O-line ponds, use was discontinued. In 1981, the ponds were drained and the effluent was treated in an offsite facility. A closure plan was implemented in 1984, the ponds were filled and covered with clay, and the area was revegetated. This ROD addresses an interim remedy for the contaminated ground water beneath and immediately downgradient from the former ponds as OU1. Future RODs will address contaminated soil, sediment, and surface water as well as any additional ground water contamination further downgradient. The primary contaminants of concern affecting the ground water are VOCs, including carbon disulfide; other organics, including HMX, RDX, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, 1,3-DNB, 1,3,5-trinitrobenzene, and nitrobenzene; and inorganics, including nitrate.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes pumping and pretreatment of contaminated ground water immediately downgradient of the former O-line ponds using electrochemical precipitation to remove inorganics, followed by onsite filtration to remove suspended solids, and UV oxidation to destroy the majority of the organic contaminants, and granular activated carbon (GAC) to remove the remaining organic compounds; re-injecting the treated water onsite upgradient of the former ponds; analyzing the precipitated filter cake and the carbon filters for hazardous waste characteristics and disposing of them offsite accordingly; monitoring ground water; and implementing institutional controls, including ground water use restrictions. The estimated present worth cost for this interim remedial action is $26,980,000, which includes an annual O&M cost of $1,413,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water discharge levels are based on best practicable treatment, are slightly higher than human health-risk standards (HBN) and SDWA MCLs, and include nitrate 10,000 ug/l (MCL); carbon disulfide 3,500 ug/l (HBN); 1,3-dinitrobenzene 5 ug/l (HBN); 2,4-dinitrotoluene 0.5 ug/l (HBN); 2,6-dinitrotoluene 0.5 mg/l (HBN); HMX 2,000 ug/l (HBN); nitrobenzene 17.5 ug/l (HBN); RDX 10 ug/l (HBN); 1,3, 5-trinitrobenzene 20 ug/l (HBN); and 2,4,6-TNT 10 ug/l (HBN). Health-based standards will be fully met in the final remedial action under one final ROD addressing ground water immediately downgradient of the former ponds (OU1), soil in and around the former pond (OU2), and the ground water plume (OU14).

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented to prevent ingestion of contaminated ground water. Ground water within the OU will not be used for potable purposes while contaminant levels are higher than health-based levels, and any well installed within the facility will be tested prior to use.

MILAN ARMY AMMUNITION PLANT, TN (Continued)

September 30, 1992

KEYWORDS:
Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Interim Remedy; MCLs; MCLGs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; RCRA; Safe Drinking Water Act; State Standards/Regulations; Treatability Studies; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Other Organics, Inorganics
Category: Ground Water - Interim

NATIONAL ELECTRIC COIL/COOPER INDUSTRIES, KY

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 3.5-acre National Electric Coil/Cooper Industries site includes an active manufacturing facility in Dayhoit, Harlan County, Kentucky. Land use in the area is light industrial and residential, with 40 families residing at a mobile home park adjacent to the site. The site is located within the floodplain of the Cumberland River, and overlies both shallow and bedrock aquifers, the latter being used for drinking water and industrial uses. From 1951 to 1985, the National Electric Coil (NEC) Company operated a manufacturing facility onsite, which rewound electric motors, manufactured coils, and rebuilt machinery used in the coal mining industry. In 1985, Cooper Industries purchased the facility and operated it until 1987. TCE was used onsite to remove oil and tar from motors and other equipment prior to rebuilding. A 1,000-gallon tank, which held the solvent, was maintained in a below-grade concrete pit. Periodically, the tank was drained and the waste liquid was allowed to flow over land and drain into the Cumberland River. Sludge from the tank and debris from an onsite furnace were disposed of along the river bank. PCB-laden oil also was allowed to drain from transformers onto the ground and into the river. These improper disposal practices, which continued until the mid-1980's, have resulted in contamination of the local drinking water supply, drainage channels, river embankment property, and facility grounds. In 1989, state investigations revealed VOC contamination in several residential wells. Bottled water was provided to affected residences and municipal lines were installed. As part of a 1990 removal action, EPA required the PRPs to excavate 5,100 tons of contaminated soil for offsite disposal. This ROD addresses an interim remedy for the VOC contamination in the bedrock aquifer to further restrict migration of the VOC-contaminant plume. A future ROD will address a final remedy for the shallow aquifer beneath the site and any other site-related contamination. The primary contaminants of concern affecting the ground water in the bedrock aquifer and air are VOCs, including TCE, toluene, and xylenes; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes onsite pumping and treatment of contaminated ground water using air stripping to remove VOCs, with onsite discharge of the treated water to the Cumberland River; capturing and treating resulting vapors using activated carbon, and disposing of the spent carbon offsite as RCRA F001 waste; and monitoring ambient air and ground water. The estimated capital cost for this remedial action is $106,000, with an estimated annual O&M cost of $150,000.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on state effluent discharge limitations and include TCE 0.172 mg/l; 1,1-DCE 0.0021 mg/l; vinyl chloride 0.128 mg/l; PCBs 0.0043 ug/l; cis-1,2-DCE 0.07 mg/l; methylene chloride 0.011 mg/l; benzene 0.833 mg/l; and lead 0.072 mg/l. Ambient air performance standards also will be met and include cis-1,2-DCE 5 ug/m^3; TCE 5 ug/m^3; and vinyl chloride 5 ug/m^3.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Monitoring; Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; Metals; O&M; Onsite Discharge; Onsite Treatment; RCRA; Solvents; State Standards/Regulations; TCE; Toluene; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: GW, Air
Major Contaminants: VOCs, Metals
Category: Ground Water - Interim

NEW HANOVER COUNTY AIRPORT BURN PIT, NC

September 29, 1992

SITE HISTORY/DESCRIPTION:

The New Hanover County Airport Burn Pit site is located on Gardner Road approximately 500 feet west of the New Hanover County Airport terminal, New Hanover, North Carolina. Land use in the vicinity of the site is commercial, industrial, and residential. The site was originally developed as a military hospital; however, from 1968 to 1979, the site was used for fire-fighter training purposes. During training exercises, jet fuel, gasoline, petroleum storage bottoms, fuel oil, kerosene, and sorbent materials from oil spill cleanup were burned in a pit. During its active years, water from the pit was allowed to flow onto land surfaces. Inspections conducted after the pit was abandoned showed that most of the standing liquid in the pit was water. The bottom of the pit and the soils immediately surrounding the pit were black with characteristics similar to tar. In addition to the burn pit area, fire-fighting activities resulted in contamination at several other site areas, including an auto burn area; a railroad tank burn area; an aircraft mock-up area; a fuel tank and pipelines area; and two stained soil areas north of the burn pit. In 1990, under EPA order, the PRP removed waste materials, contaminated water, surface and subsurface soils, and structures. Removed and disposed of were approximately 12,500 gallons of contaminated water; 3,200 tons of contaminated soil; drums; and dismantled structures and pipelines. This ROD addresses restoration of the aquifer to drinking water quality as a final action for this site. The primary contaminants of concern affecting the ground water are VOCs, including benzene; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes collecting additional ground water quality data for a 1-year period; conducting a treatability study to size the ground water treatment equipment and to determine if a technology for pretreatment is necessary; extracting and onsite pretreatment of an estimated 9.7 million gallons of contaminated ground water using either clarification, filtration, or addition of chemical complexing agents to remove suspended solids or iron, followed by treatment with air stripping to remove VOCs, with offsite discharge of the treated water to the Northside POTW system; testing and disposing of the sludge generated during the pretreatment process in the most economical means; conducting a review of the existing ground water monitoring system to ensure proper monitoring of ground water quality and the effectiveness of the system; and monitoring ground water; providing for the following contingencies if certain portions of the aquifer cannot be restored to their beneficial use including providing engineering or long-term gradient controls by low-level pumping; considering a waiver of chemical-specific ARARs for the aquifer; reevaluating the remedial technologies for ground water restoration; continued monitoring of specific wells; and implementing institutional controls to restrict access to certain portions of the aquifer. The estimated present worth for this remedial action is $1,932,800, which includes a present worth O&M cost of $1,073,700 for 4.5 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up levels are based on the North Carolina Water Quality, EPA, and MCL standards and include benzene 1 ug/l; chromium 50 ug/l; and lead 15 ug/l.

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented to restrict access to certain portions of the aquifer.

KEYWORDS:

ARAR Waiver; Air Stripping; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; MCLGs; Metals; No Action Remedy; O&M; Offsite Discharge; Onsite Treatment; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; State Standards/Regulations; Treatability Studies; VOCs.

NEW HANOVER COUNTY AIRPORT BURN PIT, NC (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Source Control - Final Action
Ground Water - Final Action

POTTER'S SEPTIC TANK SERVICE PITS, NC

August 5, 1992

SITE HISTORY/DESCRIPTION:

The 5-acre Potter's Septic Tank Service Pits (Potters's Pits) is located in a rural section of Brunswick County, North Carolina. The surrounding land use is semi-rural residential. The site is situated within a residential community known as the Town of Sandy Creek. The Chinnis Branch waterbody traverses the site, flowing from southwest to northeast. A forest/wetland region covers approximately half of the site. There are no public water supplies within approximately 10 miles of Sandy Creek because the current residences use private domestic water wells and onsite septic systems. The EPA Domestic Water Survey for the subdivision indicates that there are 60 wells in the area. Between 1969 and 1976, before the land was developed for residential use, a family business operated sludge hauling and oil spill clean-up companies as well as waste disposal pits on the site. Disposal practices consisted of placing petroleum waste products and septic tank sludges either in shallow unlined pits or directly on the land surface. In 1976, an unlined pit failed, allowing approximately 20,000 gallons of oil to flow into Chinnis Branch. The U.S. Coast Guard responded to the spill pursuant to CWA. Additionally, the site owners pumped the remaining oil from the breached pit and three other onsite pits for offsite disposal. Approximately 150 truckloads of oil sludges and stained soil were removed. Thick oil sludge that could not be pumped was mixed with sand and buried onsite. In 1982, Dixie and Earl Gurkin purchased the site and discovered buried wastes, which resulted in an EPA investigation that revealed soil and ground water contamination. In 1984, EPA conducted an emergency removal, excavating an estimated 1,770 tons of oil, sludge, and contaminated soil for offsite disposal. This ROD addresses the ground water treatment and contaminated soil for offsite disposal. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, toluene, and xylenes; other organics, including PAHs and pesticides; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes temporarily relocating all onsite residents; excavating and treating approximately 10,100 cubic yards of contaminated soil onsite using an ex-situ low temperature thermal desorption process; stabilizing the waste stream if necessary, and treating any off-gas emissions using a treatment to be selected later; sampling and analyzing the treatment residue, disposing of all non-hazardous treated soil into the original excavated areas, and filling and revegetating the areas; treating any soil that exhibits RCRA toxicity characteristics onsite using stabilization, with offsite or onsite disposal; extracting and treating ground water from the surficial aquifer onsite using precipitation/flocculation/filtration to remove heavy metals, and air stripping to remove VOCs, with discharge of the treated water onsite to surface water; transporting the residual sludge offsite for disposal or treatment, if necessary; and conducting soil sampling and ground water monitoring. This ROD provides for a contingency in the event soil and ground water remedies are not effective, which includes excavation and offsite treatment or disposal of soil, based on TCLP test results, with filling of excavated onsite areas, and pumping and onsite containment of ground water, with implementation of institutional controls, chemical-specific ARAR waivers, and continued monitoring. The estimated total present worth for the remedial action is $11,800,000, which includes a total annual O&M cost of $384,281 for 50 years. The estimated capital cost for the contingency remedy is $6,288,234.

PERFORMANCE STANDARDS OR GOALS:

Goals are based on the more stringent of state or federal standards and federal land disposal restrictions pertaining to storage and transportation of hazardous wastes. Chemical-specific ground water goals include benzene, 5 ug/l; toluene 1,000 ug/l, xylenes 1,000 ug/l; chromium 50 ug/l; lead 15 ug/l; and naphthalene 30 ug/l. Chemical-specific goals for subsurface and surface soil include benzene 0.01 mg/kg; toluene 3.4 mg/kg; xylenes 3.5 mg/kg; chromium 97.2 mg//kg; lead 25 mg/kg; and naphthalene 1.8 mg/kg.

INSTITUTIONAL CONTROLS:

Institutional controls may be implemented as part of the contingency remedy.

POTTER'S SEPTIC TANK SERVICE PITS, NC (Continued)

August 5, 1992

KEYWORDS:
Air Stripping; ARAR Waiver; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingency Remedy; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Leachability Tests; Lead; MCLGs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Pesticides; Plume Management; RCRA; Relocation; Safe Drinking Water Act; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

SAVANNAH RIVER (USDOE) (OPERABLE UNIT 1), SC

June 29, 1992

SITE HISTORY/DESCRIPTION:

The 300-square-mile Savannah River (USDOE) site (SRS) is a Department of Energy (DOE) facility located in Aiken, Barnwell, and Allendale Counties, South Carolina, 20 miles south of Aiken, South Carolina, and 25 miles southeast of Augusta, Georgia. Land use in the surrounding area is primarily agricultural. The Savannah River Site is a secured facility with no residents. The site, co-operated by the Westinghouse Savannah River Company, is a national defense-related facility producing tritium, plutonium, and other special nuclear materials. From 1958 to 1985, SRS used a northwest portion of the site, termed the "M-area," as a hazardous waste management facility (HWMF). The M-area HWMF or OU1 consisted of an unlined surface impoundment (settling basin), a process sewer line, an overflow drainage/seepage area, and an area known as Lost Lake, which represents a special ecological environment known as Carolina Bay. Manufacturing wastes from aluminum-forming and metal-finishing operations conducted onsite were discharged through the sewer line to the basin, where metals such as uranium, nickel, lead, and aluminum settled out of solution. Any basin overflow went to the drainage/seepage area and then on to Lost Lake. Use of this system ended in 1985, when a new wastewater treatment facility was installed. This interim ROD integrates previously completed RCRA closure activities that were required and approved by the South Carolina Department of Health and Environmental Control. Future RODs will address final remedial actions for other contaminated media, including the vadose zone and ground water, associated with the M-area HWMF. The primary contaminants of concern affecting soil, sludge, and surface water are VOCs, including TCE and PCE; metals, including lead; acids; and radioactive materials, including uranium.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes pumping and onsite treatment of any standing water that remained in the basin; excavating, dewatering, and stabilizing approximately 37,000 cubic yards of basin sludge using Portland cement; placing, consolidating, and compacting the stabilized sludge into the basin; discharging the sludge effluent from the dewatering process offsite to a permitted NPDES outfall; consolidating approximately 39,700 cubic yards of contaminated soil excavated from the seepage area, Lost Lake, and a portion of the sewer line into the basin; installing and maintaining a low permeability cap over the settling basin, which includes a surface soil layer that will be graded and vegetated to promote drainage; monitoring ground water; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action ranges from $3,000,000 to $5,000,000, which includes an annual O&M cost of $20,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

No chemical-specific clean-up goals were provided in this interim ROD, but will be provided for the final M-area HWMF remedial action. The goal of this interim ROD is to integrate prior RCRA decisions into the CERCLA process. The goal of the remediation is to minimize the migration of contaminants to the ground water and eliminate surface transport pathways.

INSTITUTIONAL CONTROLS:

A deed restriction on the M-area HWMF will be maintained with the Aiken County zoning authority as required by the South Carolina Hazardous Waste Management Regulations.

KEYWORDS:

Acids; Capping; Carcinogenic Compounds; Clean Water Act; Closure Requirements; Dredging; Excavation; Ground Water Monitoring; Institutional Controls; Interim Remedy; Lead; Metals; O&M; Offsite Discharge; Onsite Disposal; Onsite Treatment; PCE; Radioactive Materials; RCRA; Sludge; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Treatment; TCE; Treatment Technology; VOCs.

SAVANNAH RIVER (USDOE) (OPERABLE UNIT 1), SC (Continued)

June 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Sludge, SW
Major Contaminants: VOCs, Metals, Radioactive Materials
Category: Source Control - Interim

SAVANNAH RIVER (USDOE) (OPERABLE UNIT 2), SC

June 29, 1992

SITE HISTORY/DESCRIPTION:

The 300-square-mile Savannah River (USDOE) site (SRS) is a Department of Energy (DOE) facility located in Aiken, Barnwell, and Allendale Counties, South Carolina, 20 miles south of Aiken, South Carolina, and 25 miles southeast of Augusta, Georgia. Land use in the surrounding area is primarily agricultural. The Savannah River Site is a secured facility with no residents. The site, co-operated by the Westinghouse Savannah River Company, is a national defense-related facility producing tritium, plutonium, and other special nuclear materials. From 1956 to 1985, SRS used a northwest portion of the site as a hazardous waste management facility (HWMF), which received waste from the Savannah River Metallurgical Laboratory (MET LAB). Activities at MET LAB included corrosion testing on stainless steels and nickel-based alloys. This process required degreasing and cleaning metal parts and sample etching. Solvents used in the degreasing included acetone, carbon tetrachloride, TCA, and TCE. Potassium chloride, sodium cyanide, and hydrofluoric acids were used in the etching. All of these chemicals were used and discharged to the HWMF in small quantities. The MET LAB HWMF, or OU2, consisted of a vitrified clay process sewer line, which carried effluent from the laboratory to a basin, and a drainage outfall, which flowed into an adjacent Carolina Bay, a special ecological environment. The contaminated sediment in the bottom of the basin total 450 cubic yards. The drainage outfall consisted of a pipe beneath a roadway and a drainage ditch from the roadway into the Carolina Bay during periods of heavy rainfall. Effluents to this system consisted mainly of noncontact cooling waters and small quantities of laboratory rinse water containing the previously named hazardous substances. Beginning in 1983, hazardous wastes from the metallurgical laboratory building were sent to a TSD facility onsite at SRS, and in 1985 the process sewer line was closed. This interim ROD integrates previously completed RCRA closure activities that were required and approved by the South Carolina Department of Health and Environmental Control. Future RODs will address final remedy selection for the site ground water and remaining contaminants associated with the MET LAB HWMF. The primary contaminants of concern affecting the soil, sediment, debris, and surface water are VOCs, including TCE; metals, including lead and chromium; and acids.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and compacting the process sewer line and associated soil and sediment, placing them in the basin, and installing a low permeability cap over the basin; sampling the accumulated rainwater in the basin with onsite discharge and/or treatment, if constituent concentrations in the accumulated rainwater exceed NPDES discharge standards; maintaining the cap; monitoring ground water; and implementing institutional controls, including deed restrictions. The estimated present worth cost for this interim remedial action is $2,000,000, which includes an annual O&M cost of $20,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

No chemical-specific clean-up standards were specified in this interim ROD, but will be provided for the final MET LAB HWMF remedial action. The goal of this interim ROD is to integrate prior RCRA decisions into the CERCLA process. The goal of the remediation is to minimize the migration of contaminants to the ground water and eliminate surface transport pathways.

INSTITUTIONAL CONTROLS:

A deed restriction on the MET LAB HWMF will be maintained with the Aiken County zoning authority as required by the South Carolina Hazardous Waste Management Regulations.

KEYWORDS:

Acids; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Debris; Direct Contact; Excavation; Ground Water Monitoring; Institutional Controls; Interim Remedy; Lead; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Sediment; Soil; Solvents; State Standards/Regulations; Surface Water; Surface Water Treatment; TCE; VOCs.

SAVANNAH RIVER (USDOE) (OPERABLE UNIT 2), SC (Continued)

June 29, 1992

SITE SUMMARY

Date of previous RODs: 06/29/92
Lead: Federal Facility
Contaminated Media: Soil, Sediment, Debris, SW
Major Contaminants: VOCs, Metals, Acids
Category: Source Control - Interim

SAVANNAH RIVER (USDOE) (OPERABLE UNIT 3) SC

June 29, 1992

SITE HISTORY/DESCRIPTION:

The 300-square-mile Savannah River (USDOE) site (SRS) is a Department of Energy (DOE) facility located in Aiken County, 20 miles south of Aiken, South Carolina, and 25 miles southeast of Augusta, Georgia. Land use in the area is primarily industrial, and SRS is a secured facility with no residents. The site, co-operated by Westinghouse Savannah River Company, is a national defense-related facility producing tritium, plutonium, and other special nuclear materials. The A/M area, located in the northwest portion of the SRS, contained many operations that involved the use of hazardous substances. Between 1952 and 1981, an estimated 13 million pounds of chlorinated solvents were used in the A/M area to degrease fuel and target tubes for use in the SRS reactors. An estimated 50 to 90 percent of the solvents evaporated during use; however, the remaining solvents were discharged to the process sewer system. There are four main sections to the A/M area. The A-014 outfall received waste solvents (mainly TCE and PCE) via an underground sewerage line from buildings 313-M and 320-M onsite until 1976. From 1958 to 1985, the M-area basin hazardous waste management facility (HWMF) received an estimated 2 million pounds of spent solvents from degreasing operations in buildings 313-M, 320-M, and 321-M. In transit, some of the solvents leaked into the ground through cracks in the pipeline. Finally, the 321-M solvent storage area contained various storage tanks for TCE and PCE. In 1975, an estimated 1,200 gallons of PCE leaked from a cracked ceramic pump seal connected to a solvent storage tank located west of building 321-M. As a result of these activities and incidents, a ground water plume, encompassing 1,200 acres beneath the A/M area, is contaminated with significant concentrations of VOCs. In 1981, SRS voluntarily initiated a ground water RCRA corrective action program to investigate the nature and extent of ground water contamination and to develop a remedial program. Ground water monitoring wells were installed, and beginning in 1983, extraction and treatment of ground water began. To date, over 1.3 billion gallons of contaminated ground water have been treated. This ROD addresses an interim remedy for the A/M area ground water subsurface vadose zone, as OU3. Other RODs have addressed interim remedies for the M-area HWMF and the Savannah Metallurgical Laboratory (SRL) HWMF. Future RODs will address final remedies for these OUs. The primary contaminants of concern affecting the ground water in the A/M area are VOCs, including PCE and TCE.

SELECTED REMEDIAL ACTION:

The selected interim remedy for this site includes installing 11 or more ground water recovery wells under the RCRA program throughout the A/M area; extracting and treating contaminated ground water using an air stripper to remove volatile solvents, followed by onsite discharge to an NPDES permitted outfall; upgrading the air stripping tower to include an off-gas treatment system based on the result of a treatability study. The estimated present worth cost for this remedial action is $7,800,000, which includes an annual O&M cost of $20,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

No chemical-specific clean-up goals were specified in this interim ROD, but they will be provided for the final remedial action. The goal of this remediation is to reduce ground water contaminants and minimize migration of the contaminant plume.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Air Stripping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; O&M; Onsite Discharge; Onsite Treatment; PCE; Plume Management; RCRA; State Standards/ Regulations; TCE; Treatability Studies; VOCs.

SITE SUMMARY

Date of previous RODs: 06/29/92, 06/29/92
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs
Category: Ground Water - Interim

STANDARD AUTO BUMPER, FL

September 28, 1992

SITE HISTORY/DESCRIPTION:

The approximately 1-acre Standard Auto Bumper site is a chromium and nickel plating facility in Hialeah, northeast Dade County, Florida. Surrounding land use is primarily industrial, residential, and recreational. The topography at the site is generally flat. Site features consist of a one-story concrete block structure, two concrete-holding tanks, a concrete and asphalt slab, and numerous plating process holding and drying racks. In 1959, Standard Auto Bumper began electroplating operations, and discharged wastewater from the electroplating and stripping process to an onsite drainage ditch/swale area west of the facility. In 1972, a wastewater treatment system was constructed to convert hexavalent chromium to insoluble trivalent chromium. Between 1972 and 1979, the effluent from this treatment system was discharged to an underground, drainage trench onsite. In 1979, use of this trench was discontinued when the Hialeah sewer system began receiving effluent discharge. Dade County also documented numerous improper discharges from the facility between 1977 and 1982. EPA investigations of soil and ground water in 1985 identified elevated concentrations of metals in the ground water beneath the former disposal areas. In 1989 and 1990, a removal action included soil excavation of the discharge trench area and offsite disposal of the material. The primary source of contamination was determined to be the electroplating process waste streams. This ROD addresses onsite contaminated soil to reduce the migration of these contaminants to the ground water. Remediation of contaminated ground water will be addressed in a subsequent ROD. The primary contaminants of concern affecting the soil are metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating 2,500 cubic yards of contaminated soil with concentrations exceeding a 10^{-6} risk level and disposing of the soil offsite; backfilling the excavated areas with clean fill; and monitoring ground water. The estimated present worth cost for this remedial action is $338,186, which includes a present worth O&M cost of $40,186.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on the exceedance of a 10^{-6} risk level, including hexavalent chromium 52 mg/kg; nickel 370 mg/kg; and total chromium 519 mg/kg.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carcinogenic Compounds; Chromium; Clean Air Act; Direct Contact; Excavation; Filling; Ground Water Monitoring; Lead; Metals; Offsite Disposal; RCRA; Soil; State Standards/Regulations.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Medium: Soil
Major Contaminants: Metals
Category: Source Control - Final Action

USDOE OAK RIDGE RESERVATION (USDOE) (OPERABLE UNIT 6), TN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The Oak Ridge Reservation (Operable Unit 6) site is located within the K-25 plant, a former uranium enrichment facility in Oak Ridge, Roane County, Tennessee. Land use in the area is mixed industrial, recreational, residential, and agricultural. Since the 1940's, the fabrication, decontamination, and maintenance processes associated with activities at the site, known as K-25, have produced hazardous and radioactive wastes. To dispose of these wastes, treatment, storage, and disposal facilities were constructed at the K-25 site. In the mid-1970's, the swampy spring discharge area at the base of one of the waste disposal units, the K-1070-C/D Burial Grounds, was filled and a pipe was inserted into the hillside to collect natural seepage for routing to a storm drain. The pipe discharge is referred to as SW31. In 1989, K-25 was divided into OUs to address and isolate environmental problems into more manageable entities, and the K-1070-C/D Burial Ground and SW31 became part of the K-1070 OU. The K-1070 OU is presently undergoing an RI under CERCLA; however, SW31 has been isolated for interim action. This ROD addresses an interim remedy to reduce the migration of contaminants and degradation of the environment caused by the SW31 discharge while the investigation of the K-1070 OU continues. The objective of this ROD, which addresses OU6, is to terminate the direct discharge of contaminants to surface water by intercepting and routing contaminated waters for treatment via an NPDES-permitted outfall prior to discharge to surface water. Future RODs will address source control actions to remediate the K-1070-C/D disposal pits and trenches, which are suspected of causing releases of hazardous substances to ground water and a final remediation action to address ground water contamination problems at the K-25 site as a whole. The primary contaminants of concern affecting the surface water are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PCBs and PAHs; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes collecting and pretreating surface water using oxidation, pH adjustment, and flocculation/ clarification to remove heavy metals, followed by treatment by an air stripper to remove VOCs, and carbon polishing to remove PCBs; discharging the water offsite to a NPDES-permitted facility for final treatment prior to discharge; controlling air emissions from the air stripping process using carbon adsorption, if necessary, with regeneration or disposal of the spent carbon; and conducting quarterly surface water monitoring. The estimated capital cost for this remedial action is $350,000, with an annual O&M cost of $117,700.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific surface water clean-up goals are based on SDWA MCLs and primary health advisory. These include benzene 0.005 mg/l; PCE 0.005 mg/l; TCE 0.005 mg/l; toluene 1 mg/l; xylenes (total) 10 mg/l; naphthalene 0.13 mg/l; and lead 0.05 mg/l.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Interim Remedy; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Treatment; Organics; PAHs; PCBs; PCE; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; Surface Water; Surface Water Treatment; TCE; Toluene; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 06/28/91, 09/19/91, 09/19/91, 09/21/91
Lead: Federal Facility
Contaminated Medium: SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim

USDOE OAK RIDGE RESERVATION (OPERABLE UNIT 18), TN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The USDOE Oak Ridge Reservation (Operable Unit 18) site is located adjacent to the City of Oak Ridge, Anderson County, Tennessee. The Oak Ridge Y-12 plant was built in 1943 by the U.S. Army Corps of Engineers as part of the Manhattan Project. Y-12 occupies the upper reaches of East Fork Poplar Creek in Bear Creek Valley, which lies between Pine Ridge to the north and Chestnut Ridge to the south. The original mission of the plant was to separate the fissionable isotope of uranium using electromagnetic separation. Recent activities at Y-12 have included the chemical processing of lithium and uranium compounds, precision fabrication of components from these and many other materials, and assembly of the components into major subassemblies for nuclear weapons. In support of these activities, the plant conducts metallurgical and machine shop operations, including electroplating. The Plating Shop Container Areas, which are within the fenced security area of Y-12, receive spent plating solutions and sludge. Spills in the Plating Shop Container Areas have released inorganic and organic contaminants to the surrounding subsurface soil; however, migration of contaminants to ground water and surface water is unlikely because they are present at low concentrations. The physical and chemical properties of soil and contaminants are not conducive to the transport of inorganics to the ground water, and the gravel and asphalt surfaces of the site act to reduce erosion. This ROD addresses OU18, the soil in the Plating Shop Container Areas. A subsequent ROD may address future contaminants in ground water, surface water, and runoff, if necessary, for the UEFPC Integrator OU. Because the Plating Shop Container Areas are within the fenced security of Y-12 and are devoid of vegetation, the probability of detectable impacts to terrestrial and aquatic plants and animals is low. Currently, the total excess cancer risk is below the EPA-established range of concern, and noncarcinogenic health effects are also below the threshold for potential concern, based on a conservative exposure to protect human health at the Y-12 Plating Shop Container Areas. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes no further action. No additional action is necessary to protect human health and the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Date of previous RODs: 06/28/91, 09/19/91, 09/19/91, 09/30/92
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

USMC CAMP LEJEUNE MILITARY RESERVATION, NC

September 23, 1992

SITE HISTORY/DESCRIPTION:

The 500-acre USMC Camp Lejeune Military Reservation is located 15 miles southeast of Jacksonville, in Onslow County, North Carolina. Within the site lies the Hadnot Point Industrial Area (HPIA), which was constructed in the late 1930's. It is composed of 75 buildings and facilities, which include gas stations, offices, storage yards, maintenance shops, and a dry cleaning plant. A transformer storage area, industrial area fly ash dump, and a fuel tank farm also are located near the HPIA. Several areas of the HPIA have been investigated for potential contamination attributed to Marine Corps activities and operations that resulted in a generation of potentially hazardous wastes. This ROD addresses an interim remedial action for the shallow aquifer at the HPIA to protect human health from exposure to VOCs and metals. Subsequent actions are planned to fully address all of the impacted media at the site; specifically, soil and the deeper aquifer. The primary contaminants of concern affecting the shallow ground water aquifer are VOCs, including benzene and TCE; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes extracting and pretreating contaminated ground water using an oil/water separator; treating the water onsite using precipitation, chemical reduction, and sedimentation to remove inorganics, and air stripping to remove VOCs; treating emissions using carbon adsorption, based on the results of a treatability study; discharging the treated water offsite to the Hadnot Point Sewage treatment plant for ex-situ biological treatment, prior to final onsite discharge to the New River; transporting the free product to a waste oil recycler or incinerator offsite; conducting long-term ground water monitoring; and implementing institutional controls including ground water use restrictions. The estimated present worth cost for this remedial action is $7,600,000, which includes an estimated annual O&M cost of $351,500 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up standards are based on SDWA MCLs and state standards and include benzene 1 ug/l; TCE 2.8 ug/l; lead 15 ug/l; arsenic 50 ug/l; and chromium 50 ug/l.

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented to restrict the use of ground water and prevent installation of new wells in the area.

KEYWORDS:

Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/ Thermal Destruction; Institutional Controls; Interim Remedy; Lead; MCLs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; Publicly Owned Treatment Works (POTW); Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; Treatability Studies; Treatment Technology; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Interim

WHITEHOUSE WASTE OIL PITS (AMENDMENT), FL

June 16, 1992

SITE HISTORY/DESCRIPTION:

The 7-acre Whitehouse Waste Oil Pits site was used by Allied Petroleum Products (Allied) to dispose of acidic waste oil sludges from its oil reclamation process in Whitehouse, Duval County, Florida. A cypress swamp system and residential area are immediately adjacent to the site. The northeast tributary of McGirts Creek traverses the north site boundary. The Floridian surficial aquifer underlies the site and is the drinking water source for local residents. In Allied's reclamation process, contaminants were removed from waste oil treatment with concentrated sulfuric acid, which precipitated most of the additives and sediment as well as a large portion of the metals and other contaminants in the waste oil. The acid sludge produced in the first step and clay used to decolorize the oil were dumped into the unlined pits at the site. In 1976, following a 200,000-gallon waste oil spill that occurred during dike wall reconstruction, a treatment system to drain the liquid portion of the pits was constructed. In 1979, under the supervision of the state and city, the pits were capped with clay and top soil. A 1985 ROD addressed source control as a containment remedy consisting of a slurry wall construction, soil cap, and a ground water recovery and treatment system; however, EPA has re-evaluated the 1985 ROD selection and determined that the containment remedy failed to meet the requirements of SARA. As a result, this ROD amendment addresses an alternative for treating Whitehouse wastes by eliminating direct contact risk associated with pit soil/sludge wastes and preventing contaminated ground water in the surficial aquifer from migrating laterally. The primary contaminants of concern affecting the soil, debris, ground water, and surface water are VOCs, including benzene, toluene, and xylenes; other organics, including PCBs and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The amended remedial action for this site includes excavating and screening the soil and sludge wastes from within seven waste pits to remove coarse debris, with decontamination and offsite disposal of the debris not amenable to biotreatment; treating 56,930 cubic yards of screened soil and sludge/wastes using soil washing, followed by onsite ex-situ biotreatment of soil wash water and suspended contaminated fines using a slurry-phase bioreactor, with discharge of the treated water to an onsite drainage ditch if discharge levels are met, or further treatment in the onsite treatment system prior to discharge; treating contaminated fines and sludge onsite using solidification/stabilization, with replacement in the drainage ditch; extracting contaminated ground water with analysis and onsite treatment using granular activated carbon (GAC) adsorption and chemical precipitation units, prior to discharge to surface water; installing and maintaining a 6-inch vegetative cover over the excavated area; fencing the site; conducting a pilot-scale treatability study to further develop the treatment train; and monitoring ground water. If the ground water treatment system is not capable of achieving the clean-up goals at the end of any 5-year period, the following contingencies will apply: containment measures to prevent further migration of the ground water plume; consideration of a waiver of chemical-specific ARARs for the aquifer; implementation of institutional controls, including deed restrictions, to restrict access to certain portions of the aquifer; and monitoring onsite and offsite wells. The estimated present worth for this remedial action is $15,500,000, with O&M costs of $3,400,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Soil clean-up levels are based on a direct contact exposure pathway (risk-based). Chemical-specific goals for soil include arsenic 42 mg/kg; benzene 0.4 mg/kg; chromium 526 mg/kg; lead 500 mg/kg; naphthalene 317 mg/kg; PCB 1 mg/kg; phenol 47,467 mg/kg; PCE 4 mg/kg; toluene 2,000 mg/kg; and TCE 0.7 mg/kg. The ground water clean-up levels are in accordance with the federal and state water quality standards. Chemical-specific goals for ground water include arsenic 50 ug/l; benzene 1 ug/l; benzo(a)pyrene 0.2 ug/l; chromium 100 ug/l; lead 15 ug/l; 3,4-methyl phenol 850 ug/l; naphthalene 10 ug/l; phenol 10,000 ug/l; toluene 24 ug/l; TCE 3 ug/l; and xylenes 50 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions may be implemented as part of the contingency remedy, as needed, to restrict access to the aquifer.

WHITEHOUSE WASTE OIL PITS (AMENDMENT), FL (Continued)

June 16, 1992

KEYWORDS:
ARAR Waiver; Arsenic; Benzene; Biodegradation/ Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Contingent Remedy; Debris; Decontamination; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; MCLGs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Phenols; Plume Management; RCRA; ROD Amendment; Safe Drinking Water Act; Sludge; Soil; Soil Washing/ Flushing; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water Monitoring; Toluene; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 05/30/85
Lead: Fund
Contaminated Media: Soil, Debris, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

WILSON CONCEPTS OF FLORIDA, FL
September 22, 1992

SITE HISTORY/DESCRIPTION:
The 2-acre Wilson Concepts of Florida site operated as a manufacturing and metal-finishing facility in Pompano Beach, Broward County, Florida. Land use in the area is predominantly industrial. The site overlies the Biscayne Aquifer, a sole-source aquifer that supplies all potable water for Broward County. From 1974 to 1987, Wilson Concepts of Florida, Inc., used the site to manufacture jet aircraft engine parts, metal-working machinery, and for associated operations, such as precision machining, drilling, and milling of metal parts, vibratory deburring, degreasing, steam cleaning, and spray coating of parts. Chemicals used at the site included a variety of hydraulic and lubricating oils, metal protection agents, water coolants, methylene chloride, methyl ethyl ketone, and chemical cleaners. As a result of several inspections from 1976 through 1989, the Broward County Environmental Quality Control Board (BCEQCB) identified poor waste handling practices, including discharge of industrial wastes onto the ground. This ROD addresses onsite soil and ground water. EPA investigations have shown that the soil and ground water contamination associated with the site is no longer considered a health threat under current or likely land use conditions. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes no further action with ground water monitoring at and around the site for 1 year. The estimated total cost for the ground water monitoring is $48,000, which includes an O&M cost of $36,000 for 1 year.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Ground Water Monitoring; No Action Remedy; O&M; Sole-Source Aquifer.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

WOODBURY CHEMICAL (PRINCETON PLANT), FL

June 25, 1992

SITE HISTORY/DESCRIPTION:

The 5-acre Woodbury Chemical (Princeton Plant) site is a pesticide and fertilizer formulation and storage facility located approximately one-half mile southwest of Princeton, Dade County, Florida. Land use in the area is predominantly agricultural, with two residences located just north and west of the site. The estimated 20,000 people who reside in Princeton use the underlying sole-source Biscayne aquifer as their drinking water supply. From 1927 to 1959, the site was used as a tomato and potato packing house. From 1959 to the present, the site has been used for formulating technical-grade materials to produce pesticides and fertilizers. As a result of a tank leak or spill in the late 1970's, EPA conducted numerous investigations that revealed toxaphene contamination in soil. In 1990, a removal action was conducted at the site, which resulted in the excavation of contaminated soil. Soil contaminated with greater than 100 mg/kg of toxaphene was sent offsite to the GSX facility in Pinewood, South Carolina, and soil contaminated with less than 100 mg/kg was sent to the South Dade County landfill. The previous removal action has eliminated the principal threat at the site, and no additional action is necessary to protect human health or the environment. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action, with quarterly ground water monitoring. The estimated total cost for this remedial action is $22,500, which includes an O&M cost of $10,000 for 1 year.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Ground Water Monitoring; No Action Remedy; O&M; Sole-Source Aquifer.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

YELLOW WATER ROAD DUMP, FL

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 14-acre Yellow Water Road Dump 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 mixed commercial and residential. The property, originally purchased in 1940 for commercial development, was later acquired by the American Environmental Energy Corporation (AEEC). In 1981, AEEC entered into a joint venture with two other corporations with the intent of moving an incinerator to the site to destroy PCBs and began onsite storage of PCB-contaminated liquids and electrical equipment at the former operational area in anticipation of upcoming onsite incineration operations. The proper permits for the incinerator were never obtained. In 1982, PCB-contaminated oils were spilled at the site during onsite salvage operations to remove valuable metal parts from transformer carcasses. As a result of onsite PCB contamination, EPA conducted a number of investigations that revealed PCB contamination in the soil and ground water. In 1984, EPA conducted a removal action 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 that 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. The remedy selected by EPA for this site has been conducted in two separate operable units. A 1990 ROD addressed the source of the contamination by excavating, stabilizing, and solidifying the PCB contaminated soil. This ROD addresses the appropriate remediation for the contaminated ground water as OU2. This is the second and final planned remedial action for this site. The primary contaminant of concern affecting the ground water is PCB, an organic.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes constructing four additional ground water monitoring wells downgradient of the former operational area; installing a security fence; conducting long-term ground water monitoring; and implementing institutional controls, including deed and ground water use restrictions, to control exposure to contaminated ground water. Downgradient monitoring will be performed quarterly for 2 years, after which the ground water monitoring frequency will be reevaluated if no PCB contamination is detected. If PCB contamination is identified above MCLs in compliance wells, additional contingent remedial activities would be implemented, including construction of ground water extraction wells; installation of a ground water filtration system, with a granular activated carbon (GAC) treatment system, and a treated effluent discharge system, which uses onsite infiltration ponds or drainage swales; and transporting and disposing and/or treatment of the residual carbon and filtration waste offsite. The estimated present worth cost for this remedial action is $407,620 for initial implementation and $1,377,600 for full implementation of the contingent remedy, which includes an annual O&M cost of $575,105 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

The chemical-specific ground water clean-up goal is based on the SDWA MCLs for PCBs of 0.5 ug/l. However, because of the technical impracticability of using a treatment system to remove PCBs from ground water, a waiver of SDWA MCLs is required for ground water located directly beneath and in proximity to the former operational area.

INSTITUTIONAL CONTROLS:

Deed and ground water use restrictions, zoning controls, and water supply well permitting prohibitions will be implemented to prevent exposure of human health and the environment to PCB-contaminated ground water.

KEYWORDS:

ARAR Waiver; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls: MCLs; O&M; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PCBs; Safe Drinking Water Act; State Standards/Regulations; Toxic Substances Control Act.

YELLOW WATER ROAD DUMP, FL (Continued)

June 30, 1992

SITE SUMMARY

Date of previous RODs: 09/28/90
Lead: Federal Enforcement
Contaminated Media: GW
Major Contaminants: Organics
Category: Ground Water - Final Action

ALSCO ANACONDA, OH
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 4.8-acre Alsco Anaconda site is located in Gnadenhutten, Tuscarawas County, Ohio, within the 50- and 100-year floodplains of the Tuscarawas River. It consists of four source areas which contained F019 waste (wastewater treatment sludge) generated by the adjacent aluminum products manufacturing facility. Land use in the general area of the site is mixed industrial, recreational, and residential. Several municipal, industrial, and residential wells are located within a 1.5 mile radius of the site; however, contaminated site ground water flows towards and into the Tuscarawas River where it discharges at concentrations below any regulatory levels. Site ground water is not used as draining water. Aluminum products have been produced at neighboring manufacturing facility since 1945 when it was incorporated as Alsco, Inc. From 1965 through 1978, contamination at the Alsco Anaconda site occurred when wastewater and wastewater treatment sludge (F019) from the aluminum plant were disposed of in an unlined settling basin (which consisted of two impoundments) and a sludge pit. The F019 waste contained hazardous constituents such as cyanide and chromium. As a result of overflow from the settling basin and plant wastewater treatment discharge, sludge also became located in a wooded area between the settling basin and the river. The total volume of sludge and contaminated soil excavated from the source areas to date is approximately 45,000 tons. A 1989 ROD addressed the Source Material Operable Unit, which involved the excavation and offsite treatment and disposal of the contaminated sludge and soil, incineration of a small amount of material containing high levels of PCBs, and backfilling and revegetating excavated areas of the site. Most of this work has been completed during 1992. This ROD addresses the contaminated ground water and sediment which constitute the second operable unit at the site. The primary contaminants of concern affecting the ground water include organics such as cyanide, fluoride, PCBs; and bis(2-ethylhexyl) phthalate; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes natural flushing and attenuation of contaminants from the contaminated aquifer, and allowing ground water to discharge onsite to the Tuscarawas River; installing onsite ground water monitoring wells; installing and sampling background wells; sampling Tuscarawas River sediment and benthic organisms; and implementing institutional controls including deed restrictions to prevent installation of drinking water wells onsite until remedial action levels for ground water have been achieved. The estimated present worth cost for this remedial action is $504,600, which includes a present worth O&M cost of $455,400.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up levels include the following, which are SDWA MCLs or proposed MCLs; chromium 0.1 mg/l; cyanide 0.2 mg/l; fluoride 4 mg/l; and bis (2-ethylhexyl) phthalate 0.004 mg/l. Lead levels will meet an action level of 0.015 mg/l. Clean-up below background levels will not be required.

INSTITUTIONAL CONTROLS:
Institutional controls, including deed restrictions, will be implemented to prevent installation of drinking water wells within the site boundaries until remedial action levels for ground water have been achieved.

KEYWORDS:
Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Discharge; Organics; PCBS; RCRA; Safe Drinking Water Act; Sediment; State Standards/Regulations; Wetlands.

SITE SUMMARY

Date of previous RODs: 09/08/89
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

AMERICAN CHEMICAL SERVICES, IN
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 36-acre American Chemical Services (ACS) site is a chemical manufacturing facility in Griffith, Indiana, which was formerly involved in solvent recovery. Land use in the area is predominantly residential and industrial with a wetlands area located north of the Chesapeake and Ohio railway on the west of the site. Nine upper aquifer wells and 16 lower aquifer wells are located within 1/2 mile of the site, with area residents using most of the lower aquifer wells for drinking water. From the late 1960's to early 1970's, ACS manufactured barium naphtherate, brominated vegetable oil, lacquers and paints, liquid soldering fluid, and polyethylene solutions in polybutene. Two onsite incinerators burned still bottoms, nonreclaimable materials generated from the site, and offsite wastes; however, in the 1970's, the incinerators were dismantled, the shells were cut up and scrapped, and the burners and blowers remain onsite. From 1970 to 1975, batch manufacturing expanded, and additives, lubricants, detergents, and soldering flux were manufactured. In 1980, a 31-acre part of the property to the west of the offsite containment area was sold to the City of Griffith to expand the City's municipal landfill. Solvent recovery operations continued until 1990 when ACS lost interim status under RCRA regulations because of failure to obtain required insurance policies. Three identified disposal areas on the ACS property are the Onsite Containment Area, where approximately 400 drums containing sludge and semi-solids of unknown types were reportedly disposed of; the Still Bottoms, Treatment Lagoon #1, and adjacent areas, which received still bottoms from the solvent recovery process, including a pond and lagoon that were taken out of service in 1972, drained, and filled with an estimated 3,200 drums containing sludge materials; and the Offsite Containment Area and Kapica/Pazmey property, which was used as a waste disposal area and received wastes that included onsite incinerator ash, general refuse, a tank truck containing solidified paint, and an estimated 20,000 to 30,000 drums that were reportedly punctured prior to disposal. Disposal practices in the Offsite Containment Area ceased in 1975. This ROD addresses a final remedy for the buried drums, as well as waste, contaminated soil, debris, and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PCBs, PAHs, and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavation and offsite incineration of approximately 400 intact buried drums, decontaminating and disposing of miscellaneous debris offsite; treating contaminated soil using in-situ vapor extraction; conducting an in-situ vapor extraction pilot study for Onsite Area buried waste; excavating and treating buried waste or PCB-contaminated soil onsite using low temperature thermal treatment, with vapor emission control during excavation, and possible immobilization of inorganics after treatment; depositing the treated residuals that meet health-based levels onsite and covering the area with a soil cover; pumping and onsite treatment of contaminated ground water along with wash water from the decontamination processes and condensate from the soil treatment processes using a method to be determined during the RD phase, with onsite discharge of the treated water to surface water and wetlands; continuing to evaluate and monitor wetlands, with mitigation of affected wetlands if necessary; controlling and monitoring air emissions from excavation and treatment processes; conducting long-term ground water monitoring; and implementing, to the extent possible, institutional controls including deed restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action ranges from $37,800,000 to $46,800,000, which includes an annual O&M cost of $17,670,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are based on risk-based levels and include benzene 1.0 mg/kg; toluene 167-5,000 mg/kg; xylenes 867-26,000 mg/kg; PCBs 10 mg/kg (with 10-inch soil cover); chromium 47-1,400 mg/kg; and lead 500 mg/kg. The lead clean-up level for soil is based on the Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites and the PCB clean-up level for soil is based on TSCA policy for unrestricted access. Chemical-specific ground water clean-up goals are based on risk-based levels, SDWA MCLs, and include

AMERICAN CHEMICAL SERVICES, IN (Continued)
September 30, 1992

benzene 5 ug/l; PCE 5 ug/l; PCBs 0.06 ug/l; and arsenic 8.8 ug/l.

INSTITUTIONAL CONTROLS:
Institutional controls may be implemented in the form of deed restrictions, and site access restrictions such as fencing, to provide protection from contaminants until clean-up standards are met.

KEYWORDS:
Air Monitoring; Arsenic; Benzene; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Decontamination; Deferred Decision; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Phenols; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Toluene; Toxic Substances Control Act; TCE; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federa. Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

BOFORS NOBEL (AMENDMENT), MI

July 22, 1992

SITE HISTORY/DESCRIPTION:

The 85-acre Bofors Nobel site contains an active specialty chemical production plant in Egelston Township, Muskegon County, Michigan. Site features include an unused landfill, an active ground water pumping and treatment system, and 10 abandoned sludge lagoons. Onsite wetlands lie within the 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. From 1960 to 1976, the plant produced alcohol-based detergents, saccharin, pesticides and dye intermediates, discharging sludge, wastewater, and waste liquids into the 10 onsite lagoons. Subsequent state investigations 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 pretreat waste prior to discharge to the POTW and to treat contaminated ground water in the lacustrine aquifer. This ROD amends a 1990 ROD written by the state, which consisted of onsite incineration and onsite landfilling of lagoon area soil, construction of RCRA-type secure landfill cells to hold non-incinerated material and ash from the incinerated sludge, and construction of an onsite ground water treatment facility with extraction and onsite treatment of contaminated ground water. Since that time, an EPA predesign site investigation was conducted as part of the remedial design which revealed that a larger volume of contaminated material was present at the site than was originally believed, and that there would be inconsistent treatment of contaminated material with the same level of risk. Additionally, the cost and logistics involved in incineration were greater than originally believed, and the large increase in volume would also significantly lessen the effective reduction in risk achieved by incineration. A subsequent final ROD will address other contaminated soil and establish clean-up criteria for ground water. This ROD amendment replaces incineration as the treatment technology for soil and sludge. The primary contaminants of concern affecting the soil and sludge are semi-VOCs including benzidine and dichlorobenzidine.

SELECTED REMEDIAL ACTION:

The selected amended remedial action for this site includes excavation and onsite disposal of approximately 767,000 cubic yards of contaminated sludge and soil in onsite RCRA-type secure landfill cells, constructed as part of the original remedial action; expanding and upgrading the unused landfill adjacent to the lagoon area to meet the RCRA standards; storing lesser contaminated material in the unused landfill; installing extraction wells downgradient of the unused landfill as a tertiary leachate containment system; and monitoring the landfill and existing leachate collection system. This ROD amendment does not address any issue associated with ground water treatment. The estimated present worth cost for this amended remedial action is $45,498,216, which includes an annual O&M cost of $89,030 for 3 years.

PERFORMANCE STANDARDS OR GOALS:

EPA has determined that landfilling of contaminated soil and sludge without treatment provides the equivalent level of protection to human health and the environment from site-related risks as that provided by the remedy in the 1990 ROD. Ground water clean-up criteria will be addressed in a subsequent final ROD.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Capping; Carcinogenic Compounds; Closure Requirements; Direct Contact; Excavation; Floodplain; Landfill Closure; Leachate Collection/Treatment; O&M; Onsite Containment; Onsite Disposal; Organics; RCRA; ROD Amendment; Sludge; Soil; Solvents; State Standards/Regulations; Temporary Storage; Treatability Studies; VOCs; Wetlands.

BOFORS NOBEL (AMENDMENT), MI (Continued)

July 22, 1992

SITE SUMMARY

Date of previous RODs: 09/17/90
Lead: Fund
Contaminated Media: Soil, Sludge
Major Contaminants: SVOCs
Category: Source Control - Interim
Ground Water - Interim

BUTTERWORTH #2 LANDFILL, MI

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 180-acre Butterworth #2 Landfill is a municipal landfill in Grand Rapids, Kent County, Michigan. Land use in the area is predominantly residential and industrial. The site, which lies within the 100-year floodplain of the Grand River, contains wetland drainage areas with emergent aquatic communities. Prior to 1967, the area to the east of the stormwater out-fall was used as a municipal landfill (Butterworth #1). This portion of the site was operated as an open landfill where daily cover of refuse was not provided. After the enactment of Michigan Act 87 in 1965, Butterworth #1 was closed, and Butterworth #2 and #3 were opened. Several high-voltage power transmission lines pass through the landfill, and landfilling was not allowed in the areas below the power lines; however, it was discovered that the area was allegedly used to dispose of liquid wastes, such as solvents and paint sludge. Records indicate that from 1967 to 1971, approximately 3,000 to 4,000 cubic yards of waste per day were received at the landfill. In 1988, a surface soil/test pit assay identified PCBs at levels of 800 mg/kg and chromium at levels of 43,000 mg/kg. In 1990, a removal action was initiated to address this contamination, which resulted in 1,100 tons of material being removed from the site. This ROD addresses a final remedy for the landfill via capping and establishing ACLs for site-specific contaminants of concern in ground water. The primary contaminants of concern affecting the soil are VOCs, including benzene, TCE, and xylenes; other organics, including PCBs and pesticides; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes removing and disposing of exposed drums containing hazardous materials at an offsite RCRA facility; upgrading the landfill cover to include a clay cap, and gas venting and treatment systems to meet state standards; revegetating the area; installing additional monitoring wells in the upper and lower aquifers, and implementing a long-term monitoring program for ground water, surface water, sediment, and biota; establishing ACLs for site ground water based on the current level of contamination; mitigating affected wetlands; implementing institutional controls including deed and ground water use restrictions. The estimated present worth cost for this remedial action is $15,230,000, which includes an annual O&M cost of $110,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals were not established in this ROD because current contamination levels will be determined through sampling of compliance monitoring wells for eight consecutive quarters over a 2-year period. The indicator parameters to be analyzed quarterly will include all chemicals established as chemicals of concern. After the initial 2-year period of quarterly sampling, ground water shall be monitored for the next 3 years on a quarterly basis; then, analysis will be made for the primary contaminants of concern.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of deed and ground water use restrictions will be implemented to control future development of the landfill area, and to prohibit the installation of ground water drinking water wells outside the point of compliance (the landfill boundary).

KEY WORDS:

ACL (Alternate Concentration Limit); Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; PCBs; Pesticides; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Wetlands; Xylenes.

SUTE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Medium: Soil
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action

CANNELTON INDUSTRIES, MI
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 75-acre Cannelton Industries site is a former tannery facility located in the Upper Peninsula of Michigan, in Sault Sainte Marie, Chippewa County. Land use in the area is predominantly residential and light industrial, with 400 single-family residences and an elementary school located within 1/2 mile of the site. Nearby residents and the school are connected to the City's municipal water system, the source of which is the Saint Marys River intake, 1 mile upstream of the Cannelton site. The Saint Marys River, which is used both as a drinking water source and for recreational purposes, is adjacent to the lower area of the site. Part of the site lies within the 100-year floodplain of the river, and several wetlands areas surround the site. Additionally, the site overlies two aquifers that are hydraulically connected. From 1900 to 1958, Northwestern Leather Company operated a tannery facility onsite. The plant had no sewer system , and three drains discharged approximately 250,000 gallons per day of chemical waste to the Saint Marys River and adjacent wetlands. Discharge wastes from the tannery included metals, cyanide, sulfide, calcium carbonate, salts, formaldehydes, thinners, acids, and alcohols. The primary discharge area covers 4 acres along the river to the north of the former plant site. Of this, approximately 1 acre ("the barren zone") contains multi-colored soil and waste residues, has little vegetation, and has had reportedly spontaneous fires occur in the past. A second area along the river at the west end of the site was used as a dump site for barrels and "general" waste from the tannery. In 1958, the tannery was destroyed by a fire; since then, the property has remained unoccupied. EPA's removal program has been involved at the site on three different occasions. In 1988, they responded to recurring fires and excavated five trenches in the barren zone area. In 1989 and 1991, shoreline stabilization systems were developed around the site to prevent waste materials from eroding into the river a fence currently exists around the majority of the site. This ROD addresses a final remedy for onsite contaminated soil, sediment, and debris and will mitigate impacts to surface water and ground water through the containment of source materials. The primary contaminants of concern affecting the soil, sediment, and debris are VOCs, including TCE and xylenes; other organics, including PAHs, pesticides, phenols, and PCBs; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating, dredging, and dewatering debris, waste, soil, and sediment that exceed the clean-up criteria; placing these media in an onsite solid waste landfill, and closing the landfill in accordance with RCRA subtitle D, or more stringent state standards; filling in onsite excavated areas with clean soil to stabilize the shoreline; collecting ground water from the dewatering/construction activities and treating the water, if needed, prior to offsite discharge to POTW, or onsite discharge to surface water; conducting additional ecological studies; monitoring ground water and surface water; and implementing institutional controls to control land use, and potentially, deed restrictions to control ground water use. The estimated present worth cost for this remedial action is $19,700,000, which includes an annual O&M cost of $458,000 for years 0-1; $449,000 for years 2-3; $579,000 for year 4; and $303,000 for years 5-30.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil, sediment, and debris excavation standards are based on state direct human contact (DHC) standards and include cadmium 100 mg/kg (DHC); lead 400 mg/kg (DHC); arsenic 12.8 mg/kg (background); and carcinogenic PAHs 0.33 mg/kg (MDL). A chemical-specific excavation goal for chromium was established using back calculations based on a 10^{-6} cancer risk level for hexavalent chromium and an HI of 1 for trivalent chromium, resulting in a clean-up standard of 5,300 mg/kg for trivalent chromium and 54 mg/kg for hexavalent chromium.

INSTITUTIONAL CONTROLS:
Institutional controls in the form of land use restrictions will be implemented at the site. If it is found that health-based drinking water standards are not met after removal of source materials, deed restrictions will be sought for ground water beneath the site so that no drinking water wells will be installed.

CANNELTON INDUSTRIES, MI (Continued)
September 30, 1992

KEYWORDS:
Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Dredging; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Leachability Tests; Lead; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/Regulations; Surface Water; Surface Water Monitoring; TCE; Treatability Tests; VOCs; Water Quality Criteria; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contamianted Media: Soil, Sediment, Debris
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action

CENTRAL ILLINOIS PUBLIC SERVICE, IL

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 1-acre Central Illinois Public Service (CIPS) site is a former manufactured gas plant in Taylorville, Christian County, Illinois. Land use in the area is predominantly residential, with Manners Park, a multi-use recreational facility, located adjacent to the site. Seaman Estate pond, located south of the site, is used for fishing and swimming. Ground water beneath the site is no longer used as a drinking water source, and residences have been connected to a municipal water supply. The CIPS/Taylorville plant, constructed in 1892, was operated by CIPS from 1912 until 1932. The plant produced a low-quality gas from coal, which was used for lighting and heating. Coal tar, produced as a by-product, was typically disposed of offsite, sold, or given away to be used for various purposes. After higher quality natural gas became available in the area, the plant was closed. Onsite contamination by coal tar was discovered in 1985 during site construction. As a result of state investigations, an immediate removal action (IRA) was performed by CIPS in 1987 to remove all buried tanks, contaminated soil, and sediment at the site; to provide an alternative water supply to affected residences; and to implement institutional controls. This ROD addresses a final remedy for the remaining principal threat posed by ground water contamination at the site, and also documents the prior 1987 removal action. The primary contaminants of concern affecting the soil, sediment, debris, and ground water at the site are VOCs, including benzene, toluene, and xylenes; and other organics, including PAHs and phenols.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes documenting the previously implemented source control measures which included removal and offsite disposal of the structures associated with the original gas plant; excavation and offsite disposal of approximately 9,000 cubic yards of visibly contaminated soil down to the ground water table level and excavation and offsite disposal of 3,000 cubic yards of soil and sediment from the drainageway section leading to Seaman Estate pond; backfilling excavated areas with clean soil from offsite; plugging and abandoning private drinking water wells; and connecting affected residents to a public water supply. The selected remedial actions to be implemented now include extracting and neutralizing contaminated ground water prior to onsite treatment in a liquid phase carbon adsorption column, with onsite discharge of the treated water to the drainageway downgradient of Seaman Estate pond; transporting contaminated carbon offsite to a facility for regeneration or incineration; removing precipitated solids from the treatment process, and testing them for hazardous waste characteristics, prior to appropriate disposal; conducting long-term ground water and surface water monitoring; and implementing erosion controls, institutional controls, including deed and land use restrictions, and site access restrictions, including fencing. The estimated present worth cost for this remedial action is $9,346,034, which includes an annual O&M cost of $401,400 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up standards, which are based on state and federal drinking water criteria, include benzene 0.005 mg/l; toluene 1 mg/l; ethylbenzene 0.7 mg/l; xylenes 10 mg/l; anthracene 2.1 mg/l; benzo(a)pyrene 0.00023 mg/l; and 2-methylphenol 0.35 mg/l. In addition to meeting the individual ground water objectives indicated certain toxicity equations as defined in the ROD must be satisfied to protect against liver tumors and liver, kidney, and blood toxicity.

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented in the form of land use and deed restrictions to further protect the public health and environment.

KEYWORDS:

Alternate Water Supply; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/ Regulations; Surface Water Monitoring; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

CENTRAL ILLINOIS PUBLIC SERVICE, IL (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action
Ground Water - Final Action

CITY DISPOSAL SANITARY LANDFILL, WI

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 38-acre City Disposal Sanitary Landfill site is an inactive landfill located in Dane County, Wisconsin. The landfilled portion of the site, which occupies approximately 24 acres, contains an estimated 700,000 cubic yards of waste. Land use in the area is predominantly agricultural with minor wooded areas. The site is bordered to the east by Badfish Creek. All residents in the vicinity use ground water from private drinking water wells; however, no contamination has been detected in the wells. From 1966 to 1977, City Disposal Corporation, and later Acme Services, Inc., used the site for disposal of household, construction, debris, and industrial wastes. Industrial wastes included solvents from the plastic fabrication industry, mixtures of lubrication oil and water, and paint wastes. During the period of operation, the landfill was subdivided into 12 cells, of which cells 1 and 12 were used for initial disposal until 1975. Cells 2, 3, 4, and 6 were filled or partially filled from 1974 until closure in 1977. Cell 5 and cells 7 to 11 were never developed. After closure of the site, both City Disposal Corporation and Acme Services, Inc., were acquired by Waste Management of Wisconsin, Inc. (WMWI). Records indicated that cells 6 and 12 were used to dispose of liquid industrial waste, which was subsequently mixed with refuse. Because of the mobility and toxicity of the industrial waste, cells 6 and 12 are considered to be the principal threats of contamination at the site. This ROD addresses the final remedy for contaminated soil, debris, and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; other organics, including phenols; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a landfill gas control system to control air emissions; treating contaminated soil and debris in cells 6 and 12 using an in-situ vapor extraction (ISVE) system with an air intrusion cut-off wall to remove and treat VOCs; treating the extracted vapors by flaring; installing a hazardous waste landfill cover, Design C, over cells 6 and 12, and a solid waste landfill cover, Design B, over the rest of the landfill; extracting ground water, and conducting treatability studies to determine the best treatment; pretreating ground water onsite using precipitation to remove metals, followed by treatment using chemical oxidation or another comparable technology, with onsite discharge to Badfish Creek; monitoring ground water and residential wells; and implementing deed, land and ground water use restrictions. The estimated present worth cost for this remedial action is $14,851,387, which includes an annual O&M cost of $90,978 for years 0-5 and $21,258 for years 6-25 for source control; and $645,859 for years 0-20 and $114,487 for years 20-40 for ground water.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on Preventative Action Limits (PALs) established in NR 140 of the Wisconsin Administrative Code and include benzene 0.067 ug/l; 2-butanone (PAL or MCL not established); 1,1 dichloroethane 85 ug/l; methylene chloride 15 ug/l; toluene 68.6 ug/l; vinyl chloride 0.0015 ug/l; and xylenes 124 ug/l. Air emissions from the gas control and ISVE systems will meet the CAA requirements. RCRA standards will apply to the construction of the landfill caps.

INSTITUTIONAL CONTROLS:

Institutional controls, including deed, land, and ground water use restrictions, will be implemented to limit the use of the landfill and landfill property.

KEYWORDS:

Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Debris; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; Phenols; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; Venting; VOCs; Wetlands; Xylenes.

CITY DISPOSAL SANITARY LANDFILL, WI (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

CLARE WATER SUPPLY, MI
September 16, 1992

SITE HISTORY/DESCRIPTION:

The Clare Water Supply site is a municipal well field in the City of Clare, Clare County, Michigan. Land use in the area is predominantly commercial, industrial, and residential with wetlands neighboring the site. In addition, a drainage ditch runs though an industrial area directly northwest of the site across the well field, discharges into the wetlands, and recharges the underlying aquifer. An estimated 3,300 residents of Clare use the municipal water supply as their drinking water supply. In 1981, state investigations of the municipal wells showed VOC contamination in the ground water. In 1982, soil samples taken during the installation of monitoring wells showed soil contamination from seven industrial facilities bordering the well field and attributed contamination of the shallow perched aquifer to the leaching of contaminants from these areas. A 1990 interim action ROD for the site provided for air stripping to remove VOCs from the city's water supply. The air strippers were installed and began operating in 1991. This ROD addresses the contaminated soil, sediment, and ground water as a final remedial action for the site. The primary contaminants of concern affecting the soil, sediment, and ground water are VOCs, including benzene, PCE, TCE, and xylenes.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes dewatering and treating 54,800 cubic yards of contaminated soil and sediment, including the soil under buildings, using in-situ vapor extraction (ISVE) to remove VOCs; treating air emissions from the ISVE process using granular activated carbon; returning spent carbon units to the supplier for offsite regeneration; possibly enhancing the effectiveness of the remedy with limited excavation of hot spots, where SVE may not be practicable, temporarily capping treated areas, or adding nutrients, based on the results of pre-design studies; extracting and treating contaminated ground water onsite using UV/chemical oxidation, with reinjection of the treated ground water into the aquifer; treating water from the dewatering process using carbon adsorption prior to discharge; monitoring ground water; and implementing institutional controls, including deed and ground water use restrictions. The estimated present worth cost for this remedial action is $11,754,247, which includes an average annual O&M cost of $431,183 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on protection of ground water and include benzene 20 ug/kg; vinyl chloride 0.4 ug/kg; TCE 60 ug/kg; PCE 14 ug/kg; methylene chloride 100 ug/kg; trans-1,2-DCE 2,000 ug/kg; cis-1,2-DCE 1,400 ug/kg; xylenes 6,000 ug/kg; toluene 20,000 mg/kg; ethylbenzene 1,000 mg/kg; 1,1-DCA 14,000 mg/kg; 1,2-DCA 8 mg/kg; 1,1,2-TCA 12 mg/kg; 1,1,1-TCA 4,000 mg/kg; and styrene 20 mg/kg. Chemical-specific ground water clean-up goals are based on SDWA MCLs, and State MCLs under Michigan's Act 307 Type B Cleanup Levels and include benzene 1 mg/l; vinyl chloride 0.02 mg/l; TCE 3 mg/l; PCE 0.7 mg/l; methylene chloride 5 mg/l; trans-1,2-DCE 100 mg/l; cis-1,2-DCE 70 mg/l; xylenes 300 mg/l; toluene 800 mg/l; ethylbenzene 70 mg/l; 1,1-DCA 700 mg/l; 1,2-DCA 0.4 mg/l; 1,1,2-TCA 0.6 mg/l; 1,1,1-TCA 200 mg/l; and styrene 1 mg/l.

INSTITUTIONAL CONTROLS:

Deed and/or ground water use restrictions will be implemented to limit access to contaminated soil areas and use of contaminated ground water until the remedial action objectives are achieved.

KEYWORDS:

Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; PCE; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/ Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs; Wetlands; Xylenes.

CLARE WATER SUPPLY, MI (Continued)

September 16, 1992

SITE SUMMARY

Date of previous RODs: 08/30/90
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, GW
Major Contaminants: VOCs
Category: Source Control - Final Action

COLUMBUS OLD MUNICIPAL LANDFILL, IN
March 31, 1992

SITE HISTORY/DESCRIPTION:
The 19-acre Old Municipal Landfill site is located near the City of Columbus in Bartholomew County, Indiana. The site, located in the 100-year floodplain of the East Fork of the White River, is bounded by farmland, state roads, and an inactive gravel quarry pond. Current land use in the vicinity of the site includes an abandoned shooting range, concrete mixing operation, and the City of Columbus POTW. From 1938 to the 1960's, the site was operated as a municipal landfill accumulating an estimated 500,000 cubic yards of fill material. After the landfill reached a maximum of 20 feet, operations ceased and the landfill was closed by placing two to three feet of dredged river sediments over the entire area. Deposited materials were mainly municipal and household wastes, although wastes from industrial sources were reportedly disposed of at the landfill. Limited dumping by unauthorized parties may also have occurred. No records of site operations were kept. The waste material was dumped directly on the ground surface and was exposed to the elements. Open burning of waste material occurred regularly. Annual spring flooding caused the waste material to become submerged periodically. Eventually, the landfill began to function as a berm between the floodplain and the adjacent farmland. In 1981, Cummins Engine Company notified EPA of waste materials, including solvents, acids, lubricants, cutting fluids, and metals, that were generated and reportedly disposed of at the landfill. In 1990, the PRPs, under direct guidance of the state and EPA, conducted an investigation to assess the potential impacts of the waste material deposited in the landfill on soil, ground water, surface water, and river sediments in the vicinity of the site. Based upon findings of the remedial investigation and evaluation of current site risks, EPA concluded that the site currently poses no immediate or long-term risks to human health and the environment. This conclusion is based on current site conditions with the assumption that these conditions will not change.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site is no further action, which includes ground water monitoring and a five-year review of site conditions to evaluate the protectiveness of the remedy. In the event that the Indiana Department of Transportation and the City of Columbus proceed with construction of the proposed roadway across the site, EPA will require the implementation of a contingency remedy, which includes implementing a landfill cover maintenance program; developing a ground water recovery system implementation plan; installing a minimum of two additional ground water monitoring wells; installing fencing with appropriate warning signs; implementing a ground water monitoring program; and implementing institutional controls, including deed restrictions on land and ground water use. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

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

KEYWORDS:
Contingency Remedy; Floodplain; Ground Water Monitoring; Institutional Controls; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

ELECTROVOICE, MI
June 23, 1992

SITE HISTORY/DESCRIPTION:

The Electrovoice (EV) site is an active manufacturing facility for audio equipment in Buchanan, Michigan. Land use in the area is predominantly residential. McCoy Creek, the nearest surface water body, is located approximately 2,000 feet north of the facility. All residents are connected to the city water supply and city wells are located 4,000 feet west of the property. Electrovoice has been in operation at its present location since 1946. Current activities at the facility include painting, electroplating, assembly, die casting, and machining. The site contains a dry well area, where disposal of paint wastes occurred between 1964 to 1973; a fuel tank area, which stored no. 6 fuel oil from 1946 to 1960; and a lagoon area, where disposal of electroplating wastewaters occurred from 1952 to 1962. In 1979, the state was notified of a release of plating waste into one of the lagoons, which prompted an inspection of the site. That same year, Electrovoice hired a contractor to remediate the two lagoons and install ground water monitoring wells onsite. In 1980, the north lagoon and its contents were removed, and the south lagoon was backfilled. However, no contaminated materials were removed from the south lagoon. Ground water monitoring conducted in 1980 revealed significant concentrations of VOCs and metals. The dry well area soils are the principal onsite threat because they are the source of the ground water contamination. This ROD addresses remediation of onsite ground water and soil as a final remedial action. A future ROD will address all offsite ground water contamination, which extends from the EV property boundary about one-half mile north to McCoy Creek. The primary contaminants of concern affecting the soil, sludge, and onsite ground water at the site are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating contaminated soil in the dry well area onsite using vapor extraction; excavating the 2,100 cubic yards of remaining sludge, with offsite solidification and landfilling; collecting and treating onsite contaminated ground water using either granular or powdered activated carbon, air stripping, chemical oxidation/reduction or photolysis/oxidation, with discharge of the treated water offsite to a POTW; and monitoring off-property ground water. If, following these actions, the dry well soil does not meet treatment standards, further remedial action consistent with RCRA closure will be evaluated, which include installing a hazardous waste cap over the lagoon area soil; conducting an investigation of the potential existence of a lower aquifer in the area of the former dry well area; monitoring on and offsite ground water; and implementing institutional controls including deed restrictions for the property and surrounding properties to prohibit future installation of drinking water wells. The estimated present worth cost for this remedial action is $4,100,000, which includes an annual O&M cost of $330,000 for 2-5 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on state standards and include arsenic 0.4 ug/kg; benzene 20 ug/kg; PCE 14 ug/kg; TCE 60 ug/kg; toluene 16,000 ug/kg; and xylenes 6,000 ug/kg. Chemical-specific ground water clean-up goals are also based on state standards and include benzene 1 ug/l; TCE 3 ug/l; toluene 800 ug/l; and xylenes 20 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions on the EV property will prohibit installation of drinking water wells and construction in the lagoon area and dry well area if clean-up levels are not attained. Deed restrictions will also be included for offsite properties under which the EV plume travels.

KEYWORDS:

Air Stripping; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Closure; Clean Water Act; Closure Requirements; Contingency Remedy; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Leachability Tests; Lead; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCE; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sludge; Soil; Solidification/ Stabilization; Solvents; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment

ELECTROVOICE, MI (Continued)
June 23, 1992

Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, GW
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Interim

GRAND TRAVERSE OVERALL SUPPLY, MI
February 3, 1992

SITE HISTORY/DESCRIPTION:
The 3.9-acre Grand Traverse Overall Supply (GTOS) site is an active commercial laundering facility in Greilickville, Leelanau County, Michigan. Land use in the area is residential, with an elementary school directly east of the site. The site overlies both an unconfined aquifer and a semi-confined aquifer. Surface water in the area includes Cedar Creek, which is dammed and discharges to the unconfined aquifer located upstream of the dam, and ground water discharges into the creek downstream of the dam. From 1953 to 1977, the GTOS facility discharged laundry and process wastes from dry cleaning operations onsite to seepage lagoons and a dry-well. After 1977 laundry and process wastes were diverted to the sanitary sewer system. From 1968 to 1978, cooling water used in onsite dry cleaning operations was discharged to Cedar Creek. In 1978, the state detected VOCs, including PCE, TCE, and 1,2 DCE, in the water supply of the adjacent elementary school and condemned the well. Additional well sampling by the state determined that, as a result of disposal operations, the GTOS site was the likely source of the contaminants. From 1978 to 1980, the state required GTOS to conduct removal actions, which included replacing the contaminated drinking water wells and excavating the onsite dry well and adjacent contaminated soil, followed by offsite disposal of excavated materials; filling three of the four seepage lagoons with gravel, followed by paving; backfilling the remaining lagoon and revegetating the area. In 1978, dry cleaning operations were discontinued, but the GTOS site remains active and continues to discharge wastes into the sanitary sewer system. This ROD addresses the potential risks posed by onsite ground water. As a result of previous removal actions, organic compounds present in low levels in soil, and organic and inorganic compounds present in ground water no longer pose an unacceptable risk to human health or the environment; therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site is the no action; however, ground water monitoring for inorganics will continue for 1 year. EPA has determined that conditions at the site due to contamination by organic compounds pose no current or potential threat to human health or the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not applicable.

KEYWORDS:
Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

H. BROWN COMPANY, MI
September 30, 1992

SITE HISTORY/DESCRIPTION:
The H. Brown Company, Inc., site is a former landfill and battery reclamation facility in Walker, Kent County, Michigan. Land use in the area is predominantly recreational and industrial, with a wetland area located approximately at the northern half of a marshy area within the current eastern boundary of the site. In addition, part of the site lies within the 500-year floodplain of the Grand River. Before 1961, the site was an uncontrolled dump that received unknown types and quantities of waste. From 1961 to 1982, the owner reclaimed lead from wet-cell batteries. From 1961 and 1978, the owner reclaimed lead from wet-cell batteries and poured battery acid directly on the ground surface. The total volume of battery acid disposed of is estimated to be between 170,000 and 460,000 gallons. From 1978 until the owner ceased active reclamation activities in 1981 or 1982, battery acid was not drained to the ground; instead, it was routed to a stainless-steel catch pan and tank. In 1970, the state inspected the site and noticed acidic waters draining into a culvert that discharged into the Grand River. In 1978, the state sampled wastewater at the facility and found elevated levels of lead, copper, and nickel. EPA became involved with the site in the early 1980's and sampling of surface water from the culvert leading to the Grand River indicated elevated levels of chromium and lead. In 1989, the Agency for Toxic Substances and Disease Registry and the state investigated the site and determined that the site posed a risk to onsite workers and the community. In response to an EPA-issued unilateral administrative order to 10 PRPs in April 1991, the owner's widow and the H. Brown Company erected a fence and performed limited air monitoring around the site. This ROD addresses the final remedy for the site. The primary contaminants of concern affecting the soil, sediment, debris (battery casings), ground water, surface water, and air are VOCs, including benzene, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes demolishing onsite buildings to allow cleanup of contaminated soil beneath structures, and disposing of the debris in an onsite or offsite landfill; onsite decontamination of buildings not requiring demolition; consolidating contaminated surface soil onsite; treating an estimated 180,000 cubic yards of soil, sediments, and battery chips onsite using in-situ solidification/stabilization; constructing a containment wall around the treated soil, sediment, and debris, and covering the solidified material using a multi-layer cap; extracting contaminated ground water from the shallow aquifer beneath the site; treating collected ground water and surface water onsite using aeration, filtration, carbon adsorption, and ion exchange, prior to onsite discharge to the Grand River; conducting additional studies to further define the extent of contamination in the intermediate and bedrock aquifers; monitoring ground water and surface water; and implementing institutional controls including deed and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $15,000,000, which includes an annual O&M cost of $220,000 for 2-3 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are based on site risks, state ARARs, or background levels and include PCBs 1 mg/kg (state); arsenic 6.6 mg/kg (background); lead 5 mg/kg (state). Chemical-specific ground water clean-up goals include benzene 1 ug/l (state); arsenic 17.9 ug/l (state); and lead 1,423 ug/l (background).

INSTITUTIONAL CONTROLS:
Institutional controls, including deed restrictions and ground water use restrictions, will be implemented to prevent exposure to site contaminants, prevent cap erosion, and provide security for the remedial action equipment.

KEYWORDS:
Aeration; Air; Arsenic; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Solvents;

H. BROWN COMPANY, MI (Continued)

September 30, 1992

State Standards/Regulations; Surface Water; Surface Water Monitoring; Surface Water Treatment; Toluene; Treatment Technology; VOCs; Water Quality Criteria; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Debris, GW, SW, Air
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

HAGEN FARM, WI
September 30, 1992

SITE HISTORY/DESCRIPTION:
The Hagen Farm site is a former waste disposal facility approximately 1 mile east of the City of Stoughton, Dane County, Wisconsin. The site is defined as the area within the property boundary and the contaminant plume. The property is approximately 28 acres in size, and within the property boundary is a 10-acre area that was used for waste disposal. The site is located in a rural area that is largely dominated by sand and gravel mining and agricultural activities. Eleven private wells are located within 1,000 to 4,000 feet of the site. In addition, a wetland area is located adjacent to and just south of the site. Prior to the 1950's, the site was operated as a sand and gravel pit. The gravel pit was then used for disposal of waste materials from the late 1950's to the mid-1960's. Waste materials were disposed of in three onsite subareas designated A, B, and C. Waste materials included municipal and industrial wastes, such as solvents and other various organic materials. From 1980 to 1986, state investigations revealed organic compounds in nearby private water supply wells. A 1990 ROD addressed contaminated soil in the three disposal areas as OU1 and provided for excavation of soil in subareas B and C with consolidation in disposal area A; construction of a landfill cover at disposal area A; and implementation of a soil vapor extraction system in sub-waste soil under disposal area A. This ROD provides a final remedy for the ground water control on the property and off the property, as OU2. The ROD defines on-property ground water as contaminated ground water in the immediate vicinity of the main disposal area and off-property ground water at any location within the plume other than in the area defined as on-property ground water. The primary contaminants of concern affecting the ground water are VOCs, including 1,1-dichloroethene, ethylbenzene, benzene, tetrahydrofuran, toluene, vinyl chloride, and xylenes; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes extracting and pretreating on- and off-property ground water to remove metals and inorganic solids; treating on-property ground water using an activated biological sludge treatment system; treating off-property ground water using a treatment technology to be determined during the remedial design stage; discharging the treated ground water onsite to the wetlands, surface water, or possibly reinjecting the treated water into the aquifer to promote in situ biodegradation, based on the results of a bench-scale study; treating sludge generated from the treatment process, prior to disposal in a RCRA landfill; treating off-gases emissions from the treatment process using carbon adsorption, with regeneration or treatment of the spent carbon; monitoring private wells located around the site; implementing institutional controls including deed restrictions, and access restrictions. The estimated present worth cost for this remedial action (depending on the treatment selected for the off-property ground water) ranges from $13,612,000 to $24,163,000, which includes an annual O&M cost ranging from $550,000 to $1,062,000 for the first year.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific ground water clean-up goals are based on the State of Wisconsin Preventive Action Limits (PALs) and include benzene 0.067 ug/l; 1,1-dichloroethene 0.024 ug/l; ethylbenzene 272 ug/l; tetrahydrofuran 10 ug/l; toluene 68.6 ug/l; vinyl chloride 0.0015 ug/l; xylenes 124 ug/l; arsenic 5 ug/l; and lead 5 ug/l.

INSTITUTIONAL CONTROLS:
Institutional controls, including deed restrictions, will be implemented to prevent use of the land or ground water and to safeguard human health and the environment during remedial activities.

KEYWORDS:
Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Deferred Decision; Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Discharge; Onsite Treatment; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; Toluene; Treatability Studies; VOCs; Xylenes.

HAGEN FARM, WI (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 09/17/90
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Final Action

KOHLER LANDFILL, WI
March 30, 1992

SITE HISTORY/DESCRIPTION:
The 40-acre Kohler Company Landfill site is an operating landfill at the Kohler manufacturing facility in Kohler, Sheboygan County, Wisconsin. Land use in the area is a mixture of business and residential, and an 800-acre wildlife reserve owned by Kohler Company surrounds the site. Wetlands are located along the landfill's edge. The site lies within, but rises above, the 100-year floodplain of the Sheboygan River, which is located east and south of the plant. The estimated 57,000 people who reside within 3 miles of the site use the Sheboygan municipal system from Lake Michigan as their drinking water supply. Two residences located 1/4 mile from the site share a private well as their drinking water supply. From the early 1950's to the present, the Kohler Company has used the landfill as the primary location for disposing of manufacturing and foundry wastes generated at the Kohler manufacturing facilities. The majority of the wastes disposed of in the landfill is non-RCRA hazardous waste, including sand, cores, molds, clarifier wastes, slag, clay, and pottery, and dust collector wastes. Between 1950 and the mid-1970's, several waste disposal pits were constructed in the landfill for disposal of hydraulic oils, solvents, paint wastes, enamel powder, lint from brass polishing, and chrome-plating sludge. By 1975, these pits were closed and covered with nonhazardous fill. Beginning in 1975, all RCRA hazardous liquids were disposed of offsite. Disposal of solid RCRA hazardous wastes ceased prior to 1980, however solid non-hazardous wastes have continued to be disposed of in the landfill. In 1983, EPA detected contaminated surface water runoff at the landfill. Studies have revealed that ground water is contaminated due to leaching of chemical constituents from the landfill. This ROD addresses source contamination through containment of the waste mass as the first of two remedial actions planned for this site. A future ROD will address the contaminated ground water. The primary contaminants of concern affecting the soil and leachate are VOCs, including benzene, toluene, TCE, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes closing the landfill according to state regulations; constructing a multi-layer cap over the fill material to reduce infiltration into the waste mass; installing a perimeter leachate collection drain and treating leachate onsite using air stripping, prior to onsite discharge to the Sheboygan River; and implementing institutional controls including deed restrictions and site access restrictions. The estimated total present worth cost for this remedial action is $4,700,000, which includes an annual O&M cost of $1,000,000.

PERFORMANCE STANDARDS OR GOALS:
Clean-up goals will be met in accordance with state landfill closure codes, and discharge codes. Chemical-specific ground water clean-up goals will be addressed in a future ROD.

INSTITUTIONAL CONTROLS:
Institutional controls including deed and site access restrictions will be implemented onsite to reduce site usage, maintain cap integrity, and prevent exposure to the affected ground water.

KEYWORDS:
Air Stripping; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Floodplain; Institutional Controls; Leachate Collection/Treatment; Lead; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Soil; Solvents; State Standards/Regulations; TCE; Toluene; VOCs; Water Quality Criteria; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Leachate
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action

LA GRANDE SANITARY LANDFILL, MN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 80-acre La Grande Sanitary Landfill site is located in west-central Douglas County, Minnesota, 5 miles west of the town of Alexandria and 3 miles south of the town of Garfield. The main fill area occupies 6 acres of a small, north-trending gully, which is surrounded by forest, steep uncultivated hills, and low lying wetlands. A sand and gravel water table exists under a portion of the site, and residents downgradient are using the aquifer for drinking water. From 1974 to 1984, the landfill was in operation and accepted mixed municipal solid waste and nonhazardous industrial wastes. In 1982, a state ground water investigation revealed the presence of low level organic compounds. The landfill was closed in 1984, and a final cover was installed in accordance with state regulations. Sampling during the RI revealed that only one contaminant, manganese, was found in high levels in the Old Shop Well onsite, which required action to reduce the potential risk of exposure. This ROD provides a final remedy for the site and addresses the onsite landfill and ground water. The primary contaminants of concern affecting the soil, debris, and ground water are organics and metals.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes converting a gas monitoring well to a gas vent to control the accumulation of explosive gases; sealing off and abandoning the onsite Shop Well to ensure that it will not be used as a potable water source; stabilizing the west slope of the landfill, and placing a soil cover over the exposed landfill waste on the northwest corner; sloping and reconstructing the borrow pit area adjacent to the west slope to ensure long-term integrity of the existing cover system; conducting long-term monitoring of ground water and combustible gas; and implementing institutional controls, including deed and ground water use restrictions, and restricting site access. The estimated present worth cost for this remedial action is $501,000, which includes an annual O&M cost of $22,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals were not specified. Because of the low level risks posed by the site, treatment of onsite media is not considered necessary.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of ground water use restrictions and possibly deed restrictions will be implemented.

KEYWORDS:

Capping; Carcinogenic Compounds; Debris; Direct Contact; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; O&M; Onsite Disposal; Organics; Safe Drinking Water Act; Soil; State Standards/Regulations; Venting; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Debris, GW
Major Contaminants: Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

METAL WORKING SHOP, MI

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 2.7-acre Metal Working Shop (MWS) site is a manufacturing facility in Lake Ann, Benzie County, Michigan. Land use in the area includes residential, recreational, agricultural, and timberlands. The site is adjacent to three lakes: Lake View to the north, Bryan Lake to the east, and Lake Ann to the south. The surrounding residents use private well systems for drinking water. A variety of metal finishing and tool and die operations have been conducted at the site during the past 26 years. It was reported that from 1975 to 1977, water from two site operation rinse tanks was disposed of on the ground surface onsite. Subsequently, from 1983 to present, Lake Ann Manufacturing used the site for assembling mechanical shaft seals for pumps and compressors. As a result of an 1984 investigation, EPA identified three suspected areas of disposal that included the alleged disposal area, the alternate disposal area, and the septic system. Although samples were not collected, historical information was gathered during the site investigation. A 1987 investigation conducted by an independent contractor included collecting several soil samples and installing three ground water monitoring wells. This investigation revealed that there was no soil or ground water contamination; however, it did not prove the absence of potentially present contamination based on historical dumping. This ROD provides a final action, and no additional OUs or additional separate actions are contemplated. No site-organic contamination was identified during the RI and inorganic constituents approximated background levels; therefore, there are no contaminants of concern affecting the site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes no further action because no significant levels of contaminants exist onsite, and no additional action is necessary to protect human health or the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

MIDCO I (AMENDMENT), IN
April 13, 1992

SITE HISTORY/DESCRIPTION:

The 4-acre MIDCO I site is an abandoned, industrial waste recycling, storage, and disposal facility in Gary, Indiana. The surrounding land use is mixed industrial, commercial, and residential. The nearest residential area is about 1/4-mile west of the site. The Calumet Aquifer underlies the site and provides drinking water to wells within 1 mile of the site. From 1973 to 1979, two different owners operated the facility and stockpiled thousands of drums of bulk liquid and chemical waste. In 1976, a fire at the site destroyed an estimated 14,000 waste drums. In 1981, EPA installed a fence around the site. In 1982, EPA removed all surface wastes, including thousands of drums and an underground storage tank; excavated and disposed of contaminated surface soil; and placed a clay cover over much of the site. This ROD amends a 1989 ROD that addressed the remaining contaminated soil and ground water by treatment of an estimated 12,400 cubic yards of soil using soil vapor extraction and solidification/stabilization, followed by onsite disposal; excavation and solidification/stabilization of an estimated 1,200 cubic yards of contaminated sediments, followed by onsite disposal; and covering the site in accordance with RCRA landfill closure requirements; ground water pumping and injection into a shallow or deep aquifer. The amended remedy reduces the estimated amount of soil to be treated, as a result of new information on arsenic data and amended soil CALs; further defines the site cover requirements; and further defines the requirements of deep well injection of contaminated ground water. The primary contaminants of concern affecting the subsurface soil, sediment, and ground water are VOCs, including TCE, toluene, and xylenes; metals, including chromium and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The amended remedial action for this site includes reducing the amount of soil to be treated to a minimum of 5,200 cubic yards because of the amendment to soil CALs and the determination that arsenic may not be present above background levels at the site; treating the contaminated soil onsite using with soil vapor extraction, followed by in-situ solidification/stabilization; excavating and treating an estimated 500 cubic yards of contaminated sediment from the surrounding wetlands onsite using solidification/stabilization; pumping and treatment of contaminated ground water using air stripping and carbon absorption, followed by onsite deep well injection; constructing a final RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy in the event that ground water clean-up action levels for the Calumet Aquifer are technically impracticable to attain, which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the nearby Midco II site. The estimated present worth cost for this amended remedial action is $10,000,000, which includes an annual O&M cost of $460,000.

PERFORMANCE STANDARDS OR GOALS:

Ground water clean-up standards for the Calumet Aquifer are not changed from the 1989 ROD. Treatment requirements prior to DWI are further defined compared to the 1989 ROD and include, at a minimum, treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 950 ug/l. Treatment below MACs will be required, if necessary, to protect underground sources of drinking water. Soil treatment action levels are increased from $1x10^{-6}$ and HI=1 in the 1989 ROD to $5x10^{-4}$ and HI=5 in this amendment.

INSTITUTIONAL CONTROLS:

Institutional controls including access and deed restrictions will be implemented to protect the integrity of the site cover and operational aspects of the remedy.

KEYWORDS:

Air Stripping; ARAR Waiver; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Closure Requirements; Contingent Remedy; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; ROD Amendment; Safe Drinking Water Act; Sediment;

MIDCO I (AMENDMENT), IN (Continued)
April 13, 1992

Soil; Solidification/Stabilization; Solvents; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: 06/30/89
Lead: Federal Enforcement
Contaminated Media: Subsurface Soil, Sediment, GW
Major Contaminants: VOCs, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

MIDCO II (AMENDMENT), IN
April 13, 1992

SITE HISTORY/DESCRIPTION:
The 7-acre MIDCO II site is an abandoned chemical waste storage and disposal facility in Gary, Indiana. Land use in the surrounding area is predominantly industrial. The underlying aquifer, which is used primarily for non-drinking purposes, is highly susceptible to contamination from surface sources. From 1976 to 1978, this site was used for treatment, storage, and disposal of chemical and bulk liquid wastes. Onsite pits were used for disposal, from which wastes percolated into and contaminated the ground water. An overflow pipe from a filter bed disposal pit discharged directly into a ditch draining directly into the nearby Grand Calumet River. Additionally, an estimated 10 waste storage tanks were deteriorated and leaking. In 1977, a fire at the site destroyed an estimated 50,000 to 60,000 waste drums. In 1981, EPA installed a fence around the site. From 1984 to 1989, EPA removed all surface wastes, including thousands of drums and numerous tanks of chemical waste; excavated and disposed offsite subsurface soils and wastes from the sludge pits and the filter bed; and extended the site fence. This ROD amends a 1989 ROD that addressed the remaining contaminated soil, pit wastes, and ground water by treatment of an estimated 35,000 cubic yards of soil wastes using solidification/stabilization followed by onsite disposal; excavation and solidification/stabilization of 500 cubic yards of contaminated sediments followed by onsite disposal; covering the site in accordance with RCRA landfill closure requirements; ground water pumping and injection into a shallow or deep aquifer with or without treatment, depending on treatment studies; and implementing deed and access restrictions. The amended remedy reduces the estimated amount of soil to be treated, as a result of amended soil CALs and a determination that arsenic may not be present above background levels. The primary contaminants of concern affecting the subsurface soil, sediment, and ground water are VOCs, including toluene, TCE, and xylenes; metals, including chromium and lead; and inorganics.

SELECTED REMEDIAL ACTION:
The amended remedial action for this site includes reducing the amount of soil to be treated from an estimated 35,000 cubic yards to an estimated 12,200 cubic yards; excavating and treating the contaminated soil onsite using soil vapor extraction, followed by in-situ solidification/ stabilization; excavating an estimated 500 cubic yards of contaminated sediment from a ditch adjacent to the northeast boundary of the site, with onsite solidification/stabilization; pumping and onsite treatment of contaminated ground water using air stripping and carbon adsorption, or possibly precipitation, with deep well injection of the treated water; constructing a final vegetated RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy if clean-up action levels for the Calumet Aquifer are technically impracticable to attain which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the adjacent Midco I site. The estimated present worth cost for this amended remedial action is $13,000,000, which includes an annual O&M cost of $660,000.

PERFORMANCE STANDARDS OR GOALS:
Ground water clean-up standards are not changed from the 1989 ROD. Treatment required prior to OU1 are further defined compared to the 1989 ROD, and include at a minimum treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 99.5 ug/l. Treatment below the MACs will be required if necessary to protect underground sources of drinking water. Soil treatment action levels are increased from $1x10^{-6}$ and HI=1 in the 1989 ROD to $5x10^{-4}$ and HI=5 in this ROD.

INSTITUTIONAL CONTROLS:
Institutional controls including deed and access restrictions will be implemented to protect the integrity of the site cover and operational aspects of the remedy.

MIDCO II (AMENDMENT), IN (Continued)
April 13, 1992

KEYWORDS:
Air Stripping; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Contingent Remedy; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; ROD Amendment; Safe Water Drinking Act; Sediment; Soil; Solidification/ Stabilization; Solvents; TCE; Toluene; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 06/30/89
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, GW
Major Contaminants: VOCs, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

MUSKEGO SANITARY LANDFILL, WI

June 12, 1992

SITE HISTORY/DESCRIPTION:

The 56-acre Muskego Sanitary Landfill site is located in the City of Muskego, Waukesha County, Wisconsin. Land use in the area is predominantly residential and agricultural, with wetland areas located in the nearby vicinity. All of the site lies within the 100-year floodplain. The upper glacial drift aquifer, one of three principal sources of ground water in Waukesha County, is used for human consumption. From the 1950's to 1981, municipal waste, waste oils, paint products, and other wastes were disposed of at the site. The site is separated into three disposal areas: the Old Fill Area (38 acres); the Southeast Fill Area (16 acres); and the Non-Contiguous Fill Area (4.2 acres), composed of a drum trench, north and south refuse trenches, and an L-shaped fill area, all containing waste similar to the Old Fill Area. As a result of deteriorating water quality at onsite ground water monitoring wells, Waste Management of Wisconsin Inc. (WMWI) and the state conducted numerous investigations that revealed elevated levels of contaminants in the ground water. In 1985, WMWI installed a methane extraction system to alleviate the gas migration along the western portion of the Old Fill Area. In 1986, public water was supplied to the site and private wells in the area. Two separate areas at the site were discovered to contain buried drums and contaminated soil. The first area was located east of the Non-Contiguous Fill Area. The second area, known as the drum trench, was discovered in a portion of the Non-Contiguous Fill Area and contained 989 drums and 2,500 cubic yards of contaminated soil. In 1991, the drums and soil from both areas were disposed of offsite at appropriate hazardous waste disposal facilities. Liquid wastes and drums were also sent offsite for incineration. This interim ROD addresses the control and remediation of the contamination sources, including landfill waste, contaminated soils, leachate, and landfill gas. Future RODs will address the control and remediation of the contamination in the ground water aquifer as a separate operable unit. The primary contaminants of concern affecting the soil and sediment are VOCs, including benzene, TCE, toluene, and xylenes; and other organics, including PAHs, PCBs, pesticides, and phenols.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes installing a cap over the Old and Southeast Fill Areas; adding a landfill leachate control system at the Old Fill Area and improving the existing leachate control system at the Southeast Fill Area; discharging the collected leachate onsite to the sewer if pretreatment requirements are met, or treating leachate along with contaminated ground water as part of the subsequent OU; managing sludge residuals from the treatment processes as a hazardous waste, if it exhibits the characteristic of toxicity; capping of the Non-Contiguous Fill Area; treating soil within the drum trench and north and south refuse areas using in-situ vapor extraction to remove VOCs; treating the extracted gas using either activated carbon or thermal destruction with catalytic oxidation, or another treatment method prior to emission to the atmosphere; utilizing an active gas control system, in conjunction with the leachate collection system at both the Old and Southeast Fill Areas to destroy extracted gases with a ground flare; and conducting semi-annual ground water monitoring and implementing institutional controls including deed restrictions and site access restrictions including fencing. The estimated present net worth cost for this remedial action is $9,914,000, which includes an annual O&M cost of $309,500 for years 0-5, and $134,200 for years 6-30.

PERFORMANCE STANDARDS OR GOALS:

A performance based clean-up standard will be applied to the area covered by the ISVE system in the Non-Contiguous Fill Area. The clean-up standard will be based on residual soil gas concentrations that are low enough to assure compliance with ground water clean-up standards, which will be specified in the subsequent ROD for the contaminated ground water.

INSTITUTIONAL CONTROLS:

Institutional controls including deed restrictions will be implemented to prevent access, excavation, and disturbance of the cap and installation of the wells.

MUSKEGO SANITARY LANDFILL, WI (Continued)

June 12, 1992

KEYWORDS:

Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Floodplain; Ground Water Monitoring; Institutional Controls; Interim Remedy; Leachate Collection/Treatment; O&M; Onsite Containment; Onsite Dicharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; Phenols; RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; Vacuum Extraction; Venting; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action

NEW BRIGHTON/ARDEN HILLS, MN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 25-square-mile New Brighton/Arden Hills site includes the 4-square-mile Twin Cities Army Ammunition Plant (TCAAP) in Ramsey County, Minnesota. Land use in the area is predominantly residential with commercial and industrial sectors. The estimated 100,000 residences, located within 2 miles of the site, along with adjacent townships use various glacial and bedrock aquifers as their drinking water supply. The TCAAP facility, a small arms manufacturing facility, is currently operated by the Federal Cartridge Company (FCC) and used by two manufacturing lessees, Alliant Techsystems and 3M Corporation. Since 1941, the plant has manufactured, stored, and tested small arms ammunition and related materials. From 1941 to 1981, waste materials, which included VOCs, heavy metals, corrosive materials, and explosives, were disposed of at 14 source areas located within TCAAP. In addition, breaks and leaks in sewer lines, where other disposal occurred, may have contributed to onsite and offsite ground water and soil contamination. In 1981, state investigations of municipal and private drinking water wells in and around TCAAP identified contamination of ground water, onsite soil, sediment, and surface water by VOCs, other organics, and metals. Past removal actions and seven previous RODs, signed from 1983 to 1989, addressed interim remedial actions conducted by the Army and Alliant Techsystems and provided for the establishment of alternate drinking water supplies for surrounding communities, onsite in-situ soil vapor extraction; installing ground water pump and treat systems to remediate ground water onsite; boundary ground water recovery systems to prevent further migration of VOCs; thermal treatment of PCB-contaminated soil, and the cleaning, repairing, and testing of contaminated sewer lines. This ROD addresses remediation of the south plume of offsite contaminated ground water, as OU3. Future RODs will address the offsite north plume of contaminated ground water, as OU1, and the onsite soil, sediment, surface water, and ground water, as OU2. The primary contaminants of concern affecting the ground water are VOCs, including benzene, TCE, and xylenes; other organics including phenols; and metals, including chromium, lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes pumping and offsite treatment of contaminated ground water at the leading edge of the south plume using precipitation and filtration to remove inorganic solids and a pressurized granular activated carbon system to remove VOCs; discharging the treated ground water offsite to the potable water supply of the City of New Brighton; disposing of filtration residuals and spent carbon offsite; implementing institutional controls including ground water use restrictions; and monitoring ground water. The estimated present worth cost for this remedial action is $4,851,000, which includes an annual O&M cost of $276,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up standards, which are based on state standards and SDWA MCLs and MCLGs, include 1,1-dichloroethane 70 ug/l; (state); 1,1-dichloroethene 6 ug/l (state); cis-1,2-dichloroethene 70 ug/l (MCL); 1,1,1-trichloroethane 200 ug/l (MCL); 1,1,2-trichloroethane 3 ug/l (proposed MCLG); and TCE 5 ug/l (MCL).

INSTITUTIONAL CONTROLS:

Institutional controls to restrict the drilling of private wells will prevent consumption of contaminated water until clean-up standards are achieved.

KEYWORDS:

Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Initial Remedial Measure; Institutional Controls; Interim Remedy; Lead; MCLs; MCLGs; Metals; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Organics; Phenols; RCRA; Safe Drinking Water Act; Solvents; State Standards/ Regulations; TCE; VOCs; Xylenes.

NEW BRIGHTON/ARDEN HILLS, MN (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 06/23/83, 08/02/84, 06/30/86, 03/31/87, 09/25/87, 08/11/89
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Ground Water - Interim

PEERLESS PLATING, MI

September 21, 1992

SITE HISTORY/DESCRIPTION:

The 1-acre Peerless Plating site is a former electroplating facility in Muskegon Township, Michigan, and is located northwest of Little Black Creek and 1 mile north of Mona Lake. Land use in the area is mixed use with urban, light industrial, and residential. Lake Michigan supplies drinking water for residential and commercial businesses within a 3-mile radius of the site. From 1937 to 1983, onsite electroplating operations and processes included copper, nickel, chromium, cadmium, and zinc plating, in addition to burnishing, polishing, pickling, oiling, passivating, stress relieving, and dichromate dipping. The processes required the use of toxic, reactive, corrosive and flammable chemicals. Over the years, Peerless Plating discharged process waste with pH extremes and high heavy metal concentrations into seepage lagoons at the rear of the facility. In the 1970s, the state directed Peerless Plating to monitor waste discharge daily and to install a treatment system to meet reduced effluent limitations. The site violated the requirements and was charged by the state. In 1980, the seepage lagoon sludge was removed and disposed of, and the excavated lagoon area was backfilled and capped. In 1983, subsequent investigations concluded that treatment facilities had not been upgraded adequately and discharge limitations were still being exceeded for chromium, cyanide, cadmium, and zinc. As a result, Peerless Plating closed in June 1983, and the owners abandoned the plant. In 1983, after the state and local government detected hydrocyanic acid gas within the facility atmosphere, EPA carried out an Emergency Response Action onsite, which involved removing 37,000 gallons of hazardous liquids, draining the lagoons, excavating lagoon soil and sludge, sealing sewer lines, and neutralizing onsite the cyanides and nitric acid. In 1984, EPA investigations revealed that ground water was contaminated with VOCs and chloroform. Additionally, surface water and sediment in Little Black Creek were contaminated with heavy metals. In March 1990, EPA conducted a second removal action to remove and dispose of liquids and sludge contained in above-ground tanks onsite, encapsulate an asbestos oven, and install a fence around the facility. This ROD addresses the onsite contaminated soil and ground water as a final remedy. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for the site includes demolishing onsite buildings to facilitate soil sampling beneath the buildings, and disposing of the associated debris offsite; treating approximately 6500 cubic yards of contaminated soil onsite using in-situ vapor extraction, followed by onsite stabilization of excavated soil; testing the stabilized soil, prior to offsite disposal at a RCRA facility; controlling air emissions using carbon adsorption; pumping and onsite treatment of ground water using air stripping, followed by precipitation, pH adjustment, and chemical coagulation, with discharge of the treated ground water onsite to surface water; controlling air emissions using a carbon filter; treating the residual sludge to meet LDR standards, prior to offsite disposal at the RCRA Subtitle C facility; regenerating the spent carbon at an offsite thermal treatment facility; and monitoring ground water. The estimated present worth cost for this remedial action is $7,971,000, which includes an annual O&M cost of $323,000.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs and State standards and include benzene 1 ug/l; arsenic 0.2 ug/l; cadmium 4 ug/l; and lead 5 ug/l. Chemical-specific soil clean-up goals are based on RCRA LDRs and health-based levels and include benzene 0.02 mg/kg; arsenic 1.7 mg/kg; cadmium 0.8 mg/kg; and barium 40 mg/kg.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking

PEERLESS PLATING, MI (Continued)
September 21, 1992

Water Act; Soil; Solidification/Stabilization; Solvents; State Permit; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: *None*
Lead: Fund
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

REILLY TAR & CHEMICAL (INDIANAPOLIS PLANT), IN

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 120-acre Reilly Tar & Chemical (Indianapolis Plant) site is a former coal tar refinery and creosote wood treatment plant located in Indianapolis, Indiana. The site is divided into the 40-acre Oak Park property and the 80-acre Maywood property. The Oak Park property contains the majority of the operating facilities, including above-ground storage tanks, distillation towers, and aboveground and underground utilities. The Maywood property contains operating facilities on its northern end. This property was formerly the site of chemical process and wood preserving activities and currently contains four waste disposal areas. The area surrounding the site is mixed residential, industrial, and commercial. The site lies within the White River drainage basin. From 1921 until 1972, coal tar refinery and creosote wood treatment plants operated onsite. Beginning in 1941, several chemical plants were constructed and operated on the Oak Park property. Environmental problems at the site were found to be related to the improper use and disposal of creosoting process wastes and substances used in manufacturing chemicals. In 1955, alpha picoline, a chemical manufactured onsite, was identified in nearby residential wells, and in 1964, three contaminants from the site were detected in offsite ground water samples and onsite surface water samples. In 1975, state investigations identified several onsite problems believed to be contributing to ground water contamination with organic chemicals. In 1980, state investigations revealed various organic chemicals in soil and subsequently in 1987, 60,000 gallons of waste fuel were accidentally spilled on the Oak Park property. The spilled fuel oil was recovered, and some of the contaminated soil was excavated. This ROD provides an interim remedy for OU1 and addresses offsite migration of contaminated ground water. Several additional operable units are planned to address contamination of onsite source and onsite and offsite ground water impacted by the site. The primary contaminants of concern affecting the ground water are VOCs, including benzene and toluene; other organics, including PAHs; metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes either extracting contaminated ground water downgradient of the site and treating the water using biological treatment, followed by filtration and activated carbon adsorption, with offsite discharge of 5mgd to a POTW, with the remainder reinjected to the aquifer; or combining ground water extraction from up-gradient wells, with treatment using precipitation/clarification, followed by activated carbon, with reinjection to the aquifer in conjunction with extracting ground water from interior of the site, and treating this by precipitation/clarification, followed by air stripping, with offsite discharge to a POTW; monitoring ground water and implementing engineering controls. The final selection of options and specific design parameters will be determined during the remedial design, based on the results of treatability tests to determine the optimum design and operating requirements. The estimated present worth cost for this remedial action is $15,000,000, which includes an annual O&M cost of $1,000,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Interim ground water clean-up levels are based on the more stringent of a 10^{-6} cumulative lifetime cancer risk, or MCLs for carcinogens; and MCLGs, MCLs, or a HI = 1 for noncarcinogens. Chemical-specific ground water goals include benzene 5 ug/l (MCL); toluene 1,000 ug/l (MCL); xylenes 10,000 ug/l (MCL); pyridine and pyridine derivatives 35 ug/l (HI); arsenic 50 ug/l (MCL); chromium (MCL); lead 5 ug/l (MCL); and ammonia 30 ug/l (MCL). Treated ground water discharged to the POTW must meet separate clean-up criteria under CWA.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Arsenic; Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Deferred Decision; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Interim Remedy; Leachability Tests; Lead; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Onsite Discharge; Onsite Treatment; Organics; PAHs; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Solvents;

REILLY TAR & CHEMICAL (INDIANAPOLIS PLANT), IN (Continued)

June 30, 1992

State Standards/Regulations; Toluene; Treatability Studies; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Ground Water - Interim

REILLY TAR & CHEMICAL (ST. LOUIS PARK), MN

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 80-acre Reilly Tar and Chemical (St. Louis Park) site is a former coal tar distillation and wood preserving plant in St. Louis Park, Minnesota. Surrounding land use is predominantly residential. The site overlies a complex system of six 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 bedrock aquifers. From 1917 to 1972, coal tar distillation process wastewater was discharged to onsite surface water; as a result, small wastewater spills occurred 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. Four previous RODs in 1984, 1986, 1990, and 1992 addressed remediation of specific aquifers, the filling of a small onsite wetland, and offsite soil contamination. This ROD addresses a final remedy for the contaminated Northern Area of the Drift Aquifer, which is a surficial aquifer that is not used as a drinking water source. This aquifer does provide recharge water for the bedrock aquifers and is hydraulically and geologically connected to the Platteville and St. Peter Aquifers. Future RODs will address the remaining contamination problems presented by the site. The primary contaminants of concern affecting the ground water are organics, including PAHs.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes intercepting and containing contaminated ground water using gradient control wells; discharging the water offsite for treatment at the local POTW; and continued monitoring the discharged water to determine if within 3 to 5 years, this could be discharged directly to a storm sewer and then to surface water. At that time, if necessary, an onsite or offsite treatment facility will be built to treat the water using activated carbon, prior to discharge, with regeneration and reuse of any spent carbon. The estimated capital cost for this remedial action is $370,000, per extraction well, and if the offsite treatment facility is deemed necessary, additional capital costs are estimated at $300,000, with an estimated annual O&M cost of $45,000 per extraction well for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on site-specific Drinking Water Criteria. These levels, developed by state and EPA experts, include benzo(a)pyrene and dibenzo(a,h)anthracene 5.6 ng/l; carcinogenic PAHs 28 ng/l; and other PAHs 15 ng/l.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Contingent Remedy; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Organics; PAHs; Phenols; Plume Management; Publicly Owned Treatment Works (POTW); RCRA; State Standards/ Regulations.

SITE SUMMARY

Date of previous RODs: 06/06/84, 05/30/86, 09/28/90, 06/30/92
Lead: Federal Enforcement
Contaminated Medium: GW
Major Contaminants: Organics
Category: Ground Water - Interim

SAVANNA ARMY DEPOT, IL
March 31, 1992

SITE HISTORY/DESCRIPTION:
The Savanna Army Depot activity (SVADA) site, an active military installation, is located 70 miles west of Rockford, Illinois, in a remote and sparsely populated area. Land use in the area is predominantly agricultural and recreational, with a wetlands area located onsite. Part of the site lies within the 50-year floodplain of the Mississippi River. From 1943 to 1969, ammunition washout operations were conducted in the northwestern portion of the facility. As a result, wastewater containing explosive compounds was produced, discharged to a drain trough, and piped to four unlined lagoons, referred to as the "lower lagoons," which drained into a ditch and on to the Mississippi River. In 1961, two new unlined lagoons, or "upper lagoons," began receiving the wastewater, thus replacing the lower lagoons. Wastes that flowed into the upper lagoons drained into the soil below them. The trinitrotoluene (TNT) washout facility has not been operational since 1969, and the lagoon areas are currently not in use. Since 1979, the SVADA lagoon areas have been the subject of several U.S. Army investigations, which revealed significant contamination of the soil with high concentrations of the explosive TNT and other organic compounds. The soil is also a continued source of ground water contamination. This ROD addresses a final remedy for the Washout Lagoon Area Soil at SVADA as OU1. A future ROD will address the ground water in the vicinity of the lagoons. The primary contaminants of concern affecting the soil, debris, and surface water are VOCs and organics, including TNT; nitrobenzene (NB); 2,4-dinitrotoluene (DNT); 2-amino-4,6-DNT; 1,3,5-trinitrobenzene (TNB); and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), a pesticide.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating an estimated 18,230 cubic yards of contaminated soil from the upper and lower lagoons, drain troughs, and piping; treating the soil onsite using a rotary kiln incineration thermal treatment process, followed by onsite disposal of the treated soil and flyash in the upper lagoon area; reprocessing any treated soil, which fails the hazardous waste characteristic tests; treating soil that does not meet TCLP standards using stabilization, prior to disposal; decanting standing water in the lagoons, with treatment, if necessary; restoring any affected wetlands; and conducting perimeter air monitoring. The estimated present worth cost for this remedial action is $10,251,000, which includes an annual O&M cost of $11,400 for 2 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are based on health-based criteria and include TNT 21 mg/kg; 2,4-DNT 9.3 mg/kg; 2-A-4,6-DNT 1,191 mg/kg; 1,3,5-TNB 3.7 mg/kg; RDX 5.75 mg/kg; and NB 37.2 mg/kg. Treated soil will be subjected to TCLP and testing for other hazardous waste characteristics. Residual soil left in the ground will have no concentrations of explosive compounds that are greater than health-based criteria.

INSTITUTIONAL CONTROLS:
Not applicable

KEYWORDS:
Air Monitoring; Carcinogenic Compounds; Debris; Direct Contact; Excavation; Floodplain; Incineration/ Thermal Destruction; O&M; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Soil; Solidification/Stabilization; State Standards/ Regulations; Surface Water; Surface Water Treatment; Treatment Technology; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, Debris, SW
Major Contaminants: VOCs, Organics
Category: Source Control - Final Action

SKINNER LANDFILL, OH
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 78-acre Skinner Landfill site is located in West Chester, Butler County, Ohio. Land use in the immediate vicinity includes business and residential uses to the west and crop farming to the north. Several geologic units that underlie the site are used as aquifers by local residents. The site was used in the past for the mining of sand and gravel, and was operated for the landfilling of a wide variety of materials from approximately 1934 through 1990. Materials deposited onsite include demolition debris, household refuse, and a wide variety of chemical wastes. A low area of the site, referred to as the waste lagoon, was used for disposal of paint and ink wastes, creosote, pesticides, and other chemicals. In 1976, in response to a fire onsite and reports of observations of a black, oily liquid in a waste lagoon onsite, EPA investigated the landfill. The owner asserted that nerve gas, mustard gas, incendiary bombs, and other explosive devices were buried at the landfill in the lagoon area, but subsequently retracted this claim. The U.S. Army and EPA dug several trenches into the buried waste lagoon and found black ooze and numerous barrels of waste; no munitions of any sort were found. In 1982, EPA conducted an investigation that showed that the ground water southeast of the buried waste lagoon was contaminated with VOCs. RI studies conducted between 1986 and 1989 investigated the site ground water, surface water, soil, and sediment. In 1990, the state closed the site to further landfilling activities. EPA has organized this project into two operable units. This ROD is an interim action to protect human health by limiting site access to prevent ingestion of and direct contact with contaminated soil, and to protect the potentially affected users of ground water on and near the site. A future ROD will provide source control measures and the remaining onsite contaminants as the final response action for this site. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene; other organics, including PCBs and pesticides; and metals, including arsenic.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes implementing site access restrictions at the area of the site that was used for landfilling and disposal of liquid wastes; posting warning signs; conducting quarterly ground water monitoring; and providing an alternative water supply to residents who are potentially impacted by offsite migration of contaminated ground water. The capital cost for this remedial action is $160,000, with an annual O&M cost is $30,000.

PERFORMANCE STANDARDS OR GOALS:

No performance clean-up goals were provided for remedial action. The subsequent ROD will address the clean-up goals for the chemicals of concern in soil, sediment, ground water, and surface water.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Alternate Water Supply; Arsenic; Benzene; Carcinogenic Compounds; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Interim Remedy; Metals; O&M; Organics; PCBs; Pesticides; Soil; Solvents; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Ground Water - Interim

SOUTH ANDOVER (OPERABLE UNIT 1) (AMENDMENT), MN

June 9, 1992

SITE HISTORY/DESCRIPTION:

The 50-acre South Andover site is composed of several privately owned parcels of land near Minneapolis in Anoka County, Minnesota. Land use in the area is predominately commercial and residential, and several auto salvage and repair yards are located at, and adjacent to, the site. The site contains part of a wetlands area with several small recreational lakes in the vicinity. The site overlies three shallow aquifers. A lower bedrock aquifer supplies the surrounding community with drinking water. Between 1954 and 1981, multiple waste storage and disposal activities occurred on several properties within the site boundaries. There are several source areas where former activities included drum storage, waste storage, and waste burning. Solid and liquid chemical waste dumping and open pit burning of solvents occurred during the 1960's and 1970's. Investigations showed that drum storage and chemical waste disposal sites were partially obscured by auto salvage operations and more than 3 million waste tires. In 1976, citizen complaints of well contamination prompted the state to investigate the site and issue violations for improper storage of chemical waste and, in 1980, for improper disposal of industrial waste. Waste processing was discontinued in early 1977, and waste acceptance ceased in 1978. In 1981, the contents of approximately 700 drums were disposed of by mixing with waste oil and using the mixture as fuel; in 1988 and 1989, two tire fires occurred onsite. EPA investigations have determined contamination of soil and ground water resulting from soil that came into contact with leaking drums, electrical transformers, and/or salvaged automobiles. A 1988 ROD addressed a ground water remedy that provided extraction of the ground water from a surficial aquifer; provided municipal water to private well users onsite; placed restrictions on new wells near the site; and monitored ground water. This ROD amendment changes the 1988 ROD for ground water based on current data from a 1990 Design Investigation. The primary contaminants of concern affecting the ground water are VOCs, including PCE, TCE, and toluene; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The amended remedial action for this site includes monitoring ground water at the site; abandoning nonessential wells; and resampling wells, if action levels are exceeded. The remedial design investigation showed that there is no definable plume at the site; rather, there are random detections of compounds below background and regulatory standards. Therefore, EPA and the state are deleting three of four components identified in the 1988 ROD remedy selection. The present worth cost for this amended remedial action is $150,000.

PERFORMANCE STANDARDS OR GOALS:

Action levels for ground water at the site are based on SDWA MCLs.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Background Levels; Ground Water; Ground Water Monitoring; ROD Amendment; Treatability Tests; Wetlands.

SITE SUMMARY

Date of previous RODs: 03/30/88
Lead: Fund
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Final Action

SOUTH ANDOVER (OPERABLE UNIT 2), MN

December 24, 1991

SITE HISTORY/DESCRIPTION:

The 50-acre South Andover site is composed of several privately owned parcels of land near Minneapolis in Anoka County, Minnesota. Land use in the area is predominately commercial and residential, and several auto salvage and repair yards are located at, or adjacent to, the site. The site contains part of a wetlands area with several small recreational lakes in the vicinity. The site overlies three aquifers, one of which supplies the surrounding community with drinking water. Between 1954 and 1981, multiple waste storage and disposal activities occurred on several properties within the site boundaries. Source areas include a drum storage area, waste storage area, and waste burning area. During the 1960's and 1970's, solid and liquid chemical waste dumping and open pit burning of solvents occurred. Investigations showed that drum storage and chemical waste disposal sites were partially obscured by both auto salvage operations and an estimated 3 million waste tires. In 1976, citizen complaints of well contamination prompted the state to investigate the site and issue violations for improper chemical waste storage, and in 1980, for improper disposal of industrial waste. Waste processing was discontinued in 1977, and waste acceptance ceased in 1978. In 1981, the contents of approximately 700 drums were disposed of by mixing them with waste oil and using the mixture as fuel; then, in 1988 and 1989, two tire fires occurred onsite. EPA investigations determined that soil and ground water contamination had resulted from contact with leaking drums, electrical transformers, and/or salvaged automobiles. A 1988 ROD previously addressed the contaminated ground water onsite as OU1. This ROD addresses the contaminated onsite soil as OU2. The primary contaminants of concern affecting the soil and debris are organics, including PAHs and PCBs; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and onsite treatment of 2,100 cubic yards of PAH-contaminated soil using ex-situ biological treatment; excavating and disposing of the remaining 9,300 cubic yards of PAH-, PCB-, and metal-contaminated soil from areas 2, 3, 4, and 7 in an offsite solid waste landfill; sampling and removing offsite approximately 20 onsite drums; and monitoring surface water and sediment. The estimated present worth cost for this remedial action is $2,470,000, which includes an O&M cost of $195,000.

PERFORMANCE STANDARDS OR GOALS:

Soil clean-up goals will meet AWQCs and Minnesota surface water quality standards. Noncarcinogenic risk will be to a HI=1. Chemical-specific goals for soil cleanup include PAHs 2 mg/kg; PCBs 2 mg/kg; antimony 25 mg/kg; and lead 500 mg/kg.

INSTITUTIONAL CONTROLS:

None.

KEYWORDS:

Biodegradation/Land Application; Carcinogenic Compounds; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Lead; Metals; O&M; Offsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; Soil; Solvents; State Standards/Regulations; Surface Water Monitoring; Treatment Technology; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: 03/30/88
Lead: Fund
Contaminated Media: Soil, Debris
Major Contaminants: Organics, Metals
Category: Source Control - Final Action

SPICKLER LANDFILL, WI

June 3, 1992

SITE HISTORY/DESCRIPTION:

The 10-acre Spickler Landfill site is an inactive municipal and industrial landfill located in Spencer, Marathon County, Wisconsin. The site consists of a mercury brine pit and two fill areas called the Old and New Fill Areas. The two fill areas are separated by a crude oil pipeline right-of-way. The area surrounding the site is sparsely populated and mainly rural. Ownership of the Spickler Landfill site changed frequently during its years of operation. In 1970, the site began operations as a municipal open dump. The same year, the state authorized the construction of a clay-lined sludge disposal area at the site. No documentation exists that verifies that the pit was clay-lined as planned. In 1971, mercury brine muds were disposed of in this sludge disposal area, and the sludge disposal area was closed with a clay cap. Other industrial wastes known to have been disposed of at the site include kalo dust, which contained asbestos, and toluene, xylenes, methyl-ethyl ketone, and methylene chloride. In 1972, the landfill was licensed to accept solid wastes, including industrial waste, with the exception of toxic and hazardous materials. During 1973, numerous violations were noted by the state, including failure to perform daily cover operations and ineffective drainage control. In 1974, the state ordered the owners of the site to terminate operations and close the landfill. Between 1974 and 1975, most closure and abandonment work was completed, including placement, grading, and seeding of the landfill cover. A 1984 assessment revealed not only that areas of leachate seepage occurred on both the north and south faces of the New Fill Area, but also that the mercury brine pit had subsided and appeared to be collecting surface water. This ROD provides a final remedy for the first operable unit (OU1), which consists of the mercury brine pit, and the landfill. A future ROD will address final remediation of ground water as OU2. The primary contaminants of concern affecting the soil, sludge, and leachate are VOCs, including benzene, PCE, toluene, TCE, and xylenes; other organics, including pesticides; metals, including arsenic, chromium, and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating wastes in the mercury brine pit either by solidification and/or stabilization, based on results of a treatability test, and installing an impermeable cap over the treated material; installing a solid waste cap over the New and Old Fill areas with an active leachate collection treatment system and a gas collection system; discharging the treated leachate to wetlands, surface water, or a POTW, based on the results of TCLP testing; monitoring ground water, leachate, and landfill gases; maintaining the landfill caps; and implementing engineering and institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $4,859,000, which includes an annual O&M cost of $113,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Extracted leachate will be treated to appropriate discharge levels as specified by federal and state requirements prior to discharge to the wetlands, surface water, or a POTW. Capping and closure of the mercury brine pit are subject to the requirements of RCRA, Subtitle C.

INSTITUTIONAL CONTROLS:

Institutional controls including access and deed restrictions will be implemented onsite to prohibit installation of drinking water wells and prohibit construction on the landfill itself.

KEYWORDS:

Acids; Arsenic; Asbestos; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Closure Requirements; Direct Contact; Ground Water Monitoring; Inorganics; Institutional Controls; Landfill Closure; Leachability Tests; Leachate Collection/Treatment; Lead; Metals; O&M; Offsite Discharge; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; Publicly Owned Treatment Works (POTW); RCRA; Sludge; Soil; Solidification/ Stabilization; Solvents; State Permit; State Standards/Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

SPICKLER LANDFILL, WI (Continued)

June 3, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, Leachate
Major Contaminants: VOCs, Other Organics, Metals, Inorganics
Category: Source Control - Final Action

TAR LAKE, MI
September 29, 1992

SITE HISTORY/DESCRIPTION:

The 200-acre Tar Lake site is a former manufacturing site in Antrim County, Michigan, located 1 mile south of Mancelona, Michigan, near the village of Antrim. Land use in the area is industrial/residential, with several lakes and ponds in the vicinity of the site. From 1882 to 1945, the site was the location of iron production by the charcoal method. In 1910, Antrim Iron Works Company began producing charcoal in sealed retorts from which pyroligneous liquor was recovered. This liquor was further processed into calcium acetate, methanol, acetone, creosote oil, and wood tar. Wastes from these processes were discharged into Tar Lake, a large natural surface depression. Investigations performed by EPA and responsible parties revealed soil and ground water contamination with concentrations above federal and state regulatory levels. Ground water contamination extends 3.5 miles downgradient from the site, and Tar Lake has a strong chemical odor. This ROD addresses a final remedy for the soil and tar sludge, as well as an interim remedy to limit further contamination of ground water, as OU1. A future ROD will address OU2 as the final remedy for the ground water and surface water contamination. The primary contaminants of concern affecting the soil, tar sludge, ground water, and surface water are VOCs, including benzene, toluene, and xylenes; and other organics, including PAHs and phenols.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating approximately 30,000 cubic yards of tar sludge and approximately 40,000 cubic yards of contaminated soil in and around Tar Lake, with dewatering using extraction wells to facilitate excavation; consolidating the excavated materials into two adjoining RCRA containment cells to be constructed within the contamination area; adding solidification agents, such as bentonite and cement to the tar sludge, and capping the cell with a RCRA Subtitle C cap; installing a leachate collection system; pumping to contain the contaminated ground water, water from the dewatering process, and the ponded water on Tar Lake, and treating these using carbon adsorption or another technology based on the results of a treatability study to be conducted during the pre-design stage; injecting the treated water upgradient of the extraction wells to perform a closed loop system; monitoring ground water; and implementing institutional controls, including ground water use restrictions. The estimated present worth cost for this remedial action is $20,100,000, which includes an annual O&M cost of $791,800.

PERFORMANCE STANDARDS OR GOALS:

All soil and sludge with an excess cancer risk level greater than $1x10^{-6}$ will be excavated from the site. Chemical-specific soil and sludge clean-up levels were based on the Michigan Environmental Response Act and health-based criteria and include 2-methylphenol 8,000 ug/kg; benzene 0.4 ug/kg; benzo(a)anthracene, benzo(b)fluoranthene, and benzo(k)fluoranthene all at 100 ug/kg; phenols 6,000 ug/kg; toluene 16,000 ug/kg; and xylenes 6,000 ug/kg. Because the ground water containment is an interim measure, ground water clean-up standards are waived. Chemical-specific clean-up levels will be provided in the final action for ground water onsite.

INSTITUTIONAL CONTROLS:

Ground water usage will be restricted within the areas of the existing or potential contaminant plume.

KEYWORDS:

ARAR Waiver; Benzene; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; Landfill Closure; Leachate Collection/Treatment; MCLGs; MCLs; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Sludge; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Treatment; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

TAR LAKE, MI (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, GW, SW
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action
Ground Water - Interim

TORCH LAKE (OPERABLE UNITS 1 AND 3), MI

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 2,700-acre Torch Lake site is a copper milling and smelting facility in Houghton County, Michigan. The site includes tailings/slag piles and beaches on Torch Lake, the west shore of Torch Lake, the northern portion of Portage Lake, Portage Lake Canal, Keweenaw Waterway, the North Entry to Lake Superior, Boston Pond, and Calumet Lake in Lake Linden, Hubbell/Tamarack City, Mason, Michigan Smelter, Isle-Royale, Lake Superior, Grosse Point, Quincy Smelter, Hubbell, and other areas associated with the Keweenaw Basin. Land use in the area is predominantly residential and recreational. Wetlands are located in proximity of some of the tailing piles. The lake, which was a repository of milling wastes, served as the waterway for transportation to support the mining industry. Over 5 million tons of native copper were produced from the Keweenaw Peninsula, and more than half of this was processed along the shores of Torch Lake. Between 1868 and 1968, approximately 200 million tons of tailings were dumped into Torch Lake, filling at least 20 percent of the lake's original volume. In the late 1960's, copper milling ceased. In 1972, a discharge of 27,000 gallons of cupric ammonium carbonate leaching liquor occurred into the north end of Torch Lake from the storage vats at the Lake Linden Leaching Plant. The state investigated the spill and found no harmful effects associated with the spill; however, discoloration of several acres of lake bottom was noted. In the 1970's, high concentrations of heavy metals in the lake's sediment, toxic discharges into the lakes, and fish abnormalities prompted many investigations into the impact of mine waste disposal. From 1988 to 1989, EPA performed a removal action that included removing drums and soil to an offsite hazardous waste landfill. This ROD addresses removal of debris, surface tailings, and slag pile/beach, and disposal of drums on the western shore of the site, as OU1; and remediation of slag pile locations through the mid-Keweenaw Peninsula, as OU3. A subsequent ROD will address areas of potential contamination in and around Torch Lake, including ground water, submerged tailings at the bottom of the lake, sediment, and surface water, as OU2. The primary contaminants of concern affecting the soil, debris, and slag pile/beach are organics, including PAHs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes placing a soil cover with vegetation over 442 acres of tailings in Lake Linden, Hubbell/Tamarack City, and Mason, and 9 acres in Hubbell; placing a soil cover with vegetation over 229 acres of tailings in Calumet Lake, Boston Pond, Michigan Smelter, Dollar Bay slag pile, and Grosse Point; removing debris such as wood, empty drums, and other garbage for offsite disposal; and implementing institutional controls, including deed restrictions to control the use of tailing piles and slag piles/beach. The Isle Royale tailings will be excluded from the area to be covered with soil and vegetation. Twelve acres out of the approximately 223-acres of the Isle-Royale tailings will be developed as a sewage treatment plant; 90-acres are designated to be developed as a residential area; and 60-acres are currently being used as a source material to make cement blocks. Also excluded from the area to be covered are the area designated by the Houghton County Road Commission for use as source material for road traction during the winter; the Quincy Smelter area (based on the assumption that this area will be developed as part of a National Historic Park); and the North Entry, Redridge, and Freda tailings. If any of these excluded areas has not been addressed as planned within 5 years after RD submittal, that area will then be subject to the requirements of this ROD. The estimated present worth cost for this remedial action is $6,126,000, which includes an annual O&M cost of $109,000 for 10 years.

PERFORMANCE STANDARDS OR GOALS:

Soil clean-up levels are not established for this remedial action.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to control the use of tailing piles and slag piles/beach so that the tailings and/or slag will not expose human beings and animals to contaminants or increase the potential for runoff of contaminants into the lake. If the Quincy Smelter area is not developed as a national park, deed restrictions will be sought to prevent development of residences in the slag pile area.

TORCH LAKE (OPERABLE UNITS 1 AND 3), MI (Continued)

September 30, 1992

KEYWORDS:
Arsenic; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Direct Contact; Excavation; Lead; Metals; Mining Waste; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Organics; PAHs; Soil; State Standards/ Regulations; Treatability Studies; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Debris, Slag Pile/Beach
Major Contaminants: Organics, Metals
Category: Source Control - Interim

TRI COUNTY LANDFILL, IL
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 66-acre Tri County Landfill (TCL) site comprises two former landfills the Tri County Landfill and the Elgin Landfill, located near the junction of Kane, Cook and DuPage Counties, Illinois. The two disposal operations overlapped to the point where the two landfills were indistinguishable. Land use in the area is predominantly agricultural. The local residents and businesses use private wells as their drinking water supply. Prior to the 1940's, both landfills were used for gravel mining operations. From 1968 to 1976, the TCL received liquid and industrial waste. State and county inspection reports revealed that open dumping, area filling, and dumping into the abandoned gravel quarry had occurred at the site. In addition, confined dumping, inadequate daily cover, blowing litter, fires, lack of access restrictions, and leachate flows were typical problems reported. In 1981, the landfill was closed with a final cover. From 1961 to 1976, the Elgin landfill received brush, commercial rubbish, industrial wastes, and incinerator ash without a formal waste disposal method. As a result of residents' complaints of suspected surface and ground water contamination, the state ordered the landfills to stop contaminating, pay penalties, and post bonds. The landfills never fully complied. Further investigations revealed contamination in the soil and ground water from VOCs, SVOCs, metals, and pesticides as well as venting of methane gas. This ROD addresses a final remedy for the soil, sediment, debris, ground water, surface water, and air at the site. The primary contaminants of concern affecting these media are VOCs, including benzene and TCE; other organics, including PAHs, PCBs, and pesticides; and metals, including arsenic.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and consolidating contaminated sediment from the leachate ditch with contaminated onsite soil and drummed drill cuttings; installing a clay cap over these materials and regrading and revegetating the site; installing interceptor trenches to collect contaminated onsite ground water and leachate with pretreatment, if necessary, prior to either onsite discharge to surface water or offsite discharge to a POTW, as determined during the RD; diverting surface water from the waste areas, and collecting and treating surface water offsite; treating landfill gases using a series of gas extraction wells connected to a blower/flaring facility, prior to discharge to the atmosphere; assessing and mitigating affected wetlands; providing for contingency measures to address changed conditions or previously unknown contamination problems; allowing offsite contaminated ground water to naturally attenuate; monitoring soil, sediment, and surface water; and implementing institutional controls including deed, land, and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $12,624,000, which includes an annual O&M cost of $243,500 for 2 years.

PERFORMANCE STANDARDS OR GOALS:

There are no chemical-specific standards established for soil and sediment; however, risk-based levels or local background concentrations may be utilized. The selected remedy will reduce potential exposure to contaminated ground water to within acceptable risks of 1×10^{-4} to 1×10^{-6} excess cancer risk and an HI of less than 1.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of deed restrictions will be implemented to regulate land use and prevent future development or installation of drinking water wells near the site.

KEYWORDS:

Air; Arsenic; Benzene; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Contingent Remedy; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; MCLGs; MCLs; Metals; O&M; Offsite Discharge; Offsite Treatment; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; TCE; Vacuum Extraction; VOCs; Water Quality Criteria; Wetlands.

TRI COUNTY LANDFILL, IL (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Debris, GW, SW, Air
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

TWIN CITIES AF RESERVE (SAR LANDFILL), MN

March 31, 1992

SITE HISTORY/DESCRIPTION:

The 2-acre Twin Cities AF Reserve (SAR Landfill) site is a former disposal area for U.S. Air Force (USAF) main Base refuse in Minneapolis, Hennepin County, Minnesota. Land use in the area consists of a Small Arms Range, Minneapolis-St. Paul International Airport, and Fort Snelling State Park. The site is within the 100-year flood plain of the Minnesota River, and a wetlands associated with the National Wildlife Refuge is located adjacent to the site. The Small Arms Range Landfill (SARL), acquired by the USAF in 1955, was used for disposal of main Base refuse from 1963 to 1972. Industrial wastes, which included paint sludge, paint filters, and leaded aviation gasoline sludge, were buried at the landfill. The SARL was closed in 1972. In 1982 and 1983, the state constructed a stormwater retention and settling pond, serving Interstate 494, in the eastern part of the landfill. The landfill overlies two aquifer systems that receive recharge from the stormwater retention areas. Additionally, the upper aquifer has been shown to be connected hydraulically to the Minnesota River. In 1983, the site was identified as a hazardous waste site, and in 1987, was placed on the NPL list because of suspected contaminant release to ground water. Based on preliminary investigations VOCs, metals, and other organics were detected in the soils, surface water, and ground water. This ROD is the first and final action for the site and addresses remediation of the ground water. The primary contaminants of concern affecting the soil and ground water did not exceed ARARs and, therefore, are not considered a threat since access restrictions addressed in this ROD will be implemented at the site. The primary contaminants of concern affecting the soil and ground water are VOCs, including 2-butanone and TCE; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes allowing contaminated ground water to naturally attenuate; maintaining the site; monitoring ground water and surface 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 $737,000, which includes a present worth O&M cost of $684,000.

PERFORMANCE STANDARDS OR GOALS:

The remediation goal is to reduce the levels of contaminants in the ground water to below MCLs established under the SDWA and to ensure that contaminant levels do not exceed federal or state Water Quality Criteria for freshwater species or potential drinking water sources. The remediation will achieve a carcinogenic risk level within EPA's target range for acceptable excess carcinogenic risk of 10^{-4} to 10^{-6}. Chemical-specific ground water clean-up goals are based on SDWA MCLs or Minnesota RAL, including arsenic 10 ug/l (RAL); beryllium 1 ug/l (RAL); cadmium 4 ug/l (RAL); lead 15 ug/l (SDWA); nickel 70 ug/l (RAL); selenium 10 ug/l (RAL); TCE 5 ug/l (SDWA); and vanadium 20 ug/l (RAL).

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to limit development of the site and future ground water usage if the property is relinquished by the USAF.

KEYWORDS:

Arsenic; Carcinogenic Compounds; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Institutional Controls; Metals; O&M; Safe Drinking Water Act; Solvents; State Standards/Regulations; Surface Water Monitoring; TCE; VOCs; Water Quality Criteria.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Metals
Category: Source Control - Final Action
Ground Water - Final Action

CAL WEST METALS, NM

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 43.8-acre Cal West Metals site is a former battery breaking, recycling, and secondary lead smelting facility located one-half mile northwest of Lemitar, Socorro County, New Mexico. Land use in the area is predominantly agricultural and residential, with three households located within 1,100 feet south of the site. From 1979 to 1981, Cal West used a 12-acre fenced portion of the site for processing automobile batteries for lead, rubber, and plastics recovery. Batteries were crushed onsite and components separated using flotation and centrifugation in a rotating separator drum. Water was recycled and ultimately discharged to a lined pond, and piles of crushed battery components were stored outdoors. From 1982 to 1984, the facility was used for research and development on methods of lead recovery. Since 1985, the company has conducted intermittent work onsite with the battery waste piles to extract lead oxides, rubber, and plastics. Current site features include two evaporation ponds, three buildings, berms, soil and battery waste piles, a concrete pad, and a salvage area. From 1979 to 1985, the state conducted investigations to assess air and ground water quality onsite. In 1985, EPA investigations showed elevated levels of lead in soil, sediment, and ground water. This source control ROD addresses the principal threat of lead contamination at the site as a final remedy. The primary contaminants of concern affecting the battery waste piles, soil, sediment, and debris are organics, including PAHs; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating, consolidating, and treating an estimated 15,000 cubic yards of contaminated battery waste materials, soil, and sediment onsite using stabilization/solidification; disposing of the treated materials in the southwest corner of the fenced area and capping the disposal area with cement and a 12-inch soil cover; decontaminating onsite buildings and equipment; and sampling ground water. The estimated present worth cost for this remedial action is $1,557,000, which includes an annual O&M cost of $5,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and sediment clean-up goals are established on health-based levels for carcinogenic and noncarcinogenic risks and include arsenic 0.37 mg/kg; lead 640 mg/kg; mercury 0.82 mg/kg; and PAHs 3 mg/kg benzo(a)pyrene equivalents. Contaminated materials with lead concentrations exceeding 640 mg/kg will be treated to meet the RCRA TCLP standard of 5 mg/kg leachable lead prior to onsite disposal.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Capping; Carcinogenic Compounds; Clean Air Act; Debris; Decontamination; Direct Contact; Excavation; Ground Water Monitoring; Lead; Metals; O&M; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Sediment; Soil; Solidification/ Stabilization; Treatment Technology.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Debris, Sediment, Waste Piles
Major Contaminants: Organics, Metals
Category: Source Control - Final Action

CRYSTAL CHEMICAL (AMENDMENT), TX
June 16, 1992

SITE HISTORY/DESCRIPTION:
The 24.4-acre Crystal Chemical site consists of a 6.8-acre abandoned herbicide manufacturing facility (referred to as the onsite area) and 17.6 acres of affected surrounding properties (referred to as the offsite area) in Houston, Harris County, Texas. The site, which lies within the 100-year floodplain of an adjacent flood control channel, overlies a shallow aquifer system. Surrounding land use is commercial and industrial. From 1968 to 1981, herbicides, including arsenic compounds, were manufactured onsite. During that time several structures, four evaporation ponds, and many storage tanks were utilized in site operations, and drums of raw and finished product were routinely stored in the open. During transfer of raw materials from rail cars, onsite soil was contaminated by herbicides spilled from drums. Contamination of offsite soil and sediment was a result of periodic flooding, which caused arsenic-contaminated onsite wastewater to move 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 by EPA from 1981 to 1988, included removing chemical liquids and wastewater, temporarily capping the site, dismantling and decontaminating site structures, constructing drains and fencing, and placing fill material onsite. A 1990 ROD addressed onsite and offsite soil and ground water. This ROD amends the remedy for soil and replaces in-situ vitrification with onsite disposal and capping. The ground water remedy will not change and will be implemented as called for in the 1990 ROD. The primary contaminant of concern affecting the soil is the metal arsenic.

SELECTED REMEDIAL ACTION:
The amended remedial action for this site includes excavating 55,000 cubic yards of contaminated offsite soil with arsenic levels above 30 mg/kg and placing the soil onsite; constructing a multi-layer cap over the entire site; and implementing institutional controls, including land use restrictions. The estimated present worth cost for this amended remedial action is $5,803,300, which includes an annual O&M cost of $140,079.

PERFORMANCE STANDARDS OR GOALS:
The cap will comply with RCRA requirements for landfill closure. The excavation goal for arsenic in soil is 30 mg/kg.

INSTITUTIONAL CONTROLS:
Institutional controls, including land use restrictions, will be implemented at the site to prevent future use.

KEYWORDS:
Arsenic; Capping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Excavation; Floodplain; Institutional Controls; Landfill Closure; Metals; Onsite Containment; Onsite Disposal; RCRA; ROD Amendment; Soil.

SITE SUMMARY

Date of previous RODs: 09/27/90
Lead: Federal Enforcement
Contaminated Medium: Soil
Major Contaminants: Metals
Category: Source Control - Final Action

DOUBLE EAGLE REFINERY, OK

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 12-acre Double Eagle Refinery (DER) site is a former oil reclamation plant in Oklahoma City, Oklahoma County, Oklahoma. Land use in the area is predominantly mixed industrial and residential with a wetlands onsite. The residents and industries within 1 mile of the DER site use city water from reservoirs as their drinking water supply. Additionally, the North Canadian river is located one-half mile south of DER. The Fourth Street Refinery Superfund site is located 500 feet northeast of the DER site. The Radio Tower Area and Parcel H Area are located to the south and east of the site, respectively. The DER site includes 13 steel buildings, a fire tube boiler, two pipe heat exchangers, an undetermined number of steel tanks, concrete cells, and five vacuum precoat/scrapper filters. From 1929 to approximately 1970, DER used the site to recycle approximately 600,000 gallons of used oil each month into finished lubricating oil. From approximately 1970 until 1980, DER accepted used oil onto the site for storage only. The recycling process included adding sulfuric acid, settling, and filtrating with bleaching clays via a filter press, which generated approximately 80,000 gallons of sludge monthly. Sludge was initially sent offsite for disposal, but later was disposed of in onsite impoundments and a sludge lagoon. Offsite drainage from DER occurred onto Parcel H, which includes oily sediments in two surface ponds, and onto Radio Tower, which contains a surficial tar matrix. EPA investigations revealed 42,000 cubic yards of contaminated soil, sediment, surface water, and air. Contaminated areas included a sludge lagoon, surface spill area, surface impoundments, and process equipment. This ROD addresses a final remedy for OU1, Source Control Operable Unit. A subsequent ROD will address ground water contamination. The primary contaminants of concern affecting the soil, sediment, sludge, debris, and surface water are VOCs, including benzene and PCE; other organics, including PAHs and PCBs; metals, including arsenic and lead; and acids.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating approximately 2,700 cubic yards of contaminated materials from the two offsite areas, Radio Tower and Parcel H, and consolidating these onsite within the East/West lagoon along with contaminated materials from the DER impoundment and open areas; treating the 42,000 cubic yards of consolidated materials onsite using neutralizing agents for the acidic wastes and solidification/stabilization to remove inorganics; using surface water from the impoundments in the stabilization processes; excavating the solidified material and transporting this offsite for disposal in a RCRA landfill; demolishing contaminated onsite equipment or structures, including above-ground storage tanks, with salvage and/or removal; disposing of any asbestos-containing material, as needed; and monitoring ground water. The estimated present worth cost for this remedial action is $6,400,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific goals for soil, sediment, and sludge are based on meeting a risk of 10^{-4} to 10^{-6} and an HI=10, including lead 500 mg/kg; PAHs; and PCBs 25 mg/kg. All other residual materials will meet RCRA TCLP regulatory limits prior to offsite disposal.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Acids; Arsenic; Asbestos; Benzene; Carcinogenic Compounds; Clean Air Act; Debris; Direct Contact; Excavation; Ground Water Monitoring; Lead; Metals; Offsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; RCRA; Sediment; Sludge; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Treatment; Toluene; Treatment Technology; VOCs; Wetlands; Xylenes.

DOUBLE EAGLE REFINERY, OK (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Sludge, Debris, SW
Major Contaminants: VOCs, Other Organics, Metals, Acids
Category: Source Control - Final Action

FOURTH STREET ABANDONED REFINERY, OK

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 27-acre Fourth Street Abandoned Refinery (FSR) site is located in Oklahoma City, Oklahoma. Land use in the area is mixed industrial and residential. Four schools are located within a 1-mile radius of the site. Portions of the FSR site have been identified as wetlands. Since the early 1940's, used oils were collected, stored, re-refined, and distributed as recycled product. Another Superfund site, the Double Eagle Refinery (DER), lies about 500 feet southwest of the FSR site. The two adjacent sites contain very similar waste material since both sites recycled used oil. Contamination from FSR has contributed to contamination in an area just south of the FSR site, known as the "Parcel H" area. Sludge generated by the reclamation process was disposed of in onsite impoundments. Physical dumping also occurred in a landfill area just west of the Parcel H area, but this waste is not attributable to either the FSR or DER sites. Operations ceased in the late 1960's or early 1970's. In 1989, EPA notified the owners to conduct a removal at the site; however, the parties declined. Later in 1989, EPA performed a removal action, which included fencing the site and posting warning signs. This ROD addresses both onsite and offsite sources of contamination, including soil, sediment, sludge, debris, and surface water as the source control operable unit. This ROD also focuses on reducing the potential for contaminant migration to surface water and ground water. A subsequent ROD will address the potential migration of site contaminants via the ground water and surface water pathways. The primary contaminants of concern affecting the soil, sediment, sludge, and debris are organics, including PAHs and PCBs; metals, including arsenic and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating 1,200 cubic yards of the contaminated material from the Parcel H area and consolidating this onsite along with other contaminated material; treating approximately 42,000 cubic yards of the consolidated soil, sediment, sludge, and debris onsite using neutralization of the acidic waste and stabilization of the lead-contaminated materials; disposing of the treated wastes at a permitted landfill; and cleaning, consolidating, demolishing, and salvaging and/or removing contaminated equipment, structures, and asbestos, as necessary. The estimated present worth cost for this remedial action is $6,400,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Soil clean-up levels are established for consolidated materials that will be stabilized to ensure that leaching does not exceed the TCLP. Chemical-specific goals for soil correspond to the TSCA clean-up level for industrial land use, regional guidance for setting remedial goals, and industrial land use for the FSR site. These include lead 500 mg/kg; PAHs 30 mg/kg; and PCBs 25 mg/kg.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Arsenic; Asbestos; Carcinogenic Compounds; Clean Air Act; Clean Closure; Closure Requirements; Debris; Direct Contact; Excavation; Landfill Closure; Lead; Metals; Offsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; RCRA; Sediment; Sludge; Soil; Solidification/Stabilization; State Standards/Regulations; Treatment Technology; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Sludge, Debris
Major Contaminants: Organics, Metals, Inorganics
Category: Source Control - Final Action

GULF COAST VACUUM SERVICES (OPERABLE UNIT 1), LA

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 12.8-acre Gulf Coast Vacuum Services site is a former vacuum truck and oil field plant in Vermilion Parish, Louisiana. Land use in the area is predominantly agricultural. Ten residences within one-half mile of the site use the ground water below the Chicot Aquifer for drinking water and irrigation. The site is bounded to the north and west by pasture land, and to the east and south by another Superfund site, the D. L. Mud Superfund site, and the LeBoeuf Canal. From 1969 to 1980, several owners used the site as a trucking terminal to transport various metals, including waste generated from oil exploration and production activities. The site includes two open waste pits—specifically, the Washout Pit and West Pit—and two vegetated areas, known as the Former West Pit. The Former West Pit adjoins the West Pit to the south and was used for disposal. Other site features include vertical storage tanks, horizontal tanks, and three underground storage tanks. During site operations, unpermitted disposal of primarily oil industry-related waste occurred in the unlined pits, ditches, and site soil. EPA investigations, which started in 1980, led to three removal actions at the site from 1990 to 1992. These removal actions addressed contaminant overflow caused by critical rainfall, from both the West Pit and Washout Pit, provided for construction of a secondary containment levee west of the West Pit; pumping, treatment, and discharge of wastewater from the two pits; and fencing the area. This ROD addresses the final remedial action for all of the sources of contamination as OU1. Future RODs will address the contaminated overflow and the migration from offsite pits, as OU2. The primary contaminants of concern affecting the soil, sediment, pit sludge, and ground water are VOCs, including benzene; other organics, including PCBs and naphthalene; and metals, including arsenic and barium.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes consolidation and onsite incineration of approximately 12,000 cubic yards of organic- and inorganic-contaminated waste pit sludge and 7,950 cubic yards of associated soil, 12,000 gallons of tank contents, and 155 cubic yards of tank sludge, followed by stabilization/solidification of the residual ash, if necessary; stabilizing and solidifying onsite approximately 18,900 cubic yards of site inorganic-contaminated soil, and 600 cubic yards of surface sediment; disposing of all of these residuals in an onsite excavation and covering the area with a clay cover; allowing ground water to naturally attenuate; monitoring ground water in the upper and lower aquifers; conducting onsite and offsite air monitoring; treating air emissions as needed; and implementing institutional controls, including deed restrictions. The estimated present worth cost for this remedial action is $13,026,000, which includes an annual O&M cost of $18,050 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil, sediment, and pit sludge goals are based on SDWA MCLs, and include arsenic 16 ug/kg; barium 5,400 mg/kg; and benzene 0.66 mg/kg. Ground water is expected to meet the National Primary Drinking Water and health-based standards. Chemical-specific goals for ground water are based on SWDA MCLs and MCLGs, and include arsenic 50 ug/l (MCL); barium 2,000 ug/l (MCL); cadmium 5 ug/l (MCL); total chromium 100 ug/l (MCL); total mercury 2 ug/l (MCL); and benzene 5 ug/l (MCL).

INSTITUTIONAL CONTROLS:

Institutional controls, including deed restrictions, will be implemented onsite to prevent disturbance of the clay cover.

KEYWORDS:

Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Debris; Direct Contact; Dredging; Excavation; Ground Water; Ground Water Monitoring; Incineration/Thermal Destruction; Institutional Controls; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Solidification/Stabilization; Solvents; Treatability Studies; Treatment Technology; VOCs; Xylenes.

GULF COAST VACUUM SERVICES (OPERABLE UNIT 1), LA (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Sludge, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

GULF COAST VACUUM SERVICES (OPERABLE UNIT 2), LA

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 12.8-acre Gulf Coast Vacuum Services site is a former vacuum truck and oilfield drilling mud plant in Vermilion Parish, Louisiana. Land use in the surrounding area is predominantly agricultural, and the site is situated in the low-lying flatland of the Atlantic Gulf Coastal Plain. Ten residences, located within a half mile, use the ground water below the site, the Chicot Aquifer, for drinking water as well as irrigation. The site is bounded to the east and south by the D.L. Mud Superfund site, which is being evaluated separately. From 1969 to 1984, several owners used the site as a trucking terminal for transporting various materials, primarily waste generated from oil exploration and production. The site contains two open waste pits, specifically, the Washout Pit and the West Pit, as well as two areas covered with vegetation, known as the Former West Pit. The Former West Pit, located south of the West Pit, was used for disposal. Additionally, there are four vertical storage tanks, horizontal tanks, and three underground storage tanks. Unpermitted disposal of contaminated materials, primarily oil industry-related waste, occurred in the unlined pits, ditches, and soil at the site. In 1980, a citizen's complaint through the Vermilion Association for Protection of the Environment prompted several site investigations by EPA. EPA has conducted three removal actions at the site, addressing contaminated overflow from the Washout and West pits in 1990, overflow from the West pit into a previously constructed secondary containment area in 1991, and critical rainwater accumulation in the Washout Pit and the West Pit in 1992. All three removals involved pumping, treating, and discharging the wastewaters to prevent offsite migration and human exposure. This ROD addresses an interim remedy for OU2, the rainfall accumulation, contaminated overflow, and offsite migration from the Washout and West Pits. The primary contaminants of concern affecting the soil, sludge, and surface water (rainwater) are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including dioxin, PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating 2,700 cubic yards of contaminated sludge and 550 cubic yards of associated soil from the Washout Pit to 2 feet below where contaminant levels exceed the remedial action goals, and consolidating these materials into the West Pit to achieve positive drainage; backfilling excavated areas with clean soil, and covering the West Pit with an impermeable synthetic membrane cover; pumping and onsite treatment of 1,700,000 gallons of contaminated rainwater, with discharge of the treated rainwater onsite; abandoning three onsite water supply wells; and monitoring air during the excavation. The estimated present worth cost for this remedial action is $525,200, which includes an annual O&M cost of $5,000 for 27 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific remedial action goals were developed for the accumulated rainwater based on state effluent pollution concentration limits, and for the soil and sludge based on health-risk values. Soil and sludge excavation levels include arsenic 16 ug/kg; barium 5,400 mg/kg; benzene 0.66 mg/kg; and carcinogenic PAHs 3 mg/kg. Chemical-specific goals or surface water include arsenic 137 ug/l; barium 2 ug/l; benzene 100 ug/l; chromium 343 ug/l; endrin 180 mg/l; lead 275 ug/l; PCE 100 ug;l; phenol 47 ug/l; and TCE 69 ug/l.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Monitoring; Arsenic; Benzene; Capping; Carcinogenic Compounds; Chromium; Clean Air Act; Dioxin; Direct Contact; Excavation; Interim Remedy; Lead; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCBs; PCE; Pesticides; Phenols; RCRA; Sludge; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Treatment; TCE; Toluene; VOCs; Xylenes.

GULF COAST VACUUM SERVICES (OPERABLE UNIT 2), LA (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 06/30/92
Lead: Fund
Contaminated Media: Soil, Sludge, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Interim

KOPPERS (TEXARKANA PLANT) (AMENDMENT), TX

March 4, 1992

SITE HISTORY/DESCRIPTION:

The 62-acre Koppers (Texarkana Plant) site is a former wood treatment facility located in Texarkana, Texas. The site consists of a 34-acre residential area and a 28-acre former sand and gravel operation. The entire site lies within a 100-year flood plain. From 1910 to 1961, the Koppers Company treated wood onsite using PCP, creosote, and metallic salts. After onsite operations ceased in 1961, the structures were removed and the property was sold for residential and industrial development. In 1964, Carver Terrace, Inc. developed the northern 34 acres of the site for residences. Kennedy Sand and Gravel Company owns the remaining southern 28 acres, which operated as a sand and gravel quarry from the late 1970s to 1984. In 1975, Mount Zion Missionary Baptist Church purchased a small portion of the site from Carver Terrace Inc. to construct a church. In 1980, an investigation conducted by both the state and the Koppers Company identified onsite soil and ground water contaminated with PCP, arsenic, and creosote. In 1985, EPA placed clean soil and sod on some of the yards in the subdivision as a protective measure to reduce exposure to contaminated soil. A 1988 ROD provided for onsite treatment of contaminated soil using soil washing and treating the ground water and non-aqueous phase liquids (NAPLs) using oil/water separation and carbon treatment. However, the remedial action was not initiated because of a Congressional mandate set forth in the Conference Report to the FY92 Appropriations Bill stipulating that EPA purchase homes located on the site and provide relocation assistance to the residents. This 1992 ROD amendment appends the provisions of the mandate to the remedy, as established in the 1988 ROD. The primary contaminants of concern, as provided in the 1988 ROD, affecting the soil, sediment, debris, and ground water are VOCs, including benzene, toluene, and xylenes; other organics, including PAHs and PCP; and metals, including arsenic.

SELECTED REMEDIAL ACTION:

The amended remedial action for this ROD includes implementing all treatment actions provided for in the 1988 ROD, which include onsite soil washing as well as treatment of ground water using an oil and water separator and granular activated carbon treatment purchasing onsite residences; permanently relocating affected residents; demolishing homes and removing and disposing of debris offsite; implementing institutional controls, including deed and land use restrictions; and reclassifying the property from residential to non-residential use. The estimated amended present worth cost for this remedial action is $12,400,000, which includes an annual O&M cost ranging from $316,200 to $329,200 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific clean-up goals remain the same as those provided in the 1988 ROD. Soil clean-up goals include excavation to a 100 mg/kg action level of total carcinogenic PAHs based on a risk level between 10^{-6} and 10^{-4}. Ground water clean-up goals are not provided but were based on Best Available Treatment Requirements (BAT) for the Organic Chemical, Plastics, and Synthetic Fibers Industry.

INSTITUTIONAL CONTROLS:

Deed, land use, and zoning restrictions will be implemented to prevent future residential development of the site.

KEYWORDS:

Carbon Adsorption (GAC); Carcinogenic Compounds; Debris; Direct Contact; Excavation; Floodplain; Institutional Controls; O&M; Offsite Disposal; Onsite Treatment; Organics; PAHs; Relocation; ROD Amendment; Soil; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 09/23/88
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

MOSLEY ROAD SANITARY LANDFILL, OK

June 29, 1992

SITE HISTORY/DESCRIPTION:

The 72-acre Mosley Road Sanitary Landfill site is an inactive municipal landfill in Oklahoma City, Oklahoma County, Oklahoma. Land use in the area is primarily residential and undeveloped with 875 residents within a one-mile radius of the site. The North Canadian River flows about one-half mile west of the site, and Crutcho Creek flows near the eastern boundary of the site. The site overlies two aquifers: an alluvial aquifer and the Garber-Wellington aquifer, which is a source of drinking water for three cities near the landfill. Both of these ground water areas have been impacted by migration of landfill contaminants. Several wetland areas are located in the vicinity of the landfill. In 1973, the site was permitted as a sanitary landfill, and between February and August 1976, the state authorized the landfill to accept industrial hazardous waste. During this 6-month period, the Mosley Road Sanitary Landfill accepted approximately 1.7 million gallons of mostly liquid industrial hazardous waste. Types of wastes included industrial sludge, caustic material, plating sludge, acid solutions, oil emissions, alkaline solutions, solvents, paint sludge, toxaphene, and TCE. Waste was deposited into unlined waste pits, which are currently buried under 80 feet of municipal refuse. In 1987, the landfill reached its permitted capacity and was closed. In 1988, a compacted clay cover was installed in accordance with existing closure regulations, and the area was vegetated to reduce erosion. This ROD addresses the source (waste pits) and the contaminated ground water as a final remedial action for this site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene, and metals, including arsenic.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes repairing and improving the existing cap and adding a vegetative soil layer to reduce erosion and infiltration; allowing ground water to naturally attenuate; installing a landfill gas monitoring system; using ground water monitoring and periodic sampling to monitor leachate migration; providing a contingency for active ground water extraction and treatment, if after 5 years natural attenuation has not decreased contaminant levels; and implementing institutional controls including deed, land, and ground water use restrictions. The estimated present worth cost for this remedial action is $3,600,000. No O&M costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS:

All potential drinking water impacted by the site will meet SDWA MCLs. Chemical-specific cleanup goals for ground water include arsenic 0.05 mg/l; barium 1 mg/l; selenium 0.01 mg/kg; and vinyl chloride 0.002 mg/kg. Chemical-specific clean-up goals for the soil and debris were not provided.

INSTITUTIONAL CONTROLS:

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

KEYWORDS:

Arsenic; Background Levels; Benzene; Capping; Carcinogenic Compounds; Contingent Remedy; Debris, Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; Metals; Onsite Containment; Onsite Disposal; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; VOCs; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: Organics, Metals
Category: Source Control - Final Action

OKLAHOMA REFINING, OK
June 9, 1992

SITE HISTORY/DESCRIPTION:
The 160-acre Oklahoma Refining site is a petroleum refinery located on the eastern edge of Cyril, Oklahoma in Caddo County. Land use in the area is predominantly rural, with the township of Cyril bordering the western edge of the site and creek systems bordering the eastern and southern edges. The facility included refinery process areas, bulk storage tanks, waste pits, wastewater treatment ponds, and a land treatment area. From the 1920's until 1984, the Oklahoma Refining facility produced refining products onsite, which included gasoline, naphtha, asphalt, and nonchlorinated solvents. Wastes generated from these processes were generally disposed of in unlined product and waste storage pits or were applied to land. Refinery wastewaters were directed into an oil and water separator, treated in a series of surface impoundments, and discharged into an adjacent creek. In 1984, the Oklahoma Refining Company (ORC) removed 5,000 barrels of light non-aqueous phase liquid (LNAPL) from the ground water table. During the mid-1980's, EPA investigations revealed large-scale organic and heavy metal contamination of onsite soil and ground water. In 1990, EPA conducted a removal action, which included chracterization and removal of drums, plugging wells, and wildlife protection measures. This ROD addresses the remediation of onsite contaminated soil, sediment, surface water, and ground water as a final remedy. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and surface water are VOCs, including benzene, toluene, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes in-situ bioremediation of organic contaminated sediment; in-situ stabilization of inorganic contaminated sediment, followed by capping; removing and treating all surface water collected from surface impoundments; excavating and onsite containment of contaminated soil and sediment that exceed health-based levels; excavating and neutralizing low pH sediment, followed by replacing the treated materials in the original areas; excavating and recycling asphaltic materials; treating sediment and soil that cannot be treated in-situ using prepared-bed bioremediation, followed by stabilization, if needed, and onsite disposal and containment; extracting and containing LNAPLs-contaminated ground water, and treating the collected ground water along with surface water and storm water in an onsite treatment facility with a treatment process, which would include an oil and water separator to remove NAPLs and air stripping and/or activated carbon to remove organics, and using either oxidation, reduction, precipitation, and filtration or any combination of these to remove inorganics; injecting nutrients along with the treated water into the contaminated portion of the aquifer to enhance in-situ bioremediation; recycling the recovered hydrocarbons; monitoring ground water; plugging all unnecessary wells; and implementing institutional controls, including deed and ground water use restrictions and site access restrictions, such as fencing. The estimated present worth cost for this remedial action is $31,712,000, which includes an annual O&M cost of $425,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
The chemical-specific standards are based on Remedial Action Objectives (RAOs) for each affected medium. For soil, subsurface soil, and sediment, RAOs are health-based depending on whether exposure would result from leaching (ground water protection) or ingestion. Chemical-specific standards for ground water and surface water include arsenic 0.05 mg/kg; barium 1 mg/kg; benzene 0.005 mg/kg; chromium 0.1 mg/kg; lead 0.015 mg/kg; 2-methyl napthalene 0.15 mg/kg; 2- and 4-methylphenol 1.8 mg/kg; naphthalene 0.15 mg/kg; phenol 22 mg/kg; and toluene 1 mg/kg. Chemical-specific standards for sediment and surface soil include arsenic 25 mg/kg; barium 13,500 mg/kg; benzene 22 mg/kg; benzo(a)anthracene 4.1 mg/kg; chromium 1,350 mg/kg; ethylbenzene 27,000 mg/kg; lead 600 mg/kg; toluene 54,000 mg/kg; and xylenes 540,000 mg/kg. Chemical-specific standards for subsurface soil include arsenic 305 mg/kg; benzene 0.2 mg/kg; chromium 770 mg/kg; lead 865 mg/kg; naphthalene 79 mg/kg; and phenol 125 mg/kg.

INSTITUTIONAL CONTROLS:
A notice will be attached to the property deed to inform future land owners that the onsite ground water is contaminated and should not be used as a drinking water source.

OKLAHOMA REFINING, OK (Continued)

June 9, 1992

KEYWORDS:
Air Stripping; Arsenic; Benzene; Biodegradation/Land Application; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Deferred Decision; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Leachability Tests; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Plume Management; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Treatment; Toluene; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, Debris, GW, SW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

PREWITT ABANDONED REFINERY, NM

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 70-acre Prewitt Abandoned Refinery site is an abandoned crude oil refinery near the City of Prewitt in McKinley County, New Mexico. Land use in the area is predominantly rural. Some of the estimated 75 people who reside within 1 mile of the site use the Sonsela Sandstone Bed Aquifer as their drinking water supply source. From 1938 to 1957, various companies, including the Atlantic Richfield Company (ARCO) and El Paso Natural Gas (EPNG) Company, used the site for basic refining operations. The main onsite processing units included a distillation plant, thermal cracker, and reformer. Crude oil in storage tanks was separated into different fractions via a distillation tower. Separated fractions were stored in tanks throughout the facility. Because of a lack of waste management units, wastes were disposed of onsite near the point of generation. Wastewaters and accidental spills were usually released in unlined earthen ditches throughout the refinery area. These ditches led to a concrete tank, which was used as an oil/water separator. Oil portions recovered from the separator were returned to the refinery process, whereas water and heavier materials were released to a nearby arroyo (gully). In the early operation of the plant, the emergency release system consisted of releasing partially processed oil products to bermed containment areas on the western edge of the facility. After the refinery closed in 1957, the accompanying structures were dismantled, but the site still contains processing remnants, including piping, pits, an oil/water separator, and other waste and structural material. As a result of a citizen's complaint in 1980, PRPs conducted a remedial investigation under EPA oversight that revealed metals, PAHs, and asbestos contamination in soils; separator wastes; and Non-Aqueous Phase Liquids (NAPLs) in addition to lead, 1,2 dichloroethane, benzene, toluene, ethylbenzene, and xylene in ground water located beneath the site. In 1989, EPA directed the PRPs to fence the site and install activated carbon filtration units on five affected residential wells. In 1991, PRPs removed approximately 800 cubic yards of asbestos-containing material offsite. This ROD addresses remediation of all contaminated media at the site as a final action. The primary contaminants of concern affecting the soil, sludge, and ground water are VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PAHs; metals, including lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes extracting contaminated ground water and using an oil and water separator to remove NAPLs; treating approximately 43,000 gallons of extracted NAPLs onsite using soil vapor extraction to remove VOCs from soil, along with a thermal catalytic oxidizer to destroy VOC vapor emissions; excavating, consolidating, and onsite landfarming of approximately 1,175 cubic yards of waste from the West Pits area and approximately 1,500 cubic yards of soil contaminated with high levels of hydrocarbons, and placing a vegetative cover over the area after completion of treatment; excavating, containerizing, and removing offsite 15 cubic yards of asbestos contaminated material and soil; excavating and treating as necessary, 1,900 cubic yards of lead-contaminated surface soil with levels in excess of 500 mg/kg or subsurface soil with lead levels greater than 1,000 mg/kg, followed by offsite disposal; excavating any sludge retrieved from the oil/water separator, with offsite pretreatment and/or disposal; treating any contaminated soil identified beneath the separator onsite by landfarming or offsite by incineration, pending testing results, and backfilling the separator area; pumping and onsite treatment of the contaminated ground water using air sparging to remove organics, and reinjecting the treated water onsite; installing and maintaining activated carbon treatment units at domestic wells that exceed MCLs; monitoring soil, ground water, private wells, and air; and implementing institutional controls, including deed, land, and ground water use restrictions, and site access restrictions. The estimated present worth cost for this remedial action is $16,301,576, which includes a total O&M cost of $1,097,844 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Clean-up standards for soil and waste are based on health-based levels and EPA policy and provide for the complete removal of asbestos, and the cleanup of lead to 500 mg/kg within the top 2 feet of soil and 1,000 mg/kg of lead for soil depths greater than 2 feet. Chemical-specific ground water clean-up goals are based on state standards and SDWA MCLs

PREWITT ABANDONED REFINERY, NM (Continued)

September 30, 1992

and include benzene 5 ug/l; toluene 750 ug/l; xylenes 620 ug/l; and lead 15 ug/l. Chemical-specific goals for soil and sludge include benzo(a)pyrene 0.9 mg/kg; benzo(a)anthracene 9 mg/kg; and lead.

INSTITUTIONAL CONTROLS:

Institutional controls including deed, land, and ground water use restrictions will be implemented onsite to prevent well installation.

KEYWORDS:

Aeration; Air Monitoring; Asbestos; Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Debris; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Leachability Tests; Lead; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Sludge; Soil; Solvents; State Standards/Regulations; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Sludge, GW
Major Contaminants: VOCs Other Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

29TH AND MEAD GROUNDWATER CONTAMINATION, KS

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 1,440-acre 29th and Mead Groundwater Contamination site is an active manufacturing facility in north-central Wichita, Sedgwick County, Kansas. Since 1887, land use in the area has been predominantly industrial. In 1947, the property was purchased by Coleman, Inc., for the manufacture of household furnace and air conditioning units. Previous onsite activities had included the manufacture of railway cars, automobiles, light aircraft, and electronically controlled aircraft. In 1987, Recreational Vehicles Products (RV) purchased approximately 10 percent of the property to use for manufacturing air conditioners for recreational vehicles. Since 1990, the remaining 90 percent has been occupied by Evcon Industries. Evcon's portion of the site, which is the former Coleman Heating, Ventilation and Air Conditioning facility, includes a manufacturing plant (North Plant) and an administration/engineering building. Several industrial wells are currently in operation to support Evcon's operations, which consist of the production of consumer furnaces and air-conditioning systems intended for conventional residential use. The manufacturing process uses solvents for metal cleaning, prior to painting and fabrication of furnace or air-conditioning units. In 1983, EPA, the U.S. Geological Survey, and the state began investigating the ground water at the site and found elevated levels of several VOCs. In 1988, Coleman and the state initiated a ground water recovery and treatment program, which uses two 40-foot air strippers and a soil vapor extraction (SVE) program to treat contaminated soils in a 65,000-square-foot area. Water from the system is discharged to the Wichita Drainage Canal under a CWA NPDES permit issued by the state. This ROD, which focuses on the Coleman Operable Unit, addresses soil contamination as a final remedial action and provides interim measures for the contaminated ground water. A future ROD is planned to address a final remedy for the ground water at the site. The primary contaminants of concern affecting the soil and ground water are VOCs, including 1,1-DCA, 1,1,1-TCA, TCE, and PCE.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes continued operation and expansion of the existing SVE system to remediate other onsite source areas; monitoring the performance of the SVE system, and establishing goals during the RD phase; enhancing the hydraulic control of the existing ground water extraction and air stripping treatment system by adding a well at the southern site boundary; treating ground water onsite using air stripping, with discharge of the treated water offsite under a NPDES permit; monitoring air emissions from the ground water treatment system and the SVE system, with possible treatment of the emissions, if necessary; and monitoring the ground water collection/treatment system and the contaminant plume. The estimated present worth cost for this remedial action is $1,638,456, which includes an annual O&M cost ranging from $78,900 to $182,200 for 18 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals for the expanded SVE system will be developed during the Remedial Design phase. Chemical-specific ground water clean-up goals are based on SDWA MCLs and CWA discharge limits and include 1,1-DCA 7 ug/l; PCE 5 ug/l; 1,1,1-TCA 200 ug/l; and TCE 5 ug/l.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Air Monitoring; Air Stripping; Carcinogenic Compounds; Clean Water Act; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; MCLs; O&M; Offsite Discharge; PCE; Plume Management; Safe Drinking Water Act; Soil; State Permit; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

29TH AND MEAD GROUNDWATER CONTAMINATION, KS (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs
Category: Source Control - Final Action
Ground Water - Interim

DES MOINES TCE, IA
September 18, 1992

SITE HISTORY/DESCRIPTION:
The Des Moines TCE site is located southwest of downtown Des Moines, Polk County, Iowa. Land use in the area is predominantly industrial and commercial, and part of the site lies within the floodplain of the Raccoon River. An underground infiltration gallery, used by the Des Moines Water Works, is located directly south of the site and serves as a source of public drinking water. EPA site investigations began in the mid-1970's when chlorinated organic contaminants were detected in the Des Moines public water supply. Water from the Des Moines Water Works north infiltration gallery was found to be contaminated with trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride at levels above accepted drinking water standards. Several businesses that handled the contaminants of concern are or were located within the site boundaries. A 1986 ROD addressed OU1 and provided for extraction of ground water in the floodplain of the Raccoon River through recovery wells and treatment using air stripping, with discharge to the Raccoon River. This ROD addresses OU3, which encompasses potential sources of ground water contamination in an area north of the Raccoon River, commonly known as the "North Plume." Future RODs will address the South Area Source Control unit as OU2 to mitigate the release of contamination entering the ground water; the South Pond Drainage Area Source Control unit as OU4 to address pesticide soil contamination in the southeast portion of the site; and also contaminated buildings on the adjacent Dico property. Based on samples taken at 13 ground water monitoring wells installed in OU3 only one of the 13 wells showed contamination at levels of concern. In general, the contaminant concentrations in that well have shown a decreasing trend in the last five sampling rounds, and no specific source of contamination in this well was found during EPA's investigation of OU3.

SELECTED REMEDIAL ACTION:
The selected remedial action for OU3 includes no action with periodic ground water monitoring. Ground water from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not applicable.

KEYWORDS:
Floodplain; Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: 07/21/86
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

FARMERS' MUTUAL COOPERATIVE, IA

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 6-acre Farmers' Mutual Cooperative site is an active grain storage facility in Hospers, Sioux County, Iowa. Land use in the area is predominantly agricultural. The 643 residents of the City of Hospers obtain their drinking water from municipal water supplies and private wells. From 1908 to the present, the Farmers Mutual Cooperative Company (FMCC) used the site for the purchasing and storing of grain and agricultural chemicals, including pesticides and fertilizers. In addition, grain fumigation had been conducted onsite. In 1984, state investigations detected VOCs and herbicides in the ground water of three shallow city wells adjacent to the FMCC facility. In 1989, the state ordered FMCC to conduct an RI/FS, which showed ground water contamination was limited to the shallow wells and did not impact the deeper aquifer. The City of Hospers uses three deep aquifer wells and installed an additional deep well to meet their water supply needs. Prior actions, including removal of bulk pesticides and further handling from FMCC, have been taken to prevent additional release of contaminants. This ROD addresses ground water contamination as a final remedial action for this site. The primary contaminants of concern affecting the ground water are VOCs, including carbon tetrachloride; and other organics, including pesticides.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes allowing ground water to naturally attenuate; monitoring ground water to determine the effectiveness of the remedy; and providing for a contingency in the event that use of the impacted aquifer as a water supply is necessary prior to complete restoration. This contingency includes developing and implementing a blending program for the City of Hospers water from the upper and lower aquifers until MCLs have been achieved; testing the upper aquifer prior to its use; treating contaminated ground water for use as drinking water, or containing contaminants to enable use of the impacted aquifer without treatment. The estimated present worth cost for this remedial action ranges from $93,000 to $187,000, depending on the remedy employed. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs and include carbon tetrachloride 0.005 mg/l; chloroform 0.1 mg/l; alachlor 0.002 mg/l; atrazine 0.003 mg/l; cyanazine 10 ug/l; and metolachlor 100 ug/l.

INSTITUTIONAL CONTROLS:

Not Provided.

KEYWORDS:

Carcinogenic Compounds; Contingent Remedy; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; MCLs; Organics; Pesticides; Plume Management; Safe Drinking Water Act; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: GW
Major Contaminants: VOCs, Other Organics
Category: Ground Water - Final Action

HYDRO-FLEX, KS
March 9, 1992

SITE HISTORY/DESCRIPTION:
The 2.95-acre Hydro-Flex site, located in Topeka, Kansas, was used for manufacturing flexible copper couplings. Land use in the area is primarily industrial/commercial, with several scattered residences nearby. The site overlies a low-lying alluvial plain south of Soldier Creek and north of the Kansas River. The alluvium, which makes up part of the Kansas River floodplain, serves as a drinking water source for approximately 6,551 people within a 3-mile radius. From the 1970's to the 1980's, Hydro-Flex discharged an average of 90 gallons per day of process wastewater into an onsite wastewater disposal system consisting of a septic tank with three concrete manholes and a soil absorption field. In 1981, the onsite wastewater disposal ceased and was subsequently taken out of operation when Hydro-Flex was connected to the Topeka sewer system. A PA/SI performed by the state identified sludge and ground water contaminated with chromium and copper. This ROD addresses onsite sludge and ground water. EPA investigations have shown that levels of chromium and copper in the soil are not above naturally occurring levels and, therefore, no longer pose a health threat under current or likely land use conditions. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site is no further action because there is currently no significant contamination in the sediment-free ground water, or any significant continuing source of contamination to the ground water from the site. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:
Not applicable.

INSTITUTIONAL CONTROLS:
Not applicable.

KEYWORDS:
Floodplain; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

PESTER REFINERY, KS
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 10-acre Pester Refinery site is a former petroleum refining facility located in El Dorado, Butler County, Kansas. Land use in the area is predominantly industrial and agricultural. The City of El Dorado draws its water supply from the El Dorado reservoir, 2 miles east of the site. Petroleum refining operations in the area began in 1917, and from 1958 to 1977, Fina Oil Company operated a petroleum refinery at this site. Process wastes, such as slop-oil emulsion solids, API separator sludge, and heat exchanger bundle cleaning sludge were sent through a pipe to a burn pond. Gaseous waste products were ignited at the end of the pipe, and whatever did not burn was discharged to the pond. The site historically contained the burn pond, a stormwater pond, and a settling pond, all of which became interconnected over the years. In 1977, Pester purchased the property and operated the facility until 1985. Although other portions of the property were sold, Pester still retains ownership of land surrounding the burn pond area. In 1986, the state RCRA division initiated site investigations, which confirmed that contamination had occurred. In 1992, Fina constructed an interceptor trench and pumping system near the pond to evacuate contaminated water and materials. This ROD provides a final remedy for the principal source of contamination at the site, the burn pit sludge. A subsequent ROD addresses ground water contamination. The primary contaminants of concern affecting the soil and sludge are VOCs, including ethylbenzene, toluene, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedy for this site includes dewatering the pond and transporting the associated sludge offsite to a RCRA facility for re-refining into a usable petroleum product and/or disposal; treating the soil using in-situ soil flushing; discharging the wash water to an oil/water separator to remove free oils and sediment, followed by nutrient addition with aeration to enhance biological action; and discharging the water to a treatment facility or back to the pond for continued treatment until testing demonstrates that clean-up levels have been achieved; monitoring air; and implementing institutional controls including deed restrictions and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $2,374,800, which includes a present value O&M cost of $464,700 over 3 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil and sludge clean-up goals are based on health-based levels, and include benzo(a)anthracene 13 mg/kg and chrysene 13 mg/kg. Other contaminants of concern will be treated to meet EPA acceptable risk levels, if necessary.

INSTITUTIONAL CONTROLS:

Institutional control measures in the form of deed restrictions will be implemented to limit access to the site and control future land use.

KEYWORDS:

Aeration; Air Monitoring; Arsenic; Benzene; Biodegradation/Land Application; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Institutional Controls; Lead; Metals; O&M; Offsite Discharge; Offsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Publicly Owned Treatment Works; RCRA; Safe Drinking Water Act; Sludge; Soil; Soil Washing/Soil Flushing; Solvents; State Standards/Regulations; Surface Water Monitoring; Toluene; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sludge
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action

BRODERICK WOOD PRODUCTS, CO

March 24, 1992

SITE HISTORY/DESCRIPTION:

The 64-acre Broderick Wood Products (BWP) site is a former wood preserving facility in unincorporated Adams County, Colorado, located just outside of Denver, Colorado. Land use in the area is predominantly industrial. There are three aquifers below the site: the surficial, the Denver, and the Arapahoe. The Denver aquifer ground water is used for commercial and irrigation purposes, and the Arapahoe is tapped by several private wells in the area. All residences are currently connected to a municipal water supply system for household use. From 1947 to 1981, the BWP Company used the site to operate a wood treatment facility, where both creosote and pentachlorophenol (PCP) were mixed with carrier oil (fuel oil) and used at the site. The major site features include two unlined surface impoundments and 23 structures. Underground structures at the site include the treatment basement building and two cylinder basements. There are also 16 vessels, including storage tanks, an air cylinder, and a pressure cylinder onsite, whose capacities range from 2,400 to 50,000 gallons. Approximately 70 drums containing various chemicals, oils, and asbestos are stored in the process area, and 65 drums of oil from sludge are stored in the impoundment area of the site. Process waste from the plant was disposed of onsite, with a large amount going to the impoundments on the northwest corner of the site. In 1946, the main impoundment was constructed, and in 1956, a secondary one was constructed for additional evaporation capacity and overflow. In 1962, both impoundments caught fire and burned for several hours. BWP ceased operations as a woodtreater in 1981. Investigations were done by EPA and the state under RCRA and CERCLA authorities, which revealed contamination both onsite and on adjacent properties. In 1988, EPA issued an interim ROD to control the major source of contamination at the site, including restriction of site access, treatment of water in the impoundments and buildings, excavation and incineration of sludge, and stockpiling or onsite incineration of visibly contaminated soil in the impoundments, referred to as OU1. A petition was filed with EPA to reconsider onsite incineration; and a ROD amendment was issued in 1991 that provided for excavation and offsite recycling/incineration of the sludge from the two impoundments. Two temporary-lined cells were constructed on the property, and sludge was stockpiled temporarily until the solid sludge storage cell was completed. Approximately 950 cubic yards of solid sludge and 1,200 cubic yards of liquid sludge have been stored in lined cells with leachate collection and will be removed to an offsite recycling facility. This ROD addresses OU2, a final remedy for the BWP site. The primary contaminants of concern affecting the soil, debris, sediment, and ground water are VOCs, including benzene, toluene, and xylenes; organics, including PAHs, dioxins, and other phenolic compounds; metals, including arsenic and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes demolishing and decontaminating onsite buildings, stockpiling debris onsite temporarily, then transporting approximately 850 cubic yards of building debris and 205 cubic yards of asbestos-containing materials offsite for disposal at a permitted landfill; decontaminating 225 tons of scrap metal onsite, with offsite reclamation; pumping or excavating sludge or liquid contents from drums and vessels, storing the drummed waste onsite temporarily, then transporting the waste offsite for reclamation; pumping, approximately 9,500 gallons of contaminated water from building sumps and basements of onsite structures, and stabilizing, drumming, and transporting the drums offsite to a RCRA landfill; excavating approximately 59,000 cubic yards of organic-contaminated soil and 120 cubic yards of Fisher Ditch sediment; dewatering the sediment, followed by onsite treatment of the soil and sediment using ex-situ bioremediation in an onsite land treatment unit (LTU) over a 7-year period; conducting treatability tests to determine the best stabilization compound for the wastes, then treating 800 cubic yards of metals-contaminated soil onsite using stabilization, with disposal at an offsite RCRA landfill; closing the existing surface impoundments; recovering approximately 526 million gallons of ground water and light non-aqueous phase liquids (LNAPLs) from the surficial aquifer using subsurface drain trenches and recovery wells; removing LNAPLs in an oil/water separator, and reclaiming the LNAPLs at an offsite recycling facility; treating the remaining water using a two-phase fixed-film bioreactor, mixed with nutrients and an oxygenated chemical, then reinjected into the aquifer to stimulate bacterial

BRODERICK WOOD PRODUCTS, CO (Continued)

March 24, 1992

growth to promote further contaminant breakdown within the shallow aquifer, and also using small quantities within the soil remediation processes; collecting dense non-aqueous phase liquids (DNAPLs) and ground water from existing monitoring wells in the Denver aquifer, and treating these in the oil/water separator, with offsite recycling; monitoring ground water; and also implementing institutional controls including deed and ground water use restrictions to control access to water in the surficial and Denver aquifers. The estimated total present worth cost for this selected remedial action is $15,551,033, which includes a present worth O&M cost of $7,400,185 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific excavation goals for soil and sediment were based on health risk clean-up level indices (CLIs) greater than 1. Chemical-specific soil and sediment clean-up goals are based on health-based criteria for organic contaminants and RCRA LDR standards for metal contaminants and include toluene 0.5-10 mg/kg; xylenes 0.5-10 mg/kg; benzo(a)pyrene 15.2 mg/kg; dibenzo(a,h) anthracene 13.9 mg/kg; 2,3,7,8 TCDD equivalent 0.0006 mg/kg; pentachlorophenol, naphthalene, and pyrene at 95-99 percent reduction; arsenic 5 mg/kg; cadmium 1 mg/kg and lead 5 mg/kg. Chemical-specific ground water clean-up goals are based on SDWA MCLs and the Colorado Basic Standards and include 2,3,7,8 TCDD equivalent $5x10^{-5}$ ug/l; trichloroethylene at 5 ug/l; tetrachloroethylene 1.6 ug/l; carbozole 4.1 ug/l; phenol 623 ug/l; pentachlorophenol 1 ug/l; pyrene 312 ug/l; and naphthalene 41.6 ug/l. The ability to achieve these clean-up levels cannot be determined until the extraction system has been implemented; therefore, EPA may need to modify the remedy if necessary. This ROD provides a chemical-specific waiver for the Denver aquifer because of technical impracticability.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented at this site to prevent future residential and agricultural use of the site, and to control access to water in the Denver and surficial aquifers.

KEYWORDS:

ARAR Waiver; Arsenic; Asbestos; Benzene; Biodegradation/Land Application; Clean Air Act; Clean Water Act; Debris; Decontamination; Dioxin; Direct Contact; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Lead; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Treatment; Organics; PAHs; Phenols; RCRA; Safe Drinking Water Act; Sediment; Sludge; Soil; Solidification/Stabilization; Solvents; State Standard/Regulations; Temporary Storage; Toluene; Treatability Studies; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 06/30/88, 09/24/91 (Amendment)
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, Sediment, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

DENVER RADIUM (OPERABLE UNIT 8), CO
January 28, 1992

SITE HISTORY/DESCRIPTION:

The 10-acre Denver Radium (Operable Unit 8) site is a former radioactive extraction industry located in Denver, Denver County, Colorado. The site is divided into three areas: the 5.9-acre S.W. Shattuck Chemical Inc. (Shattuck) property; the 4.3-acre railroad right-of-way west of the Shattuck property; and nearby "vicinity" properties. Land use surrounding the site is predominantly industrial, with some residential areas. The site is located within the South Platte River drainage basin. From the 1920's to 1984, the Shattuck property was used to treat and process molybdenum ores, radium slimes, and uranium compounds and ores. The railroad right-of-way has been operational daily since the late 19th century with a spur to the Shattuck property. As a result of extensive mining and processing, radioactive contaminated soil is widely scattered resulting in a variety of radiation levels. A U.S. Bureau of Mines report led EPA to field research 31 radioactive sites in Denver and Denver County. In 1983, EPA conducted remedial investigations, which detected elevated levels of radon gas and gamma radiation. A 1989 emergency removal action at one of the vicinity properties included radon mitigation measures. This ROD addresses a final remedy for radioactive contaminated debris, ground water, and soil, as OU8. Future RODs will address the remaining contaminated media at 11 OUs not addressed by the previous seven RODs at the Denver Radium sites. The primary contaminants of concern affecting the soil, debris, and ground water are metals including arsenic and lead; inorganics, including asbestos; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes demolishing and decontaminating buildings, tanks, and equipment onsite; temporarily storing debris from vicinity properties onsite at the Shattuck area, pending either offsite disposal and/or scrap recycling, or salvaging of debris; disposing of asbestos-containing material from buildings offsite; conducting pilot scale treatability studies during remedial design to optimize stabilization design; excavating and transporting 5,000 cubic yards of radium-contaminated soil from the railroad rights-of-way and 6,000 cubic yards from the vicinity properties; consolidating these with 38,500 cubic yards of soil from the Shattuck property, and treating the soil onsite using cement-based stabilization; placing a cap over the stabilized material, and revegetating the area; filling previously excavated areas with clean fill; testing for, remediating and disposing of any RCRA hazardous waste offsite; allowing the ground water to naturally attenuate; monitoring ground water and air ; and implementing institutional controls, including deed, land, and ground water use restrictions. The estimated present worth cost for this remedial action is $26,600,000, which includes an annual O&M cost of $120,000 for 200 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil action levels are based on Nuclear Regulatory Commission and Department of Energy standards for Radium-226, exceeding 5 pci/g above background in the top 15 cm of soil and 15 pci/g above background in any layer below the top 15 cm; thorium-230, 42 pci/g; uranium; 75 pci/g; and risk-based standards for arsenic 160 mg/kg; selenium 490 mg/kg; and lead 540 mg/kg.

INSTITUTIONAL CONTROLS:

Deed, land use, and ground water use restrictions will be implemented to prevent excavation of the cover and stabilized materials and to prohibit construction of enclosed structures and agricultural use on the disposal site.

KEYWORDS:

Air Monitoring; Arsenic; Asbestos; Capping; Carcinogenic Compounds; Debris; Decontamination; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Leachability Tests; Lead; MCLs; Metals; Mining Wastes; O&M; Offsite Disposal; Onsite Disposal; Onsite Treatment; Public Exposure; Radioactive Materials; Safe Drinking Water Act; Soil; Solidification/Stabilization; State Standards/ Regulations; Temporary Storage; Treatability Studies; Treatment Technology.

DENVER RADIUM (OPERABLE UNIT 8), CO (Continued)

January 28, 1992

SITE SUMMARY

Date of previous RODs: 03/24/86, 09/30/86, 06/30/87, 09/30/87, 09/29/87, 09/29/87

Lead: Federal Enforcement

Contaminated Media: Soil, Debris, GW

Major Contaminants: Metals, Inorganics, Radioactive Materials

Category: Source Control - Interim
Ground Water - Interim

DENVER RADIUM (OPERABLE UNIT 9), CO
December 23, 1991

SITE HISTORY/DESCRIPTION:

The Denver Radium (Operable Unit 9) site is a former radioactive mining site located in Denver, Denver County, Colorado. The site includes a 17-acre former brick plant, a parking lot, and a large amount of exposed soil. Land use in the area is predominantly commercial and industrial, with a residential area located several blocks east of the site. The South Platte River lies 1,000 feet from the former brick plant. Industrial activities commenced at the site in 1886 with the construction of the Bailey Smelter. In 1890, the Gold and Silver Extraction Company began a cyanide leaching operation onsite. In 1901, the Bailey Smelter burned down. By 1903, the Colorado Zinc Company had constructed a mill on the site of the Bailey Smelter, and zinc milling operations continued until 1910. From 1914 to 1917, the U.S. Bureau of Mines operated a radium processing facility onsite, known as the National Radium Institute (NRI). Other onsite industrial activities included minerals recovery, manufacturing and servicing of storage batteries, treating and sacking of metallic ore insulation, oil reclamation, and landfilling. Robinson Brick Company (Robco) acquired 13.5 acres of the site in 1941 and a contiguous 3.5-acre parcel in 1951. Robco, the present owner of the site, utilized the site until 1980 to manufacture bricks. In 1983, EPA discovered that 30 properties, including the Robco property, contained radiologic contamination in the soil attributable to prior NRI operations. In 1988, the U.S. Bureau of Mines initiated excavation of the radiologically contaminated material. In the course of the radium cleanup, metals contamination, resulting from mining wastes disposed of and used as fill from the mid-1880's to the early 1920's, was discovered onsite. Excavation of the radiologically contaminated materials was completed in 1991 as part of OUs 4 and 5. This ROD addresses approximately 16,500 cubic yards of metal-contaminated soil as OU9, on of 11 OUs planned for the site. The primary contaminants of concern affecting the soil are metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for the site includes constructing a 3.7-acre multi-media cap over onsite contaminated soil with metal concentrations exceeding action levels; utilizing the existing concrete floor of the brick plant and asphalt parking lot in concert with the backfilled soil cap; providing inspection and repair of the concrete floor, as necessary; upgrading the asphalt with geotextile fabric and an additional 6-inch layer of asphalt; monitoring downgradient ground water; long-term monitoring to ensure effectiveness of the cap; and implementing institutional controls including deed restrictions to limit the ground water use and to maintain the integrity of the cap. The estimated present worth cost for this remedial action is $1,702,000.

PERFORMANCE STANDARDS OR GOALS:

Design of the cap will comply with RCRA and state requirements. Chemical-specific soil remediation goals, which are based on health criteria, include prevention of exposure and direct contact with action level concentrations exceeding arsenic 79 ug/l; lead 1,000 ug/l; and zinc 17,000 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to prevent using the site for commercial or industrial purposes and to prevent future development of the capped area, which could impair the effectiveness of the remedial action. Additionally, the deed restriction will prohibit placement of wells onsite for the purpose of supplying drinking water.

KEYWORDS:

Arsenic; Capping; Clean Air Act; Closure Requirements; Direct Contact; Ground Water Monitoring; Institutional Controls; Lead; Metals; Onsite Containment; Onsite Disposal; RCRA; Soil; State Standards/Regulations.

SITE SUMMARY

Date of previous RODs: 03/24/86, 09/30/86, 09/29/87, 06/30/87, 09/29/87, 09/30/87

Lead: Fund
Contaminated Medium: Soil
Major Contaminants: Metals
Category: Source Control - Interim

HILL AIR FORCE BASE, UT
September 25, 1992

SITE HISTORY/DESCRIPTION:
The 6,700-acre Hill Air Force Base (AFB) is located in north-central Utah, covering portions of Davis and Weber Counties. Surrounding land use is predominantly industrial. Shallow ground water in the area is used only for agricultural purposes, and there are no wells that currently supply drinking water from the shallow aquifer. This site is part of OU3 in the southeastern portion of the Base, which also includes the Industrial Waste Treatment Plant (IWTP), sludge beds, Berman Pond, Ponds 1 and 3, Buildings 510 and 514, and a contaminated ground water area. There are several areas of the Base where past disposal practices and spills contaminated both the soil and ground water. The Air Force has grouped geographically adjacent contaminated areas into seven OUs. The Sodium Hydroxide Tank Site is a 29,000-square-foot area that surrounds two 12,000-gallon underground storage tanks (USTs) constructed in the 1950's. The tanks, approximately 5 feet below the ground surface, are used to store sodium hydroxide solution, which is used as an additive in wastewater treatment at the IWTP. In 1980, an estimated 150,000 gallons of solution leaked from the inlet connections to the tanks over a 1-year period. A second series of leaks occurred in 1984, releasing approximately 132,000 gallons. Sampling investigations revealed high soil pH and conductivities, indicating that most of the contamination is probably at a depth of 25 to 40 feet below surface. The presence of the sodium hydroxide solution in the ground water is uncertain and will be investigated in future remedial investigations. A 1991 ROD addressed the interim remediation of OU2 subsurface soil and ground water. This interim ROD limits further degradation of ground water quality as a result of sodium hydroxide migration through the unsaturated zone. Future RODs will address a final remedy for contaminated soil and ground water at OU3 and other OUs at the Base. The primary contaminant of concern affecting the soil is an inorganic, sodium hydroxide.

SELECTED REMEDIAL ACTION:
The selected interim remedial action for this site includes removing two underground storage tanks; backfilling the excavated area with the previously excavated soil and clean fill; and constructing a 29,000 square foot sloped temporary asphalt cap at the ground surface after removal of the tanks to ensure drainage of precipitation into the existing stormwater system. The tank removal project will be conducted under a state permit and administered by the state under its Underground Storage Tank (UST) program, under a state-issued permit, which will regulate decontamination and proper disposal of the tanks and their associated piping, as well as testing for contamination of the native soil underlying the tanks and piping. The estimated present worth cost for this interim remedial action is $55,343, which includes an annual O&M cost of $540 for 3 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific performance standards for this interim action will be specified in the final ROD for all of OU3. This ROD invokes an ARAR waiver on the basis that this is part of an interim remedy; therefore, RCRA closure requirements will not be attained.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
ARAR Waiver; Capping; Clean Air Act; Debris; Direct Contact; Filling; Inorganics; Interim Remedy; O&M; Onsite Containment; Onsite Disposal; RCRA; Soil; State Standards/Regulations.

SITE SUMMARY

Date of previous RODs: 09/30/91
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: Inorganics
Category: Source Control - Interim

IDAHO POLE, MT
September 28, 1992

SITE HISTORY/DESCRIPTION:

The 50-acre Idaho Pole site is an active wood treatment facility located in Gallatin County, Bozeman, Montana. Land use in the area is light industrial. The site lies within the 100-year floodplain, and wetlands are also located onsite. The site includes the Idaho Pole Company (IPC) pole plant, Burlington Northern Railroad property, Montana Rail Link property, and land owned by the Montana Pole Company. The IPC wood-treating facility began operation in 1945, using creosote to preserve wood. In 1952, the company switched to pentachlorophenol in carrier oil (similar to fuel oil) for the wood-treating solution. In 1978, the state found evidence that an oily wood-treating fluid was being released from the plant and disposed of in ditches. IPC stopped releasing this substance and attempted to clean up the land. In an attempt to slow or eliminate movement of the oily wood-treating fluid through ground and surface water and into private wells, IPC installed and operated an interceptor drain with a sump and an interceptor trench. Absorbent pads also were used in the culverts and ditches to intercept and collect the oily wood-treating fluid. Culverts under I-90 were dammed to prevent runoff of contaminated surface water to Rocky Creek. The spillage of oily wood-treating fluid has resulted in soil, ditch sediment, and ground water contamination both onsite and offsite in the surrounding vicinity. In addition, since the oily wood-treating fluid is lighter or less dense than water, a product layer exists beneath the site, above ground water. This ROD addresses contaminated onsite soil, sediment, and ground water. The primary contaminants of concern affecting these media are organics, including dioxins, oils, PAHs, pesticides, and phenols; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and consolidating approximately 19,000 cubic yards of contaminated soil from the pasture area, ditch sediment and bottoms, and the former round house area; pretreating the soil onsite using an oil/solids separator to remove the oily wood-treating fluid, followed by biological treatment of the contaminated soil and sediment in a land treatment unit (LTU), and capping the LTU with a RCRA cap; treating 23,000 cubic yards of soil in inaccessible locations contaminated with oily wood treatment fluids using in-situ soil flushing; enhancing in-situ biological degradation of soil contaminants by the addition of oxygen and nutrients; collecting the flushed water and skimming the oil; combining this oil with recovered oil from the other site areas, followed by recycling or offsite disposal in accordance RCRA; filling excavated areas with clean soil; pumping and onsite treatment of approximately 1 billion gallons of contaminated ground water within the boundaries of the oily plume, followed by transfer to an oil/water separator-clarifier/filtration plant; treating the water using a fixed film bioreactor; consolidating the solids from the separation process into the LTU for treatment along with the contaminated soil; treating approximately 210 million gallons of contaminated ground water from under the pasture area by in-situ biodegradation; reinjecting the treated ground water onsite or treating this using additional treatments, such as carbon polishing to meet POTW pretreatment standards, if necessary; monitoring ground water; providing any contaminated residential wells with in-home carbon/reverse osmosis treatment system until MCLs are reached; and implementing engineering and institutional controls, including deed, land, and ground water use restrictions. The estimated present worth cost for this remedial action is $9,074,962, which includes a total O&M cost of $928,790 for 10-30 years.

PERFORMANCE STANDARDS OR GOALS:

Soil and sediment goals are based on a site-specific risk analysis levels and will correspond to a 10^{-4} to 10^{-6} lifetime cancer risk. Chemical-specific clean-up goals for soil include PCP 48 mg/kg (risk); total B2 PAHs 15 mg/kg (risk); total D PAHs 145 mg/kg (HO); and TCDD TE 0.001 mg/kg. Ground water clean-up levels are based on SDWA MCLs and proposed MCLs. Chemical-specific goals for ground water include pentachlorophenol 1 ug/l (MCL); benzo(a)pyrene 0.2 ug/l (MCL); and 2,3,7,8-TCDD $3x10^{-5}$ ug/l (MCL).

INSTITUTIONAL CONTROLS:

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

KEYWORDS:

Biodegradation/Land Application; Capping; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act;

IDAHO POLE, MT (Continued)
September 28, 1992

Clean Water Act; Closure Requirements; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; MCLs; O&M; Offsite Discharge; Offsite Treatment; Oils; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; Phenols; Publicly Owned Treatment Works (POTW); RCRA; Safe Drinking Water Act; Sediment; Soil; Soil Washing/ Flushing; Solvents; Temporary Storage; Treatment Technology; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Sediment, GW
Major Contaminants: Organics, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

OGDEN DEFENSE DEPOT (OPERABLE UNIT 1), UT
June 26, 1992

SITE HISTORY/DESCRIPTION:
Since 1941, the 1,100-acre Ogden Defense Depot (DDOU) site, located in Ogden, Weber County, Utah, has been a key installation in the Department of Defense supply system. Land use in the surrounding area is predominantly residential. In the past, both liquid and solid materials have been disposed of at this site. Oily liquid materials and combustible solvents were burned in pits, and solid materials were buried, burned, or taken offsite for disposal. In 1979, the U.S. Army Toxic and Hazardous Materials Agency (USATHMA) identified three locations on the DDOU where hazardous materials might have been used, stored, treated, or disposed of. A USATHMA 1980 report then broke the three locations into about 40 separate areas. Operable Unit 1, which is located in the southwest part of the DDOU, is composed of the backfill material in the Plain City Canal, Burial Site 1, and Burial Site 3-B. The Plain City Canal was an irrigation canal that flowed between two branches of Mill Creek until it was backfilled from 1969 to 1973 with burning-pit debris from Burial Site 4-A. During 1988, a soil-gas survey revealed that a portion of the Plain City Canal backfill was the apparent source of elevated VOCs in the soil gas. Burial Site 1 was reported to have been used for the disposal of riot control agent (chloroacetophenone) and white smoke (hexachloroethane) containers in the 1940's. In the early 1960's, Burial Site 3-B was reportedly the burying ground for over 1,000 arctic-style rubber boots. The DDOU, with concurrence from the state and EPA, has elected to divide the site into four operable units. This ROD addresses a final remedy for OU1 that will reduce the principal threats posed by contaminated soil and shallow ground water at the site. The final remedy for OU2, which addresses soil and ground water in the french drain area, the pesticide storage area, and the parade ground area, is currently under construction. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including TCE; other organics, including dioxins and pesticides; and metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating and transporting 4,000 cubic yards of contaminated soil and debris offsite to a RCRA permitted hazardous waste or industrial landfill; backfilling the area with clean fill; extracting and treating contaminated ground water onsite using air stripping to remove contaminants, adding a GAC system to the air stripper if dioxins and furans are detected in the effluent at concentrations above the proposed MCL for dioxins and furans; transporting wastes from the ground water treatment process, including any spent carbon offsite for incineration, stabilization/fixation or disposal; recharging the aquifer with the treated water using injection wells; monitoring air emissions; and monitoring ground water. The estimated present worth cost for this remedial action is $2,200,000, which includes an annual O&M cost of $146,000 for 7 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are health-risk based and include dioxin 0.001 mg/kg; arsenic 35 mg/kg; zinc 1,500 mg/kg; and lead 500 mg/kg. Chemical-specific ground water clean-up goals are also health-risk based and include cis-1,2-dichloroethene 70 ug/l; TCE 5 ug/l; and vinyl chloride 2 ug/l.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Monitoring; Air Stripping; Arsenic; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Closure; Clean Water Act; Debris; Dioxin; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; Pesticides; RCRA; Safe Drinking Water Act; Soil; Solidification/Stabilization; Solvents; State Standards/Regulations; TCE; Toxic Substances Control Act; Treatment Technology; VOCs.

OGDEN DEFENSE DEPOT (OPERABLE UNIT 1), UT (Continued)

June 26, 1992

SITE SUMMARY

Date of previous RODs: 09/27/90
Lead: Federal Facility
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

OGDEN DEFENSE DEPOT (OPERABLE UNIT 3), UT

September 28, 1992

SITE HISTORY/DESCRIPTION:

The site is part of the 1,100-acre Ogden Defense Depot (Operable Unit 3) site is a key installation in the Department of Defense (DOD) supply system in Ogden, Weber County, Utah. Land use in the area is predominantly rural and residential. The site overlies both a shallow and a deep aquifer, which appear to be hydraulically connected. Since 1941, oily liquid materials and combustible solvents have been burned in pits, and solid materials have been buried onsite, burned, or removed for offsite disposal. Several waste disposal areas have been identified on property previously or currently controlled by the Defense Distribution Depot Ogden, Utah (DDOU). The main onsite waste disposal areas include (1) the WWII Mustard Agent Storage Facility; (2) the Burial Site 3-A (consisting of four subareas: Chemical Warfare Agent (CWA) Identification Kit, Riot Control and Smoke Grenade, Miscellaneous Items, and Compressed Gas Cylinder Reburial Areas); and (3) the Water Purification Tablet Burial Area. From 1942 to 1946, over 1 million pounds of mustard agent were stored at the WW II Mustard Storage Facility. In 1946, the containers were moved to Dugway Proving Ground, Utah, and subsequent onsite sampling indicated no current contamination in this area. From the 1950's to 1960's, items also were buried intermittently at Burial Site 3-A. During a 1988 Army site investigation, chemical warfare agents, VOCs, including TCE, and heavy metals were detected in the onsite soil samples from the CWA Identification Kit Burial Area. Pressurized gas cylinders with unknown contents were found in the Compressed Gas Cylinder Reburial Area, and bottles containing halzone water purification tablets were found in the Water Purification Tablet Burial Area. In 1991, investigations confirmed that ground water underlying the site was also contaminated by VOCs. The site has been divided into four operable units for remediation. A 1992 ROD addressed the reduction of the principal threat posed by contaminated soil and shallow ground water, as OU4. This ROD addresses the potential threats to future onsite residents and Depot workers posed by contaminated soil and debris, as OU3. Another 1992 ROD will address the contaminated ground water underlying the site, as OU1. The primary contaminants of concern affecting the soil and debris are organics, including pesticides; metals, including arsenic; and other inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating, handsorting, and mechanically sieving 530 cubic yards of contaminated soil and debris from the Chemical Warfare Agent Identification Kit and the Riot Control and Smoke Grenade burial areas; incinerating offsite any debris or soil contaminated by chemical warfare agents or grenade fragments at a DOD facility; excavating soil and debris from the Miscellaneous Items Burial Area, and treating soil and debris that does not meet TCLP treatment standards using solidification, or another appropriate technology prior to disposal in an offsite RCRA landfill along with the untreated debris; returning excavated soil that meets criteria to the excavated areas; excavating and disposing of offsite compressed gas cylinders and the water purification tablet bottles from the Compressed Gas Cylinder and Water Purification Tablet Burial Areas. The total cost for this remedial action is $393,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on a future residential exposure scenario, which was calculated under a residential ingestion scenario where a person was assumed to be exposed as a 15-kg child ingesting 200 mg of soil per day for 6 years, and also a 70-kg adult ingesting 100 mg of soil per day for 24 years. These include arsenic 35 mg/kg and mercury 2 mg/kg.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Carcinogenic Compounds; Clean Air Act; Debris; Deferred Decision; Excavation; Incineration/ Thermal Destruction; Inorganics; Leachability Tests; Metals; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; RCRA; Soil; Solidification/ Stabilization; Solvents; State Standards/Regulations; Treatment Technology.

OGDEN DEFENSE DEPOT (OPERABLE UNIT 3), UT (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: 09/27/90, 06/26/92, 09/28/92
Lead: Federal Facility
Contaminated Media: Soil, Debris
Major Contaminants: Organics, Metals, Inorganics
Category: Source Control - Final Action

OGDEN DEFENSE DEPOT (OPERABLE UNIT 4), UT

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 1,100-acre Ogden Defense Depot site has been a key installation in the Department of Defense (DOD) supply system in Ogden, Weber County, Utah. Land use in the area is predominantly residential. In the past, both liquid and solid materials have been buried, burned, or disposed of in several areas at the Defense Distribution Depot, Ogden, Utah (DDOU). These areas have been divided into four operable units. OU4 is composed of Burial Sites 4-A through 4-E. From the 1950's to 1975, a records search of Burial Site 4-A indicated that approximately 14,000 pounds of waste material were disposed of in this area each month. In addition, approximately 40 gallons of waste oils per day were collected in drums and disposed of onsite in 4A. Burial Sites 4-B and 4-E operated as a waste oil/holding/burning pit. From 1969 to 1972, Burial Site 4-C was operated as a sanitary landfill. From the mid-1940's to mid-1960's, methyl bromide cylinders were reportedly disposed of in Burial Site 4-D; however, during site investigations, only large quantities of halazone water purification tablets contained in bottles were encountered. From the mid-1950's to mid-1960's, Burial Site 4-E was used as an oil holding/burning pit for waste oils and spent solvents, and industrial wastes produced from various processes on the Depot. This ROD addresses the five burial sites as OU4. DDOU's analysis indicated that the soil in Burial Site 4-E is the primary source of ground water contamination, whereas Burial Site 4-A is considered a potential secondary source. OU4 is the third final response action and its goal is to reduce the principal threat posed by contaminated soil and shallow ground water that may occur as a result of future exposure of residents or onsite workers. The ROD for OU1 is under review, OU2 is being implemented, and the ROD for OU3 is being prepared. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs, including benzene; other organics, including pesticides and PCBs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and transporting offsite approximately 4,500 cubic yards of contaminated soil, debris, and approximately 400 cubic yards of water purification tablets for disposal at a RCRA landfill; conducting TCLP tests to confirm the characteristics of excavated soil and debris and to determine their suitability for land disposal; treating any soil and debris failing TCLP offsite using activated carbon, other stabilization/fixation methods, or, for dioxins, incineration; excavating and removing any contaminated cylinders for offsite treatment and disposal; backfilling excavated areas with clean fill and soil, with revegetation; extracting and treating onsite 65 million gallons of contaminated ground water using air stripping to remove VOCs and carbon adsorption to remove organics followed by reinjection into the shallow aquifer; monitoring ground water and air emissions; and removing wastes generated during the treatment process offsite for disposal or incineration. The present worth cost for this remedial action ranges from $3,800,000 to $4,500,000, which includes an estimated annual O&M cost of $230,000 for 12 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on the TBC remediation criterion for PCBs of 25 mg/kg (EPA Directive 9355.4-01FS) and the TBC criterion for dioxins of 0.001 mg/l (General Approach Used by the Dioxin Disposal Advisory Group Regarding Pentachlorophenol Waste). All remaining goals are based on a future residential exposure scenario and include benzene 210 mg/kg (cancer risks of 10^{-5}); arsenic 35 mg/kg (cancer risk of 10^{-4}); and lead 500 mg/kg. Chemical-specific ground water clean-up goals are based on federal MCLs for benzene 0.005 mg/l; cis-1,2-DCE 0.070 mg/l; vinyl chloride 0.002 mg/l; and PCBs 0.005 mg/l.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Monitoring; Air Stripping; Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Dioxin; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Leachability Tests; Lead; MCLGs; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Organics; PAHs; PCBs; Pesticides; RCRA; Safe Drinking Water Act; Soil;

OGDEN DEFENSE DEPOT (OPERABLE UNIT 4), UT (Continued)

September 28, 1992

Solidification/Stabilization; Solvents; State Standards/ Regulations; Toxic Substance Control Act; Treatment Technology; VOCs.

SITE SUMMARY

Date of previous RODs: 09/27/90, 06/26/92
Lead: Federal Facility
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Interim

PORTLAND CEMENT (KILN DUST #2 & #3), UT

March 31, 1992

SITE HISTORY/DESCRIPTION:

The 71-acre Portland Cement (Kiln Dust #2 & #3) site, located in a primarily industrial/commercial area of Salt Lake City, Utah, consists of three separate but adjacent properties known as Site 2, Site 3, and the West Site. The area surrounding the site is characterized by dense residential and agricultural land, as well as highly commercialized and industrialized development in the immediate vicinity of the site. Between 1959 and 1983, the Portland Cement Company, 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, which consists primarily of heavy metals and other inorganics, is highly alkaline. Approximately 360 tons of chromium-bearing refractory bricks were disposed of with the waste CKD. In 1984, Lone Star voluntarily began environmental investigations at the site, which included installing ground water monitoring wells. The first remedial action (OU1) selected in 1990 addressed the removal of the waste CKD and temporary onsite storage of the chromium bricks. The waste CKD, the primary source of contamination of onsite soil, will be removed during the OU1 remedial action. This ROD addresses the onsite contaminated soil and chrome-bearing bricks that provide a potential source of ground water contamination onsite. The selected remedy for the OU2 action reduces principal threats and prevents further contamination of the ground water. Ground water contamination will be addressed as either a separate operable unit or under the 5-year review of the OU1 remedial action. The primary contaminants of concern affecting the soil and waste CKD are metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating approximately 27,000 cubic yards of soil with concentrations greater than lead 500 mg/kg or arsenic 70 mg/kg, with onsite solidification of soil with concentrations of lead equal to or above 5 mg/l, based on TCLP analysis; treating approximately 360 tons of chrome-bearing bricks onsite using chemical fixation, followed by solidification; transporting all excavated and treated material offsite to an appropriate disposal facility; placing an 18-inch protective cover of clean fill over the entire site; and implementing institutional controls including deed restrictions, as necessary. The estimated present worth cost for this remedial action is $6,400,000. O&M costs for the selected remedial action are assumed to be negligible.

PERFORMANCE STANDARDS OR GOALS:

Treatment levels for soil are dictated by federal Land Disposal Regulations (LDRs) and state solid waste disposal regulations. Soil will be treated to 5 ug/l lead, or less, as measured by TCLP before land disposal; chrome-bearing bricks will be treated to 5 mg/kg by TCLP analysis prior to disposal. Federal and state air regulations on total suspended particulates and fugitive dust control will apply.

INSTITUTIONAL CONTROLS:

Institutional controls and deed restrictions will be imposed as necessary to ensure the effectiveness of the remedy and to prevent exposure to highly alkaline soil. The length of time during which controls are needed will be determined during remedial design.

KEYWORDS:

Arsenic; Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Direct Contact; Excavation; Institutional Controls; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Onsite Treatment; RCRA; Soil; Solidification/Stabilization; State Standards/Regulations; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 07/19/90
Lead: Federal Enforcement
Contaminated Media: Soil, Waste
Major Contaminants: Metals
Category: Source Control - Final Action

ROCKY FLATS PLANT (USDOE) (OPERABLE UNIT 2), CO

September 1, 1992

SITE HISTORY/DESCRIPTION:

The Rocky Flats Plant (USDOE) (Operable Unit 2) site is part of the 6,550-acre Department of Energy (DOE) nuclear weapons research, development, production, and plutonium processing complex in Jefferson County Colorado. The plant is composed of the 450-acre Rocky Flats Plant (RFP) security area and the remaining buffer area. Land use in the area is predominantly rural and agricultural with several new residential areas under development. In addition, a wetland area is located 1,000 feet from the site. The South Walnut Creek Basin and Woman Creek surface water serve as a source of drinking water. Since 1951, DOE has used the site for manufacturing components for nuclear weapons, processing plutonium, and fabricating, machining, and assembling components from metals. A number of past onsite production and waste storage activities resulted in extensive site contamination. During the 1950's and 1960's, solvents and reactive metals including lithium were destroyed onsite. From 1958 to 1967, drums containing radioactive contaminated oils and solvents were stored onsite, with some of the drums corroding and leaking approximately 5,000 gallons of liquid into the soil. Prior to 1968, sanitary sewage sludge and flattened drums contaminated with uranium and plutonium were disposed of in onsite trenches, and drums of uranium-contaminated oil were burned in onsite pits. In addition, various bottled gases were detoxified onsite between 1982 and 1983. Current waste handling practices involve onsite and offsite recycling of hazardous materials, and offsite disposal of solid radioactive materials at another DOE facility. DOE has conducted a number of investigations that revealed VOCs, metals, and radionuclides above background levels in soil, sediment, ground water, and surface water. A 1969 clean-up action attempted to remove corroded and leaking drums of radioactive waste from an onsite area, remove contaminated soil, and cap the soil. During the clean-up and removal effort winds distributed plutonium to the south and east. In 1970, approximately 1,405 additional drums containing radioactive waste were removed and disposed of offsite. A 1990 ROD addressed contaminated ground water. This ROD addresses OU2, which includes the 903 Pad and Lip Area, Mound Area, and East Trenches Area, which are located southeast of the Rocky Flats Plant, and provides an interim remedy for contaminated soil and ground water. The primary contaminants of concern affecting the soil and ground water are VOCs, including PCE, TCE, toluene, and xylenes; other organics; metals, including arsenic, chromium, and lead; other inorganics; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes constructing an in-situ vacuum-enhanced soil vapor extraction system to perform pilot scale remedial tests; filtering extracted vapor using granular activated carbon, with offsite regeneration of spent carbon; installing ground water depression pumps at the East Trenches Area to expose residual DNAPLs not released through vapor extraction; collecting vapor extraction condensates and ground water in onsite ground water holding tanks; and transporting the condensates and ground water offsite for treatment at a POTW; monitoring radiation levels during equipment construction; mitigating any affected wetlands; and implementing a full scale remediation if pilot scale test results show a 1 ppm hydrocarbon recovery rate. No costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Soil and ground water clean-up goals are based on health based criteria of 10^{-4} to 10^{-6} levels for cancer risk, background levels, and SDWA MCLs and MCLGs. They include chemical-specific goals for ground water for: acetone 10 ug/l; TCE 5 ug/l; xylene 10,000 ug/l; toluene 1,000 ug/l; methylene chloride 5 ug/l; aluminum 0.2 mg/l; antimony 0.6 mg/l; arsenic 0.05 mg/l; barium 1 mg/l; chromium 0.01 mg/l; iron 0.3 mg/l; lead 0.005 mg/l; mercury 0.0002 mg/l; selenium 0.01 mg/l; gross alpha 11 pCi/l; gross beta 19 pCi/l; Pu ^{239,240} 0.05 pCi/l. Chemical-specific clean-up goals for soil include arsenic 5 mg/l; barium 100 mg/l; cadmium 1 mg/l; chromium 5 mg/l; lead 5 mg/l; mercury 0.20 mg/l; selenium 5.7 mg/l; TCE 5.6 mg/kg; acetone 0.59-160 mg/kg; xylenes 28 mg/kg; and methylene chloride 33 mg/kg.

INSTITUTIONAL CONTROLS:

Not provided.

ROCKY FLATS PLANT (USDOE) (OPERABLE UNIT 2), CO (Continued)

September 1, 1992

KEYWORDS:

Arsenic; Background Levels; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Drinking Water Contaminants; Ground Water; Ground Water Treatment; Inorganics; Interim Remedy; Lead; MCLGs; MCLs; Metals; Offsite Discharge; Offsite Treatment; Onsite Disposal; Onsite Treatment; PCE; Publicly Owned Treatment Works (POTW); Radioactive Materials; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Temporary Storage; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: 01/05/90, 01/25/91, 04/06/92
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Metals, Inorganics, Radioactive Materials
Category: Source Control - Interim
Ground Water - Interim

ROCKY FLATS PLANT (USDOE) (OPERABLE UNIT 4), CO

April 6, 1992

SITE HISTORY/DESCRIPTION:

The Rocky Flats Plant (USDOE) (Operable Unit 4) site is part of the 6,500-acre nuclear weapons research, development, production, and plutonium processing complex in Jefferson County, Colorado. The plant is composed of the 450-acre Rocky Flats Plant (RFP) security area and the remaining buffer area. Land use in the area is predominantly rural, agricultural, commercial, and industrial, with several residential areas within 5 miles of the site. Since 1951, the Department of Energy (DOE) has used the site for manufacturing components of nuclear weapons; processing plutonium; and fabricating, machining, and assembling components from metals. The central portion of RFP contains the Solar Evaporation Pond (SEPs) Waste Management Unit, including Ponds 207-A, 207-B North, 207-B Center, 207-B South, 207-C, and the Interceptor Trench System (ITS). The SEPs were formerly used to store and treat liquid process waste having less than 100,000 picocuries per liter of total long-lived alpha activity. These process wastes also contained high concentrations of nitrates as well as treated acidic wastes containing aluminum hydroxide. The ponds are known to have received other wastes, including sanitary sewer sludge, lithium chloride, lithium metal, sodium nitrate, ferric chloride, sulfuric acid, ammonium persulfates, hydrochloric acid, nitric acid, hexavalent chromium, tritium, and cyanide solutions. Sludge from the SEPs was removed periodically to implement repair work on the pond liners and as part of routine waste management activities. Removed sludge was mixed with Portland cement and solidified as a mixture of sludge and concrete for shipment for offsite disposal. In 1986, placement of process waste material into these ponds ceased. From 1971 to 1974, construction of interceptor trenches was initiated to prevent natural seepage and pond leakage from entering North Walnut Creek. In 1981, the system was replaced by the current ITS, which collects an estimated 4 million gallons per year for discharge to the 207-B ponds. This interim ROD addresses management and treatment of liquids contained in ponds 207-A, 207-B North, 207-B Center, 207-B South, and the water collected by the ITS as the OU4 at the site. Future RODs will address removal and solidification of sludge, further investigation, characterization, and remedial activities. The primary contaminants of concern affecting the surface water are VOCs, including TCE; metals, including chromium; and radioactive materials, including Pu^{-239} and Am^{-241}

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes constructing and utilizing three temporary surge tanks and associated piping to contain and transfer water collected by the ITS; evaporating approximately 3 million gallons of water from pond 207-A and 5 million gallons of water from the 207-B ponds using onsite flash evaporators and associated tanks; transferring the distillate to a holding tank for reinjection into the Raw Water System for plant cooling tower usage; and collecting the flash evaporator concentrate in holding tanks, and onsite solidification of the residual; conducting treatability studies using surrogate pond water to simulate the proposed treatment system. The estimated total cost for this interim remedial action is $8,017,000, which includes an annual O&M cost of $1,170,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific surface water clean-up goals are based on site-specific radionuclide standards and MCLGs or MCLs and attainment of relevant CWA water quality criteria.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Direct Contact; Interim Remedy; MCLGs; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; RCRA; Radioactive Materials; Safe Drinking Water Act; Solidification/Stabilization; Surface Water; Surface Water Collection/Diversion; Surface Water Treatment; TCE; Temporary Storage; Treatability Studies; Treatment Technology; VOCs; Water Quality Criteria.

ROCKY FLATS PLANT (USDOE) (OPERABLE UNIT 4), CO (Continued)

April 6, 1992

SITE SUMMARY

Date of previous RODs: 01/05/90, 01/25/91
Lead: Federal Facility
Contaminated Medium: SW
Major Contaminants: VOCs, Metals, Radioactive Materials
Category: Source Control - Interim

SILVER BOW CREEK/BUTTE AREA, MT

June 30, 1992

SITE HISTORY/DESCRIPTION:

The Silver Bow Creek/Butte Area site is a mining and processing area located 7 miles east of Anaconda in the Upper Clark Fork River Basin, Deer Lodge County, Montana. One part of the site is the Warm Springs Pond inactive area, which covers approximately 2,500 acres of open pond water and interspersed wetlands just above the beginning of the Clark Fork River. Several onsite creeks (Warm Springs, Silver Bow, Mill, Willow) and a stream by-pass (Mill-Willow By-pass) serve as principal headwaters to Clark Fork River. Three settling ponds, an area between the northern-most pond (Pond 1) and the Clark Fork River's beginning point, and a series of wildlife ponds are located in proximity to the creeks. Site contamination is the result of over 100 years of mining and process operations in the area. Until the early 1970's, mining, milling, and smelting wastes were dumped directly into Silver Bow Creek and transported downstream. Three settling ponds were constructed in the early 1900's by Anaconda Copper Mining Company to allow wastes that were deposited in Silver Bow Creek to settle out before discharging to the Clark Fork River. Approximately 19 million cubic yards of tailings and metal-contaminated sediment and sludge have collected in the ponds and 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 attributed to flood and earthquake damage that could release millions of cubic yards of tailings and sediment into the river. Several removal actions that occurred during 1967 and 1989 have been or will be implemented at the site, including the Mill-Willow By-pass removal, Travona Mine Shaft Control, and residential soil cleanups. A 1990 ROD addressed an interim action for the Warm Springs Ponds area, which included Ponds 1, 2, and 3, but deferred the decision on the area below Pond 1 for a year. When it was recognized that a decision on Pond 1 and the area below it might delay the remedy for Ponds 2 and 3, in 1991 EPA wrote an ESD that divided the Warm Springs Pond area into two operable units: the Active area, composed of Ponds 2 and 3, as OU4; and the Inactive area, composed of Pond 1 and the area below it, as OU12. This ROD addresses an interim remedy for all media at OU12. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water in the Inactive area are metals, including arsenic, chromium, and lead; and inorganics.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating all tailings and contaminated soil from the by-pass channel and the area below Pond 1 not planned for wet-closure, and consolidating the wastes over existing dry tailings within the western portion of Pond 1; placing a cover of lime, fill, and soil over the dry tailings and revegetating; modifying the by-pass channel to safely route potential flood flows; using soil and gravel that meet geotechnical requirements and have copper levels of less than 500 mg/kg to raise and strengthen existing berms; constructing new berms; raising and strengthening the north-south aspect of the Pond 1 berm, and stabilizing the east-west aspect of the Pond 1 berm to withstand a maximum credible earthquake for this area; extending and armoring the north-south aspect of the Pond 1 berm; relocating the lowermost portion of the by-pass channel, converting the present channel into a ground water interception trench; installing pumps to allow for a pump-back system to transport ground water and surface water to the active area for treatment, if levels exceed specified standards; constructing wet-closure berms to enclose the submerged tailings and contaminated sediment; chemically fixing tailings and sediment with lime, and flooding the wet-closure cells with water with a pH of greater than 8.5; constructing a run-off interception system along the east side of the Inactive area and toe drains, and installing a collection manifold for both the Active and Inactive areas; and implementing ecological monitoring and institutional controls, including deed, ground water, and land use restrictions. The total present worth cost for this remedial action is $18,100,000, which includes an annual O&M cost of $67,200 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Soil at final excavation grade for this interim action will exhibit concentrations of metals within the ranges of: arsenic 8.4–42.1 mg/kg; cadmium 0.8–4 mg/kg; copper 0.6–287 mg/kg; lead 8.4–45.5 mg/kg; and zinc 0.4–573. Chemical-specific interim ground water clean-up goals, which are based on state drinking water criteria, include arsenic 50 ug/l; cadmium

SILVER BOW CREEK/BUTTE AREA, MT (Continued)

June 30, 1992

10 ug/l; copper 1,000 ug/l; iron 300 ug/l; lead 50 ug/l; manganese 50 ug/l; and zinc 5,000 ug/l. Final soil, sediment, ground water, and surface water action levels for the various contaminants are not identified in this ROD and will be determined based on ongoing risk assessment work at other OUs within the Clark Fork Basin.

INSTITUTIONAL CONTROLS:

Institutional controls in the form of deed, ground water, and land use restrictions will be implemented to prevent residential development; domestic well construction; disruption of dry-closure caps; and swimming in the area.

KEYWORDS:

Arsenic; Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Deferred Decision; Direct Contact; Excavation; Filling; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Interim Remedy; Lead; MCLGs; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: 09/28/90
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, GW, SW
Major Contaminants: Metals, Inorganics
Category: Source Control - Interim
Ground Water - Interim

HASSAYAMPA LANDFILL, AZ

August 6, 1992

SITE HISTORY/DESCRIPTION:

The Hassayampa Landfill site is a 10-acre area of a 47-acre municipal landfill that was previously used for hazardous waste disposal. Land use in the area is predominantly desert and is sparsely cultivated. The Hassayampa Landfill lies within the Hassayampa River drainage area, but outside of the 100-year floodplain. The estimated 1,100 people who reside within a 3-mile radius of the site use the aquifer underlying the site for their drinking water. From 1961 to the present, the Maricopa County Landfill Department owned and operated the site. Waste disposed of at the landfill consisted chiefly of municipal garbage, tree trimmings, and other plant refuse. In 1979, the state requested that Hassayampa Landfill accept hazardous waste as an alternate waste disposal site during a prohibition at City of Phoenix landfills. In the 18 months that the landfill accepted hazardous waste, up to 3.28 million tons of liquid waste and approximately 4,150 tons of solid waste were deposited. The Hazardous Waste Area consisted of several unlined pits (pits 1-5) for disposal of heavy metals, solvents, petroleum distillates, oil, pesticides, acids, bases, and non-hazardous septic wastes. In 1981, under EPA guidance, a number of investigations were conducted that revealed VOC contamination in the soil and ground water. This ROD addresses the soil, debris, and ground water as the final action for the site. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating contamination in the vadose zone using vapor extraction at all locations where soil vapors exceed clean-up levels; controlling emissions from the treatment system using either vapor phase carbon adsorption or catalytic oxidation as determined during the RD phase; installing a 10-acre cap over the soil and waste in the Hazardous Waste Area; extracting and treating contaminated ground water onsite using air stripping and, as necessary, vapor phase carbon adsorption, with reinjection of the treated water onsite or in the immediate vicinity; monitoring ground water; and implementing institutional controls including deed and ground water use restrictions, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $6,100,000, which includes an annual O&M cost of $2,213,100 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

The selected remedy will comply with the federal and more stringent state standards. Soil vapor clean-up levels will be calculated based on levels that will be protective of ground-water quality. The design of the cap will be in compliance with RCRA requirements. Chemical-specific ground water clean-up goals are based on SDWA MCLs and include 1,1-DCE 7 ug/l; 1,2-DCA 5 ug/l; PCE 5 ug/l; TCE 5 ug/l; 1,2-DCE (trans) 100 ug/l; 1,2-DCE (cis) 70 ug/l; and 1,1,1-TCA 200 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented at the site to prevent direct contact with contaminated wastes and soil at pit 1 and to limit future ground water use.

KEYWORDS:

Air Stripping; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Debris; Direct Contact; Drinking Water Contaminants; Extraction; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLGs; MCLs; Metals; Municipally Owned Site; O&M; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: VOC, Metals
Category: Source Control - Final Action
Ground Water - Final Action

IRON MOUNTAIN MINE, CA
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 4,400-acre Iron Mountain Mine (IMM) site is a collection of inactive mines and associated property located on Iron Mountain, Shasta County, California. Land use in the area is predominantly commercial, with a wetlands located within 9 miles from the site. The Sacramento River is a major fishery and source of drinking water for the City of Redding, which is located 9 miles east of the site. IMM contains several inactive underground and open pit mines, numerous waste piles, abandoned mining facilities, and mine drainage treatment facilities. From 1879 to present, several owners, including Rhone-Poulenc Basic Chemicals, mined copper and other metals, such as gold, silver, pyrite, and zinc. In 1894, Mountain Mining Company acquired and began operating the mine. Mining waste generated was dumped into ravines and washed into several creeks, including Boulder and Sacramento. In 1896, Mountain Copper Company assumed ownership, and mining activities continued intermittently from the 1880's until 1962. In 1968, Stauffer Chemical Company acquired Mountain Copper and operated a copper cementation plant. In 1976, the state issued Stauffer Chemical an order requiring an abatement of the continuing pollution from IMM. Throughout the years, mining activities at IMM resulted in deposits of waste rock and pyrite tailings on the exposed ground surface, in addition to rain and surface flows, which formed acid mine drainage and transported contaminants to surface water and sediments. In 1983, EPA identified IMM as the largest discharger of toxic metals in the United States. A 1986 ROD provided limited source control and management actions to lessen discharge of AMD to surface waters. This ROD addresses control of the AMD sources in the Boulder Creek drainage basin from the Richmond and Lawson portals. Two planned RODs will address AMD to Slickrock Creek, sources for Boulder Creek drainage (excluded from this ROD), contaminated ground water, and other sources of contamination. The primary contaminants of concern affecting the sediment, debris, and surface water are metals, including lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes collecting the acid mine drainage from the Richmond and Lawson portals and constructing pipelines and necessary structures to transport the drainage into the treatment facility; treating the acid mine drainage by chemical neutralization/precipitation using the lime/sulfide High Density Sludge (HDS) treatment process, and discharging the treated effluent onsite to surface water; disposing of the residual sludge onsite in the inactive open pit mine; excavating, consolidating onsite, and capping seven waste piles that are actively eroding and discharging hazardous substances; and diverting ground water and surface water away from the landfill. The estimated present worth cost for this remedial action is $53,958,000, which includes an annual O&M cost of $27,865,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Sediment and surface water clean-up goals are based on background levels as established by SWDA MCLs or health based levels, whichever is more stringent. Chemical-specific sediment and surface water goals include antimony 0.006 mg/l; arsenic 0.050 mg/l; cadmium 0.01 mg/l; and mercury 0.002 mg/l.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
ARAR Waiver; Background Levels; Capping; Carcinogenic Compounds; Clean Water Act; Debris; Direct Contact; Drinking Water Contaminants; Excavation; Interim Remedy; Lead; MCLGs; MCLs; Metals; Mining Wastes; Offsite Treatment; Onsite Containment; Onsite Disposal; Onsite Discharge; Onsite Treatment; Safe Drinking Water Act; Sediment; Soil; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Treatment.

SITE SUMMARY

Date of previous RODs: 10/03/86
Lead: Fund
Contaminated Media: Sediment, Debris, SW
Major Contaminants: Metals
Category: Source Control - Interim

JASCO CHEMICAL, CA
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 2.05-acre Jasco Chemical site is a chemical blending and packaging facility in Mountain View, Santa Clara County, California. Land use in the area is predominantly residential with some light industry. An estimated 67,000 residents in the City of Mountain View use municipal water from wells and a reservoir as their drinking water supply; however, EPA has determined that ground water in the shallow aquifer underlying the site is a potential source of drinking water. From 1951 to 1976, the site changed hands several times. In December 1976, Jasco began repackaging bulk chemicals into smaller quantities and blending chemicals to produce products, such as paint thinners and degreasers. Jasco received bulk chemicals in 55-pound bags and in 55-gallon drums, and chemicals were stored in eight underground tar-wrapped storage tanks. In 1984, putty mixing operations were initiated. As a result of a citizen's complaint of solvents being dumped onsite, the state conducted a preliminary ground water investigation in 1984, which showed the presence of pentachlorophenol and methylene chloride, chemicals used by Jasco, in the soil and ground water. In 1985, a subsequent investigation showed the presence of high levels of contaminated soil in the drainage swales around the plant. In 1987, Jasco removed a leaking underground diesel storage tank that had been installed prior to 1976. Soil sampling in the immediate area showed the presence of diesel derivatives, such as PAHs. Since 1987, Jasco has been extracting and discharging contaminated ground water to the storm sewer system in accordance with their permit provisions. In 1990, trace chemicals placed in the eight underground tanks revealed one leak below action levels. This ROD addresses treating tank source materials present in the soil and ground water and preventing future migration of contaminants. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, PCE, TCE, toluene, and xylenes.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and treating 1,100 cubic yards of contaminated soil onsite using enhanced biotreatment; treating air emissions using carbon adsorption, and treating or disposing of spent carbon offsite; testing residual soil, with pretreatment if necessary, and onsite disposal if treatment levels are met, or offsite disposal if clean up levels are still exceeded; extracting and treating contaminated ground water with an onsite liquid phase carbon adsorption unit, and discharging treated ground water offsite to a sanitary sewer, as permitted; implementing hydraulic controls to prohibit future plume migration, conducting quarterly ground water monitoring; and implementing institutional controls including deed restrictions to limit use of ground water. The estimated present worth cost for this remedial action ranges from $601,000 to $684,000, which includes a $32,800 annual O&M cost for 5-10 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are established on health-based levels estimated using SDWA MCLs and include 1,1-DCA 0.6 mg/kg; 1,1-DCE 2 mg/kg; 1,2-DCE 0.03 mg/kg; cis-1,2-DCE 1 mg/kg; 1,1,1-TCA 100 mg/kg; acetone 30 mg/kg; benzene 0.3 mg/kg; chloroethane 4,000 mg/kg; diesel mixture 10,000 mg/kg; ethylbenzene 3,000 mg/kg; methanol 200 mg/kg; methyl ethyl ketone 9 mg/kg; methylene chloride 0.2 mg/kg; PCE 7 mg/kg; toluene 1,000 mg/kg; TCE 3 mg/kg; vinyl chloride 0.02 mg/kg; and xylenes 2,000 mg/kg. Chemical-specific ground water clean-up goals are based on federal and state MCLs and include acetone 4,000 ug/l; benzene 1 ug/l; 1,1-DCA 5 ug/l; 1,1-DCE 6 ug/l; 1,2-DCA 0.5 ug/l; methylene chloride 5 ug/l; PCE 5 ug/l; toluene 1 ug/l; petroleum hydrocarbons 1 ug/l; and vinyl chloride 0.5 ug/l.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to prevent use of the shallow ground water aquifer for drinking purposes.

KEYWORDS:

Benzene; Biodegradation/Land Application; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; MCLs; O&M; Offsite Discharge; Offsite Disposal; Offsite Treatment; Onsite Treatment; PCE; Plume Management; RCRA; Safe

JASCO CHEMICAL, CA (Continued)
September 30, 1992

Drinking Water Act; Soil; Solvents; State Standards/Regulations; TCE; Toluene; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminant: VOCs
Category: Source Control - Final Action
Ground Water - Final Action

LAWRENCE LIVERMORE NATIONAL LAB (USDOE), CA

August 5, 1992

SITE HISTORY/DESCRIPTION:

The 800-acre Lawrence Livermore National Lab (LLNL) (USDOE) site is a multidisciplinary research facility located in Livermore, California. The site is owned by the Department of Energy (DOE) and operated by the Regents of the University of California. Land use in the area is predominantly industrial with an urban area to the west and agricultural lands to the east of the LLNL facility. Wetlands at the site consist of three small areas associated with culverts that channel runoff from the surrounding area into Arroyo Las Positas at the northern perimeter of the site. About 10,000 people use the ground water, which is blended from several downtown Livermore municipal wells, as their primary drinking water supply. The LLNL site was converted from agricultural and cattle ranch land by the Navy in 1942, who used the site until 1946 as a training facility and for aircraft assembly and maintenance. Solvents, degreasers, and paints were routinely used. Between 1946 and 1950, the site was used as a naval reserve command training center, and in 1951, the Atomic Energy Commission (AEC) began using the property as a weapons design and physics research laboratory. In 1977, DOE took over responsibility of the site. Investigations for suspected ground water contamination at LLNL were prompted by the state beginning in 1984, when perchloroethylene was discovered in the domestic supply well of a nearby property. LLNL began supplying bottled water to local residents whose domestic wells had been affected by solvents migrating from the LLNL facility. Between 1985 and 1987, the LLNL continued the ground water investigations, which revealed that releases of hazardous materials had occurred at the LLNL site during the 1940's. Also in the post-Navy era, localized spills, leaking tanks, surface impoundments, and landfills contributed VOC, FHC, metal, and tritium contamination to ground water and unsaturated sediments. Prior to 1985, LLNL conducted two significant removal actions. From 1982 to 1983, four former pits in the Taxi Strip Area in eastern LLNL were excavated and backfilled; in 1984, a former landfill was also excavated and backfilled. This ROD addresses a final remedy for the contaminated sediment and ground water at the LLNL site. An additional potential source of hazardous materials, the Trailer 5475 East Taxi Strip Area, has been identified and is being investigated. If additional public health or environmental risks from this or other sources are identified, this ROD may be augmented to address any additional necessary actions. The primary contaminants of concern affecting the sediment and ground water are VOCs, including benzene, PCE, TCE, and toluene; other organics, including pesticides; metals, including lead and chromium; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes using vacuum-induced venting to extract contaminants in vapor form from the onsite unsaturated sediment and treating using catalytic oxidation and/or activated carbon; pumping water at 24 initial locations to contain and remediate the ground water plume using both existing and new extraction wells; constructing seven onsite facilities (labelled A to G) to treat the extracted ground water; designing each treatment system specifically to treat the specific combinations of contaminants, including: ultraviolet/oxidation to treat VOCs at facilities A, B, E, and F; air stripping to treat the chloroform and carbon tetrachloride at facilities C, D, and G; ion exchange at facility D to remove chromium; and granular activated carbon at treatment facility F to remove lead; controlling air emissions from the treatment processes at all facilities using granular activated carbon; recharging or reusing the treated water onsite; and monitoring ground water. The estimated present worth cost for this remedial action is $104,100,000, which includes an annual O&M cost of $21,585,000 for 50 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific sediment and ground water clean-up goals are the more stringent SDWA MCLs and State MCLs and include benzene 1 ug/l; PCE 5 ug/l; TCE 5 ug/l; lead 15 ug/l; total chromium 50 ug/l; total trihalomethanes 100 ug/l; and carbon tetrachloride 0.5 ug/l. Unsaturated sediment will be remediated only if it would result in levels above an MCL if allowed to migrate into the ground water. Unsaturated zone remediation will be complete when modeling shows that contaminants will no longer migrate and cause ground water to exceed MCL. The discharge limits for these chemicals will also be met if effluent waters from the remedial treatment are discharged to ditches or arroyos onsite.

LAWRENCE LIVERMORE NATIONAL LAB (USDOE), CA (Continued)

August 5, 1992

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Air Stripping; Benzene; 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; Incineration/ Thermal Destruction; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCE; Pesticides; Plume Management; Radioactive Materials; RCRA; Safe Drinking Water Act; Sediment; Solvents; State Standards/Regulations; TCE; Treatment Technology; Vacuum Extraction; VOCs; Water Quality Criteria.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Sediment, GW
Major Contaminants: VOCs, Other Organics, Metals, Radioactive Materials
Category: Source Control - Final Action
Ground Water - Final Action

PACIFIC COAST PIPELINE, CA

March 31, 1992

SITE HISTORY/DESCRIPTION:

The 20-acre Pacific Coast Pipeline site, located in Ventura County, California, is a former petrochemical refinery that operated from the 1920's to 1950. The site is currently used by Texaco as a pumping station for crude oil produced in local oil fields. Surrounding land use is industrial, agricultural, and residential. The site is located near the confluence of three major drainages: the Santa Clara River, Sespe Creek, and Pole Creek. Prior to the construction of a flood channel, Pole Creek emptied directly into the site. Surface water from the site is either channeled for collection in bermed storage areas or in excavated pits, or it flows into Pole Creek through drainage pipes or over the ground's surface. The San Cayetono Thrust Fault that crosses the site is associated with areas of natural oil seeps. From 1928 to 1950, refinery wastes were disposed of onsite in a large main waste pit (MWP) as well as in eight smaller unlined sumps and pits located on the South Western portion of the site. Monitoring wells installed by Texaco have identified 45 chemicals of potential concern detected at the site, including VOCs, SVOCs, and TPHs. In 1986, under state guidance, Texaco removed 33,000 cubic yards of waste material and contaminated soils from the MWP and the eight other waste disposal areas. There are currently two areas of ground water contamination: one beneath the MWP and one in the southwest site area. The source of this ground water contamination is likely associated with the disposal of refinery wastes in the MWP and other waste disposal pits. Since the removal of the refinery wastes in the MWP, concentrations of ground water contamination have decreased. This ROD addresses remediation of ground water to reduce contaminant levels below federal and state drinking water standards. The principal contaminated media are soil and ground water. The primary contaminants of concern affecting the soil in the vadose zone and ground water are VOCs, including benzene and toluene; other organics, including PAHs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes treating areas that threaten to contaminate ground water at levels above site clean-up standards using soil vapor extraction after a 1-year subsurface study; designing, constructing, and operating an onsite ground water extraction and treatment system that uses activated carbon; discharging the treated ground water to the onsite aquifer by injection, or reuse of the treated ground water in a beneficial way, such as irrigation; thermally destroying or regenerating the spent carbon; monitoring ground water to ensure effectiveness of the treatment system; and maintaining a perimeter fence. The estimated present worth cost for this remedial action ranges from $2,300,000 to $7,000,000, which includes an annual O&M cost of $480,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific clean-up goals for ground water in the aquifer are based on state MCLs, and the TBCs State Action Level for toluene, including benzene 1 ug/l (state); 1,2-DCA 0.5 ug/l (state); ethylbenzene 680 ug/l (state); methylene chloride 0.1 mg/l; and toluene 100 ug/l (state action level/TBC).

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Arsenic; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Direct Contact; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Lead; MCLs; Metals; O&M; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/Regulations; Toluene; Treatment Technology; Vacuum Extraction; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

PURITY OIL SALES, CA
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 6.8-acre Purity Oil Sales site is a former waste oil re-refining facility in the township of Malaga, Fresno County, California. Land use in the area is mixed agricultural, industrial, and residential, with the North Central Canal flowing along the southern border of the site. The town of Malaga surrounds the site at distances of about 1/2 mile or more. From 1934 to 1975, waste oil was re-refined onsite using a number of treatment processes, including clarification, chemical addition, dehydration, distillation, and filtration. During its history, the facility has changed ownership several times, and the property is now in the custody of the state. Oil and by-products from the re-refining process were stored in sumps and tanks and disposed of onsite in unlined pits. In 1973, at the request of the county, Purity Oil backfilled the waste pits with soil but did not remove any of the waste. Recent investigations have revealed that the most highly contaminated soil is in the former waste pit areas and extends from the surface to the ground water, and that the eastern 2.5 acres of the property demonstrates surface soil contamination to a 2-foot depth. In 1986 and 1987, two removal actions were initiated by the state and EPA, which involved removal of 1,800 cubic yards of hazardous materials and 30,000 gallons of waste oil and water from an above-ground tank to be disposed of offsite. A 1989 ROD addressed remediation of the ground water and tanks, as OU1, and provided for the removal of seven above-ground tanks and their contents and allowed private well users downgradient of the site to be connected to city or county water systems. This ROD addresses a final remedy for OU2, the contaminated soil at the site. The primary contaminants of concern affecting the soil, sediment, and debris are VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and pesticides; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes constructing a slurry wall around the perimeter of the site to minimize migration of contaminants; excavating approximately 500 cubic yards of contaminated canal sediment and spreading them over the site; filling the excavated areas with 8,600 cubic yards of imported soil; applying foam to control emissions during excavation and slurry wall construction; transporting and disposing of rubble uncovered during the excavation process offsite, possibly at a RCRA facility; enclosing the entire length of the North Central Canal in a reinforced concrete pipe; treating 72,000 cubic yards of deep soil onsite using a soil vapor extraction (SVE) to remove VOCs; treating air emissions from the SVE process using carbon adsorption, prior to discharge to the air; disposing of spent activated carbon offsite at a permitted RCRA facility; covering the site with a RCRA multi-layer cap, with a retaining wall to support the cap; monitoring ground water; conducting environmental monitoring to ensure the integrity of the cap; and implementing institutional controls, including deed restrictions. The estimated present worth cost for this remedial action is $36,254,000, which includes an annual O&M cost of $741,000 for 9.4 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals were not provided; however, vadose zone monitoring will be performed to ensure that the SVE system is reducing the VOC mass so that it no longer threatens to contaminate ground water at levels above SDWA MCLs.

INSTITUTIONAL CONTROLS:
Institutional controls in the form of deed restrictions will be implemented to protect the cap and prohibit future excavation.

KEYWORDS:
Arsenic; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Air Act; Clean Water Act; Debris; Direct Contact; Dredging; Excavation; Filling; Ground Water Monitoring; Institutional Controls; Landfill Closure; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCE; Pesticides; RCRA; Sediment; Slurry Wall; Soil; Solvents; Solvent Extraction; State Standards/ Regulations; TCE; Toluene; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

PURITY OIL SALES, CA (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: 09/27/89
Lead: Fund
Contaminated Media: Soil, Sediment, Debris
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action

RHONE-POULENC/ZOECON, CA
March 4, 1992

SITE HISTORY/DESCRIPTION:
The 13.19-acre Rhone-Poulenc/Zoecon site is located in East Palo Alto, San Mateo County, California. The site is composed of at least 12 separately owned parcels that include a 5.19-acre former pesticide manufacturing plant, a sludge pond, and a chemical storage facility owned by Sandoz Crop Protection Corporation. From the late 1950's to the early 1970's, another parcel at the site, called the Call-Mac Property, was used to store hazardous waste drums some of which were leaking. Land use in the area is mostly industrial with some mixed commercial and residential use within one-fourth mile of the site. The site is located approximately 2,000 feet from San Francisco Bay within the 100-year coastal floodplain, and is bounded on the east and southeast by tidal and nontidal marshes (wetlands). Surface and subsurface drainage affect surface and ground water that has numerous existing and potential beneficial uses. From 1929 to 1972 until Zoecon Corporation purchased the site, pesticides containing arsenic were manufactured and packaged onsite. In 1980, an investigation by the new site owners revealed severe contamination of soil and ground water with arsenic, which resulted from improper handling of pesticides during unloading. In 1981, the state directed the removal of 1,300 drums and 25 cubic yards of contaminated soil from the Call-Mac Property. From 1985 to 1987, ground water monitoring wells and fencing around contaminated soil were installed. In 1991, the state required removal of approximately 4,000 cubic yards of contaminated soil; however, the Sandoz parcel is currently a state-permitted RCRA facility for the storage and disposal of hazardous wastes. This ROD addresses the contaminated soil and ground water in the upland operable unit. A future ROD will address remediation of the wetlands operable unit. The primary contaminants of concern affecting the soil, debris, and ground water are metals, including arsenic and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating and removal of any offsite soil from areas at the Sandoz and Bains properties with arsenic levels greater than 5,000 mg/kg; removing or paving over soil for properties other than Sandoz and Bains, with arsenic levels greater than health-based levels of 70 mg/kg; treating soil at the Sandoz and Bains properties contaminated with arsenic levels greater than 500 mg/kg onsite using silicate stabilization; excavating and treating contaminated soil from beneath onsite structures after future demolition using stabilization; installing a slurry wall and dewatering around an area of approximately 76,800 cubic yards of arsenic-contaminated soil and the ground water remaining after soil remediation; installing a cap and liner on the currently unpaved portions of the Sandoz property, the Bains railroad track area, and portions of the adjacent properties; monitoring ground water with a contingency that, if arsenic exceeds 40 ug/l in perimeter wells or background levels in the deep aquifer, ground water treatment will be performed to contain the plume; and implementing institutional controls including deed restrictions for the Sandoz and Bains properties and other areas where paving is selected. The estimated present worth cost for this remedial action is $9,100,000, which includes a total O&M of $1,100,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
The chemical-specific clean-up standard for soil is based on the health-based standard for arsenic 300 mg/kg. Ground water is based on state and SDWA MCLs for arsenic 50 ug/l.

INSTITUTIONAL CONTROLS:
Institutional controls, including deed restrictions, will be implemented to prohibit future residential use.

KEYWORDS:
Arsenic; Background Levels; Capping; Carcinogenic Compounds; Clean; Water Act; Contingent Remedy; Debris; Deferred Decision; Direct Contact; Excavation; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Landfill Closure; Lead; MCLs; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Plume Management; RCRA; Safe Drinking Water Act; Slurry Wall; Soil; Solidification/ Stabilization; State Standards/Regulations; Treatability Studies; Treatment Technology; Wetlands.

RHONE-POULENC/ZOECON, CA (Continued)

March 4, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, Debris, GW
Major Contaminants: Metals
Category: Source Control - Final Action
Ground Water - Final Action

SACRAMENTO ARMY DEPOT (OPERABLE UNIT 3), CA

December 9, 1991

SITE HISTORY/DESCRIPTION:

The 485-acre Sacramento Army Depot (SAAD) is a U.S. Army support, service, and storage facility located approximately 7 miles southeast of the City of Sacramento, California. Land use in the area is predominantly commercial and light industrial, with residential areas located mainly to the west. An estimated 56,000 people obtain water from a deep aquifer that is not considered to be contaminated by the facility. However, some wells in the surrounding area draw water from the upper aquifers. Past and present activities conducted at SAAD include electro-optics equipment repair, the emergency manufacture of parts, shelter repair, and metal treating. The primary waste-generating activities included metal-plating and painting. In conjunction with these activities, SAAD maintains several above- and below-ground storage tanks, some unlined lagoons and burn pits, a battery disposal area, a firefighter training area, and a pesticide mixing area. As a result of a late 1970's U.S. Army initiative, a 1981 onsite investigation of SAAD revealed multiple chemical contamination from numerous sources within the facility. Ground water remediation was addressed in a previous ROD. In the past, Tank 2 was used as a waste solvent underground storage tank. In 1980, the tank was emptied, and in 1986 the tank was removed. Sampling and analysis of the soil under and around the tank showed that solvent contamination was confined to the soil well above ground water level (aquifer). A 1989 ROD addressed contaminated ground water associated with onsite burn pits. This ROD addresses the final remedial action for approximately 1,000 cubic yards of contaminated soil associated with Tank 2 (OU3). Future RODs will address contamination occurring at the oxidation lagoons, the burn pits, the pesticide mixing area, the battery disposal well, building #320 leach field, and the firefighter training area. The primary contaminants of concern affecting the soil are VOCs, including PCE and xylenes; and other organics, including PAHs and pesticides.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes constructing and installing an onsite soil vapor extraction system to remove VOCs from contaminated soil; dehumidifying the air stream and treating the collected water vapor using UV/hydrogen peroxide; treating air emissions using granular activated carbon and transporting the residual carbon offsite for recycling and treatment; monitoring air emissions during the treatment process; and sampling media after 6 months to determine compliance with clean-up standards. The estimated present worth cost for this selected remedial action is $614,414. No O&M costs are associated with this selected remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up levels are based on health-based criteria of reducing the noncarcinogenic HI to approximately 1 and include 2-butanone (MEK) 1.2 mg/kg; ethylbenzene 6 mg/kg; PCE 0.2 mg/kg; and total xylenes 23 mg/kg.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Monitoring; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Air Act; Clean Water Act; Direct Contact; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; PAHs; PCE; Pesticides; RCRA; Safe Drinking Water Act; Soil; Solvents; State Standards/ Regulations; Treatability Studies; Treatment Technology; Vacuum Extraction; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: 09/29/89, 12/09/91
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action

SACRAMENTO ARMY DEPOT (OPERABLE UNIT 4), CA
September 30, 1992

SITE HISTORY/DESCRIPTION:
The 485-acre Sacramento Army Depot (SAAD) site is a military facility in Sacramento County, California. Land use in the area is predominantly commercial and light industrial, with wetlands in the vicinity of several oxidation lagoons. The estimated 56,398 people who live within 2 to 3 miles of the site use municipal water as their drinking water supply. From 1950 to 1972, the lagoons received mostly industrial waste water from metal plating processes and domestic wastewater. Domestic wastewater was treated in the sewage treatment plant prior to discharge to the lagoons. Concentrated, untreated rinse water generated by metal plating operations was diluted with large volumes of water and then directed to the lagoons. Since the Army began investigating possible contamination at SAAD, eight operable units have been identified that may require remediation. This operable unit (OU4) consists of four lagoons, several drainage ditches, and the neighboring Old Morrison Creek. As a result of a 1981 investigation by the Army and the state, VOCs were detected in ground water and 11 heavy metals up to concentrations of 10,900 mg/kg were found in the oxidation lagoon pits. A 1989 ROD addressed OU1, the ground water, and a 1991 ROD addressed contaminated soil at Tank 2. This ROD addresses OU4, the metal-contaminated soil at the oxidation lagoons. Future OUs will address other potential risks posed by the site and a final ROD will comprehensively address all contaminated areas at SAAD. The primary contaminants of concern affecting the soil are metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes excavating and treating approximately 15,500 cubic yards of contaminated soil onsite using soil washing; dewatering and then backfilling the treated soil onsite in the excavation areas, and storing the rinsate temporarily in onsite holding tanks for recycling; treating rinsate from the treatment process using chemical precipitation, clarification/flocculation, and chemical coagulation to remove metals, prior to discharge into the sanitary sewer; dewatering the sludge containing the precipitated metals, and stabilizing this if necessary, followed by disposal in a RCRA landfill or recovery at an offsite reclamation unit. The estimated present worth cost for this remedial action is $5,020,000. There are no O&M costs associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil clean-up goals are based on PHE for the primary metals of concern including arsenic 5 mg/kg; cadmium 40 mg/kg; and lead 174 mg/kg. A treatability variance from LDR requirements is likely. Achievable treatment levels will be set by field pilot tests employing the selected technology.

INSTITUTIONAL CONTROLS:
Not Provided.

KEYWORDS:
Arsenic; Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Excavation; Lead; Metals; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; RCRA; Soil; Soil Washing/ Flushing; Solidification/Stabilization; State Standards/Regulations; Temporary Storage; Treatability Studies; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 09/28/89, 12/09/91
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: Metals
Category: Source Control - Interim

WESTINGHOUSE ELECTRIC (SUNNYVALE PLANT), CA

October 16, 1991

SITE HISTORY/DESCRIPTION:

The 75-acre Westinghouse Electric (Sunnyvale Plant) site is an active industrial facility located in Sunnyvale, Santa Clara Valley, California. The site currently manufactures steam generators, marine propulsion systems, and missile-launching systems for the U.S. Government. The area around the site has been developed for light industrial, commercial, and residential uses. A building (Building 21) used for transformer manufacturing exists onsite. In the mid-1950s, Westinghouse Electric (Sunnyvale Plant) manufactured transformers containing both Inerteen, which is a dense, non-aqueous phase liquid (DNAPL) consisting of PCBs and trichlorobenzene, and mineral oil as thermal insulating fluids. The storage and use of Inerteen and mineral oil resulted in contamination of soil and two shallow aquifers beneath the site. In addition, general handling practices and the onsite use of Inerteen as a weed killer resulted in the release of PCBs into soil. In 1981, Westinghouse conducted site investigations. In 1984 and 1985, Westinghouse, under state orders, removed PCB-contaminated soil along fence lines and railroad spurs. During these investigations, evidence of fuel hydrocarbon leakage to soil and ground water was discovered coming from two underground fuel tanks. One tank was removed under state orders, and the remaining tank is slated for removal during the remedial action phase of site work. This ROD addresses remediation of the contaminated shallow ground water and soil, which pose the primary risks at the site. The primary contaminants of concern affecting the soil and ground water are PCBs, solvents, and fuel compounds.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating approximately 400 cubic yards of contaminated soil containing greater than 25 mg/kg PCB to a depth of eight feet and incinerating the soil at an offsite federally permitted facility; filling the excavated areas with clean soil and installing an asphalt cap; permanent containment of the shallow contaminated ground water onsite where DNAPLs are detected using extraction; treating contaminated ground water onsite using a technology to be selected during the remediation design phase based on the results of future treatability and bench-scale studies, which may include using phase separation, membrane or carbon filtration, ultraviolet/ chemical oxidation, air stripping, and a carbon polish, with offsite disposal and incineration of any product phase recovered, spent carbon, and/or filtration membranes; discharging the treated ground water onsite unless an alternative end-use for the treated effluent can be implemented; notifying EPA of any future intention to cease operations, abandon, demolish, or perform construction in Building 21; monitoring ground water; and implementing institutional controls including deed and land use restrictions. The estimated present worth cost for this remedial action is $8,263,000, which includes an annual O&M cost of $225,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:

EPA is invoking a waiver of the requirement to meet the MCL for PCB-contaminated ground water in the source area where DNAPL is detected based upon the technical impracticability of remediation. Soil containing greater than 25 mg/kg PCB will be excavated to a depth of 8 feet, based on EPA guidance for PCB remediation at CERCLA sites with restricted access. The 25 mg/kg clean-up standard is a To Be Considered (TBC) criterion. Chemical-specific ground water clean-up goals are based on the more stringent of state or federal SDWA MCLs, including benzene 1 ug/kg (state); TCE 5 ug/kg (federal); toluene 1,000 ug/kg (federal); xylenes 1,750 ug/kg (state); and PCB 0.5 ug/kg (federal).

INSTITUTIONAL CONTROLS:

Deed and land use restrictions will be implemented to prevent well construction in contaminated areas and to restrict excavation below 8 feet where contaminated soil remains.

KEYWORDS:

Air Stripping; ARAR Waiver; Benzene; Capping; Carbon Adsorption; Carcinogenic Compounds; Clean Water Act; Deferred Decision; Direct Contact; Drinking Water Contaminants; Excavation; Filling; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Institutional Controls; MCLs; O&M; Offsite Disposal; Offsite Treatment; Onsite Treatment; Oils; Onsite Containment; Onsite Discharge; Organics; PCBs; Safe Drinking Water Act; Soil; Solvents; State Standards/

WESTINGHOUSE ELECTRIC (SUNNYVALE PLANT), CA (Continued)

October 16, 1991

Regulations; TCE; Toluene; Toxic Substances Control Act; Treatability Studies; Treatment Technology; VOCs; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Enforcement
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics
Category: Source Control - Final Action
Ground Water - Final Action

ARRCOM (DREXLER ENTERPRISE), ID

June 30, 1992

SITE HISTORY/DESCRIPTION:

The 1.2-acre Arrcom (Drexler Enterprise) site is an abandoned waste oil recycling facility located 2.5 miles southwest of Rathdrum, Idaho. The facility is situated in a rural residential area, and there are an estimated eight residences within a one-half mile radius of the site. The site overlies the Spokane Valley-Rathdrum Prairie Aquifer, a sole source for public and private drinking water for approximately 350,000 people. From 1960 to 1982, Arrcom used the site for oil recycling operations, which included an oil/water separation process, a shaking process to facilitate sedimentation, and a heating process for demulsification. Waste oil and recycled oil were stored in 27 tanks and 4 tank trucks. Sludge and waste oils were discarded in three disposal pits on the property or used for dust suppression on the road. In 1982, the site was abandoned, and investigations by EPA later that year revealed soil and waste oils contaminated with high levels of solvents, lead, and PCBs. Emergency response activities were conducted under EPA's removal program between 1983 and 1990. In 1983, 9,700 gallons of waste oils from tanks and 137 cubic yards of contaminated soil were removed offsite. In 1987, 13,225 gallons of waste oils and sludge and 2,000 cubic yards of soil were removed from tanks and onsite disposal pits. Also, in 1990, 1,653 tons of contaminated soil were excavated and sent offsite to hazardous waste incinerators or landfills. Residential ground water wells were sampled and ground water monitoring wells also were installed. This ROD addresses the final remedy for the Arrcom site. Previous removal actions have eliminated the need to conduct any remedial actions at the site. Therefore, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action, which is based on the post-removal soil and ground water sampling, supplemental remedial soil and ground water sampling, and the risk assessment. Removal actions onsite have reduced concentrations of contaminants in the soil to levels that do not pose a risk to human health and the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

BANGOR ORDNANCE DISPOSAL (USN SUBMARINE BASE), WA

December 10, 1991

SITE HISTORY/DESCRIPTION:

The 12-acre Bangor Ordnance Disposal (USN Submarine Base) site is located in the northern portion of the U.S. Naval Submarine Base Bangor (SUBASE) in Kitsap County, Washington. The Site A portion of the site consists of a 6-acre burn area, debris area, and a storm water discharge area. Land use in the area supports limited residential and undeveloped forest land. Site A is located near Hood Canal which borders the SUBASE to the west. The community of Vinland is located approximately 2,000 feet from Site A. Several residents who reside in Vinland use a shallow aquifer as their drinking water supply. Municipal water supplies near the site are obtained from the deeper sea level aquifer. From 1962 to 1975, the Navy used the site to detonate and incinerate various ordnance materials. The site originally consisted of burn mounds, facilities for personnel, fire suppression vehicles and equipment, an incinerator for ammunition, and a blast pit for TNT detonation. Sediments from an ordnance waste water disposal lagoon were disposed of and burned at the site through 1972. Buildings at the site were demolished and burned on site in 1977. Grading and redistribution of soil at the Site A burn area continued through 1984. In 1983 the Navy diverted surface water discharges from the Site A Burn Area to Hood Canal, to minimize contamination to the near town. This was done as a result of investigations conducted by the Navy in 1978. This ROD addresses contaminated soil and ground water at Site A. Future RODs will address an additional six operable units comprising 20 known or suspected hazardous waste sites at SUBASE. The primary contaminants of concern affecting the soil and ground water are organics, including PCBs; metals, including lead; and explosive compounds including TNT, DNT, and RDX.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating and consolidating approximately 7,000 cubic yards of ordnance-contaminated soil and 100 cubic yards of lead-contaminated soil from Debris Area 2, and modifying the soil, as necessary using mechanical or chemical means to ensure effectiveness of subsequent treatment; treating soil onsite using soil washing, followed by treatment of the process leachate using UV/oxidation, with reuse of the treated water; placing a 1-food soil cover over the residual ordnance-contaminated soil, and revegetating the area; disposing of any treated soil still containing concentrations of lead above the action level offsite at a permitted facility; conducting treatability studies to support final design of the ground water restoration plan; installing approximately eight extraction wells near the Burn Area, pending final design; treating the extracted ground water onsite using UV/oxidation; installing an effluent polishing system, in the event that ground water treatment is inadequate; discharging the treated water onsite; and monitoring ground water. The estimated present worth cost for this remedial action is $2,700,000. No O&M cost was provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil clean-up goals are based on state standards and include TNT 33 mg/kg; DNT 1.5 mg/kg; RDX 9.1 mg/kg; lead 250 mg/kg. Chemical-specific ground water clean-up goals are based on state standards and include DNT 0.1 ug/l; RDX 0.8 ug/1; lead 15 ug/l; phthalates 4 ug/l; and PCBs 0.1 ug/l.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carcinogenic Compounds; Clean Air Act; Clean Water Act; Deferred Decision; Direct Contact; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Leachate Collection/Treatment; Lead; Metals; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Treatment; Organics; PCBs; Soil Washing/Flushing; Soil; State Guidance; State Standards/Regulations; Treatability Studies; Treatment Technology.

BANGOR ORDNANCE DISPOSAL (USN SUBMARINE BASE), WA (Continued)

December 10, 1991

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: Organics, Metals, Explosive Compounds
Category: Source Control - Final Action
Ground Water - Final Action

BUNKER HILL MINING AND METALLURGICAL COMPLEX, ID

September 22, 1992

SITE HISTORY/DESCRIPTION:

The Bunker Hill Mining and Metallurgical Complex site, a 21-square-mile area centered around an inactive industrial mining and smelting site, includes the Cities of Kellogg, Page, Pinehurst, Smelterville, Wardner, Shoshone County, Idaho. The inactive several hundred acre industrial complex includes the Bunker Hill mine and mill, a lead and zinc smelter, and a phosphoric acid fertilizer plant. Other site features include the South Fork of the Coeur d'Alene River; an alluvial floodplain bordered by mountains, valleys, and gulches; and vegetated residential areas. In 1886, the first mill for processing lead and silver ore was constructed at the site. In later years, operations were expanded with the addition of a lead smelter; a blast furnace; and electrolytic zinc, sulfuric acid, phosphoric acid, and fertilizer plants. Onsite operations and disposal practices have caused the deposition of metals to offsite areas throughout the valley via airborne particulate deposition; alluvial deposition of tailings dumped in the river; and migration from onsite sources. Initially, most solid and liquid residue from the complex was discharged into the river. When the river flooded, these materials were deposited onto the valley floor and were leached into onsite soil and ground water. Although some industrial wastes were removed and disposed of offsite, thousands of tons of sludge, tailings, flue dust, and other wastes still remain onsite. In 1973, a baghouse fire severely reduced air pollution control capacity at the lead smelter. A 1974 public health study and concurrent epidemiologic and environmental investigations concluded that atmospheric emissions of particulate lead from the active smelter were the primary sources of elevated blood lead levels in local children. In 1977, two tall stacks were added to disperse contaminants from the complex. Smelter operations ceased in 1981, but limited mining and milling operations continued onsite from 1988 to 1991. In 1989, EPA began a removal program to excavate lead-contaminated soil from affected residential properties. Several additional removal actions for source materials were also completed by various PRPs from 1989 to 1991. The site has been divided into several sections for remediation based on population levels: the Hillside Area; Smelterville Flats; Central Impoundment Area (CIA), Page Pond, Smelter Complex; mine operations area, right-of-way within nonpopulat ed areas, and future development areas. A 1991 ROD addressed contaminated residential soil within the populated areas of the site, as OU1; provided for the excavation of soil with lead contamination above 1,000 mg/kg at 1,800 residential properties with disposal at an onsite repository, which was subsequently capped; and provided clean soil and sod to residents. This ROD addresses a final remedy for OU2, the nonpopulated areas of the site and those aspects of the populated areas not addressed by the 1991 ROD. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and surface water are organics, including PCBs; metals, including arsenic and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes revegetating the Hillside Area with less than 50 percent cover; contour terracing eroded hillsides and installing erosion-control structures; re-establishing riparian habitat and mitigating eroding tailings in Smelterville Flats; consolidating jig tailings into CIA; establishing soil barriers in contaminated areas; relocating the A-1 gypsum pond sediment to CIA; capping the A-4 gypsum pond or consolidating it within CIA; removing materials from the 1982 smelter cleanup and consolidating these within the smelter closure; relocating the slag pile to either the CIA or Smelter Complex; removing tailings from the West Page Swamp and consolidating these in Page Pond and capping the pond with residential soil; improving the channels for Humboldt and Grouse creeks; reprocessing, recycling, or treating all principal threat materials, including copper flue dust using cement-based stabilization; removing and recycling salvageable items; demolishing and decontaminating onsite structures; capping the CIA, Lead Smelter, and Zinc Plant with low permeability caps; collecting and treating the CIA, Lead Smelter, and Zinc Plant leachate; treating acid mine drainage from the Bunker Hill mine in the Central Treatment Plant prior to discharge to the wetlands treatment system; closing the onsite solid waste landfills; continuing blood level monitoring for lead and high-efficiency vacuum loan program to site residents; cleaning all homes exceeding 1,000 ppm lead house dust after remedial actions are completed, and developing and implementing an interior dust monitoring program; recovering and treating the

BUNKER HILL MINING AND METALLURGICAL COMPLEX, ID (Continued)
September 22, 1992

ground water in Government Gulch; constructing a passive wetland treatment system in Smelterville Flats and Pinehurst narrows to treat CIA seeps, pretreated acid mine drainage, and ground water and surface water from Government Gulch, as well as leachate from the lead and zinc closure areas, using absorption and precipitation of metals within an anaerobic substrate; constructing a second ground water system and passively treating upper zone ground water to meet discharge limits; abandoning and closing potentially contaminated wells, and providing an alternative source of water for any affected residences not serviced by the municipal water system; continually monitoring the air, surface water, ground water, and biological parameters at the site; and implementing institutional controls including land use restrictions to control future land use, and site access restrictions such as fencing. The estimated present worth cost for this remedial action is $52,035,000, which includes an annual O&M cost of $11,096,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific soil excavation goals, which are based on health-risk levels, include lead 1,000 mg/kg. Soil will be stabilized to meet RCRA LDR standards prior to disposal in CIA, which will be capped. Clean replacement soil will contain less than arsenic 100 mg/kg; cadmium 5 mg/kg; and lead 100 mg/kg. Chemical-specific sediment and debris clean-up levels were not specified; however, materials that cannot be reprocessed or recycled will be stabilized onsite prior to disposal in CIA. Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards and include arsenic 0.05 mg/l; cadmium 0.005 mg/l; lead 0.05 mg/l; and zinc 5 mg/l. Chemical-specific surface water clean-up goals are based on federal water quality criteria under the CWA and include cadmium 0.0011 mg/l; lead 0.0032 mg/l; and zinc 0.110 mg/l.

INSTITUTIONAL CONTROLS:
Institutional controls in the form of land use restrictions and other administrative restrictions will be implemented onsite for those areas where lead concentrations exceed 100 mg/kg.

KEYWORDS:
Air Monitoring; Alternate Water Supply; ARAR Waiver; Arsenic; Asbestos; Biodegradation/Land Application; Capping; Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Deferred Decision; Direct Contact; Drinking Water Contaminants; Floodplain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; Institutional Controls; Landfill Closure; Leachate Collection/Treatment; Lead; MCLs; MCLGs; Metals; Mining Wastes; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PCBs; Public Exposure; RCRA; Relocation; Safe Drinking Water Act; Sediment; Soil; Solidification/ Stabilization; State Standards/Regulations; Surface Water; Surface Water Collection/Diversion; Surface Water Monitoring; Surface Water Treatment; Toxic Substances Control Act; Treatability Studies; Treatment Technology; Wetlands.

SITE SUMMARY

Date of previous RODs: 08/30/91
Lead: Federal Enforcement
Contaminated Media: Soil, Sediment, Debris, GW, SW
Major Contaminants: Organics, Metals, Inorganics
Category: Source Control - Final Action
Ground Water - Final Action

EIELSON AIR FORCE BASE, AK

September 29, 1992

SITE HISTORY/DESCRIPTION:

The 19,700-acre Eielson Air Force Base (EAFB) site, located 26 miles southeast of Fairbanks, Alaska, is primarily a tactical air support installation. The 2-acre Blair Lakes Target Range facility, approximately 25 miles southwest of the main base, has been included in the EAFB site because of its geographical proximity. Land in the surrounding area is used principally for military training associated with Fort Wainwright, and there are few scattered residential and commercial activities close to the base. The communities of Moose Creek, North Pole, and Salcha all lie within a 20-mile radius of the base. The aquifer beneath EAFB, which supplies drinking water to private wells in Moose Creek and North Pole, has been designated a sole-source aquifer. In addition, 70 percent of EAFB and virtually all of the Blair Lakes Target Range are wetlands. Constructed in 1944, EAFB was originally a satellite installation of Fort Wainwright. Used jointly by the Army and Air Force, the site was designated Eielson AFB in 1948. Many industrial operations were conducted at the base, which generated waste oils, contaminated fuels and sludge, and spent solvents and cleansers. During the mid-1980's, the Air Force Installation Restoration Program (IRP) identified 64 potential areas of contamination that were divided into six OUs. This ROD addresses an interim remedy for OU1B to prevent further degradation of the ground water quality by significantly reducing the volume of petroleum product in site soil and free product floating on top of the ground water. OU1B contains four areas: ST20 Refueling Loop E-7 Complex, ST20 Refueling Loop E-9 Complex, ST48 Powerplant Fuel Spill Area, and ST49 Building 1300/SS50-53 Blair Lakes Target Range. A future ROD will address additional source control and final ground water response actions. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, toluene, and xylenes; and oils.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes in-situ bioventing of BTEX contaminated soil in the vadose zone, with monitoring of soil gases; collecting floating petroleum hydrocarbons from the ground water through wells, culverts, or trenches; incinerating recovered product onsite or transporting this offsite for recycling or disposal; treating extracted ground water, as needed, using air stripping, oil-water separation, or carbon filtration, as determined during the remedial design stage; and discharging the residual water onsite; monitoring petroleum product levels; collecting BTEX-LNAPLS using vacuum extraction wells, with carbon adsorption, followed by offsite disposal of carbon residuals; treating collected liquids using an oil and water separator, air stripper, or carbon adsorption; destroying air emissions using tip flare incineration; and monitoring ground water. The estimated capital cost for this remedial action is $3,867, with an annual O&M cost of $3,375 for 5 years.

PERFORMANCE STANDARDS OR GOALS:

No chemical-specific soil and ground water clean-up goals are provided for this interim remedy. Final performance goals will be established in the final remedy for site soil and ground water remediation. All air emissions and effluent discharges generated by this interim remedy will comply with the applicable federal and state environmental regulations.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Benzene; Biodegradation/Land Application; Carcinogenic Compounds; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration/Thermal Destruction; Interim Remedy; O&M; Oils; Offsite Disposal; Onsite Discharge; Onsite Disposal; Onsite Treatment; RCRA; Soil; Sole-Source Aquifer; Solvents; State Standards/Regulations; Toluene; Treatibility Studies; Treatment Technology; Vacuum Extraction; VOCs; Wetlands; Xylenes.

EIELSON AIR FORCE BASE, AK (Continued)

September 29, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Oils
Category: Source Control - Interim
Ground Water - Interim

ELMENDORF AIR FORCE BASE, AK

September 1, 1992

SITE HISTORY/DESCRIPTION:

The 13,130-acre Elmendorf Air Force Base (AFB) site is located adjacent to the municipality of Anchorage, Alaska. Land use on the base includes airfield and base support operations, personnel housing, and recreational facilities. Approximately 1.5 miles south of the base, land use is residential and industrial. Wetlands, lakes, and ponds cover about 1,416 acres of the site. The estimated 8,600 people who reside on the base do not use the shallow aquifer as their drinking water supply. From 1940 to 1991, Elmendorf AFB used a 20-acre portion of the site, referred to as source area ST41, to store the fuel product JP-4 and aviation gasoline in four 1-million gallon underground tanks. As a result of numerous leaks and above-ground spills since the tanks were installed in the 1940s, USAF conducted investigations through its Installation Restoration Program (IRP). These investigations revealed several hundred thousand gallons of fuel in the ground water and soil. Remedial investigation activities in 1988 and 1989 included installing monitoring wells and test trenches. During that time, a concrete dam was installed in an effort to recover fuel from the south seeps. Additional studies conducted in 1990 and 1991 indicated that ground water within an approximate 500-foot radius around ST41 is contaminated. In January 1991, the four tanks and piping were pumped dry and taken out of service. This ROD addresses an interim remedy at Elmendorf AFB. This action is needed to reduce further spread of fuel constituents through the recovery of floating product on the ground water surface, and containment of seeps. Future RODs will include a final remedy for ground water and soil at ST41, as OU2, and will address the other six OUs at the site. The primary contaminants of concern affecting the soil and ground water at ST41 are the compounds in JP-4, especially VOCs such as benzene, toluene, and xylenes, and other organics.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes collecting and containing the floating BTEX-LNAPLs with passive and active recovery systems; using a sump to separate the fuel and water, then recycling the fuel; treating contaminated ground water using air stripping, with discharge of the treated water offsite to a POTW; controlling air emissions from the treatment process using carbon adsorption, and disposing of spent carbon filters offsite; temporarily storing excavated well construction soil onsite; and monitoring ground water. The estimated present worth cost for this remedial action is $467,300, which includes an annual O&M cost of $27,500.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs and will be provided in the final ROD for the OU2 source area ST41.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Air Stripping; Benzene; Carbon Adsorption (GAC); Carcinogenic Compounds; Clean Water Act; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; O&M; Offsite Discharge; Offsite Disposal; Onsite Containment; Onsite Treatment; Organics; Publicly Owned Treatment Works (POTW); RCRA; Soil; State Standards/ Regulations; Temporary Storage; Toluene; VOCs; Wetlands; Xylenes.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics
Category: Source Control - Interim
Ground Water - Interim

FORT LEWIS (LANDFILL NO. 5), WA

July 10, 1992

SITE HISTORY/DESCRIPTION:

The 180-acre Fort Lewis (Landfill No. 5) site is located on the west side of the 86,000-acre Fort Lewis Military Reservation in Pierce County, Washington. Ground water is used as the source of the municipal water supply; however, supply wells are not affected by the site. From 1967 to 1990, the landfill accepted 77,000 tons per year of mixed municipal, industrial, commercial, and residential waste and 188,000 cubic yards per year of demolition waste from the Fort Lewis Military Reservation, the VA Medical Center, and McChord Air Force Base. Dewatered sludge from the Fort Lewis Sewage Treatment Plant was also disposed onsite. Initially, waste was placed in trenches running north to south, which were covered with soil in 1971. Subsequently, until 1990, site trenches running east to west were used for disposal. In 1985, as part of the closure procedures for the inactive portions of Landfill No. 5, the Army covered the east-west trenches with a multi-layer cap. Ground water modeling conducted from 1980 to 1984 revealed that contaminant concentrations in the ground water did not exceed regulatory standards and will decrease over time because the cap will reduce leachate production. This ROD addresses a final remedy for the inactive portions of the landfill. Recent investigations by the Army indicate that conditions at the site currently pose no unacceptable risks to human health or the environment; therefore, there are no primary contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action; however, onsite ground water monitoring will continue in accordance with state and local solid waste landfill operating and closure requirements. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

JOSEPH FOREST PRODUCTS, OR
September 30, 1992

SITE HISTORY/DESCRIPTION:

The 18-acre Joseph Forest Products (JFP) site is a wood-processing facility in the City of Joseph, Wallowa County, Oregon. Land use in the area is predominantly industrial and agricultural. The City of Enterprise uses two springs located 4,000 feet from JFP to serve as its municipal water supply. In 1974, and again from 1977 to 1985, Joseph Forest Products, Inc., used the site as a lumber mill, processing wood into lumber products. Structures located on the facility include a sawing facility, a wood treating facility and an adjacent drip pad, a drying building, a pumphouse, and maintenance facilities. Wood treatment operations consisted of mixing a concentrated preservative paste with water and treating lumber products with the mixture of chromium, copper, and arsenic (CCA) in a retort. Process wastes, including wood chips, sludge, and other materials remaining in the retort, were removed periodically and placed in a cement pit adjacent to the treatment building. In 1974, the treatment building and surrounding buildings were destroyed by fire. During fire-fighting operations approximately 200 gallons of contaminated treatment paste and 3,000 gallons of treatment solution were released into the soil. It is estimated that more than 160,000 pounds of CCA preservative concentrate were used at the site between 1978 and 1985. As a result of a 1984 state investigation that identified elevated levels of metals, EPA conducted a site inspection, which revealed metal contamination in surface water and soil. In 1985, a state enforcement action instructed JFP to ship eleven 55-gallon drums of waste material to an offsite hazardous waste landfill. In 1991, during EPA's remedial investigation, a removal action involved excavation and offsite disposal of highly contaminated soil. This ROD addresses a final remedy for the excavation and disposal of contaminated soil and debris remaining onsite. The primary contaminants of concern affecting the soil and debris are metals, including arsenic, chromium, and lead; and inorganics, including asbestos.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes demolishing contaminated onsite structures, including the process, storage, and mixing tanks, and the wooden structures and concrete slabs, followed by offsite disposal; decontaminating the concrete drip pad and tanks, followed by recycling or offsite disposal of debris; excavating surface and subsurface soil, with screening and segregation of hazardous waste for offsite disposal, with stabilization, if necessary, prior to disposal at appropriate facilities; backfilling any excavated areas; removing asbestos from the facility, with offsite disposal; removing underground storage tanks and any associated contaminated soil, with scrapping or offsite disposal; monitoring ground water; and implementing institutional controls, including deed and land use restrictions or environmental notices. The estimated capital cost for this remedial action is $550,000, with an annual O&M cost of $24,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS:

Excavation goals for soil/debris are based on EPA's risk standards of 10^{-5} for surface soil and 10^{-4} for subsurface soil. Chemical-specific goals for subsurface soil include arsenic 36 mg/kg; chromium 1,351 mg/kg; and copper 10,000 mg/kg. Subsurface soil goals include arsenic 336 mg/kg; chromium 1,351 mg/kg; and copper 10,000 mg/kg.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to ensure appropriate consideration of site conditions in future land use decisions.

KEYWORDS:

Arsenic; Asbestos; Background Levels; Carcinogenic Compounds; Chromium; Clean Air Act; Debris; Decontamination; Direct Contact; Excavation; Filling; Ground Water Monitoring; Inorganics; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; RCRA; Safe Drinking Water Act; Sediment; Soil; Solidification/Stabilization; State Standards/Regulations; Treatment Technology.

JOSEPH FOREST PRODUCTS, OR (Continued)

September 30, 1992

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Soil, Debris
Major Contaminants: Metals, Inorganics
Category: Source Control - Final Action

MCCHORD AFB (WASH RACK/TREATMENT), WA

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 4,600-acre McChord Air Force Base (AFB) is located in Pierce County, Washington. The site contains a 22-acre parcel of land, referred to as the Site 54 Washrack Treatment Area (WTA), which contains weapon and aircraft maintenance facilities. Land use in the area is associated with industrial and operational activities at the AFB. The WTA is located east of Clover Creek, a perennial stream that provides the only surface water drainage for McChord AFB. There are no drinking water supply wells in the immediate vicinity of the WTA. Site features included a former washrack, two leach pits, an oil/water separator (skimmer), and storm drainage infiltration ditches. The site has been utilized for airfield industrial activities, including draining fuel and washing airplanes. In 1981, the Department of Defense Installation Restoration Program was initiated onsite to identify the location and contents of past disposal sites. Through both record searches and the use of aerial photographs dating from 1957 to 1985, several site areas, including Sites 54 and 60, were identified as waste spill and disposal areas. Floating fuel was identified as underlying a 300,000-square-foot area of the site, which resulted from unrecorded spills. This ROD addresses remediation of the excavated soil and the NAPL-contaminated ground water at Site 54. The primary contaminants of concern affecting the soil and ground water are VOCs; other organics, including oils; and metals, including lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes excavating, consolidating, and treating fuel-contaminated soil onsite with ex-situ bioremediation, then backfilling the treated soil into an onsite trench; installing passive subsurface extraction trenches to collect LNAPLs, with onsite separation using fuel skimmers (oil/water separator); transporting the recovered fuel offsite in drums to either a recycling facility, if specifications are met, or to a permitted disposal facility; conducting long-term ground water monitoring; and implementing institutional controls, including deed and ground water use restrictions, as well as site physical controls. The estimated present worth cost for this remedial action is $640,000, which includes an annual O&M cost of $54,000 for years 0-1, $23,000 for the years 3-5, and $22,000 for years 6-25.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs, MTCA Method A, and background levels, and include soil clean-up levels total petroleum hydrocarbons 1,000 ug/l (MTCA Method A); and lead 11 ug/l (background).

INSTITUTIONAL CONTROLS:

Institutional controls, including deed and ground water use restrictions, will be implemented to restrict access to contaminated media.

KEYWORDS:

Background Levels; Biodegradation/Land Application; Carcinogenic Compounds; Direct Contact; Excavation; Filling; Ground Water; Ground Water Monitoring; Institutional Controls; Lead; Metals; MCLs; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Disposal; Onsite Treatment; Organics; Safe Drinking Water Act; Soil; Solvents; State Standards/ Regulations; Treatment Technology; VOCs.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Soil, GW
Major Contaminants: VOCs, Other Organics, Metals
Category: Source Control - Final Action
Ground Water - Final Action

MOUNTAIN HOME AIR FORCE BASE, ID

June 16, 1992

SITE HISTORY/DESCRIPTION:

The 7-acre Mountain Home Air Force Base (AFB) site is a fire department training area located in Mountain Home, Elmore County, Idaho. Land use in the area is predominantly rural and agricultural. An estimated 6,990 people residing within 0.6 mile of the site and several farmers in the vicinity use ground water to irrigate agricultural lands. From 1962 to 1975, the Mountain Home Air Force Base used the site for fire department training exercises. From 1962 to 1975, the fuel used in the fire training exercises was either clean fuel AVGAS or JP-4, or fuels from flight line defueling operations. Since 1975, only clean JP-4 has been used in the exercises. Each exercise began by saturating the bermed training area with water, followed directly by applying 250 to 500 gallons of fuel. The flames were extinguished with Aqueous Film Forming Foam (AFFF), or prior to 1972, with a water-based protein foam. The training session was completed with a post-exercise ignition of the residual fuel in a bermed area. The USAF investigations identified solvents and petroleum, oil, lubricant (POL) wastes in the soil. Under the Installation Restoration Program (IRP), the USAF conducted a record search, drilling, and sampling of soil borings to bedrock, the installation of monitoring wells, and hand auger samples. Corrective measures that were taken included placing warning signs, deactivating the burn pit in 1986, and installing ground water monitoring wells. This ROD provides a final remedy for onsite soil as OU4. Future RODs will address ground water contamination as a separate operable unit. Because contaminants were found at such low concentrations, the soil was covered by crushed asphalt and has little potential to impact ecological receptors. The soil poses low risks for humans at the site and no remediation is necessary. Therefore, there are no contaminants of concern at the site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site is no further action. Based on the results of the human health risk assessment the USAF, EPA, and the state have determined that chemicals remaining in the soil pose no unacceptable risks to human health or the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

N.A.S. WHIDBEY ISLAND - AULT FIELD, WA

April 21, 1992

SITE HISTORY/DESCRIPTION:

The Naval Air Station (NAS) Whidbey Island - Ault Field site, a multiple use waste disposal area, is located on a 260-acre active airbase northeast of the City of Oak Harbor, Island County, Washington. The northwest sector of the airbase, known as Area 6, maintains and provides support to naval aircraft and aviation facilities. Land use in the surrounding area is predominately residential and wooded, with wetlands located in and around the site. Area 6 is a ground water recharge zone that overlies three major aquifers. The uppermost unconfined aquifer was found to be contaminated from past site disposal practices. From 1969 to 1988, hazardous wastes were dumped and stored at various pits, trenches, and landfills located in Area 6. Past disposal at these sites included approximately 2.2 million gallons of liquids and sludge; 300,000 to 700,000 gallons of acids and solvents; an estimated 100,000 to 600,000 gallons of oily sludge; and unknown quantities of waste oils, asbestos, and hazardous wastes. Studies conducted at the site by the Navy and EPA revealed solvents, VOCs, oily wastes, acids, and asbestos in ground water and soil. This ROD addresses interim remediation of the ground water to prevent the spread of the contamination plume in the aquifer to drinking water wells while other locations on the airbase are evaluated. Future RODs will address final remedial actions for ground water. The remaining operable units will address the waste areas and associated soil contamination at this site. The primary contaminants of concern affecting the ground water are VOCs, including TCE; and metals, including chromium and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes containing the solvent contaminated ground water using extraction, followed by onsite treatment using metal precipitation, air stripping, and carbon adsorption, and reinjecting the treated water into the affected aquifer; and monitoring ground water. The estimated present worth cost for this remedial action is $2,201,000, which includes a total O&M cost of $1,230,000 for 3 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals are based on SDWA MCLs and State Model Toxics Control Act (MTCA) and include TCE 4 ug/l (MTCA); 1,1,1-TCA .5 ug/l; 1,1-DCA 200 ug/l (MTCA); 1,1-DCE 0.07 ug/l (MTCA); 1,2-DCE 70 ug/l (MTCA); vinyl chloride 0.02 ug/l (MTCA); carbon tetrachloride 0.3 ug/l (MTCA); chromium 80 ug/l (MTCA); and lead 4 ug/l (MTCA). Because this action does not constitute a final remedy for the ground water, subsequent actions will fully address risks posed by conditions at this operable unit.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Air Stripping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; Interim Remedy; Lead; MCLs; MCLGs; Metals; O&M; Onsite Discharge; Onsite Treatment; Pesticides; Plume Management; RCRA; Safe Drinking Water Act; Solvents; State Standards/Regulations; TCE; VOCs; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Metals
Category: Ground Water - Interim

PACIFIC HIDE & FUR RECYCLING (AMENDMENT), ID

April 29, 1992

SITE HISTORY/DESCRIPTION:

The 17-acre Pacific Hide & Fur Recycling site is located in Pocatello, Bannock County, Idaho. From the 1950's until 1979, McCarty's Inc. operated a recycling business which primarily accepted scrap metals, including batteries, transformers, and capacitors filled with PCB oils, which were stored on-site on the excavated pit floor. A 1988 ROD addressed source control using excavation and immobilization with a provision for onsite containment if the remedy proved unworkable. Prior to implementation of this remedy, a bench-scale treatability determined that the remedy failed to meet several important performance criteria and tentatively identified the presence of lead above onsite health-based levels. EPA planned to implement the alternate remedy, onsite containment; however, upon further review, EPA found that the design requirements of the alternate remedy, as documented in the ROD, did not comply with federal regulations and determined that construction of an on-site containment cell would not be feasible because this remedy could significantly interfere with future cleanup of on-site, Pb-contaminated soil. In order to remediate the PCB-contaminated soil in a timely and protective manner, EPA evaluated other alternatives to the on-site containment remedy. This 1992 ROD amendment addresses remediation of the PCB-contaminated areas, as well as areas contaminated with commingled lead and PCBs with a revised remedy. EPA is continuing to evaluate the nature and extent of lead, and possible other contaminants at the site and may specify additional clean-up activities, as necessary, under separate operable unit remedial actions. The primary *contaminants of concern* affecting the soil and debris are organics, including PCBs; and metals, including lead.

SELECTED REMEDIAL ACTION:

The amended remedial action for this site includes excavating, processing, transporting, and offsite disposal of approximately 8,200 cubic yards of PCB-contaminated and commingled PCB/lead-contaminated soil as follows: excavation and offsite disposal of approximately 6,500 cubic yards of untreated PCB-contaminated soil; treating approximately 900 cubic yards of contaminated soil commingled with over 25 mg/kg PCB and lead levels exceeding 5 mg/kg, using solidification, followed by offsite disposal in a permitted, hazardous waste facility; treating approximately 100 cubic yards of PCB-, lead-, and halogenated organic compound (HOC)-contaminated waste using offsite incineration, followed by solidifying and disposing of the ash offsite; decontaminating, stockpiling onsite, and covering approximately 700 cubic yards of debris for possible future salvage and recycling; and backfilling, grading, and restoring the surface site drainage. The estimated present worth cost for this remedial action ranges from $2,360,500 to $2,429,000. There is no O&M cost associated with the remedial action.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific soil excavation goals are based on RCRA hazardous waste and characterization regulations and TSCA PCB regulations, and include HOCs 1,000 mg/kg; lead 5 mg/kg (TCLP); and PCBs 25 mg/kg.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Carcinogenic Compounds; Clean Air Act; Clean Water Act; Debris; Decontamination; Direct Contact; Excavation; Filling; Incineration/Thermal Destruction; Leachability Tests; Lead; Metals; O&M; Offsite Disposal; Offsite Treatment; Oils; Onsite Disposal; Onsite Treatment; Organics; PCBs; RCRA; ROD Amendment; Soil; Solidification/Stabilization; State Standards/Regulations; Temporary Storage; Toxic Substances Control Act; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 06/28/88
Lead: Federal Enforcement
Contaminated Media: Soil, Debris
Major Contaminants: Organics, Metals
Category: Source Control - Final Action

PESTICIDE LAB - YAKIMA, WA

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 10-acre Pesticide Lab - Yakima site is located at the Yakima Agricultural Research Laboratory (YARL) in Yakima, Yakima County, Washington. The YARL occupies approximately 15 percent of the total site area, and the remainder is used for cultivation of row crops and fruit trees. Land use in the area is predominantly residential, and several residences south of the site obtain drinking water from private wells. The YARL, which has operated since 1961, develops insect control technologies to benefit fruit and vegetable agriculture in the Pacific Northwest. Wastes generated at the site consist of a wide variety of pesticide mixtures; rinsates from the cleaning of sprayers and other equipment; and solvents. The site contained a septic tank, disposal pipe, washdown pad, and drainfield system used for the discharge of dilute pesticide compounds. In 1980, YARL received interim status under RCRA; however, in 1983, unpermitted discharges led to EPA investigations that revealed evidence of soil and potential ground water contamination from leaching of contaminants through the highly permeable sand and gravel. In 1988, YARL removed the drainfield, sampled soil and ground water, and compiled monitoring information from four wells that had been installed that same year. In 1990, three additional wells were added to further facilitate ground water assessment. A RCRA Closure Plan, which was approved in 1990, provided for the removal and disposal of the septic tank contents, excavation and removal of the tank itself, washdown pad removal, additional background soil sampling, excavation and removal of contaminated soil to obtain clean-up levels, conformational soil sampling around the removed structures, installation of the three ground water monitoring wells, and 1 year of ground water sampling. Because all waste residues, contaminated soil, and subsoil have been removed or decontaminated pursuant to RCRA Clean Closure regulations, there are no contaminants of concern affecting this site.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes no further action with ground water monitoring for 1 year. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Ground Water Monitoring; No Action Remedy.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Not Applicable
Major Contaminants: Not Applicable
Category: No Action

UMATILLA ARMY DEPOT (LAGOONS), OR
September 25, 1992

SITE HISTORY/DESCRIPTION:
The Umatilla Army Depot (Lagoons) site is located in the center of the 19,700-acre U.S. Army Depot Activity, Umatilla (UMDA), 5 miles west of Hermiston, in Morrow and Umatilla Counties, Oregon. This installation was established in 1941 as an Army Ordnance Depot to store and handle munitions. Land use in the surrounding area is primarily agricultural. Approximately 1,470 wells have been identified within a 4-mile radius of UMDA, the majority of which are used for domestic and irrigation water. Three municipal water systems also draw from ground water within that same radius. From the 1950's through 1965, UMDA operated an onsite explosives washout plant, which processed munitions to remove and recover explosives using a pressurized hot water system. Plant operations included flushing and draining the explosives washout system, and wash water was discharged via an open metal trough to two infiltration lagoons, known as the explosive washout lagoons, located to the northwest of the plant. The lagoons were constructed in the 1950's and utilized until 1965, when plant operations and all discharges to the lagoon ceased. An estimated 85,000,000 gallons of effluent were discharged to the lagoons during plant operations. Investigations performed by the Army in the late 1970's to evaluate past use, storage, treatment, and disposal of toxic materials revealed contamination in the soil and shallow aquifer beneath the lagoons. The facility has been divided into 8 operable units for remediation. This ROD provides a final remedy for the soil present at the lagoons. A future ROD will address contaminated ground water beneath the lagoons and 6 remaining RODs will address remaining portions of the UMDA installation. The primary contaminants of concern affecting the soil are explosives, including DNB, 2, 4-DNT, HMX, NB, TNB, TNT, and RDX.

SELECTED REMEDIAL ACTION:
The selected remedial action for this site includes developing a composting facility onsite; constructing a roadway between the lagoons and the onsite composting facility to transport the excavated and treated soil; excavating to a 5-foot depth, approximately 6,800 tons of contaminated soil with concentrations of TNT or RDX exceeding 30 mg/kg; treating the soil onsite using ex-situ bioremediation via composting; backfilling the excavated lagoon areas with the compost, then covering the compost with a 2-foot layer of clean soil and grading and revegetating the area. The estimated present worth cost for this remedial action is $1,870,000, which includes an estimated total O&M cost of $1,084,000 over 2 years.

PERFORMANCE STANDARDS OR GOALS:
Chemical-specific excavation goals for soil are based on risk-based remedial action criteria (RAC) and include TNT 30 mg/kg (RAC) and RDX 30 mg/kg (RAC). These levels correspond to an excess cancer risk under the industrial use scenario of $7x10^{-6}$, which is within the range of acceptable cancer risks.

INSTITUTIONAL CONTROLS:
Not provided.

KEYWORDS:
Biodegradation/Land Application; Capping; Carcinogenic Compounds; Direct Contact; Excavation; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Organics; Soil; State Standards/ Regulations; Treatability Studies; Treatment Technology.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: Soil
Major Contaminants: Explosives
Category: Source Control - Final Action

U.S. DOE IDAHO NATIONAL ENGINEERING LAB (OPERABLE UNIT 2), ID

September 28, 1992

SITE HISTORY/DESCRIPTION:

The 890-square-mile U.S. DOE Idaho National Engineering Laboratory (INEL) is located 32 miles west of Idaho Falls, Idaho. The site, established in 1949, is operated as a nuclear reactor technology development and waste management facility by the U.S. Department of Energy. Land use in the area is predominantly industrial and mixed use. The site overlies a sole source Class I aquifer, the Snake River Plain Aquifer. A 10-mile-square area within the INEL complex, referred to as Test Area North (TAN), was built in the 1950's to support the Aircraft Nuclear Propulsion Program sponsored by the U.S. Air Force and Atomic Energy Commission. Within TAN, the Technical Support Facility (TSF-05) injection well was used to dispose of industrial and sanitary wastes and wastewaters from 1953 to 1972. Types of wastes disposed of in the well included low-level radioactive and process wastes, corrosive wastewater, ignitable wastes, chromium, lead, and mercury. Contaminants, including TCE, PCE, tritium and strontium-90, were first detected above MCLs in the ground water in 1987. Based on these results, a RCRA Corrective Action Program was subsequently developed to address ground water contamination at TAN, which included installation of an air sparging system in the water supply tank at the TSF to ensure that organic contaminant concentrations remain below regulatory levels. Ground water sampling and monitoring continued through 1990, and contaminated sludge from the lower 55 feet of the TSF-05 injection well was removed and analyzed in 1990. Currently, the TSF-05 injection well is closed securely and locked, and the well head has been sealed against surface water intrusion. The INEL site is divided into 10 Waste Area Groups (WAGs). Two RODs in 1991 and 1992 addressed an interim remedy for Warm Waste Pond sediment in WAG 2 and an interim remedy for unexploded ordnance and soil contamination in WAG 10. This ROD provides an interim remedy for ground water contamination near the TSF-05 injection well (WAG 1). The primary contaminants of concern affecting the ground water are VOCs, including TCE and PCE; metals, including lead; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes pumping the contaminated ground water from the injection well and treating the ground water onsite using filtration to remove suspended solids, followed by air stripping and carbon adsorption to remove organics, and ion exchange to remove inorganics and radionuclides; modifying the existing TAN onsite disposal pond to receive treated ground water and ensure that it does not exceed discharge limits; transporting any spent carbon offsite to a permitted facility for regeneration; installing two additional ground water monitoring wells within the contaminant plume; monitoring air emissions; and implementing administrative and institutional controls, including ground water use restrictions. The estimated capital cost for this remedial action is $7,715,000, with a total O&M cost of $3,194,000 for 2 years.

PERFORMANCE STANDARDS OR GOALS:

Chemical-specific ground water clean-up goals, which are based on SDWA MCLs, and include TCE 5 ug/l; PCE 5 ug/l; lead 50 ug/l; and strontium-90 300 pCi/l. Air emissions also will be monitored and will not exceed state air quality standards, which include TCE 0.00051 lb/hr, PCE 0.013 lb/hr, lead 1.5 ug/m^3; and strontium-90 10 mrem/yd.

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented at the site to restrict ground water use during these interim remedial activities.

KEYWORDS:

Air Monitoring; Air Stripping; Carbon Adsorption; Carcinogenic Compounds; Clean Air Act; Direct Contact; Drinking Water Contamination; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Interim Remedy; Lead; MCLs; Metals; O&M; Offsite Disposal; Offsite Treatment; Onsite Discharge; Onsite Treatment; PCE; Radioactive Materials; Safe Drinking Water Act; Sole Source Aquifer; Solvents; State Standards/ Regulations; TCE; Temporary Storage; Treatment Technology; VOCs.

U.S. DOE IDAHO NATIONAL ENGINEERING LAB (OPERABLE UNIT 2), ID (Continued)

September 28, 1992

SITE SUMMARY

Date of previous RODs: 12/05/91, 06/02/92
Lead: Federal Facility
Contaminated Medium: GW
Major Contaminants: VOCs, Metals, Radioactive Materials
Category: Ground Water - Interim

U.S. DOE IDAHO NATIONAL ENGINEERING LAB (OPERABLE UNIT 5), ID

December 5, 1991

SITE HISTORY/DESCRIPTION:

The Idaho National Engineering Laboratory (INEL), located 32 miles west of Idaho Falls, Idaho, occupies 890 square miles of the Eastern Snake River Plain. Land use at the INEL is industrial and mixed use, with a surrounding 500 square mile buffer zone used for cattle and sheep grazing. The 7,700 INEL employees use the Snake River Plain Aquifer that underlies the site, as a drinking water source. The aquifer has been proposed as a sole-source aquifer pursuant to the SWDA. The TRA contains high neutron flux nuclear test reactors. The Warm Waste Pond is located 200 feet east of the test reactor area. The Warm Waste Pond is composed of three wastewater infiltration/evaporation ponds. Over the past 40 years, the Warm Waste Pond received discharges of reactor cooling water, radioactive wastewater, and regenerative solutions from ion exchange columns. As a result of an investigation conducted in 1988, it was revealed that a release of radioactive and/or hazardous contaminants to the Warm Waste Pond had resulted in contamination of the pond sediment and subsurface water. The INEL is divided into 10 Waste Area Groups (WAGs), which are further subdivided into operable units to facilitate characterization and remedy selection for similar or unique contamination issues. This ROD addresses the interim remedy for the Warm Waste Pond sediment that are part of the WAG 2 group that includes the TRA. Other OUs are associated with this interim action and will address perched water below TRA. Contamination of the Snake River Plain Aquifer and complete evaluation of risks associated with the Warm Waste Pond will be addressed in separate investigations and remedial actions, as necessary. The contaminants in the perched water, currently being evaluated in an ongoing RI/FS, will be addressed in future remedial actions. The primary contaminants of concern affecting the sediment are metals, including hexavalent chromium; other inorganics; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes onsite physical separation of large and fine-grained materials, followed by treatment of 20,700 cubic yards of very-fine grained contaminated sediment onsite by chemical extraction with an acidic solution to remove cesium-137, cobalt-60, and chromium, followed by recovering contaminants from the acidic solution using ion exchange, precipitation or distillation; testing residuals, and treating to meet applicable storage and/or disposal criteria, then storing the waste onsite temporarily until final disposition can be determined; returning larger grained materials to the pond and along with the treatment process residuals, and backfilling and revegetating the area; conducting pilot studies to optimize the extraction process; and implementing institutional controls including deed restrictions. The estimated capital costs for this remedial action are $7,195,000, with an estimated O&M cost of $300,000 over 18 months.

PERFORMANCE STANDARDS OR GOALS:

Federal and state clean-up standards for cesium-37, cobalt-60, and chromium have not been established at this time. Clean-up objectives for cesium-37 are based on a 10^{-4} to 10^{-6} range for cancer risk to human health. Because this action does not constitute a final remedy for this operable unit, subsequent actions will fully address risks posed by the Warm Waste Pond sediment and associated contamination.

INSTITUTIONAL CONTROLS:

Deed restrictions will be implemented to prevent human exposure to site contaminants and provide site security.

KEYWORDS:

Capping; Chromium; Direct Contact; Excavation; Filling; Inorganics; Institutional Controls; Interim Remedy; Metals; O&M; Onsite Containment; Onsite Disposal; Onsite Treatment; Radioactive Materials; Sediment; Sole-Source Aquifer; Temporary Storage; Treatability Studies; Treatment Technology.

SITE SUMMARY

Date of previous RODs: None
Lead: Federal Facility
Contaminated Medium: Sediment
Major Contaminants: Metals, Inorganics, Radioactive Materials
Category: Source Control - Interim

U.S. DOE IDAHO NATIONAL ENGINEERING LAB (OPERABLE UNIT 22), ID

September 30, 1992

SITE HISTORY/DESCRIPTION:

The 890-square-mile U.S. DOE Idaho National Engineering Laboratory (INEL), located 32 miles west of Idaho Falls, Idaho, is operated by the U.S. Department of Energy. Land use in the area is predominantly industrial and mixed use. The site overlies a sole source Class I aquifer, known as the Snake River Plain Aquifer. Within INEL, an area known as the Power Burst Facility (PBF) operated from 1972 to 1985 and supported the testing of pressurized-water fuel rods under hypothetical reactor accidents. This area contained several site features, including a corrosive waste sump, an evaporation pond, and discharge pipe. From 1978 to 1984, water containing a chromium-based algal and corrosion inhibitor from the PBF reactor's secondary coolant system was discharged from the corrosive waste sump (CWS) via a discharge pipe to an evaporation pond. To prevent discharge of toxic hexavalent chromium to the sump, cooling water was treated in the discharge pipe by bubbling sulfur dioxide through it to reduce the hexavalent chromium to less toxic trivalent chromium, and the treated water was discharged to the sump and neutralized using sodium hydroxide or sulfuric acid. As a result of these activities, approximately 363 cubic yards of sediment in the evaporation pond have been contaminated by metals and radioactive materials. In 1987, the pond and sump were listed as RCRA land disposal units; however, wastewater exhibiting the toxicity characteristic (TC) for chromium is believed to have been discharged after the effective date of the TC rule. The INEL site is currently divided into 10 Waste Area Groups (WAGs). Three previous RODs signed in 1991 and 1992 addressed interim remedies for the warm waste pond sediment in WAG 2, unexploded ordnance and contaminated soil in WAG 10, and ground water contamination from the TS-05 injection well in WAG 1, respectively. This ROD provides an interim remedy for the contaminated sediment and sludge in the evaporation pond, discharge pipe, and waste sump as OU22 in WAG 5. A future ROD will address the underlying aquifer and unsaturated zone. The primary contaminants of concern affecting the sediment, debris, and sludge are metals, including chromium; and radioactive materials.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes removing and solidifying/stabilizing the 100 cubic yards of contaminated sediment from the evaporation pond by grouting, followed by onsite disposal in the Radioactive Waste Management Complex (RWMC) at INEL along with existing low-level waste containers; removing sludge and sediment from the waste sump; treating the sludge by grouting, if feasible, based on the results of treatability studies, and disposing of the treated sludge onsite in RWMC; decontaminating the discharge pipe; and sampling the remaining sediment to verify residual contaminant concentrations. The estimated total cost for this remedial action is $480,000. No O&M costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Sediment and sludge excavation goals are based on a site-specific residential use scenario for a population that begins residence at the site within 100 years in the future. Chemical-specific goals include chromium 800 mg/kg and cesium-137 30 pCi/g.

INSTITUTIONAL CONTROLS:

Not applicable.

KEYWORDS:

Carcinogenic Compounds; Chromium; Debris; Decontamination; Direct Contact; Interim Remedy; Metals; Onsite Disposal; Onsite Treatment; Radioactive Materials; Sediment; Sludge; Solidification/Stabilization; State Standards/ Regulations; Treatability Studies; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 12/05/91, 06/02/92, 09/28/92
Lead: Federal Facility
Contaminated Media: Sediment, Sludge, Debris
Major Contaminants: Metals, Radioactive Materials
Category: Source Control - Interim

U.S. DOE IDAHO NATIONAL ENGINEERING LAB (OPERABLE UNIT 23), ID

June 2, 1992

SITE HISTORY/DESCRIPTION:

The U.S. DOE Idaho National Engineering Laboratory (INEL), established in 1949, is located 32 miles west of Idaho Falls, Idaho. The facility occupies 890 square miles, and land use in the area is predominantly industrial. The Snake River Plain Aquifer, which underlies the INEL, has been designated as a sole source, Class I, aquifer pursuant to the Safe Drinking Water Act. Within the INEL is a 270-square-mile area, formerly known as the Naval Proving Ground (NPG), which was used prior to World War II for naval artillery testing, explosives, storage bunker testing, and ordnance disposal. Investigations by site personnel have resulted in the discovery of numerous unexploded ordnance devices, such as 3- to 16-inch artillery shells, partially exploded 125- to 2,000-pound bombs, anti-tank mines, and depth charges. This ROD addresses OU23, which covers six locations on the site: the CFA gravel pit, the storage bunkers north of Idaho Chemical Processing Plant, the National Oceanic and Atmospheric Grid, CFA Building 633 Zone, Fire Station II Zone, and Power Line Road. Unexploded ordnance has been found on the ground surface in most of these areas. It is estimated that 150 unexploded ordnance will be found and detonated during this remedial action. Areas of soil are also contaminated with explosive compounds at the ground surface, or will become contaminated by detonation activities. This interim ROD addresses ordnance in the six NPG areas and associated soil contamination. Future RODs will address remaining ordnance areas for which insufficient information exists at this time, final remedies for soil contamination, and all of the Waste Area Group 10 (WAG 10) at the INEL site. The primary contaminants of concern affecting the soil and ordnance debris are organics; inorganics; and natural decomposition products.

SELECTED REMEDIAL ACTION:

The selected interim remedial action for this site includes conducting soil sampling of the detonation areas; excavating, containerizing, and transporting an estimated 185 cubic yards of soil exceeding action levels offsite for treatment using incineration, with offsite disposal of residuals; researching historical records pertaining to ordnance activities at INEL; conducting a field search of the six NPG areas for unexploded ordnance; controlled onsite thermal treatment (detonation) of any identified ordnance, with onsite disposal or recycling of any residual metal debris; and posting signs where the public has access to ordnance areas. The estimated present worth cost for this remedial action is $2,359,500. No O&M costs are associated with this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Action levels for soil were determined based on health-based criteria and include TNT 44 mg/kg and RDX 18 mg/kg. A screening level for DNT has not been developed as it is a breakdown product of TNT. Soil at or above these screening levels will be excavated, containerized, and transported to an offsite incinerator. Any resultant ash will be disposed of by the incinerator facility. Containerized soil will be sampled and analyzed for TCLP analytes to determine whether they should be classified as a RCRA waste.

INSTITUTIONAL CONTROLS:

Not provided.

KEYWORDS:

Carcinogenic Compounds; Debris; Direct Contact; Excavation; Incineration/Thermal Destruction; Inorganics; Interim Remedy; Offsite Disposal; Offsite Treatment; Onsite Disposal; Onsite Treatment; Organics; RCRA; Soil; Sole-Source Aquifer; State Standards/Regulations; Treatment Technology.

SITE SUMMARY

Date of previous RODs: 12/05/91
Lead: Federal Facility
Contaminated Media: Soil, Debris
Major Contaminants: Organics, Inorganics, Natural Decomposition Products
Category: Source Control - Interim

WYCKOFF/EAGLE HARBOR, WA
September 29, 1992

SITE HISTORY/DESCRIPTION:

The 3,780-acre Wyckoff/Eagle Harbor site is located on the east side of Bainbridge Island, in Central Puget Sound, Kitsap County, Washington. The site consists of an inactive 40-acre wood treating facility owned by Wyckoff, the adjacent 500-acre Eagle Harbor and other upland sources of contamination to the Harbor, including a former shipyard. Land use in the area is predominantly residential, with some commercial and industrial uses. The harbor supports several fish resources, a wide variety of resident and migratory birds, and other wildlife. The shipyard operated from 1903 to 1959 on the northwest shore of Eagle Harbor, resulting in releases of metals and organic contaminants. From 1905 to 1988, wood treating operations were conducted on the southeast shore involving pressure treatment with creosote and pentachlorophenol. Preservative chemicals, which were delivered to the facility by barge and ship, were stored in tanks on the property. Contamination of soil and ground water at the wood treatment facility led to seepage into adjacent sediments. Wastewater was discharged into Eagle Harbor for many years, and the practice of storing treated pilings and timber in the water continued until the late 1940's. In 1984, NOAA investigations of the Harbor revealed that sediment, fish, and shellfish from Eagle Harbor contained elevated levels of PAHs. Later in 1984, EPA required the Wyckoff Company to conduct environmental investigation activities under RCRA, and the state required immediate action to control stormwater runoff and seepage of contaminants. In 1991, EPA defined three operable units at the Wyckoff/Eagle Harbor site: East Harbor (OU1), Wyckoff (OU2), and West Harbor (OU3). This ROD addresses subtidal/intertidal sediment and upland sources of contamination in the West Harbor (OU3), where significant sources from former shipyard activities are believed to have been controlled. Future RODs will address PAH-contaminated sub-tidal sediment in the OU1 and OU2, the contaminated East Harbor (OU1), and contaminated ground water , soil and intertidal sediment at the adjacent facility (OU2). The primary contaminants of concern affecting the subtidal/intertidal sediment and upland sources are organics, including PAHs; and metals, including arsenic, chromium, and lead.

SELECTED REMEDIAL ACTION:

The selected remedial action for this site includes dredging, dewatering, excavating approximately 1,000 to 7,000 cubic yards of intertidal sediment that exceeds levels of 5 mg/kg mercury and/or lower moderate PAH concentrations, followed by treatment using solidification/stabilization, as necessary, to comply with LDR as determined by bench scale tests; transporting sediment, which cannot be treated to meet LDR offsite for disposal at a RCRA-permitted landfill; treating wastewater from the dewatering process onsite using carbon adsorption before discharge into the harbor; capping the sediment in areas of high concern with a 1-meter thick layer of clean sediment; placing a thin layer of clean sediment in subtidal areas of low to moderate concern to enhance natural sediment recovery; conducting long-term environmental monitoring; and implementing institutional controls to prevent exposure to contaminated fish and shellfish. The estimated present worth cost for this remedial action ranges from $6,200,000 to $16,000,000, which includes a present worth O&M cost of $1,100,000 for 10 years.

PERFORMANCE STANDARDS OR GOALS:

Sediment clean-up goals are based on the State of Washington Sediment Management Standards (Sediment Standards), which provide chemical criteria for both a minimum clean-up level (MCUL) and the more stringent sediment quality standards (SQS). Chemical-specific goals for defining cleanup areas include anthracene 1,200 mg/kg; chrysene 460 mg/kg; naphthalene 170 mg/kg; pyrene 1,400 mg/kg; and mercury 0.58 mg/kg (MCUL) the long-term goal for the harbor is the SQS.

INSTITUTIONAL CONTROLS:

Institutional controls will be implemented to prevent exposure to contaminated fish and shellfish.

KEYWORDS:

Arsenic; Capping; Carbon Adsorption (GAC); Carcinogenic Compounds; Chromium; Clean Water Act; Direct Contact; Dredging; Excavation; Ground Water Monitoring; Institutional Controls; Lead; Metals; O&M; Offsite Disposal; Onsite Containment; Onsite Discharge; Onsite Disposal; Onsite Treatment; Organics; PAHs; RCRA; Sediment; Solidification/ Stabilization; State Standards/Regulations; Temporary

WYCKOFF/EAGLE HARBOR, WA (Continued)

September 29, 1992

Storage; Treatability Studies; Treatment Technology; Water Quality Criteria; Wetlands.

SITE SUMMARY

Date of previous RODs: None
Lead: Fund
Contaminated Media: Sediment, Upland Sources
Major Contaminants: Organics, Metals
Category: Source Control - Interim

RECORD OF DECISION FY 1992 SUMMARY TABLE

The FY 1992 Record of Decision (ROD) Summary Table provides an overview of site type, status of the operable unit, contamination problems, selected remedies, waste volumes, cleanup criteria and estimated remedial costs, as provided in the RODs signed during FY 1992. Information included in the Summary Table is derived from the ROD abstracts presented in Section II of this document.

The table is presented by Region, in alphabetical order according to the site name.

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
1 Brunswick Naval Air Station (Operable Unit 1), ME Part of a 3,094-Acre Active Military Facility 06/16/92	Soil, sediment, and GW contaminated with VOCs, including benzene, toluene, methylene chloride, and DCE; other organics, including PAHs; and metals, including arsenic, chromium, and lead 16,000,000 gals (GW)	The selected remedial action for this site includes constructing a low permeability RCRA cap over the landfills and a slurry wall around the waste to divert clean water away from the landfills; conducting treatability tests before designing the treatment system; pumping and onsite treatment approximately 16 million gallons of contaminated ground water, which is contained by the cap and slurry wall, using chemical oxidation, flocculation, clarification, and filtration to remove the metals and ultraviolet oxidation to destroy VOCs in an onsite system concurrent with the Eastern Plume ground water (discussed as part of another ROD) to be most cost effective; discharging the treated water offsite to the local POTW once the water meets pretreatment levels, and then into the Androscoggin River under a CWA NPDES permit; monitoring system ground water to confirm that the containment system is functioning properly, and implementing institutional controls including land, deed, and ground water use restrictions to prevent future use of the landfills or ground water.	Chemical-specific soil/sediment clean-up goals were not provided, as the risks presented by these media are within the acceptable range established by EPA. A target clean-up level for mercury in soil/sediment is specified at 1 mg/kg based on a food-web analysis, as mercury was the only contaminant identified which demonstrates a propensity to bioaccumulate in terrestrial food chains. Chemical-specific ground water clean-up goals are based on SDWA MCLs and include arsenic 50 ug/l; vinyl chloride 2 ug/l; methylene chloride 5 ug/l; 1,2-cis-DCE 70 ug/l; 1,2 -trans-DCE 100 ug/l; chromium (total) 100 ug/l; lead 15 ug/l (action level); and nickel 100 ug/l.	$7,842,000 (present worth) $1,432,000 (present worth O&M) (30 years)
1 Brunswick Naval Air Station (Operable Unit 2), ME Part of a 3,094-Acre Active Military Facility 06/16/92	GW contaminated with VOCs, including PCE and TCE Not specified	The selected remedial action for this site includes extracting and treating contaminated ground water onsite using precipitation and filtration processes to remove metals such as iron and manganese, and UV/oxidation to remove VOCs, with offsite discharge of the treated water to a local POTW for final treatment; conducting treatability tests prior to design of the treatment system; and implementing a Navy monitoring program to ensure that the system is effective. Extracted ground water for this OU will be combined with ground water from OU1, the subject of a previous ROD, and treated concurrently in a single system.	Chemical-specific ground water clean-up goals for this site were based on SDWA MCLs and health-based standards and include 1,1,1-TCA 200 ug/l; TCE 5 ug/l; PCE 5 ug/l; trans-1,2-DCE 100 ug/l; cis-1,2-DCE 70 ug/l; 1,1-DCA 3,500 ug/l; and 1,1-DCE 7 ug/l. The interim action is intended to contain the Eastern Plume and prevent further migration to Harpswell Cove pending final remedial actions.	$4,223,000 (present worth) $1,845,000 (present worth O&M) (5 years)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
1 Darling Hill Dump, VT 3.5-Acre Inactive Solid Waste Disposal Facility 06/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action because significant levels of contaminants are not present at the site. EPA, however, will continue to monitor the ground water, surface water, and sediment for a 5-year period to ensure the protectiveness of the no action remedy.	Not applicable.	$292,000 (present worth) $77,000 (annual O&M)
1 Newport Naval Education/Training Center, RI 85-Acre Training Facility 09/29/92	GW contaminated with VOCs, including benzene and TCE; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes constructing an extraction system around Tanks 53 and 56 to contain the contaminated ground water plume and prevent migration and potential discharge to surface water bodies; treating ground water onsite with a precipitation process that involves a coagulation/filtration to remove metals, followed by using UV/oxidation to treat VOCs; conducting a treatability study during the final design of the UV/oxidation treatment system to determine the appropriate oxidant and concentration necessary to destroy the VOCs; disposing of the filtration solids in accordance with federal and state regulations; discharging the treated ground water offsite to either the local wastewater treatment facility, recycling treated water back into the aquifer upgradient, or onsite to surface water if the treatment facility is unable the accept the pretreated water; and monitoring GW.	Interim chemical-specific clean-up goals are based on the MCLs and MCLGs and include arsenic 50 mg/kg (MCL); benzene 5 mg/kg (MCL); chromium 100 mg/kg (MCLG); and lead 15 mg/kg (based on EPA action level).	$3,500,000 (present worth) $2,000,000 (present worth O&M) (5 years)
1 Otis Air National Guard/Camp Edwards, MA 22,000-Acre Former Military Vehicle Maintenance Facility 05/20/92	GW contaminated with VOCs, including PCE and TCE Not specified	The selected remedial action for this site includes onsite pumping and treatment of 790 million gallons of contaminated ground water using carbon adsorption to remove VOCs; monitoring the influent and effluent of the carbon absorption treatment, and discharging the treated water to an onsite infiltration trench; and monitoring ground water.	Chemical-specific clean-up goals for ground water are based on SDWA MCLs and state standards and include PCE 5 ug/l; TCE 5 ug/l; DCE 70 ug/l; and PCA 2 ug/l (10^{-6} risk-based standard).	$2,113,000-$4,528,000 (present worth) $472,000-$1,012,000 (present worth O&M) (5 years)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
1 PSC Resources, MA 21.5-Acre Former Waste Oil and Solvent Reclamation Facility 09/15/92	Soil, sediment, debris, GW, and SW contaminated with VOCs, including benzene, PCE, and TCE; other organics, including PAHs and PCBs; and metals, including arsenic and lead 11,000 yd^3 (soil) 1,695 yd^3 (sediment)	The selected remedial action includes decontaminating, demolishing, and offsite disposal of debris and property structures at a RCRA landfill; consolidating the contaminated soil with lagoon and wetlands sediment onsite, and treating these materials using stabilization; constructing a permeable cap over the stabilized material; restoring affected wetlands; treating lagoon surface water onsite using filtration and a granular activated carbon (GAC) adsorption unit, followed by discharging the treated water into the Quaboag River or to an offsite facility; using natural attenuation to achieve ground water clean-up levels; monitoring ground water; conducting sediment and surface water sampling; and implementing institutional controls including deed, ground water and land use restrictions.	Chemical-specific soil and sediment (lagoon only) clean-up levels are based on health-risk standards and SDWA MCLs, respectively, and include benzene 1 mg/kg/3 mg/kg; TCE 2 mg/kg/4 mg/kg; PCE 2 mg/kg/12 mg/kg; lead 500 mg/kg/15 mg/kg; total PAHs 151 mg/kg; and total PCBs 1 mg/kg. Chemical-specific wetlands sediment clean-up levels are based on health-risk standards and include total PAHs 10 mg/kg; total PCBs 1 mg/kg; arsenic 12 mg/kg; and lead 375 mg/kg. Chemical-specific ground water clean-up levels are based on SDWA MCLs and state standards and include benzene 5 ug; TCE 5 ug/1; PCE 5 ug/1; and lead 15 ug/1. An ARAR waiver will be issued for certain requirements of the chemical waste landfill regulations, which require construction of chemical waste landfills in low permeable clay conditions, the use of a synthetic membrane liner, and that the bottom of the landfill be 50 feet above the historic high water table.	$3,420,747 (present worth) $731,913 (annual O&M) (30 years)
1 Revere Textile Prints, CT 15-Acre Industrial Facility 09/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action, with implementation of a 5-year sediment and ground water monitoring program. EPA has determined that the previous interim remedial activities have eliminated the need to conduct additional remedial actions and are adequate to protect human health and the environment.	Not applicable	$263,000 (present worth)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
1 Tibbetts Road, NH 2-Acre Former Waste Storage and Disposal Facility 09/29/92	Debris and GW contaminated with VOCs, including benzene, PCE, TCE, and xylenes; other organics, including PAHs; and metals, including chromium and lead Not specified	The selected remedial action for this site includes removing and disposing buildings and debris offsite to access the areas of contamination more efficiently; disposing of 15 barrels of incinerator ash residue and spent carbon filters from a previous removal action offsite; using trenches or wells to intercept ground water in the bedrock aquifer; designing and constructing a ground water dewatering and extraction system in the overburden aquifer, and treating air emissions using granular activated carbon; treating the contaminated ground water in an onsite treatment plant using metals precipitation, chemical additives, and UV/oxidation, with discharge of the treated ground water to injection wells onsite to promote flushing of weathered bedrock; disposing of the resulting sludge offsite; conducting a treatability study to determine the appropriate oxidant and concentration needed to destroy VOCs; upgrading and expanding the water supply, as needed; monitoring ground water and surface water; modifying or abandoning wells, if necessary; and implementing institutional controls, including deed and ground water use restrictions to prevent the use of contaminated ground water.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and MCLGs and state standards and include PCE 5 ug/l; toluene 1,000 ug/l; naphthalene 1,460 ug/l; arsenic 50 ug/l; manganese 3,650 ug/l; bis(2-ethylhexyl)phthalate 4 ug/l; benzene 5 ug/l; xylenes 10,000 ug/l; TCE 5 ug/l; and chromium 100 ug/l.	$3,776,000 (present worth) $2,047,000 (present worth O&M) (30 years)
1 Town Garage/Radio Beacon, NH Former Radio Beacon Facility 09/30/92	GW contaminated with VOCs Not specified	The selected remedial action for this site includes allowing the contaminated ground water in the overburden and bedrock aquifers to naturally attenuate; implementing institutional controls including deed restrictions to prevent future use of ground water; monitoring ground water; and implementing a contigency remedy to provide an alternate water supply to affected residences in the event that contaminants into the drinking water wells reverse their historical trend and concentrations begin to increase beyond the clean-up levels.	Chemical-specific interim ground water clean-up levels are based on SDWA MCLGs and state standards and include 1,1-DCE 7 ug/l; 1,1,1-TCA 200 ug/l; antimony 6 ug/l; beryllium 4 ug/l; chromium 100 ug/l; and barium 2,000 ug/l. Three years after these levels have been achieved, a risk assessment will be performed to determine whether the levels are protective and, therefore, should be final.	$1,250,000 (present worth O&M) (years 2-25)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Action Anodizing, Plating, and Polishing, NY 1-Acre Metal Finishing Shop 06/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action, with the implementation of a ground water monitoring program for 1 year to ensure that the remedy is protective of human health and the environment.	Not applicable	$0 (present worth) $0 (O&M)
2 Bioclinical Laboratories, NY 2.6-Acre Former Industrial Chemical Distribution Facility 09/30/92	Not applicable Not applicable	The selected remedial action for this site is no further action. The risk assessment results indicate that the levels of contamination present in the soil, air, sediment, and ground water present risks which fall within or below EPA's allowable risk range.	Not applicable	$0 (present worth) $0 (O&M)
2 Cosden Chemical Coatings, NJ 6.7-Acre Paint Formulation and Manufacturing Facility 09/30/92	Soil, debris, and GW contaminated with VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; metals, including arsenic, chromium, and lead; and inorganics, including asbestos 8,000 yd^3 (soil)	The selected remedial action for this site includes treating 8,000 cubic yards of contaminated soil onsite using in-situ solidification, and disposing of a small pile of concentrated PCB-contaminated soil offsite; disposing of sludge generated during the treatment process offsite; decontaminating and demolishing the contaminated building onsite, and removing and/or recycling decontaminated debris and equipment offsite; removing asbestos and PCB-contaminated debris offsite for disposal in an appropriate offsite facility; treating ground water onsite using precipitation to remove inorganic contaminants, followed by air stripping to remove VOCs, with recharge of treated ground water to the underlying aquifer; treating air emissions using carbon adsorption, if determined to be necessary during remedial design; and implementing institutional controls including deed restrictions.	Chemical-specific soil clean-up goals are risk-based and include PCBs 1 mg/kg; chromium 390 - 78,000 mg/kg; and lead 500 mg/kg. Chemical-specific ground water clean-up goals are based on state standards and SDWA MCLs and include toluene 1,000 ug/l; xylenes 44 ug/l; chromium 100 ug/l; and lead 15 ug/l.	$15,172,800 (present worth) $585,500 (O&M) (1 year)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Dover Municipal Well 4, NJ Municipal Well 09/30/92	GW contaminated with VOCs, including benzene, PCE, and TCE; and metals, including lead Not specified	The selected remedial action for this site includes onsite pumping and treatment of contaminated ground water from both the intermediate and deep aquifers using air stripping to remove VOCs; discharging the treated water offsite to the public water supply system to be used for potable water, with reinjection of surplus quantities; performing a preliminary assessment of air stripper emissions and discharge requirements to determine if vapor phase treatment using activated carbon will be necessary, and if so, disposing of or recycling the spent carbon offsite; monitoring air emissions; and monitoring ground water to ensure effectiveness of the treatment system and to determine if pretreatment for inorganics is necessary.	Chemical-specific ground water clean-up goals are based on federal and state MCLs, including PCE 1 ug/l (state); TCE 1 ug/l (state); toluene 1,000 ug/l (federal); 1,1,1-TCA 26 ug/l (state); and lead 15 ug/l (federal). Ground water will be treated to meet all applicable drinking water standards prior to offsite discharge to the public water supply. Any regulated equipment used in the selected remedy will be designed, constructed, and operated to meet state Air Pollution Control and Noise Pollution Control Act requirements.	$1,985,000 (present worth) $106,000 (annual O&M) (21 years)
2 Ellis Property, NJ 36-Acre Former Drum Storage Facility 09/30/92	Soil and GW contaminated with VOCs, including PCE and TCE; other organics, including PCBs; and metals, including arsenic, chromium, and lead 760 yd^3 (surface and subsurface soil)	The selected remedial action for this site includes excavating all contaminated soil, and treating metal-contaminated soil onsite or offsite using stabilization if necessary, prior to offsite disposal in a landfill; transporting organic- or PCB-contaminated soil offsite for treatment by incineration; backfilling the excavated area with clean fill; collecting ground water using interceptor trenches or extraction wells, and treating the water onsite using precipitation and ultrafiltration to remove metals, followed by air stripping to remove VOCs, with reinjection of the treated water onsite; treating air emissions if necessary; using engineering controls to mitigate any affected wetlands; and monitoring ground water.	Chemical-specific soil and ground water clean-up goals are established based on the levels specified in New Jersey's *Proposed Cleanup Standards for Contaminated Sites* (February 1992). Surface soil clean-up standards include arsenic 20 mg/kg; lead 100 mg/kg; benzene 3 mg/kg; PCE 9 mg/kg; TCE 23 mg/kg(s); and PCBs 0.45 mg/kg. The clean-up standards for sub-surface soil include arsenic 20 mg/kg; lead 1 mg/kg; PCE 1 mg/kg; TCE 1 mg/kg; and PCBs 100 mg/kg. Ground water clean-up standards include arsenic 8 ug/l; chromium 100 ug/l; PCE 1 ug/l; TCE 1 ug/l; toluene 1,000 ug/l; and lead 100 ug/l.	$6,653,000 (present worth) $188,200 (annual O&M) (years 0-1) $365,000 (annual O&M) (years 1-3) $283,000 (annual O&M) (years 4-30)

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Endicott Village Well Field, NY 16-Acre Inactive Landfill 09/30/92	Soil, debris, and GW contaminated with VOCs, including 1,2-DCE, benzene, PCE, TCE, toluene, vinyl chloride, and xylenes; other organics, including PAHs, PCBs, and pesticides; and metals, including lead Not specified	The selected remedial action for this site includes capping the majority of landfill #1 with a low permeability soil cap; covering the Tri-Cities Airport Controlled Activity Area and the compost facility area with a bituminous (asphalt) cap; backfilling or mitigating any affected wetlands; performing an explosive gas investigation, and installing a passive gas venting system; collecting and treating the ground water and leachate seep using an air stripper, with onsite discharge of the treated water and leachate to the Susquehana River or transporting the ground water and leachate offsite to a local POTW; maintaining the landfill cap and venting system; conducting long-term air and ground water monitoring; and implementing institutional controls including deed restrictions, and site access restrictions such as fencing.	Chemical-specific goals for ground water are based on TCE 5 ug/l; chromium 5 ug/l; and lead 5 ug/l. Leachate collection, treatment, and disposal will be designed to comply with SPDES discharge requirements and air emission standards will be adhered to for the air stripper.	$16,684,200-$16,889,400 (present worth) $248,000-$265,900 (annual O&M)
2 Evor Phillips Leasing, NJ 6.5-Acre Former Disposal Facility 09/30/92	Debris and GW contaminated with VOCs, including benzene and toluene; other organics, including PCE, pesticides, and TCE; and metals, including chromium and lead 80 yd^3 (debris)	The selected interim remedial action for this site includes excavating and overpacking approximately 30 buried drums, and removing these offsite for disposal along with an estimated 50 drums currently stored at the drum disposal area; extracting and treating contaminated ground water onsite using precipitation to remove inorganics, followed by air stripping to remove VOCs, with recharge of the treated water to the aquifer; treating air emissions using carbon absorption, prior to discharge to the atmosphere; and conducting environmental monitoring.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards including benzene 1 ug/l (state); carbon tetrachloride 2 ug/l (state); TCA 1 ug/l (state); TCE 1 ug/l (state); arsenic 50 ug/l (MCL); and lead 15 mg/l (MCL). Disposal of drums will be conducted according to RCRA requirements for offsite Treatment, Storage or Disposal (TSD) facilities.	$7,211,948 (present worth) $717,996 (annual O&M) (30 years)
2 FAA Technical Center, NJ 5,000-Acre Research and Development Facility 09/30/92	Not applicable Not applicable	The selected remedial action for this site is no further action. Based upon the completed removal actions and risk evaluation for Area G, is determined to be protective of human health and the environment.	Not applicable.	$0 (present worth) $0 (O&M)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Facet Enterprises, NY 31-Acre Manufacturing Facility 09/04/92	Soil, sediment, debris, and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PCBs and PAHs; and metals, including arsenic and lead 470,000,000 gals (GW) 6000 yd^3 (soil and sediment)	The selected remedial action for this site includes excavating contaminated soil and sediment from the disposal areas; disposing of approximately 1,275 cubic yards of TSCA waste with PCBs concentrations greater than 50 ppm offsite in a secure double-lined landfill facility; stabilizing of all RCRA wastes to prevent leaching of metals and disposing of 2,124 cubic yards of waste in a secure offsite RCRA-lined facility; disposing of approximately 120 cubic yards of non-RCRA wastes in an offsite industrial waste landfill; extracting and storing contaminated ground water in a central onsite collection tank, followed by treatment using air stripping to remove VOCs, and filtration and precipitation to remove metals, if necessary; discharging the treated effluent onsite to the facility non-contact cooling system or to surface water; and implementing a long-term ground water monitoring program and institutional controls including land use restrictions.	Action levels for excavation of surface soil/sediment are health-based and include benzo(a) anthracene 20 ppm/3 ppm; benzo(b)fluoranthene 20 ppm/3 ppm; benzo(k)fluoranthene 43 ppm/7 ppm; benzo(a)pyrene 3 ppm/1 ppm; arsenic 19 ppm/7 ppm; indeno(1,2,3-cd)pyrene 12 ppm/2 ppm; dibenzo(a,h) anthracene 3 ppm/1 ppm; PCBs 10 ppm/ 1 ppm; and chromium 1110 ppm in sediment only. Action levels for excavation of subsurface soil are also health-based and include benzo(a)anthracene 54 ppm; benzo(b)fluoranthene 55 ppm; benzo(k)fluoranthene 118 ppm; benzo(a)pyrene 8 ppm; indeno(1,2,3-cd)pyrene 33 ppm; PCBs 25 ppm; and arsenic 52 ppm. Chemical-specific clean-up goals for soil and sediment are based on RCRA TCLP, Land Ban regulations, and TSCA regulations. Chemical-specific ground water clean-up goals are based on SDWA MCLs and state drinking water standards including TCE 5 ug/l; xylenes 5 ug/l; and lead 25 ug/l. Chemical-specific ARARs will be waived if it is determined by EPA that certain portions of the ground water cannot be restored for beneficial use.	$4,850,656 (present worth) $1,305,596 (annual O&M) (20 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 General Motors/Central Foundry Division, NY 270-Acre Aluminum Casting Plant 03/31/92	Soil, sludge, debris, GW, and SW contaminated with VOCs, including TCE; other organics, including PCBs, phenols, and PAHs; and oils 174,000 yd^3 (soil, sludge, debris, and all visibly oily soil)	The selected remedial action for this site includes excavating 174,000 cubic yards of soil containing greater than or equal to 500 mg/kg PCBs, sludge, debris, and all visibly oily soil from the East Disposal Area, followed by onsite treatment using either biological, thermal destruction, or another treatment as determined by the results of treatability studies performed as part of remedy for OU1; disposing of debris offsite; consolidating and containing soil with PCB levels below 500 mg/kg in the East Disposal Area along with the treated soil and sludge, and covering the area with a composite cover; recontouring, regrading, and containing contaminated material from the Industrial Lagoon onsite with a composite cover; installing a slurry wall to control ground water migration and a runoff collection and treatment system to treat surface water, prior to onsite discharge at the East Disposal and the Industrial Lagoon areas, based on testing results; treating ground water onsite using air stripping to remove VOCs and carbon adsorption to remove PCBs, with onsite discharge to the St. Lawrence River; monitoring ground water, surface water, and air; and implementing institutional controls, including deed restrictions, to discourage use as a residential area.	The chemical-specific clean-up goal for treated soil residuals is 10 mg/kg for PCBs, which is an onsite residual disposal ARAR waiver of the TSCA regulation concerning landfill requirements of 2 mg/kg for PCBs; for sludge with initial PCB >500 mg/kg, clean-up residual level is 2 mg/kg (TSCA). Ground water clean-up goals are based on SDWA and state standards, and include PCBs 0.1 ug/l; TCE 5 ug/l; and total phenols 1 ug/l.	$31,000,000 - $45,000,000 (present worth) $567,000 (annual O&M) (0-2 years) $200,000 (annual O&M) (years 3-28)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Higgins Farm, NJ 75-Acre Former Cattle Farm 09/30/92	GW contaminated with VOCs, including benzene, PCE, TCE, and xylenes Not specified	The final remedial action for this site includes installing ground water extraction wells around the perimeter of the site; treating the contaminated ground water onsite by processes that are expected to include precipitation, flocculation, clarification, filtration, air stripping, intermediate pH adjustment, ion exchange, and final pH adjustment, however, the exact system will be developed during the RD phase; discharging the treated ground water to onsite surface water; monitoring ground water, surface water, and onsite and offsite wells including downgradient residential wells; and performing limited investigations to ensure all sources of contamination have been identified, with removal and offsite disposal of contaminated materials that were previously remediated and are currently stored onsite.	Chemical-specific goals for ground water clean-up, which are based on SDWA MCLs and state standards, include benzene 1 ug/l (state); chlorobenzene 4 ug/l (state); cis-1,2-dichloroethene 10 ug/l (state); vinyl chloride 2 ug/l (state); bis (2-ethyl hexyl) phthalate 6 ug/l (MCL); and xylenes 44 ug/l.	$5,990,000-$8,447,600 (present worth) $384,000 (annual O&M) (years 5-30)
2 Imperial Oil/Champion Chemicals, NJ 15-Acre Oil Blending Facility 09/30/92	GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes extracting and treating contaminated ground water onsite using precipitation to remove inorganic contaminants, and carbon adsorption to remove organic contaminants; discharging the treated ground water onsite to Birch Swamp; continuing the previous removal action; conducting a wetlands assessment to determine site impact; regenerating or disposing of the spent carbon; disposing of any sludge generated during the treatment process offsite; and conducting environmental monitoring to ensure the effectiveness of the remedy.	Chemical-specific ground water clean-up goals, based on federal MCLs and state levels, include benzene 1 ug/l; xylenes 40 ug/l; toluene 1,000 ug/l; pyrene 200 ug/l; PCBs 5 ug/l; arsenic 8 ug/l; beryllium 20 ug/l; and lead 10 ug/l.	$9,647,000 (present worth) $515,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Industrial Latex, NJ 9.67-Acre Chemical Adhesives and Natural and Synthetic Rubber Compounds Manufacturer 09/30/92	Soil, sediment, sludge, and debris contaminated with VOCs, including PCE, TCE, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead 38,000 yd^3 (soil and sediment) 800 gals (liquid sludge) 6 yd^3 (sludge) 600 (drums)	The selected remedial action for this site includes excavating approximately 600 buried drums with offsite disposal or incineration; dismantling 30 production vats from their steel supports and draining any remaining material that is not hardened into drums for offsite disposal or incineration; disposing of the vats in an offsite landfill; removing the floor drains and demolishing 41,000 square feet of the onsite buildings with offsite disposal; excavating the septic system along with 800 gallons of associated liquids and 6 cubic yards of sludge with offsite disposal; excavating and treating onsite an estimated 34,700 cubic yards of contaminated soil and sediment using low thermal desorption; testing soil to determine the need for stabilization prior to disposal, and backfilling treated material onsite; transporting residuals generated during the treatment process offsite for disposal or treatment; treating offgases using carbon adsorption or another appropriate treatment; monitoring air; assessing the wetland area and performing additional ground water investigations during the remedial design phase; implementing institutional controls, if necessary and site access restrictions including fencing.	Chemical-specific soil clean-up goals, which are based on the EPA Risk Assessment Guidance for Superfund (RAGS), include PCBs 1 mg/kg; heptachlor epoxide 0.1 mg/kg; benzo(a)anthracene 0.4 mg/kg; chrysene 13 mg/kg; bis (2-ethylhexyl) phthalate 46 mg/kg; indeno (1,2,3-cd) pyrene 0.2 mg/kg; arsenic 3.6 mg/kg; and lead 500 mg/kg. Building material contaminated with PCBs greater than 50 mg/kg will be disposed of in accordance with TSCA/RCRA requirements.	$17,883,600 (present worth) $4,848,700 (annual O&M) (1 year)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Islip Municipal Sanitary Landfill, NY 107.5-Acre Municipal Landfill 09/30/92	Soil, debris, and GW contaminated with VOCs, including benzene, PCE, TCE, and toluene; other organics; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes installing a modified geosynthetic membrane cap over 52 acres of the landfill; constructing a stormwater system to direct and control runoff from the site to recharge basins; allowing ground water with total VOC concentrations less than 50 ug/l to naturally attenuate; extracting and onsite treatment of ground water with total VOC concentrations greater than 50 ug/l using aeration, with discharge of the treated water onsite to a recharge basin; determining if carbon absorption will be required as a polishing treatment step to ensure compliance with state discharge limits; conducting a treatability study to determine the effectiveness of aeration in precipitating metals from the ground water, and providing for a contingency remedy that treats ground water using chemical precipitation and air stripping; evaluating the ground water treatment system to determine whether an air pollution control device is necessary; monitoring ground water and air; and implementing institutional controls including deed and ground water restrictions to prevent the installation of drinking water wells in impacted areas.	Chemical-specific ground water clean-up goals, which are based on SDWA MCLs and state standards, include benzene 5 ug/l (MCL); PCE 5 ug/l (MCL); TCE 5 ug/l (MCL); toluene 5 ug/l (MCL); arsenic 0.025 mg/l (state); chromium 50 ug/l; and lead 0.02 mg/l (state).	$17,942,025 (present worth) $4,588,875 (present worth O&M) (30 years)
2 Kin-Buc Landfill, NJ 200-Acre Inactive Disposal Area 09/28/92	Sediment, GW, and SW contaminated with VOCs, including benzene and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic 2,200 yd^3 (sediment)	The selected remedial action for this site includes excavating 2,200 cubic yards of contaminated sediment with PCB levels above 5 mg/kg using excavation methods selected to control surface water flow and minimize impact to wetlands; dewatering, consolidating, and disposing of the sediment onsite within the OU1 containment area; actively restoring 1.36 acres of affected wetlands in Edmonds Creek/Marsh using a program to be developed during the RD stage; maintaining the Mound B cover; allowing natural attenuation to reduce contaminant concentrations in the ground water to acceptable levels; and conducting long-term monitoring of ground water and surface water. If EPA determines that disposal of OU2 sediment in the OU1 containment area will delay construction of the OU1 remedy, a contingency remedy will be implemented, which provides for offsite disposal of sediment at a chemical waste facility.	Chemical-specific excavation goals for sediment are based on EPA's evaluation of bioavailability, Office of Water methods, and remediation goals at other Superfund sites and include PCBs at 5 mg/kg. EPA believes that a PCB-driven remedial action will also affect reduction of the other contaminants onsite, such as metals and PAHs.	$4,314,900 (present worth) $67,100 (annual O&M cost) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Naval Air Engineering Center (Operable Unit 5), NJ 7,400-Acre Naval Engineering Center 01/03/92	Not applicable Not applicable	The selected remedial action for this site is no further action because previously implemented removal actions have eliminated the need to conduct additional remedial action at sites 5, 19, and 21.	Not applicable	$0 (present worth) $0 (O&M)
2 Naval Air Engineering Center (Operable Unit 6), NJ 7,400-Acre Naval Engineering Center 03/16/92	Not applicable Not applicable	The selected remedial action for this site is no further action because the previously implemented removal action has eliminated the need to conduct additional clean-up activities. Recently conducted environmental investigations show no evidence of any significant contamination remaining at Site 44.	Not applicable	$0 (present worth) $0 (O&M)
2 Naval Air Engineering Center (Operable Unit 7), NJ 7,400-Acre Naval Engineering Center 03/16/92	Soil and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and PCBs; and metals 520 yd^3 (soil)	The selected remedial action for this site includes extracting and pretreating contaminated ground water from six recovery wells to remove metals, solids, and free product; transporting the free product offsite for recycling or disposal; treating ground water onsite using air stripping and granular activated carbon to remove VOCs, with discharge of the treated water onsite to the aquifer through an irrigation and infiltration system; spray irrigating the treated water over areas of subsurface soil contamination to facilitate soil flushing and removal of soil contaminants; treating air emissions from the air stripping process using granular activated carbon, prior to discharge to the atmosphere; testing residual sludge from the pretreatment processes for hazardous waste characteristics and sending this offsite for appropriate disposal; and returning spent carbon offsite to the vendor for regeneration.	Chemical specific clean-up levels for ground water and soil have not been identified because of the interim nature of this remedial action. Clean-up goals will be established when a final remedial action is chosen. Treatment residuals will be tested to determine whether RCRA Land Disposal Restrictions apply.	$4,015,000 (present worth) $400,000 (annual O&M) (3 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 North Sea Municipal Landfill, NY 131-Acre Active Landfill 09/28/92	Not applicable Not applicable	The selected remedial action for this site is no further action, with air and ground water monitoring.	Not applicable	$0 (present worth) $0 (O&M)
2 Pasley Solvents & Chemical, NY 0.5-Acre Former Oil, Solvent, and Chemical Storage Tank Farm 04/24/92	Soil and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs; and metals, including arsenic, chromium, and lead 13,000 yd^3 (soil)	The selected remedial action for this site includes treating 13,000 cubic yards of contaminated soil onsite using vacuum extraction to remove aliphatic hydrocarbons and soil flushing, as necessary, to remove VOCs, followed by disposal of treatment residuals at an offsite RCRA facility; ground water pumping and onsite treatment using precipitation, clarification, and filtration to remove heavy metals, followed by treatment with air stripping to remove VOCs; treating the liquid phase using granular activated carbon as a final polishing step, with recharge onsite into the aquifer or to infiltration trenches; treating offgases from the air stripping process using vapor phase activated carbon; disposing of residual carbon and sludge generated during the treatment processes offsite; and monitoring soil and ground water.	Chemical-specific soil clean-up goals are based on SDWA MCLs to protect ground water by the reduction of mobility and volume of contaminants and include PCE 1.4 mg/kg; TCE 0.7 mg/kg; toluene 1.5 mg/kg; and xylenes 1.2 mg/kg. Chemical-specific ground water clean-up goals may be waived because of the presence of an upgradient contamination source from another site. Clean-up goals are based on the upgradient concentrations of certain contaminants. When the upgradient source has been remediated, drinking water standards, such as SDWA MCLs and state ground water quality regulations, will be assigned.	$13,744,000 (present worth) $1,236,000 (annual O&M) (30 years)
2 Plattsburgh Air Force Base (Operable Unit 1), NY Air Force Base Landfill 09/30/92	Soil, sediment, GW, and SW contaminated with VOCs, including benzene and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic Not specified	The selected remedial action for this site includes clearing and grubbing the site; establishing a low-permeability vegetated cover system over the landfill; diverting the surface water runoff to minimize erosion of the cover and maintenance requirements; installing a gas detection and monitoring system; developing a post-closure plan to monitor, maintain, and inspect the site; monitoring ground water and surface water; and implementing institutional controls including deed restrictions.	Chemical-specific soil, sediment, and surface water clean-up goals were not developed for the LF-023 source control action because discrete source areas were not found. Clean-up levels for other contaminated media associated with the site will be established in a subsequent ROD, if necessary.	$4,574,000 (present worth) $988,000 (present worth O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Plattsburgh Air Force Base (Operable Unit 3), NY Air Force Base Landfill 09/30/92	Soil and debris contaminated with VOCs; other organics, including pesticides; and metals, including chromium and lead Not specified	The selected remedial action for this site includes clearing and grubbing the landfill site; diverting surface water runoff to minimize erosion of the cover and minimize maintenance requirements; covering the landfill with a 12-inch soil cover; revegetating the area to minimize erosion and enhance evapotranspiration; developing a post-closure plan to monitor, maintain, and inspect the site; monitoring ground water; and implementing institutional controls including deed restrictions.	Chemical-specific soil and ground water clean-up levels were not developed because none of the contaminants of concern identified in the baseline risk assessment were found to pose an unacceptable risk to either human health or the environment.	$2,114,000 (present worth) $866,000 (present worth O&M) (30 years)
2 Preferred Plating, NY 0.88-Acre Former Metal Plating Facility 09/28/92	Soil contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; metals, including arsenic, chromium, and lead; and inorganics, including cyanide 1050 yd^3 (soil)	The selected remedial action for this site includes jet grouting of the building's foundation to stabilize the foundation during excavation; excavating approximately 700 cubic yards of contaminated soil from the waste storage pit area and approximately 350 cubic yards of contaminated soil from within, around, and beneath the former sanitary leaching pool and former steam condensate leaching pool and line areas; treating the soil offsite using solidification/ stabilization or another appropriate technology still to be determined, with offsite disposal at a RCRA-permitted facility; and backfilling the excavated areas with clean soil.	Prior to disposal, the contaminated soil will be treated to comply with RCRA LDRs. Chemical-specific soil clean-up levels were not provided.	$1,423,700 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Ramapo Landfill, NY 60-Acre Landfill Site 03/31/92	Soil, debris, GW, and SW contaminated with VOCs, including benzene and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes installing a multi-media cap over the 60-acre landfill; improving the existing leachate collection system; diverting surface water drainage; and relocating and/or raising Torne Valley Road to allow for filling; installing ground water extraction wells to supplement the existing leachate collection system, and treating the extracted ground water and leachate offsite at the Suffern Wastewater Treatment Plant; conducting long-term ground water, surface water, and perimeter air monitoring with venting or control, as required; implementing institutional controls, including deed restrictions; and providing for a contingency remedy to provide preliminary design of the alternate water supply system, and ground water pretreatment and landfill gas treatment systems, if necessary.	Chemical-specific goals for leachate and shallow ground water clean-up are based on the more stringent New York State Water Quality Criteria standards. Surface water standards are based on the more stringent of human and aquatic ARARs.	$19,890,000-$26,423,000 (present worth) $319,800 - $678,600 (annual O&M) (30 Years) $24,890,000-$30,880,000 (present worth for contingency remedy with $319,600-$622,600 annual O&M for 30 years)
2 Robintech National Pipe, NY 12.7-Acre Light Industrial Facility 03/31/92	GW contaminated with VOCs, including 1,1-DCE, 1,2-DCE, TCE, 1,1,1-TCA, vinyl chloride, and xylenes Not specified	The remedial action for this site includes onsite pumping and treatment of contaminated ground water from the bedrock and overburden aquifers using air stripping to remove VOCs, followed by discharge of the treated water to the permitted effluent discharge point or, depending on plant requirements, use of the treated water in the plant process; utilizing air emission controls, if determined to be necessary during the RD phase; conducting a semi-annual monitoring program for 10 wells and the effluent discharge to track the migration and concentration of contaminants; invoking an ARAR waiver as contingency measure, if the continued monitoring and adjustments to the treatment system indicate that portions of the aquifer cannot be restored to beneficial use; and implementing institutional controls including onsite and offsite deed restrictions to restrict ground water use.	The selected remedy will achieve chemical-specific ARARs based on SDWA MCLs and state equivalents for the site, including TCE 5 ug/l; 1,1-DCE 5 ug/l; 1,2-DCE 5 ug/l; 1,1,1-TCA 5 ug/l; and vinyl chloride 2 ug/l. Air emissions from the stripping treatment operations will comply with state requirements for air resources.	$2,255,877 (present worth) $242,286 (annual O&M) (years 15-30)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
2 Rowe Industries Groundwater Contamination, NY 8.5-Acre Electronic Devices Manufacturing Facility 09/30/92	Soil and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; and metals, including arsenic, chromium, and lead 365 yd^3 (soil)	The selected remedial action for this site includes excavating 365 cubic yards of contaminated soil, treating the soil offsite using incineration or another equivalent technology to meet LDR disposal standards, then disposing the soil at an offsite RCRA landfill; conducting soil sampling to confirm that all soil contaminated above clean-up levels has been removed; pumping and onsite pretreatment of contaminated ground water to remove iron and manganese, followed by filtration to remove metals and air stripping to remove VOCs, with offsite discharge to surface water; treating air emissions, if necessary; and implementing a long-term ground water monitoring program.	Chemical-specific soil excavation goals are established to ensure that soil contaminants do not contribute to ground water contamination, and include benzene 0.5 mg/kg; PCE 1.5 mg/kg; TCE 1 mg/kg; toluene 1.5 mg/kg; and xylenes 1.2 mg/kg. Additionally, excavated soil sent for offsite disposal will be treated, if necessary, according to RCRA LDR standards. Chemical-specific ground water clean-up goals are based on SDWA MCLs and MCLGs, including arsenic 25 ug/l; chloroform 7 ug/l; PCE 5 ug/l; TCE 5 ug/l; toluene 5 ug/l; and xylenes 5 ug/l. Treated ground water discharged to Sag Harbor Cove will meet state discharge requirements.	$6,187,000 (present worth) $254,000 (annual O&M) (15 years)
2 Witco Chemical (Oakland Plant), NJ 9-Acre Former Technical Research Facility 09/28/92	Not applicable Not applicable	The selected remedial action for this site is no further action, with ground water monitoring. Results of the RI indicated that there are no significant concentrations of hazardous substances remaining onsite.	Not applicable	$8,660 (present worth) $2,000 (annual O&M) (5 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Abex,VA 700-Square-Foot Former Brass and Bronze Foundry 09/29/92	Soil contaminated with organics, including PAHs and PCBs; and metals, including chromium and lead Not specified	The selected remedial action for this site includes demolishing all foundry operations buildings, with removal and decontamination of associated equipment and demolition debris at an offsite landfill; temporarily relocating residents during soil excavation; removing and disposing of offsite any asphalt and concrete from paved areas prior to soil removal; excavating surface soil with lead concentrations greater than 500 mg/kg and subsurface soil with concentrations of lead exceeding 1,000 mg/kg from non-residential areas, from around foundations, and under residences in affected residential areas; temporarily storing these onsite prior to treatment; testing, then treating any soil that exhibits TCLP toxicity onsite using stabilization; retesting the treated materials to ensure they meet RCRA LDR requirements, followed by transporting and disposing of treated and untreated soil and waste materials offsite at a RCRA landfill; disposing of water generated during the treatment processes offsite at a POTW; backfilling all excavated areas with clean fill; installing erosion and sediment control measures; and monitoring air for dust and lead during remedial activities.	Chemical-specific soil excavation goals in residential areas down to the water table, which are based on EPA's policies for soil clean-up levels per OSWER Directive #9355.4-02, include lead 500 mg/kg for surface soil to one foot below surface and 1,000 mg/kg for subsurface soil from one foot below surface to the water table. All excavated soil and waste material will be tested using the TCLP method and, if they exhibit toxicity, they will be stabilized onsite to meet RCRA LDR standards prior to offsite disposal.	$28,891,243 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Brown's Battery Breaking, PA 14-Acre Inactive Lead Acid Battery Processing Facility 07/02/92	Soil, debris, and GW contaminated with metals, including lead and nickel; and other inorganics, including sulfate 67,000 yd^3 (soil and battery casings)	The selected remedial action for this site includes excavating and treating 67,000 cubic yards of soil and battery casings offsite using an innovative thermal treatment technology, followed by offsite disposal; constructing two vertical limestone barriers in the shallow aquifer to neutralize lead levels; pumping and treatment of contaminated ground water in the bedrock aquifer using pH adjustment, precipitation, and ion exchange, with onsite discharge; transporting sludge generated during the treatment process offsite for disposal at a POTW; monitoring ground water; and implementing institutional controls, including deed restrictions to limit site use; providing for a contingent remedy, which allows for stabilization/solidification of the soil and casings, followed by offsite disposal of the stabilized mass, if the selected innovative alternative cannot be implemented.	Clean-up levels for lead-contaminated soil are based on present EPA policy. An ARAR waiver has been issued on the basis that EPA will achieve an Equivalent Standard of Performance in the protection of human health and the environment. The recommended action level for residential areas is between 500 and 1,000 mg/kg, but no criterion for industrial areas has been established. EPA, therefore, has determined 1,000 mg/kg as the clean-up level for the lead-contaminated soil. Ground water clean-up goals for the shallow bedrock aquifer are based on CWA WQC and state standards. Chemical-specific clean-up goals for this site are background levels except for manganese, which must be cleaned to 50 mg/l (state). Other ground water goals include beryllium 0.19 ug/l (WQC); cadmium 0.88 ug/l (WQC); lead <3 ug/l (WQC); manganese 50 ug/l (state); nickel 2.9 ug/l (WQC); and sulfate 27 ug/l (WQC).	$12,316,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Butz Landfill, PA 1.5-Square Mile Inactive Landfill 06/30/92	GW contaminated with VOCs, including benzene, PCE, and TCE Not specified	The selected remedial action for this site includes installing ground water extraction wells immediately downgradient from the landfill in the area of suspected ground water and DNAPLs contamination; extracting and transporting ground water to an appropriate treatment facility and treating the extracted water using either chemical precipitation, followed by air stripping with vapor phase carbon units to control emissions or granular activated carbon, as determined during the RD phase; discharging the treated ground water onsite to surface water; and disposing of residuals produced during the treatment process offsite.	Clean-up goals for ground water are based on SDWA MCLs and state standards designed to achieve background levels for all of the VOCs in the ground water, thereby restoring the ground water to its beneficial use as a drinking water source. Background concentrations will be determined by EPA based on contaminant concentrations in upgradient monitoring wells.	$11,012,000 - $14,495,000 (present worth) $561,000 - $861,000 (annual O&M costs) (0-10 years)
3 C&D Recycling, PA 110-Acre Former Metals Recycling Facility 09/30/92	Soil, sediment, and debris contaminated with metals, including arsenic, chromium, and lead 20,565 yd^3 (soil and sediment)	The selected remedial action for this site includes excavating and stabilizing onsite 20,565 cubic yards of contaminated soil and sediment with lead levels greater than 500 mg/kg, along with the onsite ash, followed by disposal in an offsite landfill; decontaminating and/or demolishing contaminated buildings and structures with offsite disposal or decontamination and recycling of dismantled material and equipment; conducting post-excavation/removal sampling to confirm that clean-up levels are met; removing any casings and wire for offsite disposal or recycling; abandoning wells that serve no useful long-term purpose; grading and revegetating excavated areas; monitoring air, ground water, and surface water; and implementing institutional controls, including deed restrictions. If, within 180 days of the issuance of this ROD, EPA receives information that indicates an onsite containment cell may be designed and constructed, then the stabilized and decontaminated materials may be disposed of onsite.	Chemical-specific soil excavation goals and debris decontamination goals are based on health-risk levels and include lead 500 mg/kg; copper 3,300 mg/kg; antimony 35 mg/kg. Excavation goals for sediment include lead 500 mg/kg; copper 2,900 mg/kg; antimony 35 mg/kg. All soil, sediment, and ash will be stabilized to below RCRA TCLP levels prior to disposal. Building surfaces will be decontaminated to the following: lead 50 ug/m^3; copper 1,000 ug/m^3; and antimony 500 ug/m^3.	$11,985,717 (present worth) $25,390 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of *Selected Remedy*	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Chem-Solv, DE One-third of a 1.5-Acre Property 03/31/92	GW contaminated with VOCs, including benzene and TCE; and the metal manganese Not specified	The selected remedial action for this site includes ground water pumping and offsite discharge to a POTW for treatment, or as a contingency if an agreement with the POTW cannot be reached, onsite treatment using filtration, and air stripping with onsite discharge to surface water; conducting ground water monitoring and providing an alternate water supply, including wellhead treatment to affected residences if ground water monitoring detects contamination in existing residential wells; removing existing recovery wells; and implementing institutional controls, including deed and ground water use restrictions.	Chemical-specific ground water clean-up goals are based on SDWA MCLs or risk-based levels, including benzene 5 ug/l (MCL); and TCE 5 ug/l (MCL); manganese 3,000 ug/l (risk-based).	$660,000 - $686,000 (present worth) $57,000 - $148,000 (annual O&M) (years 2-8) $688,000 (present worth for contingency remedy with $148,000 - $189,000 annual O&M)
3 Commodore *Semiconductor* Group, PA 14-Acre Manufacturing Facility 09/29/92	GW contaminated with VOCs, including PCE and TCE Not specified	The selected remedial action for this site includes extending the public water supply lines and connecting affected residences located in areas south of the CSG facility; abandoning contaminated wells; continued maintenance of existing residential carbon units, with disposal or recycling of the spent carbon filters as determined during the remedial design phase; installing additional ground water extraction wells, air strippers, and vapor phase carbon units, to treat the contaminated ground water onsite with discharge to a public water system or reuse by the CSG facility, with overflow discharge offsite to a POTW; sampling ground water and treated water; and implementing institutional controls, including ground water well restrictions.	Ground water clean-up goals are based on background levels as established by SDWA MCLs or health-based levels, whichever are more stringent. Chemical-specific ground water goals include 1,2-DCB 75 ug/l; 1,2-DCA 810 ug/l; PCE 5 ug/l; TCA 200 ug/l; TCE 5 ug/l; and vinyl chloride 2 ug/l.	$5,573,700 (present worth) $446,500 (annual O&M) (years 0-2) $404,300 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Dixie Caverns County Landfill, VA 39-Acre Former Municipal Landfill 09/28/92	Not applicable Not applicable	The selected remedial action for this site is no further action.	Not applicable	$0 (present worth) $0 (O&M)
3 Dublin Water Supply, PA 4.5-Acre Former Manufacturing Facility 12/30/91	GW contaminated with VOCs, including PCE and TCE Not specified	The selected remedial action for this site includes installing and operating a new water supply well, or operation of the existing well within the plume, construction and operation of an onsite air stripping and vapor phase carbon adsorption treatment system, or other appropriate technology for the well; discharging the treated water to the municipal water supply system; expanding the Dublin Borough public distribution system to supply well and treated water to affected residences; and monitoring the residential and commercial wells not serviced by the public distribution system.	Chemical-specific ground water standards are based on SDWA MCLs including TCE 5 ug/l, PCE 5 ug/l; vinyl chloride 2 ug/l; cis-1,2-DCE 70 ug/l; trans-1,2-DCE 100 ug/l; 1,1-DCE 7 ug/l; and 1,1,1-TCA 200 ug/l. Performance standards for air emissions from the ground water stripping unit shall comply with the National Ambient Air Quality Standard (NAAQS) under CAA, and disposal standards for spent carbon filters shall meet RCRA requirements.	$5,000,000 (present worth) $300,000 (annual O&M) (30 years)
3 Eastern Diversified Metals, PA 25-Acre Former Metal Processing Plant 07/02/92	Leachate contaminated with organics, including dioxin and PCBs; and metals, including lead	The selected remedial action for this site includes onsite recycling of fluff into one of two forms—a "Final Product" that requires no further offsite processing, or a "Non-Final Product," such as plastic pellets, which will undergo further offsite processing; testing recycling residuals for RCRA hazardous waste characteristics, with offsite disposal of non-RCRA wastes and onsite treatment of RCRA wastes using a technology to be determined based on a treatability study; disposing of the treated wastes offsite; testing soil underlying the fluff; and implementing erosion and sedimentation controls.	There are no specific performance standards for any of the contaminants. The recycling products and the residuals will be tested for RCRA hazardous waste characteristics prior to use of the product or disposal of non-recyclable residuals.	$13,100,000-$21,900,000 (present worth) $6,900,000 (total cost O&M) (10 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Fike Chemical, WV 11.9-Acre Former Chemical Manufacturing Plant and Associated Wastewater Treatment Facility 03/31/92	Buried waste pits contaminated with VOCs, including PCE; other organics, including dioxins, pesticides, and phenols; metals; acids; and other inorganics 7,000 - 16,000 buried drums and containers	The selected remedial action for this site includes excavating between 7,000 and 17,000 buried drums and containers; using a self-supported portable structure to enclose active excavation areas and to minimize organic vapor and dust emissions and treating air emissions using an air filter and vapor phase carbon adsorption, with offsite disposal or incineration of the spent carbon and filters; sampling, testing, repackaging, and shipping of drummed waste offsite; using offsite incineration or other equivalent treatment technologies to treat drums containing solids and liquids; decontaminating empty drums onsite prior to offsite disposal of treatment liquids and metals; stabilizing/ neutralizing acidic wastes prior to offsite incineration; onsite storage of dioxin-contaminated drummed wastes and dioxin-contaminated soil and sludge identified during excavation for future treatment; treating cylinders onsite using a cylinder recovery vessel, or repackaging for offsite disposal; backfilling excavated areas; employing storm water management or erosion controls to divert surface water from the site; monitoring air; and treating any ground water collected during the excavation at the cooperative sewage treatment plant.	Although this interim action does not provide for chemical-specific clean-up standards, it does provide for the removal of source contamination in accordance with state and federal requirements. Performance standards will be established in future OUs addressing site media contamination.	$16,059,000 (present worth) $0 (O&M)
3 Lindane Dump, PA 61.8-Acre Dump 03/31/92	Soil, sediment, debris, and GW contaminated with VOCs, including benzene; other organics, including pesticides such as DDT, Lindane, and phenols; and metals, including arsenic and lead Not specified	The selected remedial action for this site includes installing a multi-layer cap where side slopes are stabilized; constructing a combination clay and soil cap where site slopes are unstable, and vegetating the capped areas; upgrading the existing leachate/shallow ground water collection system, and treating leachate and shallow ground water using air stripping, with onsite discharge to the Allegheny River; disposing of sludge generated during the treatment process offsite at an approved facility; constructing and maintaining a perimeter fence; monitoring ground water and surface water; restoring the Alsco Community park; and implementing institutional controls, including deed restrictions.	Chemical-specific goals for leachate and shallow ground water clean-up goals are based on the more stringent Pennsylvania state water quality criteria standards or SDWA MCLs, and include gamma BHC (Lindane) 2.0 ug/l and benzene 5 ug/l. An ARAR waiver is being issued for ground water based on technical impracticability of capturing all ground water due to the complex hydrogeologic conditions at the site, the possibility of subsidence and site damage due to extensive pumping, and the potential for migration during the pumping.	$14,122,500 (present worth) $634,000-$634,700 (annual O&M) (30 Years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 MW Manufacturing, PA 15-Acre Former Copper Recovery Facility 06/30/92	GW contaminated with VOCs, including PCE and TCE; other organics, including PAHs, pesticides, and phenols; and metals Not specified	The selected remedial action for this site includes constructing a public water supply system to supply drinking water to present and future affected residences; extracting contaminated ground water and treating the water onsite using chemical precipitation to remove inorganics, and air stripping to remove VOCs; treating effluent from the air stripping process using carbon adsorption to remove organics, followed by onsite discharge to surface water; treating air emissions from the air stripping process using thermal destruction, and recycling the residual carbon waste offsite; disposing of any collected free product offsite; dewatering and disposing of sludge generated during the treatment process offsite at a RCRA landfill; and implementing a ground water monitoring program. If it is determined by EPA and the state that certain portions of the aquifer cannot be restored to background levels, the ROD specifies modification of the selected remedy, which include engineering controls; physical barriers, or long-term pumping to contain contamination; institutional controls to limit access; and waiver of chemical-specific ARARs for portions of the aquifer where further contaminant reduction is impracticable.	Ground water clean-up goals are based on state standards, SDWA MCLs and MCLGs under SDWA, CWA, Pennsylvania Clean Streams Law, and background levels. The clean-up goals will attain background concentrations that will be determined during the remedial design. In the event that the background concentration of the contaminant is not detected, the most stringent chemical-specific ground water clean-up goal will be met.	$37,402,000 (present worth) $1,568,000 (annual O&M) (30 years) $20,000 (additional O&M every 5 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Paoli Rail Yard, PA 428-Acre Maintenance, Storage, and Repair Facility 07/21/92	Soil, sediment, debris, and GW contaminated with VOCs, including benzene, toluene, and xylenes; and other organics, including PCBs 28,000 yd^3 (soil); 3,000 yd^3 (previously excavated contaminated residential soil)	The selected remedial action for this site includes excavating and onsite treatment of approximately 28,000 cubic yards of contaminated soil with PCB concentrations of 25 mg/kg or greater, 3,000 cubic yards of previously excavated contaminated residential soil currently stored in an onsite containment cell with PCBs greater than 2 mg/kg, and stream sediment with PCB concentrations exceeding 1 mg/kg using solidification/stabilization processes, followed by disposal of the solidified mass in an onsite containment cell, with an impermeable cap; onsite decontamination of 35,000 square feet of high contact surfaces in the rail yard buildings and structures with PCB concentrations in excess of 10 ug/100 cm^2; mitigating impacts to wetland areas from the sediment excavation; pumping and onsite treatment of fuel-oil contaminated ground water; recovering the oil using a fuel oil recovery system and disposing of the recovered oil offsite at a RCRA facility, treating the ground water using filtration and activated carbon with onsite discharge through a subsurface infiltration gallery, with offsite disposal of the spent carbon; implementing erosion controls to manage sediment and storm water run-off; backfilling and regrading, and revegetating excavated areas; monitoring soil, sediment, ground water and air; and implementing institutional controls including deed, land, and ground water use restrictions.	Soil clean-up standards at the rail yard are based on health-based levels, including PCB 25 mg/kg for soil onsite and 2 mg/kg for residential areas. Chemical-specific ground water clean-up goals are based on the more stringent of state standards or SDWA MCLs, and include benzene 5 ug/l. An ARAR waiver will also be issued for certain management controls at the TSCA waste landfill under CERCLA 121(d)(4).	$28,268,000 (present worth) $494,000 (0-2 years) $258,250 (O&M) (3-7.5 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Raymark, PA 7-Acre Active Metal Manufacturing and Electroplating Plant 12/30/91	Soil/source contaminated with VOCs, including 1,2-DCE, PCE, and TCE Not specified	The selected remedial action for this site includes constructing, operating, and maintaining a soil vapor extraction system to remove VOCs from soil and unsaturated bedrock; treating air emissions from the extraction process using vapor phase carbon adsorption; constructing and maintaining a low permeability cap over the treated soil to minimize infiltration; conducting additional sampling of surface soil; and implementing institutional controls including deed restrictions, and site access restrictions.	Chemical and location-specific performance goals are based on federal and state standards. VOCs will be removed from the soil/source such that TCE in subsurface soil does not exceed 50 ug/l. VOCs will be removed from subsurface soil so that leaching of TCE from subsurface soil will not exceed SDWA ground water MCLs. Organic emissions will be minimized from the vapor extraction system such that the maximum rate of organic emission does not exceed 3 pounds per hour or 15 pounds per day. Infiltration of contaminants through the low permeability cap shall not exceed 9 cubic feet per day. Water potentially generated during the SVE process will be treated to meet CWA levels, as stated in the ROD for OUs 2 and 3. The excess cancer risk resulting from site-related contamination will be reduced to a 10^{-6} level and the HI will equal 1.	$3,654,400 (present worth) $1,222,600 (O&M) (2-20 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Rhinehart Tire Fire Dump, VA 22-Acre Drainage Area 09/29/92	Soil, sediment, debris, and SW contaminated with metals, including arsenic, lead, and zinc 1,125 yd^3 200,000 gals (SW)	The selected remedial action for this site includes excavating approximately 1,125 cubic yards of contaminated soil with zinc concentrations greater than 50 mg/kg from the pond area; sampling, excavating, and dewatering pond sediment using solidification with a solid reagent; testing the soil and sediment for hazardous characteristics and transporting these offsite for appropriate disposal; removing the synthetic liner within the pond, with offsite disposal; treating approximately 200,000 gallons of contaminated surface water from the pond using the existing oil/water separator; directing the water to Rhinehart's Pond for treatment in the existing wastewater treatment plant using chemical precipitation and filtration to remove solids, with discharge of the treated water onsite to Massey Run; backfilling Dutchman's Pond, and any surrounding soil that may be excavated with clean soil; and implementing soil erosion controls.	Chemical-specific soil excavation goals are based on background and aquatic toxicity levels and include zinc 50 mg/kg. Chemical-specific surface water discharge limits are based on state standards and include aluminum 87 ug/l; arsenic 360 ug/l; copper 9.2 ug/l; iron 1,000 ug/l; lead 34 ug/l; nickel 1,100 ug/l; silver 0.12 ug/l; and zinc 180 ug/l.	$1,300,000 (present worth) $12,000 (annual O&M) (2 years)
3 Route 940 Drum Dump, PA 2.5-Acre Grass-Covered Clearing 09/28/92	Not applicable Not applicable	The selected remedial action for this site is no action with future ground water monitoring.	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	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Strasburg Landfill, PA 22-Acre Inactive Landfill 03/31/92	Soil, debris, and air contaminated with VOCs, including benzene, TCE, toluene, and xylenes Not specified	The selected remedial action for this site includes excavating and removing the existing landfill cover, regrading the slopes of the landfill to conform with the PA and RCRA performance requirements, and replacing the existing landfill cap with a multi-layer cap; installing a gas venting system to operate as either an active or passive system, depending upon the measured gas emissions; installing a leachate collection trench around the eastern, southern, and western perimeters of the landfill to collect leachate migrating into the surfical aquifer; treating the leachate using a UV/ozone treatment system, based on the results of a pilot test, followed by onsite discharge to an onsite surface stream; monitoring ground water and air; and implementing site access restrictions.	Site-specific clean-up goals will meet state and closure ARARs.	$10,397,070-$11,306,460 (present worth) $312,471 (annual O&M) (30 Years)
3 Suffolk City Landfill, VA 67-Acre Inactive Sanitary Landfill 09/30/92	Not applicable Not applicable	The selected remedial action for this site is no further action with ground water monitoring, since sampling results indicate that the site poses no risk to human health or the environment.	Not applicable	$0 (present worth) $0 (O&M cost)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Tonolli, PA 30-Acre Former Battery Recycling and Secondary Lead Smelting Plant 09/30/92	Soil, sediment, debris, GW, and SW contaminated with metals, including arsenic, cadmium, and lead 39,000 yd^3 (soil)	The selected remedial action for this site includes transporting and treating offsite approximately 13,000 cubic yards of battery wastes, including battery casings, iron oxide, sump sediment, and dust by resource recovery at a secondary lead smelter; conducting additional sampling and characterization of other waste pile materials effectively via excavating and characterization of all sediment and battery fragments in stormwater collection piping and onsite dumps, or consolidation within the onsite landfill; excavating and consolidating approximately 39,000 cubic yards of soil with lead levels above 1,000 mg/kg within the onsite landfill; stabilizing onsite approximately 7,300 cubic yards of soil with lead levels over 10,000 mg/kg, with consolidation of the treated soil into the onsite landfill; excavating soil situated in the residential area to the immediate west of the property boundary containing greater than lead 500 mg/kg; collecting confirmatory samples, consolidating soil into the onsite landfill, and backfilling both onsite and offsite excavated areas with clean soil; sampling to define the area and volume of soil potentially impacted by the site activities and requiring remediation; consolidating and, if necessary, treating approximately 2,020 cubic yards of treated sludge, 250 drums of melted plastic, and 210 cubic yards of excavated lagoon soil in the onsite landfill prior to closure; conducting additional sampling and completion of bioassays for contaminated sediment in Bear and Nesquehoning Creeks during the RD to develop appropriate clean-up levels, and excavating all sediment above the set levels from the creek(s) with consolidation within the onsite landfill; closing the onsite landfill in accordance with the federally authorized state requirements for hazardous waste, including removal of standing water from the landfill; upgrading the leachate collection system, consolidating materials generated during the remedial action within the landfill to meet the minimum grading requirements; application of the properly designed layer of agricultural limestone, and covering over the landfill with a low permeability cap; conducting a treatability study to evaluate the [illegible]ne to provide	Chemical-specific soil excavation levels are based on health-risk calculations and include onsite lead 1,000 mg/kg and offsite lead 500 mg/kg. Soil will be stabilized onsite to meet RCRA TCLP levels, such as lead 5 mg/l, prior to disposal. Chemical-specific sediment clean-up levels will be determined during the remedial design stage. Chemical-specific surface water and ground water clean-up levels will also be determined during the remedial design stage and will be based on allowable NPDES discharge parameters and state-specified background levels, respectively.	$16,616,000 (present worth) $35,300-$35,600 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Tonolli, PA (Continued)		maximum pH buffering capacity to the consolidated soil for this in-situ passive treatment method; maintaining the cap and dewatering system, and monitoring ground water; collecting and treating approximately 2 million gallons of landfill leachate decontamination fluids generated during remediation, and approximately 16 gallons per year of contaminated stormwater using the existing onsite treatment system, prior to onsite discharge to Nesquehoning Creek; using monitoring data collected from the treatment system to determine appropriate discharge levels; decontaminating onsite buildings, dismantling of nonstructural components, with removal of equipment and debris offsite; disposing of drained nickel/iron batteries offsite; monitoring air; implementing measures to prevent runoff of surface waters, sediment, and/or contaminated soil or battery wastes into Nesquehoning or Bear Creeks; evaluating underground storage tanks during remedial design, any tanks that will impede the completion of the selected remedy (especially contaminated soil) will be addressed during remediation; treating the contaminated overburdened ground water by constructing a vertical chemical barrier, with possible injection of pH-adjusted water to enhance ground water flow rates; using gradient controls to prevent infiltration of contaminants into the bedrock aquifer; monitoring the effectiveness of the vertical chemical barrier and/or injection of the pH adjusted fluids; and implementing institutional controls, including deed restrictions to prevent excavation of the landfill and limit site use, and site access restrictions.		

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 U.S. Defense General Supply Center (Operable Unit 1), VA 640-Acre Military Support, Service, and Storage Facility 05/15/92	Soil contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs, pesticides, and phenols; metals, including arsenic, chromium, and lead; acids; and oils Not specified	The selected remedial action for this site includes implementing institutional controls and site access restrictions, including fencing of the storage area.	Not applicable	$15,000 (present worth) $0 (O&M)
3 U.S. Defense General Supply Center (Operable Unit 5), VA 640-Acre Military Support, Service, and Storage Facility 03/25/92	Soil contaminated with VOCs, including benzene and PCE; and arsenic, a metal Not specified	The selected remedial action for this site includes treating contaminated soil onsite using a vacuum extraction system, and controlling air emissions using carbon adsorption; constructing concrete covers over the pits to prevent their further use and infiltration of rainwater; disposing of or recycling the spent carbon offsite at a RCRA facility; and sampling soil at the end of the clean-up period to evaluate the effectiveness of the remedy.	Chemical-specific soil action levels are based on health-based criteria and include MCLs established for arsenic 5.7 mg/kg; benzene 0.001 mg/kg; PCE 1.5 mg/kg; DCE 0.015 mg/kg; TCE 0.036 mg/kg; toluene 2,400 mg/kg; and xylenes 24,000 mg/kg. Soil action levels will protect ground water at the site from further contamination.	$115,607 (present worth) $16,000 (annual O&M) (4 years)
3 USA Aberdeen, Michaelsville, MD 20-Acre Former Municipal Landfill 06/30/92	Soil contaminated with VOCs; other organics, including pesticides; and metals, including chromium and lead Not specified	The selected remedial action for this site includes replacing the existing cover with a multi-layer cap in accordance with state requirements for sanitary landfills; covering the cap with an earthen cover and revegetating the area; installing a methane gas venting system within the cap system to minimize the migration or accumulation of gases generated by the landfill wastes; and installing surface water controls to accommodate seasonal precipitation.	The soil clean-up goals for capping the site are established in accordance with state requirements for sanitary landfill and RCRA subtitle C requirements.	$9,207,200 (present worth) $27,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
3 Westinghouse Elevator Plant, PA 90-Acre Manufacturing Plant for Elevator and Escalator Components 06/30/92	GW contaminated with VOCs, including TCA, TCE, and 1,1-DCE Not specified	The selected remedial action for this site includes pumping and treatment of ground water using air stripping from both the onsite area, in the center of the contamination plume in contact with the DNAPLs; and the offsite area, downgradient from the center of the plume, to control migration of dissolved contaminants; discharging the treated water offsite to surface surface water; treating air emissions using carbon adsorption, and recycling and/or disposal of the spent carbon offsite at a RCRA facility; monitoring ground water and residential wells; and implementing institutional controls including deed restrictions to restrict the use of onsite ground water.	Chemical-specific clean-up goals for ground water are based on SDWA MCLs and non-zero MCLGs for VOCs, including TCE 5 ug/l; TCA 200 mg/l; and 1,1-DCE 7 ug/l; and State Water Quality Criteria for discharge to surface water. The state standard for ground water cleanup to background levels is waived due to technical impracticability. Emission reduction from the air stripper/adsorber will be reduced to the minimum obtainable levels through the use of best available technologies.	$4,400,000 (present worth) $142,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Agrico Chemical, FL 35-Acre Inactive Fertilizer Manufacturing Plant 09/29/92	Soil and sludge contaminated with VOCs; other organics, including PAHs and pesticide residues; metals, including arsenic and lead; and radioactive materials 453,000 yd^3 (soil and sludge)	The selected remedial action for this site includes excavating an estimated 32,500 cubic yards of contaminated soil with concentrations above 1,463 mg/kg fluoride from PFP I, III, and IV, and dewatering the excavated areas; excavating, solidifying, and stabilizing all soil with lead concentrations above 500 mg/kg and arsenic levels above 16 mg/kg from PFP IV; excavating and stabilizing contaminated sludge from all ponds; consolidating the excavated soil and sludge from all areas into PFP II; constructing a slurry wall around PFP II, and covering the area with a RCRA cap; monitoring ground water; and implementing institutional controls including deed restrictions, and site access restrictions such as security fencing.	Chemical-specific soil excavation goals are based on protection of ground water and include fluoride 1,463 mg/kg. The excavation goals established for lead and arsenic are based on health-based soil exposure scenarios, including lead 500 mg/kg and arsenic 16 mg/kg.	$10,731,013 (present worth) $384,313 (O&M) (present worth)
4 Alabama Army Ammunition Plant, AL 2,200-Acre Army Ammunition Plant 12/31/91	Soil and debris contaminated with explosives, including 2,4,6-TNT, 2,4-DNT, 2,6-DNT, and tetryl; metals, including lead; and asbestos, an inorganic 24,300 to 25,650 yd^3 (soil) 1,350 to 2,700 yd^3 (asbestos-containing material	The selected remedial action for the stockpiled soil in Area B includes separating between 24,300 and 25,650 cubic yards of contaminated soil and between 1,350 and 2,700 cubic yards of asbestos-containing material; incinerating onsite contaminated soil; testing the treated soil for explosives and lead to verify compliance with the treatment criteria and stabilizing the soil or ash, if necessary, to meet LDR's, followed by disposing of the treated soil and stabilized material onsite at designated backfill area; and containerizing asbestos-containing material, followed by either onsite or offsite disposal at a regulated facility depending on the quantity of material to be disposed of and the availability of disposal facilities.	Chemical-specific soil and debris clean-up goals are based on federal standards, including explosives 1 ug/g of 2,4,6-TNT (RCRA) and lead 5 mg/l in the TCLP extract (RCRA).	$10,991,900 - $17,055,600 (present worth) $8,782,800 - $14,846,500 (total cost O&M 6-9 months)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Benfield Industries, NC 3.5-Acre Former Bulk Chemical Mixing and Repackaging Plant 07/31/92	Soil and GW contaminated with VOCs, including benzene; other organics, including PAHs; and metals, including arsenic and lead 4,600 yd^3 (soil)	The selected remedial action for this site includes excavating, separating, sizing, and treating the contaminated soil using onsite soil washing; transferring the smaller soil particles to an ex-situ slurry biological treatment system; replacing coarse soil fraction and the treated soil fines in the onsite excavations, and grading and revegetating the area; treating and/or disposing of any remaining hazardous waste residual offsite; extracting and pretreating ground water onsite using aeration to remove iron and manganese, followed by treatment using ion exchange to remove heavy metals; ex-situ biotreatment using a submerged fixed-film bioreactor; and a polishing step using granular activated carbon; reintroducing the nutrient-enriched water into the onsite aquifer to facilitate in-situ biodegradation, or if necessary offsite discharge to a POTW.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards, including benzene 5 ug/l; antimony 6 ug/l; barium 1,000 ug/l; beryllium 4 ug/l; and lead 15 ug/l. Chemical-specific soil clean-up goals are based on SDWA MCLs and state standards, including benzo(a)anthracene 0.8 mg/kg; chrysene 1.6 mg/kg; naphthalene 10 mg/kg; and benzo(a)pyrene 0.3 mg/kg (health-based).	$3,079,900 (present worth) $424,360 (present worth O&M)
4 Carrier Air Conditioning, TN 135-Acre Active Manufacturing Facility 09/03/92	Soil, sludge, and GW contaminated with VOCs, including TCE and PCE; and metals, including lead and zinc 76,500 yd^3 (soil and sludge)	The selected remedial action for this site includes treating an estimated 76,500 cubic yards of contaminated soil/sludge and shallow ground water in the old lagoon and main plant source areas using soil vapor extraction (SVE); extracting and containing ground water from the Memphis Sand aquifer using the existing and supplemental extraction wells with treatment using the air strippers at Water Plant 2, followed by discharge of the treated ground water to the municipal water supply, a local POTW, surface water, or reinjecting it to the Memphis Sand aquifer; treating any air emissions from the SVE or the air stripping processes using granular activated carbon, thermal treatment, or photolytic oxidation, if necessary; implementing institutional controls deed restrictions to limit well construction and water use near the site; and conducting periodic monitoring.	The chemical-specific soil goal is 533 ug/kg for TCE, based on fate and transport modeling for TCE leachate, which would not contaminate the GW above the SDWA MCLs, and will be set until once the extraction system has been implemented. EPA may set an alternate clean-up level if contaminant levels remain constant at a level above the goals based on sampling results. GW clean-up levels are based on SDWA MCLs, MCLGs, and UIC regulations; CWA Discharge Limitations and Pretreatment standards; and/or the State Water Quality Act including TCE 5 ug/l; cis-DCE 70 ug/l; trans-DCE 100 ug/l; PCE 5 ug/l; vinyl chloride 2 ug/l; zinc 5,000 ug/l; and lead 15 ug/l or background levels.	$5,700,000 - $7,900,000 (present worth) $5,489,334 (O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Chem-Form, FL Machine Tool Manufacturing Facility 09/22/92	Not applicable Not applicable	The selected remedial action for this site is no action, with quarterly ground water monitoring for no less than 1 year.	Not applicable	$104,000 (present worth) $80,000 (annual O&M) (1 year)
4 Ciba-Geigy (McIntosh Plant), AL 1,500-Acre Active Chemical Manufacturer 07/14/92	Soil, sludge, and debris contaminated with VOCs, including benzene, toluene, and xylenes; other organics, including pesticides; metals, including arsenic, chromium, and lead; and inorganics 63,000 yd^3 (soil and sludge) 46,000 yd^3 (soil containing less than 2,500 mg/kg total organics and no gamma-BHC) 17,000 yd^3 (soil, sludge, and other waste) 46,000 yd^3 (iron slurry waste)	The selected remedial action for this site includes removing and decontaminating nonchemical construction/demolition debris from the surface of Area 8; excavation and offsite disposal of approximately 63,000 cubic yards of contaminated soil and sludge from the area as possible, to a depth of 20 feet, or until concrete structures, the water table, or the iron slurry waste are encountered; solidifying and stabilizing onsite approximately 46,000 cubic yards of contaminated soil that contain less than 2,500 mg/kg total organics and no gamma-BHC; treating approximately 17,000 cubic yards of soil, sludge, and other waste, which is not amenable to other treatment using an innovative thermal technology to be decided during the RD phase; treating 46,000 cubic yards of iron slurry waste in-situ using fixation/stabilization; backfilling and establishing a vegetative cover over excavated areas; disposing all treated soil, sludge, slurry waste, and debris residuals onsite in a RCRA landvault; monitoring air emissions and ground water; and institutional controls, including land and ground water use restrictions. In areas where clean-up levels are not attained, but no further excavation can occur, the technology(s) to be used will be based on treatability and leachability studies to be conducted during the RD stage, but may include using in-situ soil flushing alone or in combination with vacuum extraction or bioremediation to remediate areas where risk-based levels are not reached before excavation is terminated.	Chemical-specific soil and sludge clean-up goals are based on health-risk levels to assure that drinking water MCLs would not be exceeded in the ground water as a result of contaminants leaching through soil or sludge. Actual clean-up levels to be used will be determined for atrazine, diazinon, prometon, simazine, 4,4-DDD, 4,4-DDT, 4,4-DDE, and bladex using the summers and pestan models, and based on the proximity of the waste to the ground water table. It is anticipated that site contaminants that do not have specified clean-up levels in this ROD will be reduced to acceptable levels when established clean-up levels are met for the most toxic and mobile contaminants.	$49,723,000 (present worth) Not specified (O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Florida Steel, FL 150-Acre Steel Mill 06/30/92	Soil sediment, and debris contaminated with organics including PCBs; and metals, including lead 600 yd^3 soil and sediment 3,700 yd^3 (soil, sediment, and debris)	The selected remedial action for this site includes excavating and disposing offsite 600 cubic yards of soil and sediment contaminated with PCB levels equal to or greater than 50 mg/kg; excavating and onsite solidification of 37,000 cubic yards of EC dust and metals-contaminated ash and soil, including soil with lead concentrations above 600 mg/kg and/or PCB concentrations between 25 and 50 mg/kg; temporarily storing the excavated materials onsite pending final treatment in a manner that will prevent PCB contamination through surface water run-off, and disposing of the solidified materials in an onsite double-lined landfill with a RCRA cap; controlling surface water run-off from the site by routing it to the onsite surface water retention pond; periodic monitoring of surface water for at least 2 years after construction is completed; continuing ground water quality monitoring; and implementing institutional controls, including deed restrictions.	Chemical-specific soil excavation goals are based on health risk levels and the leachability of lead from soil into the underlying ground water, including lead in soil 600 mg/kg; PCBs 25 mg/kg; and slag, which contains lead 1360 mg/kg. The slag level was developed to be protective of human health in an industrial setting, and additional TCLP testing will be conducted during the RD stage to confirm its protectiveness. Compliance with the RCRA land disposal treatment standards for EC dust will be attained by meeting levels specified in the treatability variance for contaminated soil and debris.	$7,004,750 (present worth) $18,200 (annual O&M) (30 years)
4 Geigy Chemical (Aberdeen Plant), NC 1-Acre Former Agricultural Chemical Distribution Center 08/27/92	Soil and GW contaminated with pesticides, including aldrin, dieldrin, toxaphene, DDD, DDE, and DDT 1,000 yd^3 (soil)	The selected remedial action for this site includes excavating and disposing of an estimated 1,000 cubic yards of contaminated soil offsite at a RCRA-approved landfill, or an incinerator; backfilling the excavated areas with clean soil and revegetating the area; onsite pumping and treatment of contaminated ground water using a system to be developed during the RD phase, but will include a series of carbon filters; discharging the treated water to an infiltration gallery or offsite to a POTW; transporting the spent carbon offsite for disposal, destruction, or reactivation; implementing any of the following contingency remedies, if it is determined that certain portions of the aquifer cannot be restored to their beneficial use: installing physical barriers or long-term gradient controls; waiving chemical-specific ARARs; monitoring specific wells; re-evaluating remediation technologies for ground water restoration; and implementing institutional controls and site access restrictions including fencing.	Soil and ground water clean-up standards are based on the more stringent of state or federal MCLs, and will attain a 10^{-6} risk level. Chemical-specific goals for soil include aldrin 0.113 mg/kg; dieldrin 0.13 mg/kg; toxaphene 2 mg/kg; DDD 7.6 mg/kg; DDE 5.5 mg/kg; and DDT 4.75 mg/kg; aldrin 0.05 ug/l; dieldrin 0.01 ug/l; and toxaphene 1 ug/l.	$2,810,000-$4,650,000 (present worth) $1,680,000 (present worth O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 JFD Electronics/Channel Master, NC 13.09-Acre Former Television Antenna Production and Satellite Assembly System Facility 09/10/92	Soil, sludge, and GW contaminated with VOCs, including benzene and TCE; other organics; metals, including chromium, nickel, and antimony; and inorganics, including cyanide 3,000 yd^3 (soil and sludge)	The selected remedial action for this site includes excavating, consolidating, and treating onsite an estimated 3,000 cubic yards of contaminated soil and sludge using oxidation-reduction to destroy inorganics, followed by onsite stabilization of the treated soil and sludge; backfilling the stabilized material onsite and capping the area with either a RCRA-approved or non-RCRA cap, based on the results of a treatability study; extracting and treating contaminated ground water onsite using alkaline chlorination to remove cyanide and VOCs; precipitation/filtration to remove metals; and air stripping and carbon adsorption to remove VOCs, followed by either onsite discharge to surface water or offsite discharge to a POTW; disposing of the spent carbon from the treatment processes in accordance with ARARs; and conducting ground water monitoring.	Chemical-specific soil/sludge clean-up goals are based on health-based levels and include chromium 310 mg/kg; nickel 1,110 mg/kg; and antimony 25 mg/kg. Chemical-specific ground water clean-up goals are based upon health-based levels, and include benzene 5 ug/l; 1,2-dichloroethane 0.38 ug/l; 1,1-dichloroethene 7 ug/l; 1,2-dichloroethene 70 ug/l; 1,1,1-TCA 200 ug/l; TCE 2.8 ug/l; vinyl chloride 0.015 ug/l; barium 1,000 ug/l; chromium 50 ug/l; copper 1,000 ug/l; lead 20 ug/l; nickel 100 ug/l; zinc 500 ug/l; and cyanide 154 ug/l.	$6,392,000 (present worth) $2,804,000 (O&M) (5 or more years)
4 Madison County Sanitary Landfill, FL 90-Acre Active Sanitary Landfill 09/28/92	Soil and GW contaminated with VOCs; other organics; and metals Not specified	The selected remedial action for this site includes installing a multi-layer clay cap over the landfill; installing a stormwater runoff system including dikes, impoundments, and drainage ditches to control cap runoff; pumping and treatment of contaminated ground water onsite using air stripping and carbon adsorption, reinjection of the treated ground water offsite, or if infeasible, evaluating other disposal options including infiltration, irrigation, or direct discharge; monitoring ground water; implementing institutional controls including deed, land, and ground water use restrictions, and site access restrictions including fencing; and providing a contingency for installation of a passive gas and collection and control system, if methane is detected.	Chemical specific ground water clean-up goals are based on the federal and state MCLs.	$5,191,000 (present worth) $109,000 - $409,000 (annual O&M) (25 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Marine Corps Logistics Base, GA 3,200-Acre Active Military Facility 08/14/92	Surface and subsurface soil and sediment of PSC 16 and 17 contaminated with organics, including PCBs and PAHs; and metals, including chromium and lead Not specified	The selected remedial action for this site includes covering PSC 16 with a multi-layer cap; excavating and disposing of sediment from within the catch basin adjacent to PSC 16 offsite; excavating and transporting hazardous soil from PSC 17 offsite for stabilization and disposal; backfilling excavated areas with clean soil and revegetating the area; installing ground water monitoring wells; and implementing institutional controls including land use restrictions on future activities within the source areas, as well as site access restrictions such as fencing.	The proposed remedy for PSC 16 will meet ARARs; however, because capping is not a treatment technology, no health-risk based clean-up goals will be achieved. Contaminated soil from PSC 17 will be stabilized offsite in accordance with RCRA land disposal standards. Although these actions are intended to be final for soil, ground water contamination at OU3 will be investigated under a separate ROD, and final goals will be set.	$717,200 (present worth) $41,500 (annual O&M) (1 year)
4 Milan Army Ammunition Plant, TN 22,436-Acre Army Ammunition Manufacturing Plant 09/30/92	GW contaminated with VOCs, including carbon disulfide; other organics, including HMX, RDX, 2,4,6-TNT, 2,4-DNT, 2,6-DNT, 1,3-DNB, 1,3,5-trinitrobenzene, and nitrobenzene; and inorganics, including nitrate Not specified	The selected interim remedial action for this site includes pumping and pretreatment of contaminated ground water immediately downgradient of the former O-line ponds using electrochemical precipitation to remove inorganics, followed by onsite filtration to remove suspended solids, and UV oxidation to destroy the majority of the organic contaminants, and granular activated carbon (GAC) to remove the remaining organic compounds; re-injecting the treated water onsite upgradient of the former ponds; analyzing the precipitated filter cake and the carbon filters for hazardous waste characteristics and disposing of them offsite accordingly; monitoring ground water; and implementing institutional controls, including ground water use restrictions.	Chemical-specific ground water discharge levels are based on best practicable treatment, are slightly higher than human health-risk standards (HBN) and SDWA MCLs, and include nitrate 10,000 ug/l (MCL); carbon disulfide 3,500 ug/l (HBN); 1,3-dinitrobenzene 5 ug/l (HBN); 2,4-dinitrotoluene 0.5 ug/l (HBN); 2,6-dinitrotoluene 0.5 mg/l (HBN); HMX 2,000 ug/l (HBN); nitrobenzene 17.5 ug/l (HBN); RDX 10 ug/l (HBN); 1,3, 5-trinitrobenzene 20 ug/l (HBN); and 2,4,6-TNT 10 ug/l (HBN). Health-based standards will be fully met in the final remedial action under one final ROD addressing ground water immediately downgradient of the former ponds (OU1), soil in and around the former pond (OU2), and the ground water plume (OU14).	$26,980,000 (present worth) $1,413,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 National Electric Coil/Cooper Industries, KY 3.5-Acre Active Manufacturing Plant 09/30/92	GW and air contaminated by VOCs, including TCE, toluene, and xylenes; and metals, including lead Not specified	The selected remedial action for this site includes onsite pumping and treatment of contaminated ground water using air stripping to remove VOCs, with onsite discharge of the treated water to the Cumberland River; capturing and treating resulting vapors using activated carbon, and disposing of the spent carbon offsite as RCRA F001 waste; and monitoring ambient air and ground water.	Chemical-specific ground water clean-up goals are based on state effluent discharge limitations and include TCE 0.172 mg/l; 1,1-DCE 0.0021 mg/l; vinyl chloride 0.128 mg/l; PCBs 0.0043 ug/l; cis-1,2-DCE 0.07 mg/l; methylene chloride 0.011 mg/l; benzene 0.833 mg/l; and lead 0.072 mg/l. Ambient air performance standards also will be met and include cis-1,2-DCE 5 ug/m^3; TCE 5 ug/m^3; and vinyl chloride 5 ug/m^3.	$106,000 (capital cost) $150,000 (annual O&M)
4 New Hanover County Airport Burn Pit, NC Former Training Area for Fire fighters 09/29/92	GW contaminated with VOCs, including benzene; and metals, including chromium and lead 9,700,000 gals (GW)	The selected remedial action for this site includes collecting additional ground water quality data for a 1-year period; conducting a treatability study to size the ground water treatment equipment and to determine if a technology for pretreatment is necessary; extracting and onsite pretreatment of an estimated 9.7 million gallons of contaminated GW using either clarification, filtration, or addition of chemical complexing agents to remove suspended solids or iron, followed by treatment with air stripping to remove VOCs, with offsite discharge of the treated water to the Northside POTW system; testing and disposing of the sludge generated during the pretreatment process in the most economical means; conducting a review of the existing GW monitoring system to ensure proper monitoring of GW quality and the effectiveness of the system; and monitoring GW; providing for contingencies if certain portions of the aquifer cannot be restored to their beneficial use including providing engineering or long-term gradient controls by low-level pumping; considering a waiver of chemical-specific ARARs for the aquifer; reevaluating the remedial technologies for GW restoration; continued monitoring of specific wells; and institutional controls to restrict access to certain portions of the aquifer.	Chemical-specific ground water clean-up levels are based on the North Carolina Water Quality, EPA, and MCL standards and include benzene 1 ug/l; chromium 50 ug/l; and lead 15 ug/l.	$1,932,800 (present worth) $1,073,700 (O&M) (4.5 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Potter's Septic Tank Service Pits, NC 5-Acre Septic Tank Service Pits 08/05/92	Soil and GW contaminated with VOCs, including benzene, toluene, and xylenes; and metals, including chromium and lead 101,000 yd^3 (subsurface soil)	The selected remedial action for this site includes collecting and pretreating surface water using oxidation, pH adjustment, and flocculation/clarification to remove heavy metals, followed by treatment by an air stripper to remove VOCs, and carbon polishing to remove PCBs; discharging the water offsite to a NPDES-permitted facility for final treatment prior to discharge; controlling air emissions from the air stripping process using carbon adsorption, if necessary, with regeneration or disposal of the spent carbon; and conducting quarterly surface water monitoring.	Goals are based on the more stringent of state or federal standards and federal land disposal restrictions pertaining to storage and transportation of hazardous wastes. Chemical-specific ground water goals include benzene, 5 ug/l; toluene 1,000 ug/l, xylenes 1,000 ug/l; chromium 50 ug/l; lead 15 ug/l; and naphthalene 30 ug/l. Chemical-specific goals for subsurface and surface soil include benzene 0.01 mg/kg; toluene 3.4 mg/kg; xylenes 3.5 mg/kg; chromium 97.2 mg//kg; lead 25 mg/kg; and naphthalene 1.8 mg/kg.	$11,800,000 (present worth) $384,281 (annual O&M) (50 years)
4 Savannah River (USDOE) (Operable Unit 1), SC 300-Square Mile DOE Defense Production Facility 06/29/92	Soil, sludge, and SW contaminated with VOCs, including TCE and PCE; metals, including lead; acids; and radioactive materials, including uranium 39,000 yd^3 (soil) 37,000 yd^3 (sludge)	The selected remedial action for this site includes pumping and onsite treatment of any standing water that remained in the basin; excavating, dewatering, and stabilizing approximately 37,000 cubic yards of basin sludge using Portland cement; placing, consolidating, and compacting the stabilized sludge into the basin; discharging the sludge effluent from the dewatering process offsite to a permitted NPDES outfall; consolidating approximately 39,700 cubic yards of contaminated soil excavated from the seepage area, Lost Lake, and a portion of the sewer line into the basin; installing and maintaining a low permeability cap over the settling basin, which includes a surface soil layer that will be graded and vegetated to promote drainage; monitoring ground water; and implementing institutional controls including deed restrictions.	No chemical-specific clean-up goals were provided in this interim ROD, but will be provided for the final M-area HWMF remedial action. The goal of this interim ROD is to integrate prior RCRA decisions into the CERCLA process. The goal of the remediation is to minimize the migration of contaminants to the ground water and eliminate surface transport pathways.	$3,000,000-$5,000,000 (present worth) $20,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Savannah River (USDOE) (Operable Unit 2), SC 300-Square Mile DOE Defense Production Facility 06/29/92	Soil, sediment, debris, and SW contaminated with VOCs, including TCE; metals, including chromium and lead; and acids 3,000 gals (SW)	The selected remedial action for this site includes excavating and compacting the process sewer line and associated soil and sediment, placing them in the basin, and installing a low permeability cap over the basin; sampling the accumulated rainwater in the basin with onsite discharge and/or treatment, if constituent concentrations in the accumulated rainwater exceed NPDES discharge standards; maintaining the cap; monitoring ground water; and implementing institutional controls, including deed restrictions.	No chemical-specific clean-up standards were specified in this interim ROD, but will be provided for the final MET LAB HWMF remedial action. The goal of this interim ROD is to integrate prior RCRA decisions into the CERCLA process. The goal of the remediation is to minimize the migration of contaminants to the ground water and eliminate surface transport pathways.	$2,000,000 (present worth) $20,000 (annual O&M) (30 years)
4 Savannah River (USDOE) (Operable Unit 3), SC 300-Square Mile DOE Defense Production Facility 06/29/92	GW contaminated with VOCs, including PCE and TCE Not specified 1,200 acres (GW plume)	The selected interim remedy for this site includes installing 11 or more ground water recovery wells under the RCRA program throughout the A/M area; extracting and treating contaminated ground water using an air stripper to remove volatile solvents, followed by onsite discharge to an NPDES permitted outfall; upgrading the air stripping tower to include an off-gas treatment system based on the result of a treatability study.	No chemical-specific clean-up goals were specified in this interim ROD, but they will be provided for the final remedial action. The goal of this remediation is to reduce ground water contaminants and minimize migration of the contaminant plume.	$7,800,000 (present worth) $20,000 (annual O&M) (30 years)
4 Standard Auto Bumper, FL 1-Acre Chromium and Nickel Plating Facility 09/28/92	Soil contaminated with metals, including chromium and lead 2,500 yd^3 (soil)	The selected remedial action for this site includes excavating 2,500 cubic yards of contaminated soil with concentrations exceeding a 10^{-6} risk level and disposing of the soil offsite; backfilling the excavated areas with clean fill; and monitoring ground water.	Chemical-specific soil clean-up goals are based on the exceedance of a 10^{-6} risk level, including hexavalent chromium 52 mg/kg; nickel 370 mg/kg; and total chromium 519 mg/kg.	$338,186 (present worth) $40,186 (present worth O&M)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 USDOE Oak Ridge Reservation (Operable Unit 6), TN Nuclear Weapons Production Facility 09/30/92	SW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PCBs and PAHs; and metals, including lead Not specified	The selected remedial action for this site includes collecting and pretreating surface water using oxidation, pH adjustment, and flocculation/clarification to remove heavy metals, followed by treatment by an air stripper to remove VOCs, and carbon polishing to remove PCBs; discharging the water offsite to a NPDES-permitted facility for final treatment prior to discharge; controlling air emissions from the air stripping process using carbon adsorption, if necessary, with regeneration or disposal of the spent carbon; and conducting quarterly surface water monitoring.	Chemical-specific surface water clean-up goals are based on SDWA MCLs and primary health advisory. These include benzene 0.005 mg/l; PCE 0.005 mg/l; TCE 0.005 mg/l; toluene 1 mg/l; xylenes (total) 10 mg/l; naphthalene 0.13 mg/l; and lead 0.05 mg/l.	$350,000 (capital cost) $117,700 (annual O&M)
4 USDOE Oak Ridge Reservation (Operable Unit 18), TN Inactive Uranium Enrichment Facility 09/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action. No additional action is necessary to protect human health and the environment.	Not applicable	$0 (present worth) $0 (O&M)
4 USMC Camp Lejeune Military Reservation, NC 500-Acre Military Reservation 09/23/92	GW aquifer contaminated with VOCs, including benzene and TCE; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes extracting and pretreating contaminated ground water using an oil/water separator; treating the water onsite using precipitation, chemical reduction, and sedimentation to remove inorganics, and air stripping to remove VOCs; treating emissions using carbon adsorption, based on the results of a treatability study; discharging the treated water offsite to the Hadnot Point Sewage treatment plant for ex-situ biological treatment, prior to final onsite discharge to the New River; transporting the free product to a waste oil recycler or incinerator offsite; conducting long-term ground water monitoring; and implementing institutional controls including ground water use restrictions.	Chemical-specific ground water clean-up standards are based on SDWA MCLs and state standards and include benzene 1 ug/l; TCE 2.8 ug/l; lead 15 ug/l; arsenic 50 ug/l; and chromium 50 ug/l.	$7,600,000 (present worth) $351,500 (O&M) (30 years)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Whitehouse Waste Oil Pits (Amendment), FL 7-Acre Oil Reclamation Facility and Acidic Waste Oil Disposal Area 06/16/92	Soil, debris, GW, and SW contaminated with VOCs, including benzene, toluene, and xylenes; other organics, including PCBs and phenols; and metals, including arsenic, chromium, and lead 56,930 yd^3 (soil and sludge)	The amended remedial action for this site includes excavating and screening the soil and sludge wastes from within seven waste pits to remove coarse debris, with decontamination and offsite disposal of the debris not amenable to biotreatment; treating 56,930 cubic yards of screened soil and sludge/wastes using soil washing, followed by onsite ex-situ biotreatment of soil wash water and suspended contaminated fines using a slurry-phase bioreactor, with discharge of the treated water to an onsite drainage ditch if discharge levels are met, or further treatment in the onsite treatment system prior to discharge; treating contaminated fines and sludge onsite using solidification/stabilization, with replacement in the drainage ditch; extracting contaminated ground water with analysis and onsite treatment using granular activated carbon (GAC) adsorption and chemical precipitation units, prior to discharge to surface water; installing and maintaining a 6-inch vegetative cover over the excavated area; fencing the site; conducting a pilot-scale treatability study to further develop the treatment train; and monitoring ground water. If the ground water treatment system is not capable of achieving the clean-up goals at the end of any 5-year period, the following contingencies will apply: containment measures to prevent further migration of the ground water plume; consideration of a waiver of chemical-specific ARARs for the aquifer; implementation of institutional controls, including deed restrictions, to restrict access to certain portions of the aquifer; and monitoring onsite and offsite wells.	Soil clean-up levels are based on a direct contact exposure pathway (risk-based). Chemical-specific goals for soil include arsenic 42 mg/kg; benzene 0.4 mg/kg; chromium 526 mg/kg; lead 500 mg/kg; naphthalene 317 mg/kg; PCB 1 mg/kg; phenol 47,467 mg/kg; PCE 4 mg/kg; toluene 2,000 mg/kg; and TCE 0.7 mg/kg. The ground water clean-up levels are in accordance with the federal and state water quality standards. Chemical-specific goals for ground water include arsenic 50 ug/l; benzene 1 ug/l; benzo(a)pyrene 0.2 ug/l; chromium 100 ug/l; lead 15 ug/l; 3,4-methyl phenol 850 ug/l; naphthalene 10 ug/l; phenol 10,000 ug/l; toluene 24 ug/l; TCE 3 ug/l; and xylenes 50 ug/l.	$15,500,000 (present worth) $3,400,000 (O&M) (30 years)
4 Wilson Concepts of Florida, FL 2-Acre Former Manufacturing and Metal-Finishing Facility 09/22/92	Not applicable Not applicable	The selected remedial action for this site includes no further action with ground water monitoring at and around the site for 1 year.	Not applicable	$48,000 (present worth) $36,000 (annual O&M) (1 year)

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Region, Site Name, State/Type/ Worth/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Capital and O&M Costs
4 Woodbury Chemical (Princeton Plant), FL 5-Acre Pesticide and Fertilizer Formulation and Storage Facility 06/25/92	Not applicable Not applicable	The selected remedial action for this site is no further action, with quarterly ground water monitoring.	Not applicable	$22,500 (present worth) $10,000 (annual O&M) (1 year)
4 Yellow Water Road Dump, FL 14-Acre Former Storage Area for PCB-Contaminated Liquids and Electrical Equipment 06/30/92	GW contaminated with PCBs Not specified	The selected remedial action for this site includes adding 4 additional ground water monitoring wells downgradient of the former operational area; monitoring ground water; and implementing institutional controls, including deed and ground water use restrictions and fencing. Downgradient monitoring will be performed quarterly for 2 years, after which the ground water monitoring frequency will be reevaluated if no PCB contamination is detected. If PCB contamination is identified above MCLs in compliance wells, contingent remedial activities would be implemented, including construction of ground water extraction wells; installation of a ground water filtration system, with a granular activated carbon treatment system, and a treated effluent discharge system, which uses onsite infiltration ponds or drainage swales; and disposal and/or treatment of the residual carbon and filtration waste offsite.	The chemical-specific ground water clean-up goal is based on the SDWA MCL for PCBs of 0.5 ug/l. However, because of the technical impracticability of using a treatment system to remove PCBs from ground water, a waiver of SDWA MCLs is required for ground water located directly beneath and in proximity to the former operational area.	$407,629-$1,377,600 (present worth) $575,105 annual O&M (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Alsco Anaconda, OH 4.8-Acre Former Sludge Disposal Area 09/30/92	GW contaminated with organics, including cyanide, fluoride, PCBs, and bis (2-ethylhexyl) phthalate; and metals, including chromium and lead Not specified	The selected remedial action for this site includes natural flushing and attenuation of contaminants from the contaminated aquifer, and allowing ground water to discharge onsite to the Tuscarawas River; installing onsite ground water monitoring wells; installing and sampling background wells; sampling Tuscarawas River sediment and benthic organisms; and implementing institutional controls including deed restrictions to prevent installation of drinking water wells onsite until remedial action levels for ground water have been achieved.	Chemical-specific ground water clean-up levels include the following, which are SDWA MCLs or proposed MCLs; chromium 0.1 mg/1; cyanide 0.2 mg/l; fluoride 4 mg/l; and bis (2-ethylhexyl) phthalate 0.004 mg/l. Lead levels will meet an action level of 0.015 mg/l. Clean-up below background levels will not be required.	$504,600 (present worth) $455,400 (present worth O&M) (30 years)
5 American Chemical Services, IN 36-Acre Chemical Manufacturing Facility 09/30/92	Soil, debris, and GW contaminated with VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PCBs, PAHs, and phenols; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes excavation and offsite incineration of approximately 400 intact buried drums, decontaminating and disposing of miscellaneous debris offsite; treating contaminated soil using in-situ vapor extraction; conducting an in-situ vapor extraction pilot study for Onsite Area buried waste; excavating and treating buried waste or PCB-contaminated soil onsite using low temperature thermal treatment, with vapor emission control during excavation, and possible immobilization of inorganics after treatment; depositing the treated residuals that meet health-based levels onsite and covering the area with a soil cover; pumping and onsite treatment of contaminated ground water along with wash water from the decontamination processes and condensate from the soil treatment processes using a method to be determined during the RD phase, with onsite discharge of the treated water to surface water and wetlands; continuing to evaluate and monitor wetlands, with mitigation of affected wetlands if necessary; controlling and monitoring air emissions from excavation and treatment processes; conducting long-term ground water monitoring; and implementing, to the extent possible, institutional controls including deed restrictions, and site access restrictions such as fencing.	Chemical-specific soil clean-up goals are based on risk-based levels and include benzene 1.0 mg/kg; toluene 167-5,000 mg/kg; xylenes 867-26,000 mg/kg; PCBs 10 mg/kg (with 10-inch soil cover); chromium 47-1,400 mg/kg; and lead 500 mg/kg. The lead clean-up level for soil is based on the Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites and the PCB clean-up level for soil is based on TSCA policy for unrestricted access. Chemical-specific ground water clean-up goals are based on risk-based levels, SDWA MCLs, and include benzene 5 ug/l; PCE 5 ug/l; PCBs 0.06 ug/l; and arsenic 8.8 ug/l.	$37,800,000-$46,800,000 (present worth) $17,670,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Bofors Nobel (Amendment), MI 85-Acre Active Specialty Chemical Production Plant 07/22/92	Soil and sludge contaminated with SVOCs, including benzidine and dichlorobenzidine 762,000 yd^3 (soil and sludge)	The selected amended remedial action for this site includes excavation and onsite disposal of approximately 767,000 cubic yards of contaminated sludge and soil in onsite RCRA-type secure landfill cells, constructed as part of the original remedial action; expanding and upgrading the unused landfill adjacent to the lagoon area to meet the RCRA standards; storing lesser contaminated material in the unused landfill; installing extraction wells downgradient of the unused landfill as a tertiary leachate containment system; and monitoring the landfill and existing leachate collection system. This ROD amendment does not address any issue associated with ground water treatment.	EPA has determined that landfilling of contaminated soil and sludge without treatment provides the equivalent level of protection to human health and the environment from site-related risks as that provided by the remedy in the 1990 ROD. Ground water clean-up criteria will be addressed in a subsequent final ROD.	$45,498,216 (present worth) $89,030 (annual O&M) (3 years)
5 Butterworth #2 Landfill, MI 180-Acre Municipal Landfill 09/29/92	Soil contaminated with VOCs, including PCBs and pesticides; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes removing and disposing of exposed drums containing hazardous materials at an offsite RCRA facility; upgrading the landfill cover to include a clay cap, and gas venting and treatment systems to meet state standards; revegetating the area; installing additional monitoring wells in the upper and lower aquifers, and implementing a long-term monitoring program for ground water, surface water, sediment, and biota; establishing ACLs for site ground water based on the current level of contamination; mitigating affected wetlands; implementing institutional controls including deed and ground water use restrictions.	Chemical-specific ground water clean-up goals were not established in this ROD because current contamination levels will be determined through sampling of compliance monitoring wells for eight consecutive quarters over a 2-year period. The indicator parameters to be analyzed quarterly will include all chemicals established as chemicals of concern. After the initial 2-year period of quarterly sampling, ground water shall be monitored for the next 3 years on a quarterly basis; then, analysis will be made for the primary contaminants of concern.	$15,230,000 (present worth) $110,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Cannelton Industries, MI 75-Acre Former Tannery Facility 09/30/92	Soil, sediment, and debris contaminated with VOCs, including TCE and xylenes; other organics, including PAHs, pesticides, phenols, and PCBs; metals, including arsenic, chromium, and lead; and inorganics 199,700 yd^3 (soil)	The selected remedial action for this site includes excavating, dredging, and dewatering debris, waste, soil, and sediment that exceed the clean-up criteria; placing these media in an onsite solid waste landfill, and closing the landfill in accordance with RCRA subtitle D, or more stringent state standards; filling in onsite excavated areas with clean soil to stabilize the shoreline; collecting ground water from the dewatering/construction activities and treating the water, if needed, prior to offsite discharge to POTW, or onsite discharge to surface water; conducting additional ecological studies; monitoring ground water and surface water; and implementing institutional controls to control land use, and potentially, deed restrictions to control ground water use.	Chemical-specific soil, sediment, and debris excavation standards are based on state direct human contact (DHC) standards and include cadmium 100 mg/kg (DHC); lead 400 mg/kg (DHC); arsenic 12.8 mg/kg (background); and carcinogenic PAHs 0.33 mg/kg (MDL). A chemical-specific excavation goal for chromium was established using back calculations based on a 10^{-6} cancer risk level for hexavalent chromium and an HI of 1 for trivalent chromium, resulting in a clean-up standard of 5,300 mg/kg for trivalent chromium and 54 mg/kg for hexavalent chromium.	$19,700,000 (present worth) $458,000 (annual O&M) (years 0-1) $449,000 (annual O&M) (years 2-3) $579,000 (annual O&M) (year 4) $303,000 (annual O&M) (years 5-30)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Central Illinois Public Service, IL 1-Acre Former Manufactured Gas Plant 09/30/92	Soil, sediment, debris, and GW contaminated with VOCs, including benzene, toluene, and xylenes; and other organics, including PAHs and phenols 9,000 yd^3 (soil) 3,000 yd^3 (sediment)	The selected remedial action for this site includes documenting the previously implemented source control measures which included removal and offsite disposal of the structures associated with the original gas plant; excavation and offsite disposal of approximately 9,000 cubic yards of visibly contaminated soil down to the ground water table level and excavation and offsite disposal of 3,000 cubic yards of soil and sediment from the drainageway section leading to Seaman Estate pond; backfilling excavated areas with clean soil from offsite; plugging and abandoning private drinking water wells; and connecting affected residents to a public water supply. The selected remedial actions to be implemented now include extracting and neutralizing contaminated ground water prior to onsite treatment in a liquid phase carbon adsorption column, with onsite discharge of the treated water to the drainageway downgradient of Seaman Estate pond; transporting contaminated carbon offsite to a facility for regeneration or incineration; removing precipitated solids from the treatment process, and testing them for hazardous waste characteristics, prior to appropriate disposal; conducting long-term ground water and surface water monitoring; and implementing erosion controls, institutional controls, including deed and land use restrictions, and site access restrictions, including fencing.	Chemical-specific ground water clean-up standards, which are based on state and federal drinking water criteria, include benzene 0.005 mg/l; toluene 1 mg/l; ethylbenzene 0.7 mg/l; xylenes 10 mg/l; anthracene 2.1 mg/l; benzo(a)pyrene 0.00023 mg/l; and 2-methylphenol 0.35 mg/l. In addition to meeting the individual ground water objectives indicated certain toxicity equations as defined in the ROD must be satisfied to protect against liver tumors and liver, kidney, and blood toxicity.	$9,346,034 (present worth) $401,400 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 City Disposal Sanitary Landfill, WI 38-Acre Inactive Landfill 09/28/92	Soil, debris, and GW contaminated with VOCs, including benzene, TCE, toluene, and xylenes; other organics, including phenols; metals, including arsenic, chromium, and lead; and inorganics 700,000 yd^3 (soil and debris)	The selected remedial action for this site includes installing a landfill gas control system to control air emissions; treating contaminated soil and debris in cells 6 and 12 using an in-situ vapor extraction (ISVE) system with an air intrusion cut-off wall to remove and treat VOCs; treating the extracted vapors by flaring; installing a hazardous waste landfill cover, Design C, over cells 6 and 12, and a solid waste landfill cover, Design B, over the rest of the landfill; extracting ground water, and conducting treatability studies to determine the best treatment; pretreating ground water onsite using precipitation to remove metals, followed by treatment using chemical oxidation or another comparable technology, with onsite discharge to Badfish Creek; monitoring ground water and residential wells; and implementing deed, land and ground water use restrictions.	Chemical-specific ground water clean-up goals are based on Preventative Action Limits (PALs) established in NR 140 of the Wisconsin Administrative Code and include benzene 0.067 ug/l; 2-butanone (PAL or MCL not established); 1,1 dichloroethane 85 ug/l; methylene chloride 15 ug/l; toluene 68.6 ug/l; vinyl chloride 0.0015 ug/l; and xylenes 124 ug/l. Air emissions from the gas control and ISVE systems will meet the CAA requirements. RCRA standards will apply to the construction of the landfill caps.	$14,851,387 (present worth) For source control: $90,978 (annual O&M) (years 0-5) $21,258 (annual O&M) (years 6-25) For GW $645,859 (annual O&M) (years 0-20) $114,487 (annual O&M) (years 20-40)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Clare Water Supply, MI Municipal Well Field 09/16/92	Soil, sediment, and GW contaminated with VOCs, including benzene, PCE, TCE, and xylenes 54,800 yd^3 (soil and sediment)	The selected remedial action for this site includes dewatering and treating 54,800 cubic yards of contaminated soil and sediment, including the soil under buildings, using in-situ vapor extraction (ISVE) to remove VOCs; treating air emissions from the ISVE process using granular activated carbon; returning spent carbon units to the supplier for offsite regeneration; possibly enhancing the effectiveness of the remedy with limited excavation of hot spots, where SVE may not be practicable, temporarily capping treated areas, or adding nutrients, based on the results of pre-design studies; extracting and treating contaminated ground water onsite using UV/chemical oxidation, with reinjection of the treated ground water into the aquifer; treating water from the dewatering process using carbon adsorption prior to discharge; monitoring ground water; and implementing institutional controls, including deed and ground water use restrictions.	Chemical-specific soil clean-up goals are based on protection of ground water and include benzene 20 ug/kg; vinyl chloride 0.4 ug/kg; TCE 60 ug/kg; PCE 14 ug/kg; methylene chloride 100 ug/kg; trans-1,2-DCE 2,000 ug/kg; cis-1,2-DCE 1,400 ug/kg; xylenes 6,000 ug/kg; toluene 20,000 mg/kg; ethylbenzene 1,000 mg/kg; 1,1-DCA 14,000 mg/kg; 1,2-DCA 8 mg/kg; 1,1,2-TCA 12 mg/kg; 1,1,1-TCA 4,000 mg/kg; and styrene 20 mg/kg. Chemical-specific ground water clean-up goals are based on SDWA MCLs, and State MCLs under Michigan's Act 307 Type B Cleanup Levels and include benzene 1 mg/l; vinyl chloride 0.02 mg/l; TCE 3 mg/l; PCE 0.7 mg/l; methylene chloride 5 mg/l; trans-1,2-DCE 100 mg/l; cis-1,2-DCE 70 mg/l; xylenes 300 mg/l; toluene 800 mg/l; ethylbenzene 70 mg/l; 1,1-DCA 700 mg/l; 1,2-DCA 0.4 mg/l; 1,1,2-TCA 0.6 mg/l; 1,1,1-TCA 200 mg/l; and styrene 1 mg/l.	$11,754,247 (present worth) $431,183 (average annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Columbus Old Municipal Landfill, IN 19-Acre Old Municipal Landfill 03/31/92	Not applicable Not applicable	The selected remedial action for this site is no further action, which includes ground water monitoring and a five-year review of site conditions to evaluate the protectiveness of the remedy. In the event that the Indiana Department of Transportation and the City of Columbus proceed with construction of the proposed roadway across the site, EPA will require the implementation of a contingency remedy, which includes implementing a landfill cover maintenance program; developing a ground water recovery system implementation plan; installing a minimum of two additional ground water monitoring wells; installing fencing with appropriate warning signs; implementing a ground water monitoring program; and implementing institutional controls, including deed restrictions on land and ground water use.	Not applicable	$0 (present worth) $0 (O&M)
5 Electrovoice, MI Active Manufacturing Facility 06/23/92	Soil, sludge, and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs; metals, including arsenic, chromium, and lead; and inorganics 2,100 yd^3 (sludge)	The selected remedial action for this site includes treating contaminated soil in the dry well area onsite using vapor extraction; excavating the 2,100 cubic yards of remaining sludge, with offsite solidification and landfilling; collecting and treating onsite contaminated ground water using either granular or powdered activated carbon, air stripping, chemical oxidation/reduction or photolysis/oxidation, with discharge of the treated water offsite to a POTW; and monitoring off-property ground water. If, following these actions, the dry well soil does not meet treatment standards, further remedial action consistent with RCRA closure will be evaluated, which include installing a hazardous waste cap over the lagoon area soil; conducting an investigation of the potential existence of a lower aquifer in the area of the former dry well area; monitoring on and offsite ground water; and implementing institutional controls including deed restrictions for the property and surrounding properties to prohibit future installation of drinking water wells.	Chemical-specific soil clean-up goals are based on state standards and include arsenic 0.4 ug/kg; benzene 20 ug/kg; PCE 14 ug/kg; TCE 60 ug/kg; toluene 16,000 ug/kg; and xylenes 6,000 ug/kg. Chemical-specific ground water clean-up goals are also based on state standards and include benzene 1 ug/l; TCE 3 ug/l; toluene 800 ug/l; and xylenes 20 ug/l.	$4,100,000 (present worth) $330,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Grand Traverse Overall Supply, MI 3.9-Acre Active Commercial Laundering Facility 02/03/92	Not applicable Not applicable	The selected remedial action for this site is the no action; however, ground water monitoring for inorganics will continue for 1 year. EPA has determined that conditions at the site due to contamination by organic compounds pose no current or potential threat to human health or the environment.	Not applicable	$0 (present worth) $0 (O&M)
5 H. Brown Company, MI Former Landfill and Battery Reclamation Facility 09/30/92	Soil, sediment, debris, GW, SW, and air contaminated with VOCs, including benzene, toluene, and xylenes; other organics, including PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead 147,000 yd^3 (soil) 33,000 yd^3 (battery casings)	The selected remedial action for this site includes demolishing onsite buildings to allow cleanup of contaminated soil beneath structures, and disposing of the debris in an onsite or offsite landfill; onsite decontamination of buildings not requiring demolition; consolidating contaminated surface soil onsite; treating an estimated 180,000 cubic yards of soil, sediments, and battery chips onsite using in-situ solidification/stabilization; constructing a containment wall around the treated soil, sediment, and debris, and covering the solidified material using a multi-layer cap; extracting contaminated ground water from the shallow aquifer beneath the site; treating collected ground water and surface water onsite using aeration, filtration, carbon adsorption, and ion exchange, prior to onsite discharge to the Grand River; conducting additional studies to further define the extent of contamination in the intermediate and bedrock aquifers; monitoring ground water and surface water; and implementing institutional controls including deed and ground water use restrictions, and site access restrictions such as fencing.	Chemical-specific soil clean-up goals are based on site risks, state ARARs, or background levels and include PCBs 1 mg/kg (state); arsenic 6.6 mg/kg (background); lead 5 mg/kg (state). Chemical-specific ground water clean-up goals include benzene 1 ug/l (state); arsenic 17.9 ug/l (state); and lead 1,423 ug/l (background).	$15,000,000 (present worth) $220,000 (annual O&M) (years 2-3)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Hagen Farm, WI 28-Acre Former Waste Disposal Facility 09/30/92	GW contaminated with VOCs including 1,1-dichloroethene, ethylbenzene, benzene, tetrahydrofuran, toluene, vinyl chloride, and xylenes; and metals, including arsenic and lead Not specified	The selected remedial action for this site includes extracting and pretreating on- and off-property ground water to remove metals and inorganic solids; treating on-property ground water using an activated biological sludge treatment system; treating off-property ground water using a treatment technology to be determined during the remedial design stage; discharging the treated ground water onsite to the wetlands, surface water, or possibly reinjecting the treated water into the aquifer to promote in situ biodegradation, based on the results of a bench-scale study; treating sludge generated from the treatment process, prior to disposal in a RCRA landfill; treating off-gases emissions from the treatment process using carbon adsorption, with regeneration or treatment of the spent carbon; monitoring private wells located around the site; implementing institutional controls including deed restrictions, and access restrictions.	Chemical-specific ground water clean-up goals are based on the State of Wisconsin Preventive Action Limits (PALs) and include benzene 0.067 ug/l; 1,1-dichloroethene 0.024 ug/l; ethylbenzene 272 ug/l; tetrahydrofuran 10 ug/l; toluene 68.6 ug/l; vinyl chloride 0.0015 ug/l; xylenes 124 ug/l; arsenic 5 ug/l; and lead 5 ug/l.	$13,612,000-$24,163,000 (present worth) $1,062,000 (annual O&M) (1 year)
5 Kohler Landfill, WI 40-Acre Active Landfill 03/30/92	Soil and leachate contaminated with VOCs, including benzene, toluene, TCE, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes closing the landfill according to state regulations; constructing a multi-layer cap over the fill material to reduce infiltration into the waste mass; installing a perimeter leachate collection drain and treating leachate onsite using air stripping, prior to onsite discharge to the Sheboygan River; and implementing institutional controls including deed restrictions and site access restrictions.	Clean-up goals will be met in accordance with state landfill closure codes, and discharge codes. Chemical-specific ground water clean-up goals will be addressed in a future ROD.	$4,700,000 (present worth) $1,000,000 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 La Grande Sanitary Landfill, MN 80-Acre Landfill Site 09/30/92	Soil, debris, and GW contaminated with organics and metals Not specified	The selected remedial action for this site includes converting a gas monitoring well to a gas vent to control the accumulation of explosive gases; sealing off and abandoning the onsite Shop Well to ensure that it will not be used as a potable water source; stabilizing the west slope of the landfill, and placing a soil cover over the exposed landfill waste on the northwest corner; sloping and reconstructing the borrow pit area adjacent to the west slope to ensure long-term integrity of the existing cover system; conducting long-term monitoring of ground water and combustible gas; and implementing institutional controls, including deed and ground water use restrictions, and restricting site access.	Chemical-specific ground water clean-up goals were not specified. Because of the low level risks posed by the site, treatment of onsite media is not considered necessary.	$501,000 (present worth) $22,000 (annual O&M) (30 years)
5 Metal Working Shop, MI 2.7-Acre Manufacturing Facility 06/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action because no significant levels of contaminants exist onsite, and no additional action is necessary to protect human health or the environment.	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	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 MIDCO I (Amendment), IN 4-Acre Abandoned, Industrial Waste Recycling, Storage, and Disposal Facility 04/13/92	Subsurface soil, sediment, and GW contaminated with VOCs, including toluene, TCE, and xylenes; metals, including chromium and lead; and inorganics 5,200 - 7,800 yd^3 (soil) 100 yd^3 (sediment)	The amended remedial action for this site includes reducing the amount of soil to be treated to a minimum of 5,200 cubic yards because of the amendment to soil CALs and the determination that arsenic may not be present above background levels at the site; treating the contaminated soil onsite using with soil vapor extraction, followed by in-situ solidification/stabilization; excavating and treating an estimated 500 cubic yards of contaminated sediment from the surrounding wetlands onsite using solidification/stabilization; pumping and treatment of contaminated ground water using air stripping and carbon absorption, followed by onsite deep well injection; constructing a final RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy in the event that ground water clean-up action levels for the Calumet Aquifer are technically impracticable to attain, which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the nearby Midco II site.	Ground water clean-up standards for the Calumet Aquifer are not changed from the 1989 ROD. Treatment requirements prior to DWI are further defined compared to the 1989 ROD and include, at a minimum, treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 950 ug/l. Treatment below MACs will be required, if necessary, to protect underground sources of drinking water. Soil treatment action levels are increased from $1x10^{-6}$ and HI=1 in the 1989 ROD to $5x10^{-4}$ and HI=5 in this amendment.	$10,000,000 (present worth) $460,000 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 MIDCO II (Amendment), IN 7-Acre Abandoned Chemical Waste Storage and Disposal Facility 04/13/92	Subsurface soil, sediment, and GW contaminated with VOCs, including toluene, TCE, and xylenes; metals, including chromium and lead; and inorganics 18,300 yd^3 (soil) 500 yd^3 (sediment)	The amended remedial action for this site includes reducing the amount of soil to be treated from an estimated 35,000 cubic yards to an estimated 12,200 cubic yards; excavating and treating the contaminated soil onsite using soil vapor extraction, followed by in-situ solidification/ stabilization; excavating an estimated 500 cubic yards of contaminated sediment from a ditch adjacent to the northeast boundary of the site, with onsite solidification/stabilization; pumping and onsite treatment of contaminated ground water using air stripping and carbon adsorption, or possibly precipitation, with deep well injection of the treated water; constructing a final vegetated RCRA cover over the entire site; implementing institutional controls including deed restrictions, and site access restrictions; conducting long-term monitoring and providing for a contingency remedy if clean-up action levels for the Calumet Aquifer are technically impracticable to attain which includes low-level pumping to contain contaminated ground water and additional institutional controls. The ground water treatment or underground injection portions of this remedy may be combined with remedial actions for the adjacent Midco I site.	Ground water clean-up standards are not changed from the 1989 ROD. Treatment required prior to OU1 are further defined compared to the 1989 ROD, and include at a minimum treatment to MACs, which are required for RCRA delisting. Specific MACs include methylene chloride 31.5 ug/l; trichloroethene 31.5 ug/l; toluene 6,300 ug/l; chromium 630 ug/l; nickel 630 ug/l; and lead 99.5 ug/l. Treatment below the MACs will be required if necessary to protect underground sources of drinking water. Soil treatment action levels are increased from $1x10^{-6}$ and HI=1 in the 1989 ROD to $5x10^{-4}$ and HI=5 in this ROD.	$13,000,000 (present worth) $660,000 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Muskego Sanitary Landfill, WI 56-Acre Active Sanitary Landfill 06/12/92	Soil and sediment contaminated with VOCs, including benzene, TCE, toluene, and xylenes; and other organics, including PAHs, PCBs, pesticides, and phenols Not specified	The selected remedial action for this site includes installing a cap over the Old and Southeast Fill Areas; adding a landfill leachate control system at the Old Fill Area and improving the existing leachate control system at the Southeast Fill Area; discharging the collected leachate onsite to the sewer if pretreatment requirements are met, or treating leachate along with contaminated ground water as part of the subsequent OU; managing sludge residuals from the treatment processes as a hazardous waste, if it exhibits the characteristic of toxicity; capping of the Non-Contiguous Fill Area; treating soil within the drum trench and north and south refuse areas using in-situ vapor extraction to remove VOCs; treating the extracted gas using either activated carbon or thermal destruction with catalytic oxidation, or another treatment method prior to emission to the atmosphere; utilizing an active gas control system, in conjunction with the leachate collection system at both the Old and Southeast Fill Areas to destroy extracted gases with a ground flare; and conducting semi-annual ground water monitoring and implementing institutional controls including deed restrictions and site access restrictions including fencing.	A performance based clean-up standard will be applied to the area covered by the ISVE system in the Non-Contiguous Fill Area. The clean-up standard will be based on residual soil gas concentrations that are low enough to assure compliance with ground water clean-up standards, which will be specified in the subsequent ROD for the contaminated ground water.	$9,914,000 (present worth) $309,500 (annual O&M) (years 0-5) $134,200 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 New Brighton/Arden Hills, MN 25-Square-Mile Ammunition Manufacturing Facility 09/30/92	GW contaminated with VOCs, including benzene, TCE, and xylenes; other organics, including phenols; and metals, including chromium and lead Not specified	The selected remedial action for this site includes pumping and offsite treatment of contaminated ground water at the leading edge of the south plume using precipitation and filtration to remove inorganic solids and a pressurized granular activated carbon system to remove VOCs; discharging the treated ground water offsite to the potable water supply of the City of New Brighton; disposing of filtration residuals and spent carbon offsite; implementing institutional controls including ground water use restrictions; and monitoring ground water.	Chemical-specific ground water clean-up standards, which are based on state standards and SDWA MCLs and MCLGs, include 1,1-dichloroethane 70 ug/l; (state); 1,1-dichloroethene 6 ug/l (state); cis-1,2-dichloroethene 70 ug/l (MCL); 1,1,1-trichloroethane 200 ug/l (MCL); 1,1,2-trichloroethane 3 ug/l (proposed MCLG); and TCE 5 ug/l (MCL).	$4,851,000 (present worth) $276,000 (annual O&M) (30 years)
5 Peerless Plating, MI 1-Acre Former Electroplating Facility 09/21/92	Soil, debris, and GW contaminated with VOCs, including benzene, TCE, toluene, and xylenes; metals, including arsenic, chromium, and lead; and inorganics 6,500 yd^3 (soil)	The selected remedial action for the site includes demolishing onsite buildings to facilitate soil sampling beneath the buildings, and disposing of the associated debris offsite; treating approximately 6500 cubic yards of contaminated soil onsite using in-situ vapor extraction, followed by onsite stabilization of excavated soil; testing the stabilized soil, prior to offsite disposal at a RCRA facility; controlling air emissions using carbon adsorption; pumping and onsite treatment of ground water using air stripping, followed by precipitation, pH adjustment, and chemical coagulation, with discharge of the treated ground water onsite to surface water; controlling air emissions using a carbon filter; treating the residual sludge to meet LDR standards, prior to offsite disposal at the RCRA Subtitle C facility; regenerating the spent carbon at an offsite thermal treatment facility; and monitoring ground water.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and State standards and include benzene 1 ug/l; arsenic 0.2 ug/l; . cadmium 4 ug/l; and lead 5 ug/l. Chemical-specific soil clean-up goals are based on RCRA LDRs and health-based levels and include benzene 0.02 mg/kg; arsenic 1.7 mg/kg; cadmium 0.8 mg/kg; and barium 40 mg/kg.	$7,971,000 (present worth) $323,000 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Reilly Tar & Chemical (Indianapolis Plant), IN 120-Acre Former Coal Tar Refinery and Creosote Wood Treatment Plant 06/30/92	GW contaminated with VOCs, including benzene and toluene; other organics, including PAHs; metals, including arsenic, chromium, and lead; and other inorganics Not specified	The selected remedial action for this site includes either extracting contaminated ground water downgradient of the site and treating the water using biological treatment, followed by filtration and activated carbon adsorption, with offsite discharge of 5mgd to a POTW, with the remainder reinjected to the aquifer; or combining ground water extraction from up-gradient wells, with treatment using precipitation/clarification, followed by activated carbon, with reinjection to the aquifer in conjunction with extracting ground water from interior of the site, and treating this by precipitation/clarification, followed by air stripping, with offsite discharge to a POTW; monitoring ground water and implementing engineering controls. The final selection of options and specific design parameters will be determined during the remedial design, based on the results of treatability tests to determine the optimum design and operating requirements.	Interim ground water clean-up levels are based on the more stringent of a 10^{-6} cumulative lifetime cancer risk, or MCLs for carcinogens; and MCLGs, MCLs, or a HI = 1 for noncarcinogens. Chemical-specific ground water goals include benzene 5 ug/l (MCL); toluene 1,000 ug/l (MCL); xylenes 10,000 ug/l (MCL); pyridine and pyridine derivatives 35 ug/l (HI); arsenic 50 ug/l (MCL); chromium (MCL); lead 5 ug/l (MCL); and ammonia 30 ug/l (MCL). Treated ground water discharged to the POTW must meet separate clean-up criteria under CWA.	$15,000,000 (present worth) $1,000,000 (annual O&M) (30 years)
5 Reilly Tar & Chemical (St. Louis Park), MN 80-Acre Former Coal Tar Distillation and Wood Preserving Plant 09/30/92	GW contaminated with organics, including PAHs Not specified	The selected remedial action for this site includes intercepting and containing contaminated ground water using gradient control wells; discharging the water offsite for treatment at the local POTW; and continued monitoring the discharged water to determine if within 3 to 5 years, this could be discharged directly to a storm sewer and then to surface water. At that time, if necessary, an onsite or offsite treatment facility will be built to treat the water using activated carbon, prior to discharge, with regeneration and reuse of any spent carbon.	Chemical-specific ground water clean-up goals are based on site-specific Drinking Water Criteria. These levels, which were developed by state and EPA experts, include benzo(a) pyrene and dibenzo(a,h)anthracene 5.6 ng/l; carcinogenic PAHs 28 ng/l; and other PAHs 15 ng/l.	$370,000 (capital cost per well) $300,000 (additional capital costs) $45,000 (annual O&M per well) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Savanna Army Depot, IL Active Military Installation 03/31/92	Soil, debris, and SW contaminated with VOCs and organics, including TNT; nitrobenzene (NB); 2,4-dinitrotoluene (DNT); 2-amino-4, 6-DNT; 1,3,5-trinitrobenzene (TNB); and hexahydro-1, 3,5-trinitro-1,3,5-triazine (RDX), a pesticide 18,230 yd^3 (soil)	The selected remedial action for this site includes excavating an estimated 18,230 cubic yards of contaminated soil from the upper and lower lagoons, drain troughs, and piping; treating the soil onsite using a rotary kiln incineration thermal treatment process, followed by onsite disposal of the treated soil and flyash in the upper lagoon area; reprocessing any treated soil, which fails the hazardous waste characteristic tests; treating soil that does not meet TCLP standards using stabilization, prior to disposal; decanting standing water in the lagoons, with treatment, if necessary; restoring any affected wetlands; and conducting perimeter air monitoring.	Chemical-specific soil clean-up goals are based on health-based criteria and include TNT 21 mg/kg; 2,4-DNT 9.3 mg/kg; 2-A-4,6-DNT 1,191 mg/kg; 1,3,5-TNB 3.7 mg/kg; RDX 5.75 mg/kg; and NB 37.2 mg/kg. Treated soil will be subjected to TCLP and testing for other hazardous waste characteristics. Residual soil left in the ground will have no concentrations of explosive compounds that are greater than health-based criteria.	$10,251,000 (present worth) $11,400 (annual O&M) (2 years)
5 Skinner Landfill, OH 78-Acre Landfill 09/30/92	Soil and GW contaminated with VOCs, including benzene; other organics, including PCBs and pesticides; and metals, including arsenic Not specified	The selected interim remedial action for this site includes implementing site access restrictions at the area of the site that was used for landfilling and disposal of liquid wastes; posting warning signs; conducting quarterly ground water monitoring; and providing an alternative water supply to residents who are potentially impacted by offsite migration of contaminated ground water.	No performance clean-up goals were provided for remedial action. The subsequent ROD will address the clean-up goals for the chemicals of concern in soil, sediment, ground water, and surface water.	$160,000 (capital cost) $30,000 (annual O&M)
5 South Andover (Operable Unit 1) (Amendment), MN 50-Acre Privately Owned Parcels of Land 06/09/92	GW contaminated with VOCs, including PCE, TCE, and toluene; and metals, including arsenic, chromium, and lead Not specified	The amended remedial action for this site includes monitoring ground water at the site; abandoning nonessential wells; and resampling wells, if action levels are exceeded. The remedial design investigation showed that there is no definable plume at the site; rather, there are random detections of compounds below background and regulatory standards. Therefore, EPA and the state are deleting three of four components identified in the 1988 ROD remedy selection.	Action levels for ground water at the site are based on SDWA MCLs.	$150,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 South Andover (Operable Unit 2), MN 50-Acre Privately Owned Parcels of Land 12/24/91	Soil and debris contaminated with organics, including PAHs and PCBs; and metals, including lead 2,100 yd^3 (PAH-contaminated soil) 9,300 yd^3 (PAH, PCB, and metal-contaminated soil)	The selected remedial action for this site includes excavating and onsite treatment of 2,100 cubic yards of PAH-contaminated soil using ex-situ biological treatment; excavating and disposing of the remaining 9,300 cubic yards of PAH-, PCB-, and metal-contaminated soil from areas 2, 3, 4, and 7 in an offsite solid waste landfill; sampling and removing offsite approximately 20 onsite drums; and monitoring surface water and sediment.	Soil clean-up goals will meet AWQCs and Minnesota surface water quality standards. Noncarcinogenic risk will be to a HI=1. Chemical-specific goals for soil cleanup include PAHs 2 mg/kg; PCBs 2 mg/kg; antimony 25 mg/kg; and lead 500 mg/kg.	$2,470,000 (present worth) $195,000 (total cost O&M)
5 Spickler Landfill, WI 10-Acre Inactive Municipal and Industrial Landfill 06/03/92	Soil, sludge, and leachate contaminated with VOCs, including benzene, PCE, toluene, TCE, and xylenes; other organics, including pesticides; metals, including arsenic, chromium, and lead; and other inorganics, including asbestos Not specified	The selected remedial action for this site includes treating wastes in the mercury brine pit either by solidification and/or stabilization, based on results of a treatability test, and installing an impermeable cap over the treated material; installing a solid waste cap over the New and Old Fill areas with an active leachate collection treatment system and a gas collection system; discharging the treated leachate to wetlands, surface water, or a POTW, based on the results of TCLP testing; monitoring ground water, leachate, and landfill gases; maintaining the landfill caps; and implementing engineering and institutional controls including deed restrictions.	Extracted leachate will be treated to appropriate discharge levels as specified by federal and state requirements prior to discharge to the wetlands, surface water, or a POTW. Capping and closure of the mercury brine pit are subject to the requirements of RCRA, Subtitle C.	$4,859,000 (present worth) $113,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Tar Lake, MI 200-Acre Former Manufacturing Site 09/29/92	Soil, tar sludge, GW, and SW contaminated with VOCs, including benzene, toluene, and xylenes; and other organics, including PAHs and phenols 30,000 yd^3 (tar sludge) 40,000 yd^3 (soil)	The selected remedial action for this site includes excavating approximately 30,000 cubic yards of tar sludge and approximately 40,000 cubic yards of contaminated soil in and around Tar Lake, with dewatering using extraction wells to facilitate excavation; consolidating the excavated materials into two adjoining RCRA containment cells to be constructed within the contamination area; adding solidification agents, such as bentonite and cement to the tar sludge, and capping the cell with a RCRA Subtitle C cap; installing a leachate collection system; pumping to contain the contaminated ground water, water from the dewatering process, and the ponded water on Tar Lake, and treating these using carbon adsorption or another technology based on the results of a treatability study to be conducted during the pre-design stage; injecting the treated water upgradient of the extraction wells to perform a closed loop system; monitoring ground water; and implementing institutional controls, including ground water use restrictions.	All soil and sludge with an excess cancer risk level greater than $1x10^{-6}$ will be excavated from the site. Chemical-specific soil and sludge clean-up levels were based on the Michigan Environmental Response Act and health-based criteria and include 2-methylphenol 8,000 ug/kg; benzene 0.4 ug/kg; benzo(a)anthracene, benzo(b)fluoranthene, and benzo(k)fluoranthene all at 100 ug/kg; phenols 6,000 ug/kg; toluene 16,000 ug/kg; and xylenes 6,000 ug/kg. Because the ground water containment is an interim measure, ground water clean-up standards are waived. Chemical-specific clean-up levels will be provided in the final action for ground water onsite.	$20,100,000 (present worth) $791,800 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Torch Lake (Operable Units 1 and 3), MI 2,700-Acre Copper Milling and Smelting Facility 09/30/92	Soil, debris, and slag pile/beach contaminated with organics, including, PAHs; and metals, including arsenic, chromium, and lead 680 Acres (soil/tailings)	The selected remedial action for this site includes placing a soil cover with vegetation over 442 acres of tailings in Lake Linden, Hubbell/Tamarack City, and Mason, and 9 acres in Hubbell; placing a soil cover with vegetation over 229 acres of tailings in Calumet Lake, Boston Pond, Michigan Smelter, Dollar Bay slag pile, and Grosse Point; removing debris such as wood, empty drums, and other garbage for offsite disposal; and implementing institutional controls, including deed restrictions to control the use of tailing piles and slag piles/beach. The Isle Royale tailings will be excluded from the area to be covered with soil and vegetation. Twelve acres out of the approximately 223-acres of the Isle-Royale tailings will be developed as a sewage treatment plant; 90-acres are designated to be developed as a residential area; and 60-acres are currently being used as a source material to make cement blocks. Also excluded from the area to be covered are the area designated by the Houghton County Road Commission for use as source material for road traction during the winter; the Quincy Smelter area (based on the assumption that this area will be developed as part of a National Historic Park); and the North Entry, Redridge, and Freda tailings. If any of these excluded areas has not been addressed as planned within 5 years after RD submittal, that area will then be subject to the requirements of this ROD.	Soil clean-up levels are not established for this remedial action.	$6,126,000 (present worth) $109,000 (annual O&M) (10 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Tri County Landfill, IL 66-Acre Former Landfills (Two) 09/30/92	Soil, sediment, debris, GW, SW, and air contaminated with VOCs, including benzene and TCE; other organics, including PAHs, PCBs, and pesticides; and metals, including arsenic Not specified	The selected remedial action for this site includes excavating and consolidating contaminated sediment from the leachate ditch with contaminated onsite soil and drummed drill cuttings; installing a clay cap over these materials and regrading and revegetating the site; installing interceptor trenches to collect contaminated onsite ground water and leachate with pretreatment, if necessary, prior to either onsite discharge to surface water or offsite discharge to a POTW, as determined during the RD; diverting surface water from the waste areas, and collecting and treating surface water offsite; treating landfill gases using a series of gas extraction wells connected to a blower/flaring facility, prior to discharge to the atmosphere; assessing and mitigating affected wetlands; providing for contingency measures to address changed conditions or previously unknown contamination problems; allowing offsite contaminated ground water to naturally attenuate; monitoring soil, sediment, and surface water; and implementing institutional controls including deed, land, and ground water use restrictions, and site access restrictions such as fencing.	There are no chemical-specific standards established for soil and sediment; however, risk-based levels or local background concentrations may be utilized. The selected remedy will reduce potential exposure to contaminated ground water to within acceptable risks of 10^{-4} to 10^{-6} excess cancer risk and an HI of less than 1.	$12,624,000 (present worth) $243,500 (annual O&M) (2 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
5 Twin Cities AF Reserve (SAR Landfill), MN 2-Acre Former Disposal Area for U.S. Air Force Main Base Refuse 03/31/92	Soil and GW contaminated with VOCs, including 2-butanone and TCE; and metals, including arsenic and lead Not specified	The selected remedial action for this site includes allowing contaminated ground water to naturally attenuate; maintaining the site; monitoring ground water and surface water; and implementing institutional controls, including deed restrictions, and site access restrictions, such as fencing.	The remediation goal is to reduce the levels of contaminants in the ground water to below MCLs established under the SDWA and to ensure that contaminant levels do not exceed federal or state Water Quality Criteria for freshwater species or potential drinking water sources. The remediation will achieve a carcinogenic risk level within EPA's target range for acceptable excess carcinogenic risk of 10^{-4} to 10^{-6}. Chemical-specific ground water clean-up goals are based on SDWA MCLs or Minnesota RAL, including arsenic 10 ug/l (RAL); beryllium 1 ug/l (RAL); cadmium 4 ug/l (RAL); lead 15 ug/l (SDWA); nickel 70 ug/l (RAL); selenium 10 ug/l (RAL); TCE 5 ug/l (SDWA); and vanadium 20 ug/l (RAL).	$737,000 (present worth) $684,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Cal West Metals, NM 43.8-Acre Former Battery Breaking, Recycling, and Secondary Lead Smelting Facility	Battery waste piles, soil, sediment, and debris contaminated with organics, including PAHs; and metals, including arsenic and lead 12,000 yd^3 (soil) 2,700 yd^3 (source waste material)	The selected remedial action for this site includes excavating, consolidating, and treating an estimated 15,000 cubic yards of contaminated battery waste materials, soil, and sediment onsite using stabilization/solidification; disposing of the treated materials in the southwest corner of the fenced area and capping the disposal area with cement and a 12-inch soil cover; decontaminating onsite buildings and equipment; and sampling ground water.	Chemical-specific soil and sediment clean-up goals are established on health-based levels for carcinogenic and noncarcinogenic risks and include arsenic 0.37 mg/kg; lead 640 mg/kg; mercury 0.82 mg/kg; and PAHs 3 mg/kg benzo(a)pyrene equivalents. Contaminated materials with lead concentrations exceeding 640 mg/kg will be treated to meet the RCRA TCLP standard of 5 mg/kg leachable lead prior to onsite disposal.	$1,557,000 (present worth) $5,000 (annual O&M) (30 years)
6 Crystal Chemical (Amendment), TX 24.4-Acre Site (6.8-Acre Abandoned Herbicide Manufacturing Facility and 17.6 Acres of Affected Surrounding Properties) 06/16/92	Soil contaminated with the metal arsenic 55,000 yd^3 (soil)	The amended remedial action for this site includes excavating 55,000 cubic yards of contaminated offsite soil with arsenic levels above 30 mg/kg and placing the soil onsite; constructing a multi-layer cap over the entire site; and implementing institutional controls, including land use restrictions.	The cap will comply with RCRA requirements for landfill closure. The excavation goal for arsenic in soil is 30 mg/kg.	$5,803,300 (present worth) $140,079 (annual O&M)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Double Eagle Refinery, OK 12-Acre Former Oil Reclamation Plant 09/28/92	Soil, sediment, sludge, debris, and SW contaminated with VOCs, including benzene and PCE; other organics, including PAHs and PCBs; metals, including arsenic and lead; and acids 42,000 yd^3 (soil, sediment, and sludge)	The selected remedial action for this site includes excavating approximately 2,700 cubic yards of contaminated materials from the two offsite areas, Radio Tower and Parcel H, and consolidating these onsite within the East/West lagoon along with contaminated materials from the DER impoundment and open areas; treating the 42,000 cubic yards of consolidated materials onsite using neutralizing agents for the acidic wastes and solidification/stabilization to remove inorganics; using surface water from the impoundments in the stabilization processes; excavating the solidified material and transporting this offsite for disposal in a RCRA landfill; demolishing contaminated onsite equipment or structures, including above-ground storage tanks, with salvage and/or removal; disposing of any asbestos-containing material, as needed; and monitoring ground water.	Chemical-specific goals for soil, sediment, and sludge are based on meeting a risk of 10^{-4} to 10^{-6} and an HI=10, including lead 500 mg/kg; PAHs; and PCBs 25 mg/kg. All other residual materials will meet RCRA TCLP regulatory limits prior to offsite disposal.	$6,400,000 (present worth) $0 (O&M)
6 Fourth Street Abandoned Refinery, OK 27-Acre Oil Refinery and Recycling Facility 09/28/92	Soil, sediment, sludge, and debris contaminated with organics, including PAHs and PCBs; metals, including arsenic and lead; and inorganics, including asbestos 1,200 yd^3 (contaminated material) 42,000 yd^3 (consolidated soil, sediment, sludge, and debris)	The selected remedial action for this site includes excavating 1,200 cubic yards of the contaminated material from the Parcel H area and consolidating this onsite along with other contaminated material; treating approximately 42,000 cubic yards of the consolidated soil, sediment, sludge, and debris onsite using neutralization of the acidic waste and stabilization of the lead-contaminated materials; disposing of the treated wastes at a permitted landfill; and cleaning, consolidating, demolishing, and salvaging and/or removing contaminated equipment, structures, and asbestos, as necessary.	Soil clean-up levels are established for consolidated materials that will be stabilized to ensure that leaching does not exceed the TCLP. Chemical-specific goals for soil correspond to the TSCA clean-up level for industrial land use, regional guidance for setting remedial goals, and industrial land use for the FSR site. These include lead 500 mg/kg; PAHs 30 mg/kg; and PCBs 25 mg/kg.	$6,400,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Gulf Coast Vacuum Services (Operable Unit 1), LA 12.8-Acre Former Vacuum Truck and Oil Field Drilling Plant 09/30/92	Soil, sediment, pit sludge, and GW contaminated with VOCs, including benzene; other organics, including PCBs and napthalene; and metals, including arsenic and barium 19,500 yd^3 (soil and sediment) 15,100 yd^3 (soil and sludge)	The selected remedial action for this site includes consolidation and onsite incineration of approximately 12,000 cubic yards of organic- and inorganic-contaminated waste pit sludge and 7,950 cubic yards of associated soil, 12,000 gallons of tank contents, and 155 cubic yards of tank sludge, followed by stabilization/solidification of the residual ash, if necessary; stabilizing and solidifying onsite approximately 18,900 cubic yards of site inorganic-contaminated soil, and 600 cubic yards of surface sediment; disposing of all of these residuals in an onsite excavation and covering the area with a clay cover; allowing ground water to naturally attenuate; monitoring ground water in the upper and lower aquifers; conducting onsite and offsite air monitoring; treating air emissions as needed; and implementing institutional controls, including deed restrictions.	Chemical-specific soil, sediment, and pit sludge goals are based on SDWA MCLs, and include arsenic 16 ug/kg; barium 5,400 mg/kg; and benzene 0.66 mg/kg. Ground water is expected to meet the National Primary Drinking Water and health-based standards. Chemical-specific goals for ground water are based on SWDA MCLs and MCLGs, and include arsenic 50 ug/l (MCL); barium 2,000 ug/l (MCL); cadmium 5 ug/l (MCL); total chromium 100 ug/l (MCL); total mercury 2 ug/l (MCL); and benzene 5 ug/l (MCL).	$13,026,000 (present worth) $18,050 (annual O&M) (30 years)
6 Gulf Coast Vacuum Services (Operable Unit 2), LA 12.8-Acre Former Vacuum Truck and Oil Field Drilling Plant 09/30/92	Soil, sludge, and SW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including dioxin, PAHs, PCBs, pesticides, and phenols; and metals, including arsenic, chromium, and lead 3,250 yd^3 (soil and sludge) 1,700,000 gals (SW)	The selected remedial action for this site includes excavating 2,700 cubic yards of contaminated sludge and 550 cubic yards of associated soil from the Washout Pit to 2 feet below where contaminant levels exceed the remedial action goals, and consolidating these materials into the West Pit to achieve positive drainage; backfilling excavated areas with clean soil, and covering the West Pit with an impermeable synthetic membrane cover; pumping and onsite treatment of 1,700,000 gallons of contaminated rainwater, with discharge of the treated rainwater onsite; abandoning three onsite water supply wells; and monitoring air during the excavation.	Chemical-specific remedial action goals were developed for the accumulated rainwater based on state effluent pollution concentration limits, and for the soil and sludge based on health-risk values. Soil and sludge excavation levels include arsenic 16 ug/kg; barium 5,400 mg/kg; benzene 0.66 mg/kg; and carcinogenic PAHs 3 mg/kg. Chemical-specific goals or surface water include arsenic 137 ug/l; barium 2 ug/l; benzene 100 ug/l; chromium 343 ug/l; endrin 180 mg/l; lead 275 ug/l; PCE 100 ug;l; phenol 47 ug/l; and TCE 69 ug/l.	$525,200 (present worth) $5,000 (annual O&M) (27 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Koppers (Texarkana Plant) (Amendment), TX 62-Acre Former Wood Treatment Facility 03/04/92	Soil, sediment, debris, and GW contaminated with VOCs, including benzene, toluene, and xylenes; other organics, including PAHs and PCP; and metals, including arsenic Not specified	The amended remedial action for this ROD includes implementing all treatment actions provided for in the 1988 ROD, which include onsite soil washing as well as treatment of ground water using an oil and water separator and granular activated carbon treatment purchasing onsite residences; permanently relocating affected residents; demolishing homes and removing and disposing of debris offsite; implementing institutional controls, including deed and land use restrictions; and reclassifying the property from residential to non-residential use.	Chemical-specific clean-up goals remain the same as those provided in the 1988 ROD. Soil clean-up goals include excavation to a 100 mg/kg action level of total carcinogenic PAHs based on a risk level between 10^{-6} and 10^{-4}. Ground water clean-up goals are not provided but were based on Best Available Treatment Requirements (BAT) for the Organic Chemical, Plastics, and Synthetic Fibers Industry.	$12,400,000 (present worth) $316,200 - $329,200 (annual O&M) (30 years)
6 Mosley Road Sanitary Landfill, OK 72-Acre Inactive Municipal Landfill 06/29/92	Soil, debris, and GW contaminated with VOCs, including benzene; and metals, including arsenic. Not specified	The selected remedial action for this site includes repairing and improving the existing cap and adding a vegetative soil layer to reduce erosion and infiltration; allowing ground water to naturally attenuate; installing a landfill gas monitoring system; using ground water monitoring and periodic sampling to monitor leachate migration; providing a contingency for active ground water extraction and treatment, if after 5 years natural attenuation has not decreased contaminant levels; and implementing institutional controls including deed, land, and ground water use restrictions.	All potential drinking water impacted by the site will meet SDWA MCLs. Chemical-specific cleanup goals for ground water include arsenic 0.05 mg/l; barium 1 mg/l; selenium 0.01 mg/kg; and vinyl chloride 0.002 mg/kg. Chemical-specific clean-up goals for the soil and debris were not provided.	$3,600,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Oklahoma Refining, OK 160-Acre Petroleum Refinery 06/09/92	Soil, sediment, debris, GW, and SW contaminated with VOCs, including benzene, toluene, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes in-situ bioremediation of organic contaminated sediment; in-situ stabilization of inorganic contaminated sediment, followed by capping; removing and treating all surface water collected from surface impoundments; excavating and onsite containment of contaminated soil and sediment that exceed health-based levels; excavating and neutralizing low pH sediment, followed by replacing the treated materials in the original areas; excavating and recycling asphaltic materials; treating sediment and soil that cannot be treated in-situ using prepared-bed bioremediation, followed by stabilization, if needed, and onsite disposal and containment; extracting and containing LNAPLs-contaminated ground water, and treating the collected ground water along with surface water and storm water in an onsite treatment facility with a treatment process, which would include an oil and water separator to remove NAPLs and air stripping and/or activated carbon to remove organics, and using either oxidation, reduction, precipitation, and filtration or any combination of these to remove inorganics; injecting nutrients along with the treated water into the contaminated portion of the aquifer to enhance in-situ bioremediation; recycling the recovered hydrocarbons; monitoring ground water; plugging all unnecessary wells; and implementing institutional controls, including deed and ground water use restrictions and site access restrictions, such as fencing.	The chemical-specific standards are based on Remedial Action Objectives (RAOs) for each affected medium. For soil, subsurface soil, and sediment, RAOs are health-based depending on whether exposure would result from leaching (ground water protection) or ingestion. Chemical-specific standards for ground water and surface water include arsenic 0.05 mg/kg; barium 1 mg/kg; benzene 0.005 mg/kg; chromium 0.1 mg/kg; lead 0.015 mg/kg; 2-methyl napthalene 0.15 mg/kg; 2- and 4-methylphenol 1.8 mg/kg; naphthalene 0.15 mg/kg; phenol 22 mg/kg; and toluene 1 mg/kg. Chemical-specific standards for sediment and surface soil include arsenic 25 mg/kg; barium 13,500 mg/kg; benzene 22 mg/kg; benzo(a)anthracene 4.1 mg/kg; chromium 1,350 mg/kg; ethylbenzene 27,000 mg/kg; lead 600 mg/kg; toluene 54,000 mg/kg; and xylenes 540,000 mg/kg. Chemical-specific standards for subsurface soil include arsenic 305 mg/kg; benzene 0.2 mg/kg; chromium 770 mg/kg; lead 865 mg/kg; naphthalene 79 mg/kg; and phenol 125 mg/kg.	$31,712,000 (present worth) $425,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
6 Prewitt Abandoned Refinery, NM 70-Acre Abandoned Crude Oil Refinery 09/30/92	Soil, sludge, and GW contaminated with VOCs, including benzene, TCE, toluene, and xylenes; other organics, including PAHs; metals, including lead; and inorganics, including asbestos 49,000,000 gals (GW)	The selected remedial action for this site includes extracting contaminated ground water and using an oil and water separator to remove NAPLs; treating approximately 43,000 gallons of extracted NAPLs onsite using soil vapor extraction to remove VOCs from soil, along with a thermal catalytic oxidizer to destroy VOC vapor emissions; excavating, consolidating, and onsite landfarming of approximately 1,175 cubic yards of waste from the West Pits area and approximately 1,500 cubic yards of soil contaminated with high levels of hydrocarbons, and placing a vegetative cover over the area after completion of treatment; excavating, containerizing, and removing offsite 15 cubic yards of asbestos contaminated material and soil; excavating and treating as necessary, 1,900 cubic yards of lead-contaminated surface soil with levels in excess of 500 mg/kg or subsurface soil with lead levels greater than 1,000 mg/kg, followed by offsite disposal; excavating any sludge retrieved from the oil/water separator, with offsite pretreatment and/or disposal; treating any contaminated soil identified beneath the separator onsite by landfarming or offsite by incineration, pending testing results, and backfilling the separator area; pumping and onsite treatment of the contaminated ground water using air sparging to remove organics, and reinjecting the treated water onsite; installing and maintaining activated carbon treatment units at domestic wells that exceed MCLs; monitoring soil, ground water, private wells, and air; and implementing institutional controls, including deed, land, and ground water use restrictions, and site access restrictions.	Clean-up standards for soil and waste are based on health-based levels and EPA policy and provide for the complete removal of asbestos, and the cleanup of lead to 500 mg/kg within the top 2 feet of soil and 1,000 mg/kg of lead for soil depths greater than 2 feet. Chemical-specific ground water clean-up goals are based on state standards and SDWA MCLs and include benzene 5 ug/l; toluene 750 ug/l; xylenes 620 ug/l; and lead 15 ug/l. Chemical-specific goals for soil and sludge include benzo(a)pyrene 0.9 mg/kg; benzo(a)anthracene 9 mg/kg; and lead.	$16,301,576 (present worth) $1,097,844 (total cost O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
7 29th and Mead Groundwater Contamination, KS 1,440-Acre Active Manufacturing Facility 09/29/92	Soil and GW contaminated with VOCs, including 1,1-DCA, 1,1,1-TCA, TCE, and PCE 4,000,000 ft^3 (soil)	The selected remedial action for this site includes continued operation and expansion of the existing SVE system to remediate other onsite source areas; monitoring the performance of the SVE system, and establishing goals during the RD phase; enhancing the hydraulic control of the existing ground water extraction and air stripping treatment system by adding a well at the southern site boundary; treating ground water onsite using air stripping, with discharge of the treated water offsite under a NPDES permit; monitoring air emissions from the ground water treatment system and the SVE system, with possible treatment of the emissions, if necessary; and monitoring the ground water collection/treatment system and the contaminant plume.	Chemical-specific soil clean-up goals for the expanded SVE system will be developed during the Remedial Design phase. Chemical-specific ground water clean-up goals are based on SDWA MCLs and CWA discharge limits and include 1,1-DCA 7 ug/l; PCE 5 ug/l; 1,1,1-TCA 200 ug/l; and TCE 5 ug/l.	$1,638,456 (present worth) $78,900 - $182,200 (annual O&M) (18 years)
7 Des Moines TCE, IA Industrial and Commercial TCE Site 09/18/92	Not applicable Not applicable	The selected remedial action for OU3 includes no action with periodic ground water monitoring. Ground water from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system.	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	Clean-up Goals	Present Worth/ Capital and O&M Costs
7 Farmers' Mutual Cooperative, IA 6-Acre Active Grain Storage Facility 09/29/92	GW contaminated with VOCs, including carbon tetrachloride; and other organics, including pesticides Not specified	The selected remedial action for this site includes allowing ground water to naturally attenuate; monitoring ground water to determine the effectiveness of the remedy; and providing for a contingency in the event that use of the impacted aquifer as a water supply is necessary prior to complete restoration. This contingency includes developing and implementing a blending program for the City of Hospers water from the upper and lower aquifers until MCLs have been achieved; testing the upper aquifer prior to its use; treating contaminated ground water for use as drinking water, or containing contaminants to enable use of the impacted aquifer without treatment.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and include carbon tetrachloride 0.005 mg/l; chloroform 0.1 mg/l; alachlor 0.002 mg/l; atrazine 0.003 mg/l; cyanazine 10 ug/l; and metolachlor 100 ug/l.	$93,000 - $187,000 (present worth) $0 (O&M)
7 Hydro-Flex, KS 2.95-Acre Manufacturing Facility 03/09/92	Not applicable Not applicable	The selected remedial action for this site is no further action because there is currently no significant contamination in the sediment-free ground water, or any significant continuing source of contamination to the ground water from the site.	Not applicable	$0 (present worth) $0 (O&M)
7 Pester Refinery, KS 10-Acre Inactive Petroleum Refinery 09/30/92	Soil and sludge contaminated with VOCs, including ethylbenzene, toluene, and xylenes; other organics, including PAHs and phenols; and metals, including arsenic, chromium, and lead 70,000 yd^3 (soil) 20,000 yd^3 (sludge)	The selected remedy for this site includes dewatering the pond and transporting the associated sludge offsite to a RCRA facility for re-refining into a usable petroleum product and/or disposal; treating the soil using in-situ soil flushing; discharging the wash water to an oil/water separator to remove free oils and sediment, followed by nutrient addition with aeration to enhance biological action; and discharging the water to a treatment facility or back to the pond for continued treatment until testing demonstrates that clean-up levels have been achieved; monitoring air; and implementing institutional controls including deed restrictions and site access restrictions such as fencing.	Chemical-specific soil and sludge clean-up goals are based on health-based levels, and include benzo(a)anthracene 13 mg/kg and chrysene 13 mg/kg. Other contaminants of concern will be treated to meet EPA acceptable risk levels, if necessary.	$2,374,800 (present worth) $464,700 (present worth O&M) (3 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Broderick Wood Products, CO 64-Acre Wood Preserving Facility 03/24/92	Soil, debris, sediment, and GW contaminated with VOCs, including benzene, toluene, and xylenes; organics, including PAHs, dioxins, and other phenolic compounds; metals, including arsenic and lead; and inorganics, including asbestos 59,000 yd^3 (organic-contaminated soil) 800 yd^3 (metal-contaminated soil) 120 yd^3 (sediment) 42,000 gals (organics and sludge) 850 yd^3 (debris) 205 yd^3 (asbestos-containing meterials) 225 tons (scrap metal) 9,500 gals (GW)	The selected remedial action for this site includes demolishing and decontaminating onsite buildings, stockpiling debris onsite temporarily, then transporting approximately 850 cubic yards of building debris and 205 cubic yards of asbestos-containing materials offsite for disposal at a permitted landfill; decontaminating 225 tons of scrap metal onsite, with offsite reclamation; pumping or excavating sludge or liquid contents from drums and vessels, storing the drummed waste onsite temporarily, then transporting the waste offsite for reclamation; pumping, approximately 9,500 gallons of contaminated water from building sumps and basements of onsite structures, and stabilizing, drumming, and transporting the drums offsite to a RCRA landfill; excavating approximately 59,000 cubic yards of organic-contaminated soil and 120 cubic yards of Fisher Ditch sediment; dewatering the sediment, followed by onsite treatment of the soil and sediment using ex-situ bioremediation in an onsite land treatment unit (LTU) over a 7-year period; conducting treatability tests to determine the best stabilization compound for the wastes, then treating 800 cubic yards of metals-contaminated soil onsite using stabilization, with disposal at an offsite RCRA landfill; closing the existing surface impoundments; recovering approximately 526 million gallons of ground water and light non-aqueous phase liquids (LNAPLs) from the surficial aquifer using subsurface drain trenches and recovery wells; removing LNAPLs in an oil/water separator, and reclaiming the LNAPLs at an offsite recycling facility; treating the remaining water using a two-phase fixed-film bioreactor, mixed with nutrients and an oxygenated chemical, then reinjected into the aquifer to stimulate bacterial growth to promote further contaminant breakdown within the shallow aquifer, and also using small quantities within the soil remediation processes; collecting DNAPLs and GW from existing monitoring wells in the Denver aquifer, and treating these in the oil/water separator, with offsite recycling; monitoring GW; and implementing deed and GW use restrictions.	Chemical-specific excavation goals for soil and sediment were based on health risk clean-up level indices (CLIs) greater than 1. Chemical-specific soil and sediment clean-up goals are based on health-based criteria for organic contaminants and RCRA LDR standards for metal contaminants and include toluene 0.5-10 mg/kg; xylenes 0.5-10 mg/kg; benzo(a)pyrene 15.2 mg/kg; dibenzo(a,h) anthracene 13.9 mg/kg; 2,3,7,8 TCDD equivalent 0.0006 mg/kg; pentachlorophenol, naphthalene, and pyrene at 95-99 percent reduction; arsenic 5 mg/kg; cadmium 1 mg/kg and lead 5 mg/kg. Chemical-specific ground water clean-up goals are based on SDWA MCLs and the Colorado Basic Standards and include 2,3,7,8 TCDD equivalent $5x10^{-5}$ ug/l; trichloroethylene at 5 ug/l; TCE 1.6 ug/l; carbozole 4.1 ug/l; phenol 623 ug/l; pentachlorophenol 1 ug/l; pyrene 312 ug/l; and naphthalene 41.6 ug/l. The ability to achieve these clean-up levels cannot be determined until the extraction system has been implemented; therefore, EPA may need to modify the remedy if necessary. This ROD provides a chemical-specific waiver for the Denver aquifer because of technical impracticability.	$15,551,033 (present worth) $7,400,185 (present worth O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Denver Radium (Operable Unit 8), CO 10-Acre Former Radioactive Extraction Industry 01/28/92	Soil, debris, and GW contaminated with metals, including arsenic and lead; other inorganics, including asbestos; and radioactive materials 50,000 yd^3 (soil)	The selected remedial action for this site includes demolishing and decontaminating buildings, tanks, and equipment onsite; temporarily storing debris from vicinity properties onsite at the Shattuck area, pending either offsite disposal and/or scrap recycling, or salvaging of debris; disposing of asbestos-containing material from buildings offsite; conducting pilot scale treatability studies during remedial design to optimize stabilization design; excavating and transporting 5,000 cubic yards of radium-contaminated soil from the railroad rights-of-way and 6,000 cubic yards from the vicinity properties; consolidating these with 38,500 cubic yards of soil from the Shattuck property, and treating the soil onsite using cement-based stabilization; placing a cap over the stabilized material, and revegetating the area; filling previously excavated areas with clean fill; testing for, remediating and disposing of any RCRA hazardous waste offsite; allowing the ground water to naturally attenuate; monitoring ground water and air; and implementing institutional controls, including deed, land, and ground water use restrictions.	Chemical-specific soil action levels are based on Nuclear Regulatory Commission and Department of Energy standards for Radium-226, exceeding 5 pci/g above background in the top 15 cm of soil and 15 pci/g above background in any layer below the top 15 cm; thorium-230, 42 pci/g; uranium; 75 pci/g; and risk-based standards for arsenic 160 mg/kg; selenium 490 mg/kg; and lead 540 mg/kg.	$26,600,000 (present worth) $120,000 (annual O&M) (200 years)
8 Denver Radium (Operable Unit 9), CO 17-Acre Former Brick Plant 12/23/91	Soil contaminated with metals, including arsenic and lead Not specified	The selected remedial action for the site includes constructing a 3.7-acre multi-media cap over onsite contaminated soil with metal concentrations exceeding action levels; utilizing the existing concrete floor of the brick plant and asphalt parking lot in concert with the backfilled soil cap; providing inspection and repair of the concrete floor, as necessary; upgrading the asphalt with geotextile fabric and an additional 6-inch layer of asphalt; monitoring downgradient ground water; long-term monitoring to ensure effectiveness of the cap; and implementing institutional controls including deed restrictions to limit the ground water use and to maintain the integrity of the cap.	Design of the cap will comply with RCRA and state requirements. Chemical-specific soil remediation goals, which are based on health criteria, include prevention of exposure and direct contact with action level concentrations exceeding arsenic 79 ug/l; lead 1,000 ug/l; and zinc 17,000 ug/l.	$1,702,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Hill Air Force Base, UT 6,700-Acre Air Force Base 09/25/92	Soil contaminated with an inorganic, sodium hydroxide Not specified	The selected interim remedial action for this site includes removing two underground storage tanks; backfilling the excavated area with the previously excavated soil and clean fill; and constructing a 29,000 square foot sloped temporary asphalt cap at the ground surface after removal of the tanks to ensure drainage of precipitation into the existing stormwater system. The tank removal project will be conducted under a state permit and administered by the state under its Underground Storage Tank (UST) program, under a state-issued permit, which will regulate decontamination and proper disposal of the tanks and their associated piping, as well as testing for contamination of the native soil underlying the tanks and piping.	Chemical-specific performance standards for this interim action will be specified in the final ROD for all of OU3. This ROD invokes an ARAR waiver on the basis that this is part of an interim remedy; therefore, RCRA closure requirements will not be attained.	$55,343 (present worth) $540 (annual O&M) (3 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Idaho Pole, MT 50-Acre Active Wood Treatment Facility 09/28/92	Soil, sediment, and GW contaminated with organics, including dioxins, oils, PAHs, pesticides, and phenols; and inorganics 19,000 yd^3 (soil)	The selected remedial action for this site includes excavating and consolidating approximately 19,000 cubic yards of contaminated soil from the pasture area, ditch sediment and bottoms, and the former round house area; pretreating the soil onsite using an oil/solids separator to remove the oily wood-treating fluid, followed by biological treatment of the contaminated soil and sediment in a land treatment unit (LTU), and capping the LTU with a RCRA cap; treating 23,000 cubic yards of soil in inaccessible locations contaminated with oily wood treatment fluids using in-situ soil flushing; enhancing in-situ biological degradation of soil contaminants by the addition of oxygen and nutrients; collecting the flushed water and skimming the oil; combining this oil with recovered oil from the other site areas, followed by recycling or offsite disposal in accordance RCRA; filling excavated areas with clean soil; pumping and onsite treatment of approximately 1 billion gallons of contaminated ground water within the boundaries of the oily plume, followed by transfer to an oil/water separator-clarifier/filtration plant; treating the water using a fixed film bioreactor; consolidating the solids from the separation process into the LTU for treatment along with the contaminated soil; treating approximately 210 million gallons of contaminated ground water from under the pasture area by in-situ biodegradation; reinjecting the treated ground water onsite or treating this using additional treatments, such as carbon polishing to meet POTW pretreatment standards, if necessary; monitoring ground water; providing any contaminated residential wells with in-home carbon/reverse osmosis treatment system until MCLs are reached; and implementing engineering and institutional controls, including deed, land, and ground water use restrictions.	Soil and sediment goals are based on a site-specific risk analysis levels and will correspond to a 10^{-4} to 10^{-6} lifetime cancer risk. Chemical-specific clean-up goals for soil include PCP 48 mg/kg (risk); total B2 PAHs 15 mg/kg (risk); total D PAHs 145 mg/kg (HO); and TCDD TE 0.001 mg/kg. Ground water clean-up levels are based on SDWA MCLs and proposed MCLs. Chemical-specific goals for ground water include pentachlorophenol 1 ug/l (MCL); benzo(a)pyrene 0.2 ug/l (MCL); and 2,3,7,8-TCDD $3x10^{-5}$ ug/l (MCL).	$9,074,962 (present worth) $928,790 (O&M) (10-30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Ogden Defense Depot (Operable Unit 1), UT 1,100-Acre Defense Supply Depot 06/26/92	Soil, debris, and GW contaminated with VOCs, including TCE; other organics, including dioxins and pesticides; and metals, including arsenic and lead 4,000 yd^3 (soil and debris)	The selected remedial action for this site includes excavating and transporting 4,000 cubic yards of contaminated soil and debris offsite to a RCRA permitted hazardous waste or industrial landfill; backfilling the area with clean fill; extracting and treating contaminated ground water onsite using air stripping to remove contaminants, adding a GAC system to the air stripper if dioxins and furans are detected in the effluent at concentrations above the proposed MCL for dioxins and furans; transporting wastes from the ground water treatment process, including any spent carbon offsite for incineration, stabilization/fixation or disposal; recharging the aquifer with the treated water using injection wells; monitoring air emissions; and monitoring ground water.	Chemical-specific soil clean-up goals are health-risk based and include dioxin 0.001 mg/kg; arsenic 35 mg/kg; zinc 1,500 mg/kg; and lead 500 mg/kg. Chemical-specific ground water clean-up goals are also health-risk based and include cis-1,2-dichloroethene 70 ug/l; TCE 5 ug/l; and vinyl chloride 2 ug/l.	$2,200,000 (present worth) $146,000 (annual O&M) (7 years)
8 Ogden Defense Depot (Operable Unit 3), UT 1,100-Acre Defense Supply Depot 09/28/92	Soil and debris contaminated with organics, including pesticides; metals, including arsenic, and other inorganics 530 yd^3 (soil and debris)	The selected remedial action for this site includes excavating, handsorting, and mechanically sieving 530 cubic yards of contaminated soil and debris from the Chemical Warfare Agent Identification Kit and the Riot Control and Smoke Grenade burial areas; incinerating offsite any debris or soil contaminated by chemical warfare agents or grenade fragments at a DOD facility; excavating soil and debris from the Miscellaneous Items Burial Area, and treating soil and debris that does not meet TCLP treatment standards using solidification, or another appropriate technology prior to disposal in an offsite RCRA landfill along with the untreated debris; returning excavated soil that meets criteria to the excavated areas; excavating and disposing of offsite compressed gas cylinders and the water purification tablet bottles from the Compressed Gas Cylinder and Water Purification Tablet Burial Areas.	Chemical-specific soil clean-up goals are based on a future residential exposure scenario, which was calculated under a residential ingestion scenario where a person was assumed to be exposed as a 15-kg child ingesting 200 mg of soil per day for 6 years, and also a 70-kg adult ingesting 100 mg of soil per day for 24 years. These include arsenic 35 mg/kg and mercury 2 mg/kg.	$393,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Ogden Defense Depot (Operable Unit 4), UT 1,100-Acre Defense Supply Depot 09/28/92	Soil, debris, and GW contaminated with VOCs, including benzene; other organics, including pesticides and PCBs; and metals, including arsenic, chromium, and lead 4,500 yd^3 (soil and debris) 400 yd^3 (debris) 65,000,000 gals (GW)	The selected remedial action for this site includes excavating and transporting offsite approximately 4,500 cubic yards of contaminated soil, debris, and approximately 400 cubic yards of water purification tablets for disposal at a RCRA landfill; conducting TCLP tests to confirm the characteristics of excavated soil and debris and to determine their suitability for land disposal; treating any soil and debris failing TCLP offsite using activated carbon, other stabilization/fixation methods, or, for dioxins, incineration; excavating and removing any contaminated cylinders for offsite treatment and disposal; backfilling excavated areas with clean fill and soil, with revegetation; extracting and treating onsite 65 million gallons of contaminated ground water using air stripping to remove VOCs and carbon adsorption to remove organics followed by reinjection into the shallow aquifer; monitoring ground water and air emissions; and removing wastes generated during the treatment process offsite for disposal or incineration.	Chemical-specific soil clean-up goals are based on the TBC remediation criterion for PCBs of 25 mg/kg (EPA Directive 9355.4-01FS) and the TBC criterion for dioxins of 0.001 mg/l (General Approach Used by the Dioxin Disposal Advisory Group Regarding Pentachlorophenol Waste). All remaining goals are based on a future residential exposure scenario and include benzene 210 mg/kg (cancer risks of 10^{-5}); arsenic 35 mg/kg (cancer risk of 10^{-4}); and lead 500 mg/kg. Chemical-specific ground water clean-up goals are based on federal MCLs for benzene 0.005 mg/l; cis-1,2-DCE 0.070 mg/l; vinyl chloride 0.002 mg/l; and PCBs 0.005 mg/l.	$3,800,000-$4,500,000 (present worth) $230,000 (annual O&M) (12 years)
8 Portland Cement (Kiln Dust #2 & #3), UT 71-Acre Cement Manufacturing Facility 03/31/92	Soil and waste CKD contaminated with metals, including arsenic, chromium, and lead 27,000 yd^3 soil above 500 mg/kg lead or 70 mg/kg arsenic 360 tons chrome-bearing bricks	The selected remedial action for this site includes excavating approximately 27,000 cubic yards of soil with concentrations greater than lead 500 mg/kg or arsenic 70 mg/kg, with onsite solidification of soil with concentrations of lead equal to or above 5 mg/l, based on TCLP analysis; treating approximately 360 tons of chrome-bearing bricks onsite using chemical fixation, followed by solidification; transporting all excavated and treated material offsite to an appropriate disposal facility; placing an 18-inch protective cover of clean fill over the entire site; and implementing institutional controls including restrictions, as necessary.	Treatment levels for soil are dictated by federal Land Disposal Regulations (LDRs) and state solid waste disposal regulations. Soil will be treated to 5 ug/l lead, or less, as measured by TCLP before land disposal; chrome-bearing bricks will be treated to 5 mg/kg by TCLP analysis prior to disposal. Federal and state air regulations on total suspended particulates and fugitive dust control will apply.	$6,400,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Rocky Flats Plant (USDOE) (Operable Unit 2), CO 6,550-Acre Nuclear Weapons Research, Development, Production, and Plutonium Processing Complex 09//01/92	Soil and GW contaminated with VOCs, including PCE, TCE, toluene, and xylenes; metals, including arsenic, chromium, and lead; other inorganics; and radioactive materials Not specified	The selected interim remedial action for this site includes constructing an in-situ vacuum-enhanced soil vapor extraction system to perform pilot scale remedial tests; filtering extracted vapor using granular activated carbon, with offsite regeneration of spent carbon; installing ground water depression pumps at the East Trenches Area to expose residual DNAPLs not released through vapor extraction; collecting vapor extraction condensates and ground water in onsite ground water holding tanks; and transporting the condensates and ground water offsite for treatment at a POTW; monitoring radiation levels during equipment construction; mitigating any affected wetlands; and implementing a full scale remediation if pilot scale test results show a 1 ppm hydrocarbon recovery rate.	Soil and ground water clean-up goals are based on health based criteria of 10^{-4} to 10^{-6} levels for cancer risk, background levels, and SDWA MCLs and MCLGs. They include chemical-specific goals for ground water for: acetone 10 ug/l; TCE 5 ug/l; xylene 10,000 ug/l; toluene 1,000 ug/l; methylene chloride 5 ug/l; aluminum 0.2 mg/l; antimony 0.6 mg/l; arsenic 0.05 mg/l; barium 1 mg/l; chromium 0.01 mg/l; iron 0.3 mg/l; lead 0.005 mg/l; mercury 0.0002 mg/l; selenium 0.01 mg/l; gross alpha 11 pCi/l; gross beta 19 pCi/l; Pu ^{239,240} 0.05 pCi/l. Chemical-specific clean-up goals for soil include arsenic 5 mg/l; barium 100 mg/l; cadmium 1 mg/l; chromium 5 mg/l; lead 5 mg/l; mercury 0.20 mg/l; selenium 5.7 mg/l; TCE 5.6 mg/kg; acetone 0.59-160 mg/kg; xylenes 28 mg/kg; and methylene chloride 33 mg/kg.	present worth (not provided) O&M (not provided)
8 Rocky Flats Plant (USDOE) (Operable Unit 4), CO 6,550-Acre Nuclear Weapons Research, Development, Production, and Plutonium Processing Complex 04/06/92	SW contaminated with VOCs, including TCE; metals, including chromium; and radioactive materials, including Pu^{-239} and Am^{-241} 8,000,000 gals (SW)	The selected interim remedial action for this site includes constructing and utilizing three temporary surge tanks and associated piping to contain and transfer water collected by the ITS; evaporating approximately 3 million gallons of water from pond 207-A and 5 million gallons of water from the 207-B ponds using onsite flash evaporators and associated tanks; transferring the distillate to a holding tank for reinjection into the Raw Water System for plant cooling tower usage; and collecting the flash evaporator concentrate in holding tanks, and onsite solidification of the residual; conducting treatability studies using surrogate pond water to simulate the proposed treatment system.	Chemical-specific surface water clean-up goals are based on site-specific radionuclide standards and MCLGs or MCLs and attainment of relevant CWA water quality criteria.	$8,107,000 (present worth) $1,170,000 (annual O&M) (3 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
8 Silver Bow Creek/Butte Area, MT Mining and Processing Area 06/30/92	Soil, sediment, GW, and SW contaminated with metals, including arsenic, chromium, and lead; and inorganics 474,400 yd^3 (soil) 2,890,000 yd^3 (sediment)	The selected remedial action for this site includes excavating all tailings and contaminated soil from the by-pass channel and the area below Pond 1 not planned for wet-closure, and consolidating the wastes over existing dry tailings within the western portion of Pond 1; placing a cover of lime, fill, and soil over the dry tailings and revegetating; modifying the by-pass channel to safely route potential flood flows; using soil and gravel that meet geotechnical requirements and have copper levels of less than 500 mg/kg to raise and strengthen existing berms; constructing new berms; raising and strengthening the north-south aspect of the Pond 1 berm, and stabilizing the east-west aspect of the Pond 1 berm to withstand a maximum credible earthquake for this area; extending and armoring the north-south aspect of the Pond 1 berm; relocating the lowermost portion of the by-pass channel, converting the present channel into a ground water interception trench; installing pumps to allow for a pump-back system to transport ground water and surface water to the active area for treatment, if levels exceed specified standards; constructing wet-closure berms to enclose the submerged tailings and contaminated sediment; chemically fixing tailings and sediment with lime, and flooding the wet-closure cells with water with a pH of greater than 8.5; constructing a run-off interception system along the east side of the Inactive area and toe drains, and installing a collection manifold for both the Active and Inactive areas; and implementing ecological monitoring and institutional controls, including deed, ground water, and land use restrictions.	Soil at final excavation grade for this interim action will exhibit concentrations of metals within the ranges of: arsenic 8.4–42.1 mg/kg; cadmium 0.8–4 mg/kg; copper 0.6–287 mg/kg; lead 8.4–45.5 mg/kg; and zinc 0.4–573. Chemical-specific interim ground water clean-up goals, which are based on state drinking water criteria, include arsenic 50 ug/l; cadmium 10 ug/l; copper 1,000 ug/l; iron 300 ug/l; lead 50 ug/l; manganese 50 ug/l; and zinc 5,000 ug/l. Final soil, sediment, ground water, and surface water action levels for the various contaminants are not identified in this ROD and will be determined based on ongoing risk assessment work at other OUs within the Clark Fork Basin.	$18,100,000 (present worth) $67,200 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Hassayampa Landfill, AZ 10-Acre Municipal Landfill 08/06/92	Soil, debris, and GW contaminated with VOCs and metals, including chromium and lead Not specified	The selected remedial action for this site includes treating contamination in the vadose zone using vapor extraction at all locations where soil vapors exceed clean-up levels; controlling emissions from the treatment system using either vapor phase carbon adsorption or catalytic oxidation as determined during the RD phase; installing a 10-acre cap over the soil and waste in the Hazardous Waste Area; extracting and treating contaminated ground water onsite using air stripping and, as necessary, vapor phase carbon adsorption, with reinjection of the treated water onsite or in the immediate vicinity; monitoring ground water; and implementing institutional controls including deed and ground water use restrictions, and site access restrictions such as fencing.	The selected remedy will comply with the federal and more stringent state standards. Soil vapor clean-up levels will be calculated based on levels that will be protective of ground-water quality. The design of the cap will be in compliance with RCRA requirements. Chemical-specific ground water clean-up goals are based on SDWA MCLs and include 1,1-DCE 7 ug/l; 1,2-DCA 5 ug/l; PCE 5 ug/l; TCE 5 ug/l; (trans) 1,2-DCE 100 ug/l; (cis) 1,2-DCE 70 ug/l; and 1,1,1-TCA 200 ug/l.	$6,100,000 (present worth) $2,213,100 (annual O&M) (30 years)
9 Iron Mountain Mine, CA 4,400 Acre Collection of Inactive Mines and Associate Property 09/30/92	Sediment, debris, and SW contaminated with metals, including lead 70,000 yd^3 (soil and waste)	The selected remedial action for this site includes collecting the acid mine drainage from the Richmond and Lawson portals and constructing pipelines and necessary structures to transport the drainage into the treatment facility; treating the acid mine drainage by chemical neutralization/precipitation using the lime/sulfide High Density Sludge (HDS) treatment process, and discharging the treated effluent onsite to surface water; disposing of the residual sludge onsite in the inactive open pit mine; excavating, consolidating onsite, and capping seven waste piles that are actively eroding and discharging hazardous substances; and diverting ground water and surface water away from the landfill.	Sediment and surface water clean-up goals are based on background levels as established by SWDA MCLs or health based levels, whichever is more stringent. Chemical-specific sediment and surface water goals include antimony 0.006 mg/l; arsenic 0.050 mg/l; cadmium 0.01 mg/l; and mercury 0.002 mg/l.	$53,958,000 (present worth) $27,865,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Jasco Chemical, CA 2.05-Acre Chemical Blending and Packaging Facility 09/30/92	Soil and GW contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes 1,100 yd^3 (soil)	The selected remedial action for this site includes excavating and treating 1,100 cubic yards of contaminated soil onsite using enhanced biotreatment; treating air emissions using carbon adsorption, and treating or disposing of spent carbon offsite; testing residual soil, with pretreatment if necessary, and onsite disposal if treatment levels are met, or offsite disposal if clean up levels are still exceeded; extracting and treating contaminated ground water with an onsite liquid phase carbon adsorption unit, and discharging treated ground water offsite to a sanitary sewer, as permitted; implementing hydraulic controls to prohibit future plume migration, conducting quarterly ground water monitoring; and implementing institutional controls including deed restrictions to limit use of ground water.	Chemical-specific soil clean-up goals are established on health-based levels estimated using SDWA MCLs and include 1,1-DCA 0.6 mg/kg; 1,1-DCE 2 mg/kg; 1,2-DCE 0.03 mg/kg; cis-1,2-DCE 1 mg/kg; 1,1,1-TCA 100 mg/kg; acetone 30 mg/kg; benzene 0.3 mg/kg; chloroethane 4,000 mg/kg; diesel mixture 10,000 mg/kg; ethylbenzene 3,000 mg/kg; methanol 200 mg/kg; methyl ethyl ketone 9 mg/kg; methylene chloride 0.2 mg/kg; PCE 7 mg/kg; toluene 1,000 mg/kg; TCE 3 mg/kg; vinyl chloride 0.02 mg/kg; and xylenes 2,000 mg/kg. Chemical-specific ground water clean-up goals are based on federal and state MCLs and include acetone 4,000 ug/l; benzene 1 ug/l; 1,1-DCA 5 ug/l; 1,1-DCE 6 ug/l; 1,2-DCA 0.5 ug/l; methylene chloride 5 ug/l; PCE 5 ug/l; toluene 1 ug/l; petroleum hydrocarbons 1 ug/l; and vinyl chloride 0.5 ug/l.	$601,000 - $684,000 (present worth) $32,800 (annual O&M) (5-10 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Lawrence Livermore National Lab (USDOE), CA 800-Acre Multi-disciplinary Research Facility 08/05/92	Sediment and GW contaminated with VOCs, including benzene, PCE, TCE, and toluene; other organics, including pesticides; metals, including lead and chromium; and radioactive materials Not specified	The selected remedial action for this site includes using vacuum-induced venting to extract contaminants in vapor form from the onsite unsaturated sediment and treating using catalytic oxidation and/or activated carbon; pumping water at 24 initial locations to contain and remediate the ground water plume using both existing and new extraction wells; constructing seven onsite facilities (labelled A to G) to treat the extracted ground water; designing each treatment system specifically to treat the specific combinations of contaminants, including: ultraviolet/oxidation to treat VOCs at facilities A, B, E, and F; air stripping to treat the chloroform and carbon tetrachloride at facilities C, D, and G; ion exchange at facility D to remove chromium; and granular activated carbon at treatment facility F to remove lead; controlling air emissions from the treatment processes at all facilities using granular activated carbon; recharging or reusing the treated water onsite; and monitoring ground water.	Chemical-specific sediment and ground water clean-up goals are the more stringent SDWA MCLs and California State MCLs and include benzene 1 ug/l; PCE 5 ug/l; TCE 5 ug/l; lead 15 ug/l; total chromium 50 ug/l; total trihalomethanes 100 ug/l; and carbon tetrachloride 0.5 ug/l. Sediment of the unsaturated zone will be remediated only if it is predicted that it would result in concentrations above an MCL if allowed to migrate into the ground water. Unsaturated zone remediation will be complete when modeling shows that contaminants will no longer migrate and cause ground water to exceed MCL. The CWA (NPDES) discharge limits for these chemicals will also be met if effluent waters from the remedial treatment are discharged to ditches or arroyos onsite.	$104,100,000 (present worth) $21,585,000 (annual O&M) (50 years)
9 Pacific Coast Pipeline, CA 20-Acre Petro-Chemical Refinery 03/31/92	Soil and GW contaminated with VOCs, including benzene and toluene; other organics, including PAHs; and metals, including arsenic, chromium, and lead Not specified	The selected remedial action for this site includes treating areas that threaten to contaminate ground water at levels above site clean-up standards using soil vapor extraction after a 1-year subsurface study; designing, constructing, and operating an onsite ground water extraction and treatment system that uses activated carbon; discharging the treated ground water to the onsite aquifer by injection, or reuse of the treated ground water in a beneficial way, such as irrigation; thermally destroying or regenerating the spent carbon; monitoring ground water to ensure effectiveness of the treatment system; and maintaining a perimeter fence.	Chemical-specific clean-up goals for ground water in the aquifer are based on state MCLs, and the TBCs State Action Level for toluene, including benzene 1 ug/l (state); 1,2-DCA 0.5 ug/l (state); ethylbenzene 680 ug/l (state); methylene chloride 0.1 mg/l; and toluene 100 ug/l (state action level/TBC).	$2,300,000-$7,000,000 (present worth) $480,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Purity Oil Sales, CA 6.8-Acre Former Waste Oil Re-refining Facility 09/30/92	Soil, sediment, and debris contaminated with VOCs, including benzene, PCE, TCE, toluene, and xylenes; other organics, including PAHs and pesticides; and metals, including arsenic, chromium, and lead 500 yd^3 canal sediment 8,600 yd^3 (soil) 72,000 yd^3 (soil) 45,000 yd^3 (surface soil)	The selected remedial action for this site includes constructing a slurry wall around the perimeter of the site to minimize migration of contaminants; excavating approximately 500 cubic yards of contaminated canal sediment and spreading them over the site; filling the excavated areas with 8,600 cubic yards of imported soil; applying foam to control emissions during excavation and slurry wall construction; transporting and disposing of rubble uncovered during the excavation process offsite, possibly at a RCRA facility; enclosing the entire length of the North Central Canal in a reinforced concrete pipe; treating 72,000 cubic yards of deep soil onsite using a soil vapor extraction (SVE) to remove VOCs; treating air emissions from the SVE process using carbon adsorption, prior to discharge to the air; disposing of spent activated carbon offsite at a permitted RCRA facility; covering the site with a RCRA multi-layer cap, with a retaining wall to support the cap; monitoring ground water; conducting environmental monitoring to ensure the integrity of the cap; and implementing institutional controls, including deed restrictions.	Chemical-specific soil clean-up goals were not provided; however, vadose zone monitoring will be performed to ensure that the SVE system is reducing the VOC mass so that it no longer threatens to contaminate ground water at levels above SDWA MCLs.	$36,254,000 (present worth) $741,000 (annual O&M) (9.4 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Rhone-Poulenc/Zoecon, CA 13.19-Acre Pesticide Manufacturing Plant, Sludge Pond, and Chemical Storage Facility 03/04/92	Soil, debris, and GW contaminated with metals, including arsenic and lead 32,000,000 gals (GW)	The selected remedial action for this site includes excavating and removal of any offsite soil from areas at the Sandoz and Bains properties with arsenic levels greater than 5,000 mg/kg; removing or paving over soil for properties other than Sandoz and Bains, with arsenic levels greater than health-based levels of 70 mg/kg; treating soil at the Sandoz and Bains properties contaminated with arsenic levels greater than 500 mg/kg onsite using silicate stabilization; excavating and treating contaminated soil from beneath onsite structures after future demolition using stabilization; installing a slurry wall and dewatering around an area of approximately 76,800 cubic yards of arsenic-contaminated soil and the ground water remaining after soil remediation; installing a cap and liner on the currently unpaved portions of the Sandoz property, the Bains railroad track area, and portions of the adjacent properties; monitoring ground water with a contingency that, if arsenic exceeds 40 ug/l in perimeter wells or background levels in the deep aquifer, ground water treatment will be performed to contain the plume; and implementing institutional controls including deed restrictions for the Sandoz and Bains properties and other areas where paving is selected.	The chemical-specific clean-up standard for soil is based on the health-based standard for arsenic 300 mg/kg. Ground water is based on state and SDWA MCLs for arsenic 50 ug/l.	$9,100,000 (present worth) $1,100,000 (total O&M cost) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Sacramento Army Depot (Operable Unit 3), CA 485-Acre U.S. Army Support, Service, and Storage Facility 12/09/91	Soil contaminated with VOCs, including PCE and xylenes; and other organics, including PAHs and pesticides Not specified	The selected remedial action for this site includes constructing and installing an onsite soil vapor extraction system to remove VOCs from contaminated soil; dehumidifying the air stream and treating the collected water vapor using UV/hydrogen peroxide; treating air emissions using granular activated carbon and transporting the residual carbon offsite for recycling and treatment; monitoring air emissions during the treatment process; and sampling media after 6 months to determine compliance with clean-up standards.	Chemical-specific soil clean-up levels are based on health-based criteria of reducing the noncarcinogenic HI to approximately 1 and include 2-butanone (MEK) 1.2 mg/kg; ethylbenzene 6 mg/kg; PCE 0.2 mg/kg; and total xylenes 23 mg/kg.	$614,414 (present worth) $0 (O&M)
9 Sacramento Army Depot (Operable Unit 4), CA 485-Acre Military Facility 09/30/92	Soil contaminated with metals, including arsenic, chromium, and lead 15,500 yd^3 (soil)	The selected remedial action for this site includes excavating and treating approximately 15,500 cubic yards of contaminated soil onsite using soil washing; dewatering and then backfilling the treated soil onsite in the excavation areas, and storing the rinsate temporarily in onsite holding tanks for recycling; treating rinsate from the treatment process using chemical precipitation, clarification/flocculation, and chemical coagulation to remove metals, prior to discharge into the sanitary sewer; dewatering the sludge containing the precipitated metals, and stabilizing this if necessary, followed by disposal in a RCRA landfill or recovery at an offsite reclamation unit.	Chemical-specific soil clean-up goals are based on PHE for the primary metals of concern including arsenic 5 mg/kg; cadmium 40 mg/kg; and lead 174 mg/kg. A treatability variance from LDR requirements is likely. Achievable treatment levels will be set by field pilot tests employing the selected technology.	$5,020,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
9 Westinghouse Electric (Sunnyvale Plant), CA 75-Acre Active Industrial Facility 10/16/91	Soil and GW contaminated with PCBs, solvents, and fuel compounds 400 yd^3 of soil containing greater than 25 mg/kg PCB	The selected remedial action for this site includes excavating approximately 400 cubic yards of contaminated soil containing greater than 25 mg/kg PCB to a depth of eight feet and incinerating the soil at an offsite federally permitted facility; filling the excavated areas with clean soil and installing an asphalt cap; permanent containment of the shallow contaminated ground water onsite where DNAPLs are detected using extraction; treating contaminated ground water onsite using a technology to be selected during the remediation design phase based on the results of future treatability and bench-scale studies, which may include using phase separation, membrane or carbon filtration, ultraviolet/ chemical oxidation, air stripping, and a carbon polish, with offsite disposal and incineration of any product phase recovered, spent carbon, and/or filtration membranes; discharging the treated ground water onsite unless an alternative end-use for the treated effluent can be implemented; notifying EPA of any future intention to cease operations, abandon, demolish, or perform construction in Building 21; monitoring ground water; and implementing institutional controls including deed and land use restrictions.	EPA is invoking a waiver of the requirement to meet the MCL for PCB-contaminated ground water in the source area where DNAPL is detected based upon the technical impracticability of remediation. Soil containing greater than 25 mg/kg PCB will be excavated to a depth of 8 feet, based on EPA guidance for PCB remediation at CERCLA sites with restricted access. The 25 mg/kg clean-up standard is a To Be Considered (TBC) criterion. Chemical-specific ground water clean-up goals are based on the more stringent of state or federal SDWA MCLs, including benzene 1 ug/kg (state); TCE 5 ug/kg (federal); toluene 1,000 ug/kg (federal); xylenes 1,750 ug/kg (state); and PCB 0.5 ug/kg (federal).	$8,263,000-$8,300,000 (present worth) $225,000 (annual O&M) (30 Years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Arrcom (Drexler Enterprise), ID 1.2-Acre Abandoned Waste Oil Recycling Facility 06/30/92	Not applicable Not applicable	The selected remedial action for this site is no further action, which is based on the post-removal soil and ground water sampling, supplemental remedial soil and ground water sampling, and the risk assessment. Removal actions onsite have reduced concentrations of contaminants in the soil to levels that do not pose a risk to human health and the environment.	Not applicable	$0 (present worth) $0 (O&M)
10 Bangor Ordnance Disposal (USN Submarine Base), WA 12-Acre Disposal Site 12/10/91	Soil and GW contaminated with organics, including PCBs; metals, including lead; and explosive compounds, including TNT, DNT, and RDX 7,100 yd^3 soil	The selected remedial action for this site includes excavating and consolidating approximately 7,000 cubic yards of ordnance-contaminated soil and 100 cubic yards of lead-contaminated soil from Debris Area 2, and modifying the soil, as necessary using mechanical or chemical means to ensure effectiveness of subsequent treatment; treating soil onsite using soil washing, followed by treatment of the process leachate using UV/oxidation, with reuse of the treated water; placing a 1-food soil cover over the residual ordnance-contaminated soil, and revegetating the area; disposing of any treated soil still containing concentrations of lead above the action level offsite at a permitted facility; conducting treatability studies to support final design of the ground water restoration plan; installing approximately eight extraction wells near the Burn Area, pending final design; treating the extracted ground water onsite using UV/oxidation; installing an effluent polishing system, in the event that ground water treatment is inadequate; discharging the treated water onsite; and monitoring ground water.	Chemical-specific soil clean-up goals are based on state standards and include TNT 33 mg/kg; DNT 1.5 mg/kg; RDX 9.1 mg/kg; lead 250 mg/kg. Chemical-specific ground water clean-up goals are based on state standards and include DNT 0.1 ug/l; RDX 0.8 ug/1; lead 15 ug/l; phthalates 4 ug/l; and PCBs 0.1 ug/l.	$2,700,000 (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	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Bunker Hill Mining and Metallurgical Complex, ID 21-Square-Mile Inactive Industrial Complex 09/22/92	Soil, sediment, debris, GW, and SW contaminated with organics, including PCBs; metals, including arsenic and lead; and inorganics, including asbestos Not specified	The selected remedial action for this site includes revegetating the Hillside Area with less than 50 percent cover; contour terracing eroded hillsides and installing erosion-control structures; re-establishing riparian habitat and mitigating eroding tailings in Smelterville Flats; consolidating jig tailings into CIA; establishing soil barriers in contaminated areas; relocating the A-1 gypsum pond sediment to CIA; capping the A-4 gypsum pond or consolidating it within CIA; consolidating materials from the 1982 smelter cleanup within the smelter closure; relocating the slag pile tailings from the West Page Swamp in Page Pond and capping the pond; improving the channels for Humboldt and Grouse creeks; reprocessing, recycling, or treating all principal threat materials, including copper flue dust using cement-based stabilization; removing and recycling salvageable items; decontaminating onsite structures; capping the CIA, Lead Smelter, and Zinc Plant with low permeability caps; collecting and treating the CIA, Lead Smelter, and Zinc Plant leachate; treating acid mine drainage from the Bunker Hill mine in the Central Treatment Plant prior to discharge to the wetlands treatment system; closing the onsite solid waste landfills; continuing blood level monitoring for lead and high-efficiency vacuum loan program to site residents; cleaning all homes exceeding 1,000 ppm lead house dust, and implementing an interior dust monitoring program; recovering and treating the ground water in Government Gulch; constructing a passive wetland treatment system in Smelterville Flats and Pinehurst narrows to treat CIA seeps, pretreated acid mine drainage, and ground water and surface water from Government Gulch, and leachate from the lead and zinc closure areas, using absorption and precipitation of metals within an anaerobic substrate; using a second ground water system to passively treat upper zone ground water; abandoning and closing potentially contaminated wells, and providing an alternative source of water for any affected residences; monitoring air, surface water, ground water; and implementing institutional controls, including land use restrictions and fencing.	Chemical-specific soil excavation goals, which are based on health-risk levels, include lead 1,000 mg/kg. Soil will be stabilized to meet RCRA LDR standards prior to disposal in CIA, which will be capped. Clean replacement soil will contain less than arsenic 100 mg/kg; cadmium 5 mg/kg; and lead 100 mg/kg. Chemical-specific sediment and debris clean-up levels were not specified; however, materials that cannot be reprocessed or recycled will be stabilized onsite prior to disposal in CIA. Chemical-specific ground water clean-up goals are based on SDWA MCLs and state standards and include arsenic 0.05 mg/l; cadmium 0.005 mg/l; lead 0.05 mg/l; and zinc 5 mg/l. Chemical-specific surface water clean-up goals are based on federal water quality criteria under the CWA and include cadmium 0.0011 mg/l; lead 0.0032 mg/l; and zinc 0.110 mg/l.	$52,035,000 (present worth) $11,096,000 (annual O&M) (30 years)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Eielson Air Force Base, AK 19,700-Acre Tactical Support Installation 09/29/92	Soil and GW contaminated with VOCs, including benzene, toluene, and xylenes; and oils Not specified	The selected remedial action for this site includes in- situ bioventing of BTEX contaminated soil in the vadose zone, with monitoring of soil gases; collecting floating petroleum hydrocarbons from the ground water through wells, culverts, or trenches; incinerating recovered product onsite or transporting this offsite for recycling or disposal; treating extracted ground water, as needed, using air stripping, oil-water separation, or carbon filtration, as determined during the remedial design stage; and discharging the residual water onsite; monitoring petroleum product levels; collecting BTEX-LNAPLS using vacuum extraction wells, with carbon adsorption, followed by offsite disposal of carbon residuals; treating collected liquids using an oil and water separator, air stripper, or carbon adsorption; destroying air emissions using tip flare incineration; and monitoring ground water.	No chemical-specific soil and ground water clean-up goals are provided for this interim remedy. Final performance goals will be established in the final remedy for site soil and ground water remediation. All air emissions and effluent discharges generated by this interim remedy will comply with the applicable federal and state environmental regulations.	$3,867 (capital cost) $3,375 (annual O&M) (5 years)
10 Elmendorf Air Force Base, AK 13,130-Acre Air Force Base 09/01/92	Soil and GW contaminated with VOCs, including benzene, toluene, and xylenes; and other organics Not specified	The selected interim remedial action for this site includes collecting and containing the floating BTEX-LNAPLs with passive and active recovery systems; using a sump to separate the fuel and water, then recycling the fuel; treating contaminated ground water using air stripping, with discharge of the treated water offsite to a POTW; controlling air emissions from the treatment process using carbon adsorption, and disposing of spent carbon filters offsite; temporarily storing excavated well construction soil onsite; and monitoring ground water.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and will be provided in the final ROD for the OU2 source area ST41.	$467,300 (present worth) $27,500 (annual O&M) (5 years)
10 Fort Lewis (Landfill No. 5), WA 180-Acre Military Landfill 07/10/92	Not applicable Not applicable	The selected remedial action for this site is no further action; however, onsite ground water monitoring will continue in accordance with state and local solid waste landfill operating and closure requirements.	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	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Joseph Forest Products, OR 18-Acre Wood Processing Facility 09/30/92	Soil and debris contaminated with metals, including arsenic, chromium, and lead; and inorganics, including asbestos 2,796 yd^3 (surface and subsurface soil)	The selected remedial action for this site includes demolishing contaminated onsite structures, including the process, storage, and mixing tanks, and the wooden structures and concrete slabs, followed by offsite disposal; decontaminating the concrete drip pad and tanks, followed by recycling or offsite disposal of debris; excavating surface and subsurface soil, with screening and segregation of hazardous waste for offsite disposal, with stabilization, if necessary, prior to disposal at appropriate facilities; backfilling any excavated areas; removing asbestos from the facility, with offsite disposal; removing underground storage tanks and any associated contaminated soil, with scrapping or offsite disposal; monitoring ground water; and implementing institutional controls, including deed and land use restrictions or environmental notices.	Excavation goals for soil/debris are based on EPA's risk standards of 10^{-5} for surface soil and 10^{-4} for subsurface soil. Chemical-specific goals for subsurface soil include arsenic 36 mg/kg; chromium 1,351 mg/kg; and copper 10,000 mg/kg. Subsurface soil goals include arsenic 336 mg/kg; chromium 1,351 mg/kg; and copper 10,000 mg/kg.	$550,000 (present worth) $24,000 (annual O&M) (3 years)
10 McChord AFB (Wash Rack/Treatment), WA 4,600-Acre Weapon and Aircraft Maintenance Facilities 09/28/92	Soil and GW contaminated with VOCs; other organics, including oils; and metals, including lead Not specified	The selected remedial action for this site includes excavating, consolidating, and treating fuel-contaminated soil onsite with ex-situ bioremediation, then backfilling the treated soil into an onsite trench; installing passive subsurface extraction trenches to collect LNAPLs, with onsite separation using fuel skimmers (oil/water separator); transporting the recovered fuel offsite in drums to either a recycling facility, if specifications are met, or to a permitted disposal facility; conducting long-term ground water monitoring; and implementing institutional controls, including deed and ground water use restrictions, as well as site physical controls.	Chemical-specific ground water clean-up goals are based on SDWA MCLs, MTCA Method A, and background levels, and include soil clean-up levels total petroleum hydrocarbons 1,000 ug/l (MTCA Method A); and lead 11 ug/l (background).	$640,000 (present worth) $54,000 (annual O&M) (years 0-1) $23,000 (annual O&M) (years 3-5) $22,000 (annual O&M) (years 6-25)

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Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Mountain Home Air Force Base (Operable Unit 4), ID 7-Acre Fire Department Training Area 06/16/92	Not applicable Not applicable	The selected remedial action for this site is no further action. Based on the results of the human health risk assessment the USAF, EPA, and the state have determined that chemicals remaining in the soil pose no unacceptable risks to human health or the environment.	Not applicable	$0 (present worth) $0 (O&M)
10 N.A.S. Whidbey Island - Ault Field, WA 260-Acre Naval Facility Waste Disposal Area 04/21/92	GW contaminated with VOCs, including TCE; and metals, including chromium and lead Not specified	The selected remedial action for this site includes containing the solvent contaminated ground water using extraction, followed by onsite treatment using metal precipitation, air stripping, and carbon adsorption, and reinjecting the treated water into the affected aquifer; and monitoring ground water.	Chemical-specific ground water clean-up goals are based on SDWA MCLs and State Model Toxics Control Act (MTCA) and include TCE 4 ug/l (MTCA); 1,1,1-TCA .5 ug/l; 1,1-DCA 200 ug/l (MTCA); 1,1-DCE 0.07 ug/l (MTCA); 1,2-DCE 70 ug/l (MTCA); vinyl chloride 0.02 ug/l (MTCA); carbon tetrachloride 0.3 ug/l (MTCA); chromium 80 ug/l (MTCA); and lead 4 ug/l (MTCA). Because this action does not constitute a final remedy for the ground water, subsequent actions will fully address risks posed by conditions at this operable unit.	$2,201,700 (present worth) $1,230,000 (total O&M cost) (3 years)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Pacific Hide & Fur Recycling (Amendment), ID 17-Acre Recycling Facility 04/29/92	Soil and debris contaminated with organics, including PCBs; and metals, including lead 8,200 yd^3 (PCB-contaminated and commingled PCB/lead-contaminated soil)	The amended remedial action for this site includes excavating, processing, transporting, and offsite disposal of approximately 8,200 cubic yards of PCB-contaminated and commingled PCB/lead-contaminated soil as follows: excavation and offsite disposal of approximately 6,500 cubic yards of untreated PCB-contaminated soil; treating approximately 900 cubic yards of contaminated soil commingled with over 25 mg/kg PCB and lead levels exceeding 5 mg/kg, using solidification, followed by offsite disposal in a permitted, hazardous waste facility; treating approximately 100 cubic yards of PCB-, lead-, and halogenated organic compound (HOC)-contaminated waste using offsite incineration, followed by solidifying and disposing of the ash offsite; decontaminating, stockpiling onsite, and covering approximately 700 cubic yards of debris for possible future salvage and recycling; and backfilling, grading, and restoring the surface site drainage.	Chemical-specific soil excavation goals are based on RCRA hazardous waste and characterization regulations and TSCA PCB regulations, and include HOCs 1,000 mg/kg; lead 5 mg/kg (TCLP); and PCBs 25 mg/kg.	$2,360,500 - $2,429,000 (present worth) $0 (O&M)
10 Pesticide Lab - Yakima, WA 10-Acre Pesticide Lab and Research Laboratory 09/30/92	Not applicable Not applicable	The selected remedial action for this site includes no further action with ground water monitoring for 1 year.	Not applicable	$0 (present worth) $0 (O&M)
10 Umatilla Army Depot (Lagoons), OR 19,700-Acre Army Ordnance Depot 09/25/92	Soil contaminated with explosives, including DNB, 2,4-DNT, HMX, NB, TNB, TNT, and RDX 4,800 yd^3 (soil)	The selected remedial action for this site includes developing a composting facility onsite; constructing a roadway between the lagoons and the onsite composting facility to transport the excavated and treated soil; excavating to a 5-foot depth, approximately 6,800 tons of contaminated soil with concentrations of TNT or RDX exceeding 30 mg/kg; treating the soil onsite using ex-situ bioremediation via composting; backfilling the excavated lagoon areas with the compost, then covering the compost with a 2-foot layer of clean soil and grading and revegetating the area.	Chemical-specific excavation goals for soil are based on risk-based remedial action criteria (RAC) and include TNT 30 mg/kg (RAC) and RDX 30 mg/kg (RAC). These levels correspond to an excess cancer risk under the industrial use scenario of $7x10^{-6}$, which is within the range of acceptable cancer risks.	$1,870,000 (present worth) $1,084,000 (total O&M cost) (2 years)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 U.S. DOE Idaho National Engineering Lab (Operable Unit 2), ID Portion of a 890-Square-Mile Nuclear Reactor Technology Development and Waste Management Facility 09/28/92	GW contaminated with VOCs, including TCE and PCE; metals, including lead; and radioactive materials Not specified	The selected remedial action for this site includes pumping the contaminated ground water from the injection well and treating the ground water onsite using filtration to remove suspended solids, followed by air stripping and carbon adsorption to remove organics, and ion exchange to remove inorganics and radionuclides; modifying the existing TAN onsite disposal pond to receive treated ground water and ensure that it does not exceed discharge limits; transporting any spent carbon offsite to a permitted facility for regeneration; installing two additional ground water monitoring wells within the contaminant plume; monitoring air emissions; and implementing administrative and institutional controls, including ground water use restrictions.	Chemical-specific ground water clean-up goals, which are based on SDWA MCLs, and include TCE 5 ug/l; PCE 5 ug/l; lead 50 ug/l; and strontium-90 300 pCi/l. Air emissions also will be monitored and will not exceed state air quality standards, which include TCE 0.00051 lb/hr, PCE 0.013 lb/hr, lead 1.5 ug/m^3; and strontium-90 10 mrem/yd.	$7,715,000 (capital cost) $3,194,000 (total O&M cost) (2 years)
10 U.S. DOE Idaho National Engineering Lab (Operable Unit 5), ID Portion of 890-Square-Mile Nuclear Reactor Technology Development and Waste Management Facility 12/05/91	Sediment contaminated with metals, including hexavalent chromium; other organics; and radioactive materials 20,700 yd^3 (sediment)	The selected remedial action for this site includes onsite physical separation of large and fine-grained materials, followed by treatment of 20,700 cubic yards of very-fine grained contaminated sediment onsite by chemical extraction with an acidic solution to remove cesium-137, cobalt-60, and chromium, followed by recovering contaminants from the acidic solution using ion exchange, precipitation or distillation; testing residuals, and treating to meet applicable storage and/or disposal criteria, then storing the waste onsite temporarily until final disposition can be determined; returning larger grained materials to the pond and along with the treatment process residuals, and backfilling and revegetating the area; conducting pilot studies to optimize the extraction process; and implementing institutional controls including deed restrictions.	Federal and state clean-up standards for cesium-37, cobalt-60, and chromium have not been established at this time. Clean-up objectives for cesium-37 are based on a 10^{-4} to 10^{-6} range for cancer risk to human health. Because this action does not constitute a final remedy for this operable unit, subsequent actions will fully address risks posed by the Warm Waste Pond sediment and associated contamination.	$7,195,000 (capital cost) $300,000 (total O&M cost) (1.5 years)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 U.S. DOE Idaho National Engineering Lab (Operable Unit 22), ID Portion of a 890-Square-Mile Nuclear Reactor Technology Development and Waste Management Facility 09/30/92	Sediment, debris, and sludge contaminated with metals, including chromium; and radioactive materials 100 yd^3 (sediment)	The selected interim remedial action for this site includes removing and solidifying/stabilizing the 100 cubic yards of contaminated sediment from the evaporation pond by grouting, followed by onsite disposal in the Radioactive Waste Management Complex (RWMC) at INEL along with existing low-level waste containers; removing sludge and sediment from the waste sump; treating the sludge by grouting, if feasible, based on the results of treatability studies, and disposing of the treated sludge onsite in RWMC; decontaminating the discharge pipe; and sampling the remaining sediment to verify residual contaminant concentrations.	Sediment and sludge excavation goals are based on a site-specific residential use scenario for a population that begins residence at the site within 100 years in the future. Chemical-specific goals include chromium 800 mg/kg and cesium-137 30 pCi/g.	$480,000 (total cost) (O&M) (not provided)
10 U.S. DOE Idaho National Engineering Lab (Operable Unit 23), ID Portion of a 890-Square-Mile Nuclear Reactor Technology Development and Waste Management Facility 06/02/92	Soil and ordnance debris contaminated with organics; inorganics; and natural decomposition products 185 yd^3 (soil)	The selected interim remedial action for this site includes conducting soil sampling of the detonation areas; excavating, containerizing, and transporting an estimated 185 cubic yards of soil exceeding action levels offsite for treatment using incineration, with offsite disposal of residuals; researching historical records pertaining to ordnance activities at INEL; conducting a field search of the six NPG areas for unexploded ordnance; controlled onsite thermal treatment (detonation) of any identified ordnance, with onsite disposal or recycling of any residual metal debris; and posting signs where the public has access to ordnance areas.	Action levels for soil were determined based on health-based criteria and include TNT 44 mg/kg and RDX 18 mg/kg. A screening level for DNT has not been developed as it is a breakdown product of TNT. Soil at or above these screening levels will be excavated, containerized, and transported to an offsite incinerator. Any resultant ash will be disposed of by the incinerator facility. Containerized soil will be sampled and analyzed for TCLP analytes to determine whether they should be classified as a RCRA waste.	$2,359,500 (present worth) $0 (O&M)

FY92 Record of Decision Summary Table

Region, Site Name, State/Type/ Signature Date/ Remedial Action	Threat/Problem Waste Volume	Components of Selected Remedy	Clean-up Goals	Present Worth/ Capital and O&M Costs
10 Wyckoff/Eagle Harbor, WA 3,780-Acre Inactive Wood Treatment Facility and Shipyard 09/29/92	Subtidal/intertidal sediment and upland sources contaminated with organics, including PAHs; and metals, including arsenic, chromium, and lead 314,900 m^2 (sediment)	The selected remedial action for this site includes dredging, dewatering, excavating approximately 1,000 to 7,000 cubic yards of intertidal sediment that exceeds levels of 5 mg/kg mercury and/or lower moderate PAH concentrations, followed by treatment using solidification/stabilization, as necessary, to comply with LDR as determined by bench scale tests; transporting sediment, which cannot be treated to meet LDR offsite for disposal at a RCRA-permitted landfill; treating wastewater from the dewatering process onsite using carbon adsorption before discharge into the harbor; capping the sediment in areas of high concern with a 1-meter thick layer of clean sediment; placing a thin layer of clean sediment in subtidal areas of low to moderate concern to enhance natural sediment recovery; conducting long-term environmental monitoring; and implementing institutional controls to prevent exposure to contaminated fish and shellfish.	Sediment clean-up goals are based on the State of Washington Sediment Management Standards (Sediment Standards), which provide chemical criteria for both a minimum clean-up level (MCUL) and the more stringent sediment quality standards (SQS). Chemical-specific goals for defining cleanup areas include anthracene 1,200 mg/kg; chrysene 460 mg/kg; naphthalene 170 mg/kg; pyrene 1,400 mg/kg; and mercury 0.58 mg/kg (MCUL) the long-term goal for the harbor is the SQS.	$6,200,000-$16,000,000 (present worth) $1,100,000 (present worth O&M) (10 years)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX

Listed below are major keyword categories and subcategories for Superfund FY 1992 Record of Decision (ROD) abstracts presented in this document. The keyword category list is followed by a comprehensive listing of each ROD containing each of the noted keywords, listed by site, State, and Region.

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
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

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

Testing/Pilot Studies

Leachability Tests
Treatability Studies

Technology

Aeration
Air Monitoring
Air Stripping
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

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

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

Fike Chemical, WV (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Spickler Landfill, WI (V); Double Eagle Refinery, OK (VI)

Arsenic

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Ellis Property, NJ (II); Facet Enterprises, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); C & D Recycling, PA (III); Lindane Dump, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); Spickler Landfill, WI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); Wyckoff/Eagle Harbor, WA (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Asbestos

Cosden Chemical Coatings, NJ (II); Fike Chemical, WV (III); Alabama Army Ammunition Plant, AL (IV); Spickler Landfill, WI (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Prewitt Abandoned Refinery, NM (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X)

Benzene

Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Higgins Farm, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Chem-Solv, DE (III); Lindane Dump, PA (III); Paoli Rail Yard, PA (III); Strasburg Landfill, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Ciba-Geigy (McIntosh Plant), AL (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X)

Carcinogenic Compounds

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Carcinogenic Compounds (Continued)

Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); Standard Auto Bumper, FL (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Pester Refinery, KS (VII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Chromium

Brunswick Naval Air Station (Operable Unit 1), ME (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Islip Municipal Sanitary Landfill, NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); C & D Recycling, PA (III); Lindane Dump, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); USA Aberdeen, Michaelsville, MD (III); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Spickler Landfill, WI (V); Torch Lake (Operable Units 1 and 3), MI (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Pester Refinery, KS (VII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Joseph Forest Products, OR (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); Wyckoff/Eagle Harbor, WA (X)

Dioxin

Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII)

Inorganics

Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); Preferred Plating, NY (II); Fike Chemical, WV (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); Milan Army Ammunition Plant, TN (IV); Alsco Anaconda, OH (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Spickler Landfill, WI (V); Prewitt Abandoned Refinery, NM (VI); Denver Radium (Operable Unit 8), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Lead

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Eastern Diversified Metals, PA (III); Lindane Dump, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Marine Corp Logistics Base, GA (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Torch Lake (Operable Units 1 and 3), MI (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); Wyckoff/Eagle Harbor, WA (X)

Metals

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III);

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Metals (Continued)

C & D Recycling, PA (III); Chem-Solv, DE (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); Wyckoff/Eagle Harbor, WA (X)

Mining Wastes

Torch Lake (Operable Units 1 and 3), MI (V); Denver Radium (Operable Unit 8), CO (VIII); Iron Mountain Mine, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Oils

General Motors/Central Foundry Division, NY (II); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X)

Organics/VOCs

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Pester Refinery, KS (VII);

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Organics/VOCs (Continued)

Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

PAHs (Polynuclear Aromatic Hydrocarbons)

PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Ramapo Landfill, NY (II); Abex Corp, VA (III); MW Manufacturing, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); Electrovoice, MI (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); Muskego Sanitary Landfill, WI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); South Andover (Operable Unit 2), MN (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Wyckoff/Eagle Harbor, WA (X)

PCBs (Polychlorinated Biphenyls)

PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Abex Corp, VA (III); Eastern Diversified Metals, PA (III); Paoli Rail Yard, PA (III); Florida Steel, FL (IV); Marine Corp Logistics Base, GA (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); H.Brown Company, MI (V); Muskego Sanitary

PRIMARY HAZARDOUS SUBSTANCES DETECTED

PCBs (Polychlorinated Biphenyls) (Continued)

Landfill, WI (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Ogden Defense Depot (Operable Unit 4), UT (VIII); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Pacific Hide & Fur Recycling (Amendment), ID (X)

PCE (Tetrachloroethylene/Perchloroethylene)

Brunswick Naval Air Station (Operable Unit 2), ME (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Higgins Farm, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Preferred Plating, NY (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Fike Chemical, WV (III); MW Manufacturing, PA (III); Raymark, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); JFD Electronics/Channel Master, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); Clare Water Supply, MI (V); Electrovoice, MI (V); Spickler Landfill, WI (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); 29th & Mead Groundwater Contamination, KS (VII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

Pesticides

Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Industrial Latex, NJ (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); Potter's Septic Tank Service Pits, NC (IV); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); H.Brown Company, MI (V); Muskego Sanitary Landfill, WI (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); Spickler Landfill, WI (V); Tri County Landfill, IL (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Farmers' Mutual Cooperative, IA (VII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Lawrence Livermore National Lab (USDOE), CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); N.A.S. Whidbey Island - Ault Field, WA (X)

Phenols

General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Ramapo Landfill, NY (II); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); H.Brown Company, MI (V); Kohler Landfill,

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PRIMARY HAZARDOUS SUBSTANCES DETECTED

Phenols (Continued)

WI (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tar Lake, MI (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII)

Radioactive Materials

Agrico Chemical, FL (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Denver Radium (Operable Unit 8), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Lawrence Livermore National Lab (USDOE), CA (IX); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X)

Solvents

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); National Electric Coil/Cooper Ind, KY (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Solvents (Continued)

(Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast PipeLines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

TCE (Trichloroethylene)

Brunswick Naval Air Station (Operable Unit 2), ME (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Preferred Plating, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); MW Manufacturing, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); Westinghouse Elevator Plant, PA (III); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); National Electric Coil/Cooper Ind, KY (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Spickler Landfill, WI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); 29th & Mead Groundwater Contamination, KS (VII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Purity Oil Sales, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

Toluene

Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Rowe Industries Groundwater Contamination, NY (II); Paoli Rail Yard, PA (III); Strasburg Landfill, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Ciba-Geigy (McIntosh Plant), AL (IV); National Electric Coil/Cooper Ind, KY (IV); Potter's Septic Tank Service Pits, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI

PRIMARY HAZARDOUS SUBSTANCES DETECTED

Toluene (Continued)

(V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Jasco Chemical, CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X)

Xylenes

Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); Facet Enterprises, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Paoli Rail Yard, PA (III); Strasburg Landfill, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); National Electric Coil/Cooper Ind, KY (IV); Potter's Septic Tank Service Pits, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Jasco Chemical, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X)

CONTAMINATED MEDIA

Air

Ramapo Landfill, NY (II); Strasburg Landfill, PA (III); H.Brown Company, MI (V); Tri County Landfill, IL (V)

Debris

PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Eastern Diversified Metals, PA (III); Rhinehart Tire Fire Dump, VA (III);

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

CONTAMINATED MEDIA

Debris (Continued)

Strasburg Landfill, PA (III); Tonolli, PA (III); Alabama Army Ammunition Plant, AL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); H.Brown Company, MI (V); La Grande Sanitary Landfill, MN (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 2), MN (V); Torch Lake (Operable Units 1 and 3), MI (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Prewitt Abandoned Refinery, NM (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Hill Air Force Base, UT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

Ground Water

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Tonolli, PA (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Skinner Landfill, OH (V); South Andover (Operable Unit 1)(Amendment), MN (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI);

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

CONTAMINATED MEDIA

Ground Water (Continued)

29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

Sediment (Creek/River/Stream)

Brunswick Naval Air Station (Operable Unit 1), ME (I); PSC Resources, MA (I); Facet Enterprises, NY (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); C & D Recycling, PA (III); Lindane Dump, PA (III); Paoli Rail Yard, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); Florida Steel, FL (IV); Marine Corp Logistics Base, GA (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Alsco Anaconda, OH (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); Clare Water Supply, MI (V); H.Brown Company, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Oklahoma Refining, OK (VI); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Iron Mountain Mine, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Purity Oil Sales, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); Wyckoff/Eagle Harbor, WA (X)

Sludge

General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Tonolli, PA (III); Agrico Chemical, FL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Bofors Nobel (Amendment), MI (V); Electrovoice, MI (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X)

Soil

Brunswick Naval Air Station (Operable Unit 1), ME (I); PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

CONTAMINATED MEDIA

Soil (Continued)

Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

Surface Water

PSC Resources, MA (I); Kin-Buc Landfill, NJ (II); Ramapo Landfill, NY (II); Fike Chemical, WV (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); Cannelton Industries, MI (V); H.Brown Company, MI (V); Savanna Army Depot, IL (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII);

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

CONTAMINATED MEDIA

Surface Water (Continued)

Silver Bow Creek/Butte Area, MT (VIII); Iron Mountain Mine, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Direct Contact

Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

PUBLIC HEALTH AND ENVIRONMENTAL THREATS

Direct Contact (Continued)

(IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA(IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Public Exposure

Brown's Battery Breaking, PA (III); Denver Radium (Operable Unit 8), CO (VIII); Bunker Hill Mining and Metallurgical Complex, ID (X)

REMEDY SELECTION

ARAR Waiver

PSC Resources, MA (I); General Motors/Central Foundry Division, NY (II); Pasley Solvents & Chemical, NY (II); Robintech/National Pipe, NY (II); Brown's Battery Breaking, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Westinghouse Elevator Plant, PA (III); Geigy Chemical (Aberdeen Plant), NC (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); MIDCO I (Amendment), IN (V); Tar Lake, MI (V); Broderick Wood Products, CO (VIII); Hill Air Force Base, UT (VIII); Iron Mountain Mine, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

Institutional Controls

Brunswick Naval Air Station (Operable Unit 1), ME (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits

REMEDY SELECTION

Institutional Controls (Continued)

(Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Columbus Old Municipal Landfill, IN (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Crystal Chemical (Amendment), TX (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Idaho Pole, MT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); Wyckoff/Eagle Harbor, WA (X)

Interim Remedy

Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); Evor Phillips Leasing, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Fike Chemical, WV (III); U.S. Defense General Supply Center (Operable Unit 1), VA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); Tar Lake, MI (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Hill Air Force Base, UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Iron Mountain Mine, CA (IX); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

No Action Remedy

Darling Hill Dump, VT (I); Revere Textile Prints, CT (I); Action Anodizing, Plating and Polishing, NY (II); Bioclinical Laboratories, NY (II); FAA Technical Center, NJ (II); Naval Air Engineering Center (Operable Unit 5), NJ (II); Naval Air Engineering Center (Operable Unit 6), NJ (II); North Sea Municipal Landfill, NY (II); Witco Chemical (Oakland Plant), NJ (II); Dixie Caverns County Landfill, VA (III); Route 940 Drum Dump, PA (III); Suffolk City Landfill, VA (III); Chem-form, FL (IV); New Hanover County Airport Burn Pit, NC (IV);

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

REMEDY SELECTION

No Action Remedy (Continued)

USDOE Oak Ridge Reservation (Operable Unit 18), TN (IV); Wilson Concepts of Florida, FL (IV); Woodbury Chemical (Princeton Plant), FL (IV); Columbus Old Municipal Landfill, IN (V); Grand Traverse Overall Supply, MI (V); Metal Working Shop, MI (V); Des Moines TCE, IA (VII); Hydro-Flex, KS (VII); Arrcom (Drexler Enterprise), ID (X); Fort Lewis (Landfill No. 5), WA (X); Mountain Home Air Force Base, ID (X); Pesticide Lab - Yakima, WA (X)

O&M

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Witco Chemical (Oakland Plant), NJ (II); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Eastern Diversified Metals, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Chem-form, FL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Wilson Concepts of Florida, FL (IV); Woodbury Chemical (Princeton Plant), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Savanna Army Depot, IL (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

REMEDY SELECTION

O&M (Continued)

Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); Wyckoff/Eagle Harbor, WA (X)

ROD Amendment

Whitehouse Waste Oil Pits (Amendment), FL (IV); Bofors Nobel (Amendment), MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); South Andover (Operable Unit 1)(Amendment), MN (V); Crystal Chemical (Amendment), TX (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Pacific Hide & Fur Recycling (Amendment), ID (X)

WATER SUPPLY

Alternate Water Supply

Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Ramapo Landfill, NY (II); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); MW Manufacturing, PA (III); Central Illinois Public Service, IL (V); Skinner Landfill, OH (V); Bunker Hill Mining and Metallurgical Complex, ID (X)

Drinking Water Contaminants

Otis Air National Guard/Camp Edwards, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Dover Municipal Well 4, NJ (II); Evor Phillips Leasing, NJ (II); Higgins Farm, NJ (II); Pasley Solvents & Chemical, NY (II); Ramapo Landfill, NY (II); Butz Landfill, PA (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); Potter's Septic Tank Service Pits, NC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Central Illinois Public Service, IL (V); Clare Water Supply, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Skinner Landfill, OH (V); South Andover (Operable Unit 2), MN (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); 29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Idaho Pole, MT

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

REMEDY SELECTION

Drinking Water Contaminants (Continued)

(VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

SITE-SPECIFIC CHARACTERISTICS

Floodplain

Darling Hill Dump, VT (I); PSC Resources, MA (I); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); FAA Technical Center, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 5), NJ (II); Naval Air Engineering Center (Operable Unit 6), NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Strasburg Landfill, PA (III); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); JFD Electronics/Channel Master, NC (IV); National Electric Coil/Cooper Ind, KY (IV); Alsco Anaconda, OH (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Columbus Old Municipal Landfill, IN (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); Muskego Sanitary Landfill, WI (V); Savanna Army Depot, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Crystal Chemical (Amendment), TX (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Des Moines TCE, IA (VII); Hydro-Flex, KS (VII); Idaho Pole, MT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Rhone-Poulenc/Zoecon, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

Sole-Source Aquifer

Otis Air National Guard/Camp Edwards, MA (I); Butz Landfill, PA (III); Chem-form, FL (IV); Wilson Concepts of Florida, FL (IV); Woodbury Chemical (Princeton Plant), FL (IV); Eielson Air Force Base, AK (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

Wetlands

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Darling Hill Dump, VT (I); PSC Resources, MA (I); Town Garage/Radio Beacon, NH (I); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); General Motors/Central Foundry Division, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); C & D Recycling, PA (III); Commodore Semiconductor Group, PA (III); MW Manufacturing, PA (III); USA Aberdeen, Michaelsville, MD (III); Potter's Septic Tank Service Pits, NC (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); H.Brown

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

SITE-SPECIFIC CHARACTERISTICS

Wetlands (Continued)

Company, MI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 1)(Amendment), MN (V); South Andover (Operable Unit 2), MN (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Mosley Road Sanitary Landfill, OK (VI); Idaho Pole, MT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Rhone-Poulenc/Zoecon, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); N.A.S. Whidbey Island - Ault Field, WA (X); Wyckoff/Eagle Harbor, WA (X)

STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Hybrid/Alternate Closure

Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II)

Clean Air Act

Brunswick Naval Air Station (Operable Unit 1), ME (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Dover Municipal Well 4, NJ (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Abex Corp, VA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Fike Chemical, WV (III); MW Manufacturing, PA (III); Raymark, PA (III); Tonolli, PA (III); USA Aberdeen, Michaelsville, MD (III); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); Standard Auto Bumper, FL (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Pester Refinery, KS (VII);

STANDARDS/REGULATIONS/PERMITS/GUIDANCE

RCRA (Continued)

(USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Closure Requirements

General Motors/Central Foundry Division, NY (II); USA Aberdeen, Michaelsville, MD (III); Marine Corp Logistics Base, GA (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Bofors Nobel (Amendment), MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); Spickler Landfill, WI (V); Fourth Street Abandoned Refinery, OK (VI); Denver Radium (Operable Unit 9), CO (VIII); Idaho Pole, MT (VIII)

Clean Closure

Cosden Chemical Coatings, NJ (II); Rhinehart Tire Fire Dump, VA (III); Electrovoice, MI (V); Fourth Street Abandoned Refinery, OK (VI); Ogden Defense Depot (Operable Unit 1), UT (VIII)

Landfill Closure

Brunswick Naval Air Station (Operable Unit 1), ME (I); PSC Resources, MA (I); Endicott Village Well Field, NY (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Strasburg Landfill, PA (III); Tonolli, PA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Florida Steel, FL (IV); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Electrovoice, MI (V); H.Brown Company, MI (V); MIDCO II (Amendment), IN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Crystal Chemical (Amendment), TX (VI); Fourth Street Abandoned Refinery, OK (VI); Hassayampa Landfill, AZ (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

Safe Drinking Water Act

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Pasley Solvents & Chemical, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA

STANDARDS/REGULATIONS/PERMITS/GUIDANCE

Safe Drinking Water Act (Continued)

(III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Tonolli, PA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

MCLs (Maximum Contaminant Limits)

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Pasley Solvents & Chemical, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); New Hanover County Airport Burn Pit, NC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical

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MCLGs

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Rowe Industries Groundwater Contamination, NY (II); Butz Landfill, PA (III); Chem-Solv, DE (III); MW Manufacturing, PA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Milan Army Ammunition Plant, TN (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); N.A.S. Whidbey Island - Ault Field, WA (X)

State Standards/Regulations

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply,

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PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); Standard Auto Bumper, FL (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

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Public Health Advisory

None

State Guidance

Madison County Sanitary Landfill, FL (IV)

State Permit

Otis Air National Guard/Camp Edwards, MA (I); Madison County Sanitary Landfill, FL (IV); Peerless Plating, MI (V); Spickler Landfill, WI (V); 29th & Mead Groundwater Contamination, KS (VII)

TESTING/PILOT STUDIES

Leachability Tests

PSC Resources, MA (I); Tonolli, PA (III); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Potter's Septic Tank Service Pits, NC (IV); Cannelton Industries, MI (V); Electrovoice, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Spickler Landfill, WI (V); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Denver Radium (Operable Unit 8), CO (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Pacific Hide & Fur Recycling (Amendment), ID (X)

Treatability Studies

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Evor Phillips Leasing, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Eastern Diversified Metals, PA (III); Raymark, PA (III); Tonolli, PA (III); Agrico Chemical, FL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Milan Army Ammunition Plant, TN (IV); New Hanover County Airport Burn Pit, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI

TESTING/PILOT STUDIES

Treatability Studies (Continued)

(V); Electrovoice, MI (V); Hagen Farm, WI (V); MIDCO I (Amendment), IN (V); Peerless Plating, MI (V);Reilly Tar & Chemical (Indianapolis Plant), IN (V); South Andover (Operable Unit 1)(Amendment), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Prewitt Abandoned Refinery, NM (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); Wyckoff/Eagle Harbor, WA (X)

TECHNOLOGY

Aeration

Higgins Farm, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Benfield Industries, NC (IV); H.Brown Company, MI (V); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII)

Air Monitoring

Dover Municipal Well 4, NJ (II); Endicott Village Well Field, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); North Sea Municipal Landfill, NY (II); Ramapo Landfill, NY (II); Abex Corp, VA (III); C & D Recycling, PA (III); Fike Chemical, WV (III); Strasburg Landfill, PA (III); Tonolli, PA (III); Ciba-Geigy (McIntosh Plant), AL (IV); National Electric Coil/Cooper Ind, KY (IV); American Chemical Services, IN (V); Savanna Army Depot, IL (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Denver Radium (Operable Unit 8), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Sacramento Army Depot (Operable Unit 3), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

Air Stripping

Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Westinghouse Elevator Plant, PA (III); Carrier Air Conditioning, TN (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge

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TECHNOLOGY

Air Stripping (Continued)

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Biodegradation/Land Application

General Motors/Central Foundry Division, NY (II); Benfield Industries, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Reilly Tar & Chemical (Indianapolis Plant), IN (V); South Andover (Operable Unit 2), MN (V); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Jasco Chemical, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); Umatilla Army Depot (Lagoons), OR (X)

Capping

Brunswick Naval Air Station (Operable Unit 1), ME (I); PSC Resources, MA (I); Endicott Village Well Field, NY (II); General Motors/Central Foundry Division, NY (II); Islip Municipal Sanitary Landfill, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Ramapo Landfill, NY (II); Lindane Dump, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); Wyckoff/Eagle Harbor, WA (X)

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TECHNOLOGY

Carbon Adsorption (GAC)

Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Dover Municipal Well 4, NJ (II); Evor Phillips Leasing, NJ (II); General Motors/Central Foundry Division, NY (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Fike Chemical, WV (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Central Illinois Public Service, IL (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tar Lake, MI (V); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Elmendorf Air Force Base, AK (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); Wyckoff/Eagle Harbor, WA (X)

Decontamination

PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Abex Corp, VA (III); C & D Recycling, PA (III); Paoli Rail Yard, PA (III); Tonolli, PA (III); Ciba-Geigy (McIntosh Plant), AL (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); H.Brown Company, MI (V); Cal West Metals, NM (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products, OR (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X)

Dredging

PSC Resources, MA (I); Kin-Buc Landfill, NJ (II); Rhinehart Tire Fire Dump, VA (III); Savannah River (USDOE)(Operable Unit 1), SC (IV); Cannelton Industries, MI (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Purity Oil Sales, CA (IX); Wyckoff/Eagle Harbor, WA (X)

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TECHNOLOGY

Excavation

PSC Resources, MA (I); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Preferred Plating, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Fike Chemical, WV (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Standard Auto Bumper, FL (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 2), MN (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Filling

PSC Resources, MA (I); General Motors/Central Foundry Division, NY (II); Preferred Plating, NY (II); Fike Chemical, WV (III); Rhinehart Tire Fire Dump, VA (III); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); Potter's Septic Tank Service Pits, NC (IV); Standard Auto Bumper, FL (IV); Central Illinois Public Service, IL (V); Oklahoma Refining, OK (VI); Denver Radium (Operable Unit 8), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Purity Oil Sales, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Ground Water Monitoring

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Darling Hill Dump, VT (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Revere Textile Prints, CT (I); Tibbetts Road, NH (I); Town Garage/Radio Beacon, NH (I); Action Anodizing, Plating and Polishing, NY (II); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); North Sea Municipal Landfill, NY (II); Pasley Solvents & Chemical, NY (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Witco Chemical (Oakland Plant), NJ (II); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Route 940 Drum Dump, PA (III); Strasburg Landfill, PA (III); Suffolk City Landfill, VA (III); Tonolli, PA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Chem-form, FL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); Standard Auto Bumper, FL (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Wilson Concepts of Florida, FL (IV); Woodbury Chemical (Princeton Plant), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Columbus Old Municipal Landfill, IN (V); Electrovoice, MI (V); Grand Traverse Overall Supply, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Skinner Landfill, OH (V); South Andover (Operable Unit 1)(Amendment), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Des Moines TCE, IA (VII); Farmers' Mutual Cooperative, IA (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Fort Lewis (Landfill No. 5), WA (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pesticide Lab - Yakima, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); Wyckoff/Eagle Harbor, WA (X)

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TECHNOLOGY

Ground Water Treatment (Continued)

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Tonolli, PA (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); American Chemical Services, IN (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X)

Incineration/Thermal Destruction

Ellis Property, NJ (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Fike Chemical, WV (III); Alabama Army Ammunition Plant, AL (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Potter's Septic Tank Service Pits, NC (IV); USMC Camp Lejeune Military Reservation, NC (IV); American Chemical Services, IN (V); Central Illinois Public Service, IL (V); Savanna Army Depot, IL (V); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Eielson Air Force Base, AK (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

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Leachate Collection/Treatment

Endicott Village Well Field, NY (II); Ramapo Landfill, NY (II); Lindane Dump, PA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); Bofors Nobel (Amendment), MI (V); Kohler Landfill, WI (V); Muskego Sanitary Landfill, WI (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Bunker Hill Mining and Metallurgical Complex, ID (X)

Levees

None

Offsite Discharge

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Dover Municipal Well 4, NJ (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Carrier Air Conditioning, TN (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); New Hanover County Airport Burn Pit, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); Electrovoice, MI (V); Hagen Farm, WI (V); New Brighton/Arden Hills, MN (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Spickler Landfill, WI (V); Tri County Landfill, IL (V); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Idaho Pole, MT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Jasco Chemical, CA (IX); Elmendorf Air Force Base, AK (X)

Offsite Disposal

PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Kin-Buc Landfill, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Preferred Plating, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Commodore Semiconductor Group, PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Lindane Dump, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Alabama Army Ammunition Plant, AL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); Marine Corp Logistics Base, GA (IV); Milan Army Ammunition Plant, TN (IV); Potter's Septic Tank Service Pits, NC (IV); Standard Auto Bumper, FL (IV); USMC Camp Lejeune Military Reservation, NC (IV); Yellow Water Road Dump, FL (IV); American Chemical Services, IN (V); Butterworth #2 Landfill, MI (V); Central Illinois Public Service, IL (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (St. Louis Park), MN (V); South Andover (Operable Unit 2), MN (V); Torch Lake (Operable Units 1 and 3), MI (V); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII);

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TECHNOLOGY

Offsite Disposal (Continued)

Denver Radium (Operable Unit 8), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Jasco Chemical, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Offsite Treatment

Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Industrial Latex, NJ (II); Preferred Plating, NY (II); Ramapo Landfill, NY (II); Rowe Industries Groundwater Contamination, NY (II); Brown's Battery Breaking, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Eastern Diversified Metals, PA (III); Fike Chemical, WV (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Cannelton Industries, MI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); New Brighton/Arden Hills, MN (V); Peerless Plating, MI (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tri County Landfill, IL (V); Prewitt Abandoned Refinery, NM (VI); Broderick Wood Products, CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X)

Onsite Containment

Brunswick Naval Air Station (Operable Unit 1), ME (I); Endicott Village Well Field, NY (II); General Motors/Central Foundry Division, NY (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); C & D Recycling, PA (III); Lindane Dump, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Madison County Sanitary Landfill, FL (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Kohler Landfill, WI (V); Muskego Sanitary Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Crystal Chemical (Amendment), TX (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary

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TECHNOLOGY

Onsite Containment (Continued)

Landfill, OK (VI); Oklahoma Refining, OK (VI); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Elmendorf Air Force Base, AK (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); Wyckoff/Eagle Harbor, WA (X)

Onsite Discharge

Otis Air National Guard/Camp Edwards, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Pasley Solvents & Chemical, NY (II); Robintech/National Pipe, NY (II); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); MW Manufacturing, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); Westinghouse Elevator Plant, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Alsco Anaconda, OH (V); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Spickler Landfill, WI (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Idaho Pole, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); N.A.S. Whidbey Island - Ault Field, WA (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); Wyckoff/Eagle Harbor, WA (X)

Onsite Disposal

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Endicott Village Well Field, NY (II); General Motors/Central Foundry Division, NY (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); C & D Recycling, PA (III); Lindane Dump, PA (III); Raymark, PA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); USA Aberdeen, Michaelsville, MD (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier

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TECHNOLOGY

Onsite Disposal (Continued)

Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Bofors Nobel (Amendment), MI (V); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Kohler Landfill, WI (V); La Grande Sanitary Landfill, MN (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Torch Lake (Operable Units 1 and 3), MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Crystal Chemical (Amendment), TX (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Mosley Road Sanitary Landfill, OK (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Denver Radium (Operable Unit 8), CO (VIII); Denver Radium (Operable Unit 9), CO (VIII); Hill Air Force Base, UT (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Onsite Treatment

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Otis Air National Guard/Camp Edwards, MA (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Dover Municipal Well 4, NJ (II); Ellis Property, NJ (II); Endicott Village Well Field, NY (II); Evor Phillips Leasing, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Imperial Oil/Champion Chemicals, NJ (II); Industrial Latex, NJ (II); Islip Municipal Sanitary Landfill, NY (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Robintech/National Pipe, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); C & D Recycling, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Dublin Water Supply, PA (III); Eastern Diversified Metals, PA (III); MW Manufacturing, PA (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Strasburg Landfill, PA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Westinghouse Elevator Plant, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); Madison County Sanitary Landfill, FL (IV); Milan Army Ammunition Plant, TN (IV); National Electric Coil/Cooper Ind, KY (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Onsite Treatment (Continued)

(USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV);USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); American Chemical Services, IN (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); Hagen Farm, WI (V); Kohler Landfill, WI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Hassayampa Landfill, AZ (IX); Iron Mountain Mine, CA (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Elmendorf Air Force Base, AK (X); McChord AFB (Wash Rack/Treatment), WA (X); N.A.S. Whidbey Island - Ault Field, WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

Plume Management

Brunswick Naval Air Station (Operable Unit 1), ME (I); Newport Naval Education/Training Center, RI (I); MW Manufacturing, PA (III); Westinghouse Elevator Plant, PA (III); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 3), SC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tar Lake, MI (V); Oklahoma Refining, OK (VI); 29th & Mead Groundwater Contamination, KS (VII); Farmers' Mutual Cooperative, IA (VII); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Rhone-Poulenc/Zoecon, CA (IX); N.A.S. Whidbey Island - Ault Field, WA (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Publicly Owned Treatment Works (POTW)

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); Newport Naval Education/Training Center, RI (I); Endicott Village Well Field, NY (II); Ramapo Landfill, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); Chem-Solv, DE (III); Commodore Semiconductor Group, PA (III); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Geigy Chemical (Aberdeen Plant), NC (IV); JFD Electronics/Channel Master, NC (IV); New Hanover County Airport Burn Pit, NC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Cannelton Industries, MI (V); Electrovoice, MI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Spickler Landfill, WI (V); Tri County Landfill, IL (V); Pester Refinery, KS (VII); Idaho Pole, MT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Elmendorf Air Force Base, AK (X)

Relocation

Abex Corp, VA (III); Potter's Septic Tank Service Pits, NC (IV); Koppers (Texarkana Plant)(Amendment), TX (VI); Bunker Hill Mining and Metallurgical Complex, ID (X)

Slurry Wall

Brunswick Naval Air Station (Operable Unit 1), ME (I); General Motors/Central Foundry Division, NY (II); Agrico Chemical, FL (IV); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX)

Soil Washing/Flushing

Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Benfield Industries, NC (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Pester Refinery, KS (VII); Idaho Pole, MT (VIII); Sacramento Army Depot (Operable Unit 4), CA (IX)

Solidification/Stabilization

PSC Resources, MA (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Facet Enterprises, NY (II); Preferred Plating, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Fike Chemical, WV (III); Paoli Rail Yard, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Electrovoice, MI (V); H.Brown Company, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Oklahoma Refining, OK (VI); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Joseph Forest Products,

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Solidification/Stabilization (Continued)

OR (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); Wyckoff/Eagle Harbor, WA (X)

Solvent Extraction

Ciba-Geigy (McIntosh Plant), AL (IV); Purity Oil Sales, CA (IX)

Surface Water Diversion/Collection

Brunswick Naval Air Station (Operable Unit 1), ME (I); General Motors/Central Foundry Division, NY (II); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Plattsburgh Air Force Base (Operable Unit 3), NY (II); Ramapo Landfill, NY (II); Fike Chemical, WV (III); USA Aberdeen, Michaelsville, MD (III); Florida Steel, FL (IV); Tar Lake, MI (V); Tri County Landfill, IL (V); Gulf Coast Vacuum Services (Operable Unit 2), LA (VI); Oklahoma Refining, OK (VI); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Iron Mountain Mine, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

Surface Water Monitoring

Brunswick Naval Air Station (Operable Unit 1), ME (I); Darling Hill Dump, VT (I); PSC Resources, MA (I); Tibbetts Road, NH (I); General Motors/Central Foundry Division, NY (II); Higgins Farm, NJ (II); Kin-Buc Landfill, NJ (II); Plattsburgh Air Force Base (Operable Unit 1), NY (II); Ramapo Landfill, NY (II); C & D Recycling, PA (III); Lindane Dump, PA (III); Whitehouse Waste Oil Pits (Amendment), FL (IV); Butterworth #2 Landfill, MI (V); Cannelton Industries, MI (V); Central Illinois Public Service, IL (V); H.Brown Company, MI (V); South Andover (Operable Unit 2), MN (V); Tri County Landfill, IL (V); Twin Cities AF Reserve (SAR Landfill), MN (V); Pester Refinery, KS (VII); Silver Bow Creek/Butte Area, MT (VIII); Bunker Hill Mining and Metallurgical Complex, ID (X)

Surface Water Treatment

PSC Resources, MA (I); General Motors/Central Foundry Division, NY (II); Kin-Buc Landfill, NJ (II); Rhinehart Tire Fire Dump, VA (III); Savannah River (USDOE)(Operable Unit 1), SC (IV); Savannah River (USDOE)(Operable Unit 2), SC (IV); USDOE Oak Ridge Reservation (Operable Unit 6), TN (IV); H.Brown Company, MI (V); Savanna Army Depot, IL (V); Tar Lake, MI (V); Tri County Landfill, IL (V); Double Eagle Refinery, OK (VI); Oklahoma Refining, OK (VI); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Silver Bow Creek/Butte Area, MT (VIII); Iron Mountain Mine, CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Temporary Storage

Abex Corp, VA (III); Fike Chemical, WV (III); Florida Steel, FL (IV); Bofors Nobel (Amendment), MI (V); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Sacramento Army Depot (Operable Unit 4), CA (IX); Elmendorf Air Force Base, AK (X); Pacific Hide & Fur Recycling (Amendment), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); Wyckoff/Eagle Harbor, WA (X)

Treatment Technology

Brunswick Naval Air Station (Operable Unit 1), ME (I); Brunswick Naval Air Station (Operable Unit 2), ME (I); PSC Resources, MA (I); Tibbetts Road, NH (I); Cosden Chemical Coatings, NJ (II); Ellis Property, NJ (II); Facet Enterprises, NY (II); General Motors/Central Foundry Division, NY (II); Industrial Latex, NJ (II); Naval Air Engineering Center (Operable Unit 7), NJ (II); Pasley Solvents & Chemical, NY (II); Preferred Plating, NY (II); Rowe Industries Groundwater Contamination, NY (II); Abex Corp, VA (III); Brown's Battery Breaking, PA (III); C & D Recycling, PA (III); Fike Chemical, WV (III); Paoli Rail Yard, PA (III); Raymark, PA (III); Rhinehart Tire Fire Dump, VA (III); Tonolli, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Agrico Chemical, FL (IV); Alabama Army Ammunition Plant, AL (IV); Benfield Industries, NC (IV); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); Florida Steel, FL (IV); JFD Electronics/Channel Master, NC (IV); Marine Corp Logistics Base, GA (IV); Potter's Septic Tank Service Pits, NC (IV); Savannah River (USDOE)(Operable Unit 1), SC (IV); USMC Camp Lejeune Military Reservation, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); American Chemical Services, IN (V); Central Illinois Public Service, IL (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); H.Brown Company, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Savanna Army Depot, IL (V); South Andover (Operable Unit 2), MN (V); Spickler Landfill, WI (V); Tar Lake, MI (V); Cal West Metals, NM (VI); Double Eagle Refinery, OK (VI); Fourth Street Abandoned Refinery, OK (VI); Gulf Coast Vacuum Services (Operable Unit 1), LA (VI); Koppers (Texarkana Plant)(Amendment), TX (VI); Oklahoma Refining, OK (VI); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Pester Refinery, KS (VII); Broderick Wood Products, CO (VIII); Denver Radium (Operable Unit 8), CO (VIII); Idaho Pole, MT (VIII); Ogden Defense Depot (Operable Unit 1), UT (VIII); Ogden Defense Depot (Operable Unit 3), UT (VIII); Ogden Defense Depot (Operable Unit 4), UT (VIII); Portland Cement (Kiln Dust #2 & #3), UT (VIII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Rocky Flats Plant (USDOE)(Operable Unit 4), CO (VIII); Hassayampa Landfill, AZ (IX); Jasco Chemical, CA (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Sacramento Army Depot (Operable Unit 4), CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X); Eielson Air Force Base, AK (X); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X); Pacific Hide & Fur Recycling (Amendment), ID (X); Umatilla Army Depot (Lagoons), OR (X); US DOE Idaho National Engineering Lab (Operable Unit 2), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 5), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 22), ID (X); US DOE Idaho National Engineering Lab (Operable Unit 23), ID (X); Wyckoff/Eagle Harbor, WA (X)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

TECHNOLOGY

Vacuum Extraction

Tibbetts Road, NH (I); Pasley Solvents & Chemical, NY (II); Raymark, PA (III); U.S. Defense General Supply Center (Operable Unit 5), VA (III); Carrier Air Conditioning, TN (IV); Ciba-Geigy (McIntosh Plant), AL (IV); American Chemical Services, IN (V); City Disposal Sanitary Landfill, WI (V); Clare Water Supply, MI (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Muskego Sanitary Landfill, WI (V); Peerless Plating, MI (V); Tri County Landfill, IL (V); Prewitt Abandoned Refinery, NM (VI); 29th & Mead Groundwater Contamination, KS (VII); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Hassayampa Landfill, AZ (IX); Lawrence Livermore National Lab (USDOE), CA (IX); Pacific Coast Pipe Lines, CA (IX); Purity Oil Sales, CA (IX); Sacramento Army Depot (Operable Unit 3), CA (IX); Eielson Air Force Base, AK (X)

Venting

Endicott Village Well Field, NY (II); Strasburg Landfill, PA (III); USA Aberdeen, Michaelsville, MD (III); City Disposal Sanitary Landfill, WI (V); La Grande Sanitary Landfill, MN (V); Muskego Sanitary Landfill, WI (V)

Volatilization/Soil Aeration

None

Vitrification

None

MISCELLANEOUS

Municipally-Owned Site

Hassayampa Landfill, AZ (IX)

Woodlands

None

HISTORICALLY SIGNIFICANT

ACL (Alternate Concentration Limits)

Butterworth #2 Landfill, MI (V)

RECORD OF DECISION FY 1992 KEYWORD LIST INDEX (Continued)

MISCELLANEOUS

Background Levels

Action Anodizing, Plating and Polishing, NY (II); Pasley Solvents & Chemical, NY (II); Brown's Battery Breaking, PA (III); Butz Landfill, PA (III); Rhinehart Tire Fire Dump, VA (III); South Andover (Operable Unit 1)(Amendment), MN (V); Mosley Road Sanitary Landfill, OK (VI); Rocky Flats Plant (USDOE)(Operable Unit 2), CO (VIII); Iron Mountain Mine, CA (IX); Rhone-Poulenc/Zoecon, CA (IX); Joseph Forest Products, OR (X); McChord AFB (Wash Rack/Treatment), WA (X)

Deferred Decision

Naval Air Engineering Center (Operable Unit 7), NJ (II); Preferred Plating, NY (II); Ciba-Geigy (McIntosh Plant), AL (IV); American Chemical Services, IN (V); Hagen Farm, WI (V); Reilly Tar & Chemical (Indianapolis Plant), IN (V); Oklahoma Refining, OK (VI); Ogden Defense Depot (Operable Unit 3), UT (VIII); Silver Bow Creek/Butte Area, MT (VIII); Rhone-Poulenc/Zoecon, CA (IX); Westinghouse Electric (Sunnyvale Plant), CA (IX); Bunker Hill Mining and Metallurgical Complex, ID (X)

Initial Remedial Measure (IRM)

None

Contingent Remedy

Town Garage/Radio Beacon, NH (I); Islip Municipal Sanitary Landfill, NY (II); Kin-Buc Landfill, NJ (II); Ramapo Landfill, NY (II); Robintech/National Pipe, NY (II); Brown's Battery Breaking, PA (III); Chem-Solv, DE (III); MW Manufacturing, PA (III); Ciba-Geigy (McIntosh Plant), AL (IV); Geigy Chemical (Aberdeen Plant), NC (IV); New Hanover County Airport Burn Pit, NC (IV); Potter's Septic Tank Service Pits, NC (IV); Whitehouse Waste Oil Pits (Amendment), FL (IV); Yellow Water Road Dump, FL (IV); Columbus Old Municipal Landfill, IN (V); Electrovoice, MI (V); MIDCO I (Amendment), IN (V); MIDCO II (Amendment), IN (V); Reilly Tar & Chemical (St. Louis Park), MN (V); Tri County Landfill, IL (V); Mosley Road Sanitary Landfill, OK (VI); Farmers' Mutual Cooperative, IA (VII); Rhone-Poulenc/Zoecon, CA (IX)

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992

REGION	SITE NAME	STATE	SIGN DATE
1	Auburn Road Landfill	NH	09/17/86
1	Auburn Road Landfill	NH	09/29/89
1	Baird & McGuire	MA	09/30/86
1	Baird & McGuire	MA	09/14/89
1	Baird & McGuire	MA	09/27/90
1	Beacon Heights Landfill	CT	09/23/85
1	Beacon Heights Landfill	CT	09/28/90
1	Brunswick Naval Air Station (Operable Unit 1)	ME	06/16/92
1	Brunswick Naval Air Station (Operable Unit 2)	ME	06/16/92
1	Cannon Engineering	MA	03/31/88
1	Charles George Reclamation Trust Landfill	MA	12/29/83
1	Charles George Reclamation Trust Landfill	MA	07/11/85
1	Charles George Reclamation Trust Landfill	MA	09/29/88
1	Charles George Reclamation Trust Landfill	MA	09/29/88
1	Coakley Landfill	NH	06/28/90
1	Darling Hill Dump	VT	06/30/92
1	Davis Liquid Waste	RI	09/29/87
1	Dover Municipal Landfill	NH	09/10/91
1	Groveland Wells	MA	09/30/88
1	Groveland Wells	MA	09/30/91
1	Hocomonco Pond	MA	09/30/85
1	Industri-plex	MA	09/30/86
1	Iron Horse Park	MA	09/15/88
1	Iron Horse Park	MA	06/27/91
1	Kearsarge Metallurgical	NH	09/28/90
1	Keefe Environmental Services	NH	11/15/83
1	Keefe Environmental Services	NH	03/21/88
1	Kellogg-Deering Well Field	CT	09/25/86
1	Kellogg-Deering Well Field	CT	09/29/89
1	Landfill & Resource Recovery	RI	09/29/88
1	Laurel Park	CT	06/30/88
1	McKin	ME	07/15/83
1	McKin	ME	07/22/85
1	Mottolo Pig Farm	NH	03/29/91
1	New Bedford	MA	04/06/90
1	Newport Naval Education/Training Center	RI	09/29/92
1	Norwood PCBs	MA	09/29/89
1	Nyanza Chemical Waste Dump	MA	09/04/85
1	Nyanza Chemical Waste Dump	MA	09/23/91
1	O'Connor	ME	09/27/89
1	Old Springfield Landfill	VT	09/22/88
1	Old Springfield Landfill	VT	09/29/90
1	Otis Air National Guard/Camp Edwards	MA	05/20/92
1	Ottati & Goss/Kingston Steel Drum	NH	01/16/87
1	Picillo Farm	RI	09/30/85

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
1	Picillo Farm (Amendment)	RI	03/03/87
1	Pinette's Salvage Yard	ME	05/30/89
1	Plymouth Harbor/Cannon Engineering	MA	09/30/85
1	PSC Resources	MA	09/15/92
1	Re-Solve	MA	07/01/83
1	Re-Solve	MA	09/24/87
1	Revere Textile Prints	CT	09/30/92
1	Rose Disposal Pit	MA	09/23/88
1	Saco Tannery Waste Pits	ME	09/27/89
1	Savage Municipal Water Supply	NH	09/27/91
1	Silresim Chemical	MA	09/19/91
1	South Municipal Water Supply Well	NH	09/27/89
1	Stamina Mills	RI	09/28/90
1	Sullivan's Ledge	MA	06/29/89
1	Sullivan's Ledge	MA	09/27/91
1	Sylvester's	NH	07/29/82
1	Sylvester's	NH	09/22/83
1	Tibbetts Road	NH	09/29/92
1	Tinkham Garage	NH	09/30/86
1	Town Garage/Radio Beacon	NH	09/30/92
1	Union Chemical	ME	12/27/90
1	W.R. Grace (Acton Plant)	MA	09/29/89
1	Wells G&H	MA	09/14/89
1	Western Sand & Gravel	RI	09/28/84
1	Western Sand & Gravel	RI	04/16/91
1	Winthrop Landfill	ME	11/22/85
1	Yaworski Waste Lagoon	CT	09/29/88
Subtotal	**72**		
2	Action Anodizing, Plating, and Polishing	NY	06/30/92
2	American Thermostat	NY	01/07/88
2	American Thermostat	NY	06/29/90
2	AO Polymer	NJ	06/28/91
2	Applied Environmental Services	NY	06/24/91
2	Asbestos Dump	NJ	09/30/88
2	Asbestos Dump	NJ	09/27/91
2	Beachwood/Berkeley Wells	NJ	06/30/88
2	BEC Trucking	NY	09/28/89
2	Bioclinical Laboratories	NY	09/30/92
2	Bog Creek Farm	NJ	09/30/85
2	Bog Creek Farm	NJ	06/28/89
2	Brewster Wellfield	NY	09/30/86
2	Brewster Wellfield	NY	09/29/88
2	Bridgeport Rental & Oil Service	NJ	12/31/84
2	Burnt Fly Bog	NJ	11/16/83
2	Burnt Fly Bog	NJ	09/29/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
2	Byron Barrel & Drum	NY	09/29/89
2	C & J Disposal	NY	03/29/91
2	Caldwell Trucking	NJ	09/25/86
2	Caldwell Trucking	NJ	09/28/89
2	Chemical Control	NJ	09/20/83
2	Chemical Control	NJ	09/23/87
2	Chemical Insecticide	NJ	09/28/89
2	Chemical Leaman Tank Lines	NJ	09/28/90
2	Chemsol	NJ	09/20/91
2	Ciba-Geigy	NJ	04/24/89
2	Cinnaminson Ground Water Contamination	NJ	09/28/90
2	Circuitron	NY	03/29/91
2	Claremont Polychemical	NY	09/22/89
2	Claremont Polychemical	NY	09/28/90
2	Clothier Disposal	NY	12/28/88
2	Colesville Municipal Landfill	NY	03/29/91
2	Combe Fill North Landfill	NJ	09/29/86
2	Combe Fill South Landfill	NJ	09/29/86
2	Conklin Dumps	NY	03/29/91
2	Cooper Road	NJ	09/30/87
2	Cosden Chemical Coatings	NJ	09/30/92
2	Curcio Scrap Metal	NJ	06/28/91
2	D'Imperio Property	NJ	03/27/85
2	DeRewal Chemical	NJ	09/29/89
2	Diamond Alkali	NJ	09/30/87
2	Dover Municipal Well 4	NJ	09/30/92
2	Ellis Property	NJ	09/30/92
2	Endicott Village Well Field	NY	09/25/87
2	Endicott Village Well Field	NY	03/29/91
2	Endicott Village Well Field	NY	09/30/92
2	Evor Phillips Leasing	NJ	09/30/92
2	Ewan Property	NJ	09/29/88
2	Ewan Property	NJ	09/29/89
2	FAA Technical Center	NJ	09/26/89
2	FAA Technical Center	NJ	09/28/90
2	FAA Technical Center	NJ	09/30/92
2	Facet Enterprises	NY	09/04/92
2	Fibers Public Supply Wells	PR	09/30/91
2	Florence Land Recontouring Landfill	NJ	06/27/86
2	Forest Glen Subdivision	NY	12/29/89
2	Fort Dix Landfill	NJ	09/24/91
2	Friedman Property	NJ	04/30/85
2	Frontera Creek	PR	09/30/91
2	Fulton Terminals	NY	09/29/89
2	Garden State Cleaners	NJ	09/26/91
2	GE Wiring Devices	PR	09/30/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
2	GE-Moreau	NY	07/13/87
2	GEMS Landfill	NJ	09/27/85
2	General Motors/Central Foundry Division	NY	03/31/92
2	General Motors/Central Foundry Division	NY	12/17/90
2	Genzale Plating	NY	03/29/91
2	Glen Ridge Radium	NJ	06/30/89
2	Glen Ridge Radium	NJ	06/01/90
2	Global Landfill	NJ	09/11/91
2	Goose Farm	NJ	09/27/85
2	Haviland Complex	NY	09/30/87
2	Helen Kramer Landfill	NJ	09/27/85
2	Hertel Landfill	NY	09/27/91
2	Higgins Farm	NJ	09/24/90
2	Higgins Farm	NJ	09/30/92
2	Hooker - 102nd Street	NY	09/26/90
2	Hooker - Hyde Park	NY	11/26/85
2	Hooker Chemical/Ruco Polymer	NY	09/28/90
2	Hudson River PCB	NY	09/25/84
2	Imperial Oil/Champion Chemicals	NJ	09/26/90
2	Imperial Oil/Champion Chemicals	NJ	09/30/92
2	Industrial Latex	NJ	09/30/92
2	Islip Municipal Sanitary Landfill	NY	09/30/92
2	Juncos Landfill	PR	09/24/91
2	Katonah Municipal Well	NY	09/25/87
2	Kentucky Avenue Wellfield	NY	09/30/86
2	Kentucky Avenue Wellfield	NY	09/28/90
2	Kin-Buc Landfill	NJ	09/30/88
2	Kin-Buc Landfill	NJ	09/28/92
2	King of Prussia	NJ	09/28/90
2	Krysowaty Farm	NJ	06/20/84
2	Lang Property	NJ	09/29/86
2	Lipari Landfill	NJ	08/03/82
2	Lipari Landfill	NJ	09/30/85
2	Lipari Landfill	NJ	07/11/88
2	Lone Pine Landfill	NJ	09/28/84
2	Lone Pine Landfill	NJ	09/28/90
2	Love Canal	NY	05/06/85
2	Love Canal	NY	10/26/87
2	Love Canal (93rd Street)	NY	09/26/88
2	Love Canal (93rd Street)(Amendment)	NY	05/15/91
2	Ludlow Sand & Gravel	NY	09/30/88
2	M & T DeLisa Landfill	NJ	09/20/90
2	Mannheim Avenue Dump	NJ	09/27/90
2	Marathon Battery	NY	09/30/86
2	Marathon Battery	NY	09/30/88
2	Marathon Battery	NY	09/29/89

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
2	Mattiace Petrochemicals	NY	09/27/90
2	Mattiace Petrochemicals	NY	06/27/91
2	Metaltec/Aerosystems	NJ	06/30/86
2	Metaltec/Aerosystems	NJ	09/27/90
2	Montclair/West Orange Radium	NJ	06/30/89
2	Montclair/West Orange Radium	NJ	06/01/90
2	Montgomery Township Housing Development	NJ	09/29/87
2	Montgomery Township Housing Development	NJ	06/30/88
2	Myers Property	NJ	09/28/90
2	Nascolite	NJ	03/31/88
2	Nascolite	NJ	06/28/91
2	Naval Air Engineering Center (Operable Unit 1)	NJ	02/04/91
2	Naval Air Engineering Center (Operable Unit 2)	NJ	02/04/91
2	Naval Air Engineering Center (Operable Unit 3)	NJ	09/30/91
2	Naval Air Engineering Center (Operable Unit 4)	NJ	09/30/91
2	Naval Air Engineering Center (Operable Unit 5)	NJ	01/03/92
2	Naval Air Engineering Center (Operable Unit 6)	NJ	12/31/91
2	Naval Air Engineering Center (Operable Unit 7)	NJ	03/16/92
2	NL Industries	NJ	09/27/91
2	North Sea Municipal Landfill	NY	09/29/89
2	North Sea Municipal Landfill	NY	09/28/92
2	Old Bethpage Landfill	NY	03/17/88
2	Olean Wellfield	NY	09/24/85
2	Pasley Solvents & Chemical	NY	04/24/92
2	Pepe Field	NJ	09/29/89
2	Picatinny Arsenal	NJ	09/28/89
2	Pijak Farm	NJ	09/30/84
2	Plattsburgh Air Force Base (Operable Unit 1)	NY	09/30/92
2	Plattsburgh Air Force Base (Operable Unit 3)	NY	09/30/92
2	Pollution Abatement Services	NY	06/06/84
2	Pomona Oaks Well Contamination	NJ	09/26/90
2	Port Washington Landfill	NY	09/30/89
2	Preferred Plating	NY	09/22/89
2	Preferred Plating	NY	09/28/92
2	Price Landfill #1	NJ	09/20/83
2	Price Landfill #1	NJ	09/29/86
2	Radium Chemical	NY	06/21/90
2	Ramapo Landfill	NY	03/31/92
2	Reich Farms	NJ	09/30/88
2	Renora	NJ	09/29/87
2	Ringwood Mines/Landfill	NJ	09/29/88
2	Robintech/National Pipe	NY	03/31/92
2	Rockaway Borough Wellfield	NJ	09/29/86
2	Rockaway Borough Wellfield	NJ	09/30/91
2	Rocky Hill Municipal Well	NJ	06/30/88
2	Roebling Steel	NJ	03/29/90

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
2	Roebling Steel	NJ	09/26/91
2	Rowe Industries Groundwater Contamination	NY	09/30/92
2	Sarney Farm	NY	09/27/90
2	Sayreville Landfill	NJ	09/28/90
2	Scientific Chemical Processing	NJ	09/14/90
2	Sealand Restoration	NY	09/28/90
2	Sharkey Landfill	NJ	09/29/86
2	Sinclair Refinery	NY	09/30/85
2	Sinclair Refinery	NY	09/30/91
2	SMS Instruments	NY	09/29/89
2	Solvent Savers	NY	09/28/90
2	South Brunswick Landfill	NJ	09/30/87
2	South Jersey Clothing	NJ	09/26/91
2	Spence Farm	NJ	09/30/84
2	Suffern Village Well Field	NY	09/25/87
2	Swope Oil & Chemical	NJ	09/27/85
2	Swope Oil & Chemical	NJ	09/27/91
2	Syncon Resins	NJ	09/29/86
2	Syosset Landfill	NY	09/27/90
2	Tabernacle Drum Dump	NJ	06/30/88
2	Upjohn Facility	PR	09/30/88
2	Upper Deerfield Township Sanitary Landfill	NJ	09/30/91
2	Vega Alta Public Supply Wells	PR	09/29/87
2	Vestal Water Supply 1-1	NY	06/27/86
2	Vestal Water Supply 1-1	NY	09/27/90
2	Vineland Chemical	NJ	09/28/89
2	Vineland State School	NJ	09/30/89
2	Volney Municipal Landfill	NY	07/31/87
2	Waldick Aerospace Devices	NJ	09/29/87
2	Waldick Aerospace Devices	NJ	03/29/91
2	Warwick Landfill	NY	06/27/91
2	White Chemical	NJ	09/26/91
2	Wide Beach Development	NY	09/30/85
2	Williams Property	NJ	09/29/87
2	Witco Chemical (Oakland Plant)	NJ	09/28/92
2	Woodland Township Route 532	NJ	05/16/90
2	Woodland Township Route 72	NJ	05/16/90
2	York Oil	NY	02/09/88
Subtotal	**193**		
3	Abex	VA	09/29/92
3	Alladin Plating	PA	09/27/88
3	Ambler Asbestos Piles	PA	09/30/88
3	Ambler Asbestos Piles	PA	09/29/89
3	Army Creek Landfill	DE	09/30/86
3	Army Creek Landfill	DE	06/29/90

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
3	Arrowhead Associates/Scovill	VA	09/30/91
3	AVCO Lycoming-Williamsport Division	PA	06/28/91
3	Avtex Fibers	VA	09/30/88
3	Avtex Fibers	VA	09/28/90
3	Bally Ground Water Contamination	PA	06/30/89
3	Bendix Flight System Division	PA	09/30/88
3	Berks Sand Pit	PA	09/29/88
3	Blosenski Landfill	PA	09/29/86
3	Brodhead Creek	PA	03/29/91
3	Brown's Battery Breaking	PA	09/28/90
3	Brown's Battery Breaking	PA	07/02/92
3	Bruin Lagoon	PA	06/02/82
3	Bruin Lagoon	PA	09/29/86
3	Butz Landfill	PA	09/28/90
3	Butz Landfill	PA	06/30/92
3	C&D Recycling	PA	09/30/92
3	C & R Battery	VA	03/30/90
3	Chem-Solv	DE	03/31/92
3	Chisman Creek	VA	09/30/86
3	Chisman Creek	VA	03/31/88
3	Coker's Sanitation Service Landfill	DE	09/28/90
3	Commodore Semiconductor Group	PA	09/29/92
3	Craig Farm Drum	PA	09/29/89
3	Croydon TCE Spill	PA	12/28/88
3	Croydon TCE Spill	PA	06/29/90
3	Cryo-Chem	PA	09/29/89
3	Cryo-Chem	PA	09/28/90
3	Cryo-Chem	PA	09/30/91
3	Delaware City PVC	DE	09/30/86
3	Delaware Sand & Gravel	DE	04/22/88
3	Delta Quarries/Stotler Landfill	PA	03/29/91
3	Dixie Caverns County Landfill	VA	09/30/91
3	Dixie Caverns County Landfill	VA	09/28/92
3	Dorney Road	PA	09/29/88
3	Dorney Road	PA	09/30/91
3	Douglassville Disposal	PA	09/27/85
3	Douglassville Disposal	PA	06/24/88
3	Douglassville Disposal	PA	06/30/89
3	Dover Air Force Base	DE	09/28/90
3	Drake Chemical (Phase I)	PA	09/30/84
3	Drake Chemical (Phase II)	PA	05/13/86
3	Drake Chemical (Phase III)	PA	09/29/88
3	Dublin Water Supply	PA	12/30/91
3	East Mt. Zion	PA	06/29/90
3	Eastern Diversified Metals	PA	03/29/91
3	Eastern Diversified Metals	PA	07/02/92

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
3	Enterprise Avenue	PA	05/10/84
3	Fike Chemical	WV	09/29/88
3	Fike Chemical	WV	09/28/90
3	Fike Chemical	WV	03/31/92
3	First Piedmont Quarry 719	VA	06/28/91
3	Fischer & Porter	PA	05/04/84
3	Greenwood Chemical	VA	12/29/89
3	Greenwood Chemical	VA	12/31/90
3	Halby Chemical	DE	06/28/91
3	Harvey-Knott Drum	DE	09/30/85
3	Havertown PCP	PA	09/29/89
3	Havertown PCP	PA	09/30/91
3	Hebelka Auto Salvage Yard	PA	03/31/89
3	Hebelka Auto Salvage Yard	PA	09/30/91
3	Heleva Landfill	PA	03/22/85
3	Heleva Landfill (Amendment)	PA	09/30/91
3	Hellertown Manufacturing	PA	09/30/91
3	Henderson Road	PA	06/30/88
3	Henderson Road	PA	09/29/89
3	Hranica Landfill	PA	06/29/90
3	Industrial Drive	PA	09/29/86
3	Industrial Drive	PA	03/29/91
3	Kane & Lombard Street Drums	MD	09/30/87
3	Keystone Sanitation Landfill	PA	09/30/90
3	Kimberton	PA	09/30/88
3	Kimberton	PA	06/30/89
3	L.A. Clarke & Sons	VA	03/31/88
3	Lackawanna Refuse	PA	03/22/85
3	Lansdowne Radiation	PA	08/02/85
3	Lansdowne Radiation	PA	09/22/86
3	Leetown Pesticide	WV	03/31/86
3	Lehigh Electric & Engineering	PA	02/11/83
3	Limestone Road	MD	09/30/86
3	Lindane Dump	PA	03/31/92
3	Lord Shope Landfill	PA	06/29/90
3	Matthews Electro Plating	VA	06/02/83
3	McAdoo Associates	PA	06/05/84
3	McAdoo Associates	PA	06/28/85
3	McAdoo Associates	PA	09/30/91
3	Mid-Atlantic Wood Preservers	MD	12/31/90
3	Middletown Air Field	PA	12/31/87
3	Middletown Air Field	PA	12/17/90
3	Middletown Road Dump	MD	03/17/86
3	Millcreek Dump	PA	05/07/86
3	Modern Sanitation Landfill	PA	06/28/91
3	Moyers Landfill	PA	09/30/85

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
3	MW Manufacturing	PA	03/31/89
3	MW Manufacturing	PA	06/29/90
3	MW Manufacturing	PA	06/30/92
3	NCR, Millsboro	DE	08/12/91
3	New Castle Spill	DE	09/28/89
3	New Castle Steel Plant	DE	03/31/88
3	Old City of York Landfill	PA	09/30/91
3	Ordnance Works Disposal Areas	WV	03/31/88
3	Ordnance Works Disposal Areas (Amendment)	WV	09/29/89
3	Osborne Landfill	PA	09/28/90
3	Palmerton Zinc Pile	PA	09/04/87
3	Palmerton Zinc Pile	PA	06/29/88
3	Paoli Rail Yard	PA	07/21/92
3	Presque Isle	PA	09/30/87
3	Publicker/Cuyahoga Wrecking Plant	PA	06/30/89
3	Publicker/Cuyahoga Wrecking Plant	PA	06/28/91
3	Raymark	PA	09/28/90
3	Raymark	PA	12/30/91
3	Reeser's Landfill	PA	03/30/89
3	Resin Disposal	PA	06/28/91
3	Rhinehart Tire Fire Dump	VA	06/30/88
3	Rhinehart Tire Fire Dump	VA	09/29/92
3	Route 940 Drum Dump	PA	09/28/92
3	Saltville Waste Disposal Ponds	VA	06/30/87
3	Sand Gravel & Stone	MD	09/30/85
3	Sand Gravel & Stone	MD	09/28/90
3	Saunders Supply	VA	09/30/91
3	Sealand Limited	DE	09/30/91
3	Southern Maryland Wood Treating	MD	06/29/88
3	Strasburg Landfill	PA	06/29/89
3	Strasburg Landfill	PA	06/28/91
3	Strasburg Landfill	PA	03/31/92
3	Suffolk City Landfill	VA	09/30/92
3	Taylor Borough Dump	PA	06/28/85
3	Taylor Borough Dump	PA	03/17/86
3	Tonolli	PA	09/30/92
3	Tybouts Corner Landfill	DE	03/06/86
3	Tyson Dump #1	PA	12/21/84
3	Tyson Dump #1 (Amendment)	PA	03/31/88
3	Tyson Dump #1	PA	09/30/88
3	Tyson Dump #1	PA	09/28/90
3	U.S. Defense General Supply Center (Operable Unit 1)	VA	05/15/92
3	U.S. Defense General Supply Center (Operable Unit 5)	VA	03/25/92
3	US Titanium	VA	11/21/89
3	USA Aberdeen - Edgewood	MD	09/27/91
3	USA Aberdeen, Michaelsville	MD	09/27/91

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
3	USA Aberdeen, Michaelsville	MD	06/30/92
3	USA Letterkenny - PDO	PA	08/02/91
3	USA Letterkenny Southeast Area	PA	08/02/91
3	Voortman Farm	PA	06/30/88
3	Wade (ABM)	PA	08/30/84
3	Walsh Landfill	PA	06/29/90
3	West Virginia Ordnance	WV	03/27/87
3	West Virginia Ordnance	WV	09/30/88
3	Westinghouse Elevator Plant	PA	06/30/92
3	Westline	PA	07/03/86
3	Westline	PA	06/29/88
3	Westline (Amendment)	PA	03/30/90
3	Whitmoyer Laboratories	PA	06/30/89
3	Whitmoyer Laboratories (Operable Unit 2)	PA	12/17/90
3	Whitmoyer Laboratories (Operable Unit 3)	PA	12/31/90
3	Wildcat Landfill	DE	06/29/88
3	Wildcat Landfill	DE	11/28/88
3	William Dick Lagoons	PA	06/28/91
Subtotal	**162**		
4	A.L. Taylor (Valley of Drums)	KY	06/18/86
4	Aberdeen Pesticide Dumps	NC	06/30/89
4	Aberdeen Pesticide Dumps (Amendment)	NC	09/30/91
4	Agrico Chemical	FL	09/29/92
4	Airco	KY	06/24/88
4	Alabama Army Ammunition Plant	AL	12/31/91
4	Alpha Chemical	FL	05/18/88
4	American Creosote Works (Jackson Plant)	TN	01/05/89
4	American Creosote Works (Pensacola)	FL	09/30/85
4	American Creosote Works (Pensacola)	FL	09/28/89
4	Amnicola Dump	TN	03/30/89
4	Arlington Blending & Packaging	TN	06/28/91
4	B.F. Goodrich	KY	06/24/88
4	Benfield Industries	NC	07/31/92
4	Brown Wood Preserving	FL	04/08/88
4	Bypass 601 Groundwater Contamination	NC	08/31/90
4	Cabot/Koppers	FL	09/27/90
4	Cape Fear Wood Preserving	NC	06/30/89
4	Carolawn	SC	09/27/89
4	Carolina Transformer	NC	08/29/91
4	Carrier Air Conditioning	TN	09/03/92
4	Celanese/Shelby Fibers Operations	NC	03/23/88
4	Celanese/Shelby Fibers Operations	NC	03/28/89
4	Charles Macon Lagoon & Drum Storage	NC	09/30/91
4	Chem-Form	FL	09/22/92
4	Chemtronics	NC	04/05/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
4	Chemtronics (Amendment)	NC	04/26/89
4	Ciba-Geigy (McIntosh Plant)	AL	09/28/89
4	Ciba-Geigy (McIntosh Plant)	AL	09/30/91
4	Ciba-Geigy (McIntosh Plant)	AL	07/14/92
4	City Industries	FL	03/29/90
4	Coleman-Evans Wood Preserving	FL	09/25/86
4	Coleman-Evans Wood Preserving (Amendment)	FL	09/26/90
4	Davie Landfill	FL	09/30/85
4	Distler Brickyard	KY	08/19/86
4	Distler Farm	KY	08/19/86
4	Dubose Oil Products	FL	03/29/90
4	Florida Steel	FL	06/30/92
4	Flowood	MS	09/30/88
4	Gallaway Pits	TN	09/26/86
4	Geiger (C & M Oil)	SC	06/01/87
4	Geigy Chemical (Aberdeen Plant)	NC	08/27/92
4	Gold Coast Oil	FL	09/11/87
4	Golden Strip Septic Tank	SC	09/12/91
4	Harris/Palm Bay Facility	FL	06/28/90
4	Hercules 009 Landfill	GA	06/27/91
4	Hipps Road Landfill	FL	09/03/86
4	Hipps Road Landfill (Amendment)	FL	09/21/90
4	Hollingsworth Solderless	FL	04/10/86
4	Howe Valley Landfill	KY	09/28/90
4	Independent Nail	SC	09/28/87
4	Independent Nail	SC	08/30/88
4	Interstate Lead (ILCO)	AL	09/30/91
4	Jadco-Hughes	NC	09/27/90
4	JFD Electronics/Channel Master	NC	09/10/92
4	Kassouf-Kimerling Battery Disposal	FL	03/31/89
4	Kassouf-Kimerling Battery Disposal	FL	03/30/90
4	Lees Lane Landfill	KY	09/25/86
4	Lewisburg Dump	TN	09/19/90
4	Madison County Sanitary Landfill	FL	09/28/92
4	Mallory Capacitor	TN	08/29/91
4	Marine Corps Logistics Base	GA	08/14/92
4	Maxey Flats Nuclear Disposal	KY	09/30/91
4	Medley Farms Drum Dump	SC	05/29/91
4	Miami Drum	FL	09/13/82
4	Miami Drum	FL	09/16/85
4	Milan Army Ammunition Plant	TN	09/30/92
4	Monsanto (Augusta Plant)	GA	12/07/90
4	Mowbray Engineering	AL	09/25/86
4	Munisport Landfill	FL	07/26/90
4	National Electric Coil/Cooper Industries	KY	09/30/92
4	National Starch & Chemical	NC	09/30/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
4	National Starch & Chemical	NC	09/28/90
4	New Hanover County Airport Burn Pit	NC	09/29/92
4	Newport Dump	KY	03/27/87
4	Newsom Brothers/Old Reichhold Chemicals	MS	09/18/89
4	North Hollywood Dump	TN	09/13/90
4	NW 58th Street Landfill	FL	09/21/87
4	Palmetto Wood Preserving	SC	09/30/87
4	Parramore Surplus	FL	09/15/87
4	Peppers Steel & Alloys	FL	03/12/86
4	Perdido Groundwater Contamination	AL	09/30/88
4	Petroleum Products	FL	10/05/90
4	Pickettville Road Landfill	FL	09/28/90
4	Pioneer Sand	FL	09/26/86
4	Potter's Septic Tank Service Pits	NC	08/05/92
4	Powersville Landfill	GA	09/30/87
4	Sangamo Dump/Twelve-Mile/Hartwell PCB	SC	12/19/90
4	Sapp Battery Salvage	FL	09/26/86
4	Savannah River (USDOE) (Operable Unit 1)	SC	06/29/92
4	Savannah River (USDOE) (Operable Unit 2)	SC	06/29/92
4	Savannah River (USDOE) (Operable Unit 3)	SC	06/29/92
4	Schuylkill Metal	FL	09/28/90
4	SCRDI Bluff Road	SC	09/12/90
4	SCRDI Dixiana	SC	09/26/86
4	Sherwood Medical Industries	FL	03/27/91
4	Sixty-second Street Dump	FL	06/27/90
4	Smith's Farm Brooks	KY	09/29/89
4	Smith's Farm Brooks (Amendment)	KY	09/30/91
4	Sodyeco	NC	09/24/87
4	Standard Auto Bumper	FL	09/28/92
4	Stauffer Chemical (LeMoyne Plant)	AL	09/27/89
4	Stauffer Chemical Cold Creek (Bucks Plant)	AL	09/27/89
4	Sydney Mine Sludge Ponds	FL	09/29/89
4	Tower Chemical	FL	07/09/87
4	Tri-City Industrial Disposal	KY	08/28/91
4	Tri-City Oil Conservationist	FL	09/21/87
4	USA Anniston Army Depot	AL	09/26/91
4	USAF Robins Air Force Base	GA	06/25/91
4	USDOE Oak Ridge Reservation (Operable Unit 2)	TN	06/28/91
4	USDOE Oak Ridge Reservation (Operable Unit 3)	TN	09/19/91
4	USDOE Oak Ridge Reservation (Operable Unit 4)	TN	09/19/91
4	USDOE Oak Ridge Reservation (Operable Unit 6)	TN	09/30/92
4	USDOE Oak Ridge Reservation (Operable Unit 18)	TN	09/30/92
4	USMC Camp Lejeune Military Reservation	NC	09/23/92
4	Varsol Spill	FL	03/29/85
4	Velsicol Chemical Hardeman County	TN	06/27/91
4	Wamchem	SC	06/30/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
4	Whitehouse Waste Oil Pits	FL	05/30/85
4	Whitehouse Waste Oil Pits (Amendment)	FL	06/16/92
4	Wilson Concepts of Florida	FL	09/22/92
4	Woodbury Chemical (Princeton Plant)	FL	06/25/92
4	Wrigley Charcoal	TN	09/30/91
4	Yellow Water Road	FL	09/28/90
4	Yellow Water Road Dump	FL	06/30/92
4	Zellwood Groundwater Contamination	FL	12/17/87
4	Zellwood Groundwater Contamination (Amendment)	FL	03/01/90
Subtotal	**127**		
5	A & F Materials Reclaiming	IL	11/23/83
5	A & F Materials Reclaiming	IL	06/14/85
5	A & F Materials Reclaiming	IL	08/14/86
5	Acme Solvent Reclaiming	IL	09/27/85
5	Acme Solvent Reclaiming	IL	12/31/90
5	Adrian Municipal Well Field	MN	09/29/89
5	Algoma Municipal Landfill	WI	09/29/90
5	Allied Chemical & Ironton Coke	OH	09/29/88
5	Allied Chemical & Ironton Coke	OH	12/28/90
5	Alsco Anaconda	OH	09/08/89
5	Alsco Anaconda	OH	09/30/92
5	American Chemical Services	IN	09/30/92
5	Anderson Development	MI	09/28/90
5	Anderson Development (Amendment)	MI	09/30/91
5	Arcanum Iron & Metal	OH	09/26/86
5	Arrowhead Refinery	MN	09/30/86
5	Auto Ion Chemicals	MI	09/27/89
5	Belvidere Municipal Landfill #1	IL	06/29/88
5	Berlin & Farro	MI	02/29/84
5	Berlin & Farro	MI	09/30/91
5	Better Brite Plating Chrome & Zinc	WI	06/28/91
5	Big D Campground	OH	09/29/89
5	Bofors Nobel	MI	09/17/90
5	Bofors Nobel (Amendment)	MI	07/22/92
5	Bower's Landfill	OH	03/31/89
5	Buckeye Reclamation	OH	08/19/91
5	Burlington Northern (Brainerd/Baxter)	MN	06/04/86
5	Burrows Sanitation	MI	09/30/86
5	Butterworth #2 Landfill	MI	09/29/92
5	Byron Salvage Yard	IL	03/13/85
5	Byron Salvage Yard	IL	09/23/86
5	Byron Salvage Yard	IL	06/30/89
5	Cannelton Industries	MI	09/30/92
5	Carter Industrials	MI	09/18/91
5	Cemetery Dump	MI	09/11/85

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
5	Cemetery Dump	MI	09/29/89
5	Central Illinois Public Service	IL	09/30/92
5	Charlevoix Municipal Well Field	MI	06/12/84
5	Charlevoix Municipal Well Field	MI	09/30/85
5	Chem-Central	MI	09/30/91
5	Chem-Dyne	OH	07/05/85
5	City Disposal Sanitary Landfill	WI	09/28/92
5	Clare Water Supply	MI	08/30/90
5	Clare Water Supply	MI	09/16/92
5	Cliff/Dow Dump	MI	09/27/89
5	Columbus Old Municipal Landfill	IN	03/31/92
5	Conrail Railyard Elkhart	IN	06/28/91
5	Coshocton City Landfill	OH	06/17/88
5	Cross Brothers Pail Recycling (Pembroke)	IL	03/25/85
5	Cross Brothers Pail Recycling (Pembroke)	IL	09/28/89
5	Dakhue Sanitary Landfill	MN	06/28/91
5	Eau Claire Municipal Well Field	WI	06/10/85
5	Eau Claire Municipal Well Field	WI	03/31/88
5	EH Schilling Landfill	OH	09/29/89
5	Electrovoice	MI	06/23/92
5	Enviro-Chem	IN	09/25/87
5	Enviro-Chem (Northside Sanitary Landfill) (Amendment)	IN	06/07/91
5	Fadrowski Drum Disposal	WI	06/10/91
5	Fields Brook	OH	09/30/86
5	Fisher Calo	IN	08/07/90
5	FMC (Fridley)	MN	09/30/87
5	Folkertsma Refuse	MI	06/28/91
5	Forest Waste Products	MI	02/29/84
5	Forest Waste Products	MI	06/30/86
5	Forest Waste Products	MI	03/31/88
5	Fort Wayne Reduction	IN	08/26/88
5	Fultz Landfill	OH	09/30/91
5	G & H Landfill	MI	12/21/90
5	Grand Traverse Overall Supply	MI	02/03/92
5	H. Brown Company	MI	09/30/92
5	Hagen Farm	WI	09/17/90
5	Hagen Farm	WI	09/30/92
5	Hedblum Industries	MI	09/29/89
5	Hunts Disposal	WI	09/29/90
5	IMC Terre Haute East Plant	IN	06/22/88
5	Industrial Excess Landfill	OH	09/30/87
5	Industrial Excess Landfill	OH	07/17/89
5	Ionia City Landfill	MI	09/29/89
5	Janesville Ash Beds	WI	12/29/89
5	Janesville Old Landfill	WI	12/29/89
5	Johns Manville	IL	06/30/87

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
5	K & L Landfill	MI	09/28/90
5	Kentwood Landfill	MI	03/29/91
5	Kohler Landfill	WI	03/30/92
5	Koppers (Texarkana Plant)	IL	06/30/89
5	Kummer Sanitary Landfill	MN	06/12/85
5	Kummer Sanitary Landfill	MN	09/30/88
5	Kummer Sanitary Landfill	MN	09/29/90
5	Kysor Industrial	MI	09/29/89
5	La Grande Sanitary Landfill	MN	09/30/92
5	Lake Sandy Jo/M & M Landfill	IN	09/26/86
5	LaSalle Electrical Utilities	IL	08/29/86
5	LaSalle Electrical Utilities	IL	03/30/88
5	Laskin/Poplar Oil	OH	08/09/84
5	Laskin/Poplar Oil	OH	09/30/87
5	Laskin/Poplar Oil	OH	06/29/89
5	LeHillier Mankato	MN	09/27/85
5	Lemberger Landfill	WI	09/23/91
5	Lemberger Transport & Recycling	WI	09/23/91
5	Liquid Disposal	MI	09/30/87
5	Long Prairie Ground Water Contamination	MN	06/27/88
5	MacGillis & Gibbs/Bell Lumber & Pole	MN	09/30/91
5	Main Street Well Field	IN	08/02/85
5	Main Street Well Field	IN	03/29/91
5	Marion (Bragg) Landfill	IN	09/30/87
5	Mason County Landfill	MI	09/28/88
5	Master Disposal Service Landfill	WI	09/26/90
5	Metal Working Shop	MI	06/30/92
5	Metamora Landfill	MI	09/30/86
5	Metamora Landfill	MI	09/28/90
5	Miami County Incinerator	OH	06/30/89
5	Michigan Disposal Service (Cork St. Landfill)	MI	09/30/91
5	Mid-State Disposal Landfill	WI	09/30/88
5	MIDCO I	IN	06/30/89
5	MIDCO I (Amendment)	IN	04/13/92
5	MIDCO II	IN	06/30/89
5	MIDCO II (Amendment)	IN	04/13/92
5	Morris Arsenic Dump	MN	08/07/85
5	Moss-American Kerr-McGee Oil	WI	09/27/90
5	Motor Wheel	MI	09/30/91
5	Muskego Sanitary Landfill	WI	06/12/92
5	National Presto Industries	WI	08/01/90
5	National Presto Industries	WI	09/30/91
5	Naval Industrial Reserve Ordnance Plant	MN	09/28/90
5	New Brighton/Arden Hills	MN	08/11/89
5	New Brighton/Arden Hills	MN	09/30/92
5	New Brighton/Arden Hills #1	MN	06/24/83

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
5	New Brighton/Arden Hills #2	MN	09/19/83
5	New Brighton/Arden Hills #3	MN	08/02/84
5	New Brighton/Arden Hills #4	MN	06/30/86
5	New Brighton/Arden Hills #5	MN	03/31/87
5	New Brighton/Arden Hills #6 (TCAAP)	MN	09/25/87
5	New Brighton/Arden Hills (TCAAP) (Amendment)	MN	08/11/89
5	New Lyme Landfill	OH	09/27/85
5	Ninth Avenue Dump	IN	09/20/88
5	Ninth Avenue Dump	IN	06/30/89
5	NL Industries Taracorp Lead Smelt	IL	03/30/90
5	NL Taracorp Golden Auto	MN	09/29/88
5	Northern Engraving	WI	09/28/87
5	Northernaire Plating	MI	09/11/85
5	Northernaire Plating	MI	09/29/89
5	Northside Sanitary Landfill (Enviro-Chem)	IN	09/25/87
5	Northside Sanitary Landfill (Enviro-Chem)(Amendment)	IN	07/31/91
5	Novaco Industries	MI	06/27/86
5	Novaco Industries (Amendment)	MI	09/05/91
5	Oak Grove Sanitary Landfill	MN	09/30/88
5	Oak Grove Sanitary Landfill	MN	12/21/90
5	Oconomowoc Electroplating	WI	09/20/90
5	Old Mill	OH	08/07/85
5	Onalaska Municipal Landfill	WI	08/14/90
5	Organic Chemicals	MI	09/30/91
5	Ossineke Groundwater Contamination	MI	06/28/91
5	Ott/Story/Cordova Chemical	MI	09/29/89
5	Ott/Story/Cordova Chemical	MI	09/29/90
5	Outboard Marine	IL	05/15/84
5	Outboard Marine (Amendment)	IL	03/31/89
5	Pagel's Pit	IL	06/28/91
5	Peerless Plating	MI	09/21/92
5	Peterson Sand & Gravel	IL	09/14/88
5	Pine Bend Sanitary Landfill	MN	09/30/91
5	Poer Farm	IN	09/29/88
5	Pristine	OH	12/31/87
5	Pristine (Amendment)	OH	03/30/90
5	Rasmussen's Dump	MI	03/28/91
5	Reilly Tar & Chemical (Indianapolis Plant)	IN	06/30/92
5	Reilly Tar & Chemical (St. Louis Park)	MN	09/30/92
5	Reilly Tar & Chemical (St. Louis Park)	MN	06/06/84
5	Reilly Tar & Chemical (St. Louis Park)	MN	05/30/86
5	Reilly Tar & Chemical (St. Louis Park)	MN	09/28/90
5	Republic Steel Quarry	OH	09/30/88
5	Rose Township (Amendment)	MI	01/18/89
5	Rose Township Dump	MI	09/30/87
5	Sangamo Dump/Crab Orchard NWR (USDOI)	IL	03/30/90

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
5	Sangamo Dump/Crab Orchard NWR (USDOI)	IL	08/01/90
5	Savanna Army Depot	IL	03/31/92
5	Schmalz Dump	WI	08/13/85
5	Schmalz Dump	WI	09/30/87
5	SE Rockford Groundwater Contamination	IL	06/14/91
5	Seymour Recycling	IN	09/30/86
5	Seymour Recycling	IN	09/25/87
5	Skinner Landfill	OH	09/30/92
5	South Andover	MN	03/30/88
5	South Andover (Operable Unit 1) (Amendment)	MN	06/09/92
5	South Andover (Operable Unit 2)	MN	12/24/91
5	South Macomb Disposal #9, 9A	MI	08/13/91
5	Spickler Landfill	WI	06/03/92
5	Spiegelberg Landfill	MI	09/30/86
5	Spiegelberg Landfill	MI	06/29/90
5	Springfield Township Dump	MI	09/29/90
5	St Louis River	MN	09/28/90
5	Stoughton City Landfill	WI	09/30/91
5	Sturgis Municipal Wells	MI	09/30/91
5	Summit National Liquid Disposal Service	OH	06/30/88
5	Summit National Liquid Disposal Service (Amendment)	OH	11/02/90
5	Tar Lake	MI	09/29/92
5	Thermo Chem	MI	09/30/91
5	Torch Lake (Operable Units 1 and 3)	MI	09/30/92
5	Tri County Landfill	IL	09/30/92
5	Tri-State Plating	IN	03/30/90
5	Twin Cities AF Reserve (SAR Landfill)	MN	03/31/92
5	U S Aviex	MI	09/07/88
5	Union Scrap Iron Metal	MN	03/30/90
5	United Scrap Lead	OH	09/30/88
5	University of Minnesota (Rosemount Research Center)	MN	06/11/90
5	Velsicol Chemical	IL	09/30/88
5	Verona Well Field	MI	05/01/84
5	Verona Well Field	MI	08/12/85
5	Verona Well Field	MI	06/28/91
5	Waite Park Wells	MN	09/28/89
5	Washington County Landfill	MN	11/15/90
5	Waste Disposal Engineering	MN	12/31/87
5	Wauconda Sand & Gravel	IL	09/30/85
5	Wauconda Sand & Gravel	IL	03/31/89
5	Wausau Groundwater Contamination	WI	12/23/88
5	Wausau Groundwater Contamination	WI	09/29/89
5	Wayne Waste Oil	IN	03/30/90
5	Wedzeb Enterprises	IN	06/30/89
5	Wheeler Pit	WI	09/28/90
5	Whitehall Municipal Wells	MI	09/29/89

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
5	Windom Municipal Dump	MN	09/29/89
5	Zanesville Well Field	OH	09/30/91
Subtotal	**221**		
6	Arkwood	AR	09/28/90
6	AT & SF (Clovis)	NM	09/23/88
6	Bailey Waste Disposal	TX	06/28/88
6	Bayou Bonfouca	LA	08/15/85
6	Bayou Bonfouca	LA	03/31/87
6	Bayou Sorrel	LA	11/14/86
6	Bio-Ecology Systems	TX	06/06/84
6	Brio Refinery	TX	03/31/88
6	Cal West Metals	NM	09/29/92
6	Cecil Lindsey	AR	04/23/86
6	Cimarron Mining	NM	09/21/90
6	Cimarron Mining	NM	09/06/91
6	Cleve Reber	LA	03/31/87
6	Compass Industries (Avery Drive)	OK	09/29/87
6	Crystal Chemical	TX	09/27/90
6	Crystal Chemical (Amendment)	TX	06/16/92
6	Crystal City Airport	TX	09/29/87
6	Dixie Oil Processors	TX	03/31/88
6	Double Eagle Refinery	OK	09/28/92
6	Fourth Street Abandoned Refinery	OK	09/28/92
6	French, Limited	TX	03/24/88
6	Geneva Industries/Fuhrmann Energy	TX	09/18/86
6	Gulf Coast Vacuum Services (Operable Unit 1)	LA	09/30/92
6	Gulf Coast Vacuum Services (Operable Unit 2)	LA	09/30/92
6	Gurley Pit	AR	10/06/86
6	Gurley Pit	AR	09/26/88
6	Hardage/Criner	OK	11/14/86
6	Hardage/Criner (Amendment)	OK	11/22/89
6	Harris (Farley Street)	TX	09/27/85
6	Highlands Acid Pit	TX	06/25/84
6	Highlands Acid Pit	TX	06/26/87
6	Homestake Mining	NM	09/27/89
6	Industrial Waste Control	AR	06/28/88
6	Jacksonville Municipal Landfill	AR	09/27/90
6	Koppers (Texarkana Plant)	TX	09/23/88
6	Koppers (Texarkana Plant)(Amendment)	TX	03/04/92
6	Mid-South Wood Products	AR	11/14/86
6	Mosley Road Sanitary Landfill	OK	06/29/92
6	MOTCO	TX	03/15/85
6	MOTCO	TX	09/27/89
6	North Cavalcade Street	TX	06/28/88
6	Odessa Chromium #1	TX	09/08/86

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
6	Odessa Chromium #1	TX	03/18/88
6	Odessa Chromium (Andrews Highway) #2	TX	09/08/86
6	Odessa Chromium (Andrews Highway) #2	TX	03/18/88
6	Oklahoma Refining	OK	06/09/92
6	Old Inger Oil Refinery	LA	09/25/84
6	Old Midland Products	AR	03/24/88
6	Pagano Salvage	NM	09/27/90
6	Pesses Chemical	TX	12/22/88
6	Petro-Chemical (Turtle Bayou)	TX	03/27/87
6	Petro-Chemical (Turtle Bayou)	TX	09/06/91
6	Prewitt Abandoned Refinery	NM	09/30/92
6	Rogers Road Municipal Landfill	AR	09/27/90
6	Sand Springs Petrochemical Complex	OK	09/29/87
6	Sand Springs Petrochemical Complex	OK	06/28/88
6	Sheridan Disposal Services	TX	12/29/88
6	Sheridan Disposal Services	TX	09/27/89
6	Sikes Disposal Pits	TX	09/18/86
6	Sol Lynn/Industrial Transformers	TX	03/25/88
6	Sol Lynn/Industrial Transformers	TX	09/23/88
6	South Cavalcade Street	TX	09/26/88
6	South Valley (Edmunds)	NM	06/28/88
6	South Valley (Edmunds)	NM	03/30/89
6	South Valley (PL83)	NM	09/30/88
6	South Valley (SJ6)	NM	03/22/85
6	South Valley (SJ6)	NM	09/30/88
6	Stewco	TX	09/16/88
6	Tar Creek (Ottawa County)	OK	06/06/84
6	Tenth Street Dump/Junkyard	OK	09/27/90
6	Texarkana Wood Preserving	TX	09/25/90
6	Tinker AFB (Soldier Creek/Bldg 3001)	OK	08/16/90
6	Triangle Chemical	TX	06/11/85
6	United Creosoting	TX	09/30/86
6	United Creosoting	TX	09/29/89
6	United Nuclear	NM	09/30/88
6	Vertac	AR	09/27/90
Subtotal	**77**		
7	29th and Mead Groundwater Contamination	KS	09/29/92
7	Aidex Corp	IA	08/24/83
7	Aidex Corp	IA	09/30/84
7	Arkansas City Dump	KS	09/29/88
7	Arkansas City Dump	KS	09/19/89
7	Big River Sand	KS	06/28/88
7	Chemplex 1	IA	09/27/89
7	Cherokee County	KS	12/21/87
7	Cherokee County	KS	09/18/89

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
7	Conservation Chemical	MO	09/30/87
7	Deere, John Duboque	IA	09/29/88
7	Des Moines TCE	IA	07/21/86
7	Des Moines TCE	IA	09/18/92
7	Doepke Disposal Holliday	KS	09/21/89
7	EI DuPont De Nemours (County Rd X23)	IA	05/28/91
7	Ellisville Area	MO	07/10/85
7	Ellisville Area	MO	09/29/86
7	Ellisville Area	MO	09/30/91
7	Ellisville Area (Amendment)	MO	09/30/91
7	Fairfield Coal Gasification Plant	IA	09/21/90
7	Farmers' Mutual Cooperative	IA	09/29/92
7	Findett	MO	12/28/88
7	Fulbright Landfill	MO	09/30/88
7	Hastings Groundwater Contamination	NE	09/28/88
7	Hastings Groundwater Contamination	NE	09/26/89
7	Hastings Groundwater Contamination (East Industrial)	NE	09/28/90
7	Hastings Groundwater Contamination (FAR-MAR-CO)	NE	09/28/90
7	Hastings Groundwater Contamination (Operable Unit 1)	NE	09/30/91
7	Hastings Groundwater Contamination (Operable Units 10 and 2)	NE	09/30/91
7	Hastings Groundwater Contamination/Far-Mar-Co	NE	09/30/88
7	Hydro-Flex	KS	03/09/92
7	John Deere (Ottumwa Works Landfill)	IA	09/23/91
7	Johns Sludge Pond	KS	09/22/89
7	Kem-Pest Laboratories	MO	09/29/89
7	Kem-Pest Laboratories	MO	12/31/90
7	Lee Chemical	MO	03/21/91
7	Lehigh Portland Cement	IA	06/28/91
7	Lindsay Manufacturing	NE	09/28/90
7	Mid-America Tanning	IA	09/24/91
7	Midwest Manufacturing/North Farm	IA	09/30/88
7	Midwest Manufacturing/North Farm	IA	09/27/90
7	Minker/Stout/Romaine Creek	MO	09/29/88
7	Minker/Stout/Romaine Creek (Romaine Portion)	MO	09/28/87
7	Minker/Stout/Romaine Creek (Stout Portion)	MO	09/28/87
7	Missouri Electric Works	MO	09/28/90
7	Northwestern States Portland Cement	IA	06/26/90
7	People's Natural Gas	IA	09/16/91
7	Pester Refinery	KS	09/30/92
7	Shaw Avenue Dump	IA	09/26/91
7	Shenandoah Stables	MO	07/28/88
7	Shenandoah Stables	MO	09/28/90
7	Solid State Circuits	MO	09/27/89
7	Syntex Facility (Verona)	MO	05/05/88
7	Times Beach	MO	01/13/84
7	Times Beach	MO	09/29/88

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
7	Todtz, Lawrence Farm	IA	11/04/88
7	Vogel Paint & Wax	IA	09/20/89
7	Waverly Groundwater Contamination	NE	09/26/90
7	Weldon Spring Quarry/Plant/Pits (USDOE)	MO	09/28/90
7	Wheeling Disposal Service	MO	09/27/90
7	White Farm Equipment Dump	IA	09/28/90
Subtotal	**61**		
8	Anaconda Smelter	MT	10/02/87
8	Anaconda Smelter	MT	09/23/91
8	Arsenic Trioxide	ND	09/26/86
8	Baxter/Union Pacific Tie Treating	WY	09/26/86
8	Broderick Wood Products	CO	06/30/88
8	Broderick Wood Products	CO	03/24/92
8	Broderick Wood Products (Amendment)	CO	09/24/91
8	Burlington Northern (Somers Plant)	MT	09/27/89
8	California Gulch	CO	03/29/88
8	Central City-Clear Creek	CO	09/30/87
8	Central City-Clear Creek	CO	03/31/88
8	Central City-Clear Creek	CO	09/30/91
8	Chemical Sales (Operable Unit 1)	CO	06/27/91
8	Chemical Sales (Operable Unit 2)	CO	06/27/91
8	Chemical Sales (Operable Unit 3)	CO	06/27/91
8	Denver Radium (Operable Unit 8)	CO	01/28/92
8	Denver Radium (Operable Unit 9)	CO	12/23/91
8	Denver Radium I	CO	09/29/87
8	Denver Radium II	CO	09/29/87
8	Denver Radium III	CO	09/29/87
8	Denver Radium/Card Property	CO	06/30/87
8	Denver Radium/Open Space	CO	09/29/87
8	Denver Radium/ROBCO	CO	09/30/86
8	Denver Radium/Streets	CO	03/24/86
8	East Helena	MT	11/22/89
8	Hill Air Force Base	UT	09/30/91
8	Hill Air Force Base	UT	09/25/92
8	Idaho Pole	MT	09/28/92
8	Libby Ground Water Contamination	MT	09/26/86
8	Libby Ground Water Contamination	MT	12/30/88
8	Marshall Landfill	CO	09/26/86
8	Martin Marietta, Denver Aerospace	CO	09/24/90
8	Milltown Reservoir Sediments	MT	04/14/84
8	Milltown Reservoir Sediments	MT	08/07/85
8	Monticello Mill Tailings (DOE)	UT	08/22/90
8	Monticello Radioactively Contaminated Properties	UT	09/29/89
8	Mystery Bridge at Highway 20	WY	09/24/90
8	Ogden Defense Depot	UT	09/27/90

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
8	Ogden Defense Depot (Operable Unit 1)	UT	06/26/92
8	Ogden Defense Depot (Operable Unit 3)	UT	09/28/92
8	Ogden Defense Depot (Operable Unit 4)	UT	09/28/92
8	Portland Cement (Kiln Dust #2 & #3)	UT	07/19/90
8	Portland Cement (Kiln Dust #2 & #3)	UT	03/31/92
8	Rocky Flats Plant (USDOE)	CO	01/05/90
8	Rocky Flats Plant (USDOE)	CO	01/25/91
8	Rocky Flats Plant (USDOE) (Operable Unit 2)	CO	09/01/92
8	Rocky Flats Plant (USDOE) (Operable Unit 4)	CO	04/06/92
8	Rocky Mountain Arsenal	CO	06/04/87
8	Rocky Mountain Arsenal (Operable Unit 16)	CO	02/26/90
8	Rocky Mountain Arsenal (Operable Unit 17)	CO	05/14/90
8	Rocky Mountain Arsenal (Operable Unit 18)	CO	02/26/90
8	Rocky Mountain Arsenal (Operable Unit 19)	CO	02/26/90
8	Rocky Mountain Arsenal (Operable Unit 20)	CO	03/20/90
8	Rocky Mountain Arsenal (Operable Unit 21)	CO	06/06/91
8	Rocky Mountain Arsenal (Operable Unit 22)	CO	05/03/90
8	Rocky Mountain Arsenal (Operable Unit 23)	CO	05/03/90
8	Rocky Mountain Arsenal (Operable Unit 26)	CO	09/05/91
8	Sand Creek Industrial	CO	09/29/89
8	Sand Creek Industrial	CO	09/28/90
8	Sharon Steel (Midvale Tailings)	UT	09/24/90
8	Silver Bow Creek/Butte Area	MT	09/28/90
8	Silver Bow Creek/Butte Area	MT	06/30/92
8	Smuggler Mountain	CO	09/26/86
8	Wasatch Chemical (Lot 6)	UT	03/29/91
8	Whitewood Creek	SD	03/30/90
8	Woodbury Chemical	CO	07/19/85
8	Woodbury Chemical	CO	09/29/89
Subtotal	**67**		
9	Advanced Micro Devices #915	CA	08/26/91
9	Advanced Micro Devices	CA	09/11/91
9	Applied Materials	CA	09/28/90
9	Atlas Asbestos Mine	CA	07/19/89
9	Atlas Asbestos Mine	CA	02/14/91
9	Beckman Instruments (Porterville)	CA	09/26/89
9	Castle Air Force Base	CA	08/12/91
9	Celtor Chemical Works	CA	10/04/83
9	Celtor Chemical Works	CA	09/30/85
9	Coalinga Asbestos Mine	CA	07/19/89
9	Coalinga Asbestos Mine	CA	09/21/90
9	Coast Wood Preserving	CA	09/29/89
9	CTS Printex	CA	06/28/91
9	Del Norte Pesticides Storage	CA	09/30/85
9	Fairchild Semiconductor (South San Jose)	CA	03/20/89

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
9	Fairchild Semiconductor/Mt. View	CA	06/09/89
9	Fairchild Semiconductor/Mt. View	CA	06/30/89
9	Raytheon	CA	06/09/89
9	Firestone Tire (Salinas Plant)	CA	09/13/89
9	FMC (Fresno Plant)	CA	06/28/91
9	Hassayampa Landfill	AZ	08/06/92
9	IBM (San Jose Plant)	CA	12/15/88
9	Indian Bend Wash Area	AZ	09/21/88
9	Indian Bend Wash Area (Operable Units 1, 4, 5, and 6)	AZ	09/12/91
9	Intel (Mountain View Plant)	CA	06/09/89
9	Intel (Santa Clara III)	CA	09/20/90
9	Intersil	CA	09/27/90
9	Iron Mountain Mine	CA	10/03/86
9	Iron Mountain Mine	CA	09/30/92
9	J H Baxter	CA	09/27/90
9	Jasco Chemical	CA	09/30/92
9	Jibboom Junkyard	CA	05/09/85
9	Koppers (Oroville Plant)	CA	09/13/89
9	Lawrence Livermore National Lab (USDOE)	CA	08/05/92
9	Lorentz Barrel & Drum	CA	09/25/88
9	Louisiana Pacific	CA	09/28/90
9	McColl	CA	04/11/84
9	Mesa Area Ground Water Contamination	AZ	09/27/91
9	MGM Brakes	CA	09/29/88
9	Micro Storage/Intel Magnetics	CA	08/26/91
9	Monolithic Memories	CA	09/11/91
9	Motorola (52nd Street Plant)	AZ	09/30/88
9	Mountain View Mobile Homes	AZ	06/02/83
9	National Semiconductor	CA	09/11/91
9	Nineteenth Avenue Landfill	AZ	09/29/89
9	Operating Industries Landfill #1	CA	07/31/87
9	Operating Industries Landfill #2	CA	11/16/87
9	Operating Industries Landfill #3	CA	09/30/88
9	Operating Industries Landfill (Amendment)	CA	09/28/90
9	Ordot Landfill	GU	09/28/88
9	Pacific Coast Pipeline	CA	03/31/92
9	Phoenix - Goodyear Airport Area	AZ	09/26/89
9	Phoenix - Goodyear Airport Area	AZ	09/29/87
9	Purity Oil Sales	CA	09/26/89
9	Purity Oil Sales	CA	09/30/92
9	Rhone-Poulenc/Zoecon	CA	03/04/92
9	Sacramento Army Depot	CA	09/29/89
9	Sacramento Army Depot (Operable Unit 3)	CA	12/09/91
9	Sacramento Army Depot (Operable Unit 4)	CA	09/30/92
9	San Fernando Valley (Area 1)	CA	09/24/87
9	San Fernando Valley (Area 1)	CA	06/30/89

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
9	San Gabriel Valley (Area 1)	CA	05/11/84
9	San Gabriel Valley (Area 1)	CA	09/30/87
9	San Gabriel Valley (Area 1)	CA	09/29/88
9	San Gabriel Valley (Area 2)	CA	09/29/88
9	San Gabriel Valley (Area 4)	CA	09/29/88
9	Selma Treating	CA	09/24/88
9	Signetics	CA	09/11/91
9	Sola Optical USA	CA	09/27/91
9	Solvent Service	CA	09/27/90
9	South Bay Asbestos Area	CA	09/29/88
9	South Bay Asbestos Area	CA	09/29/89
9	South Bay Asbestos Area (Amendment)	CA	06/26/91
9	Spectra-Physics (Teledyne Semiconductor)	CA	03/22/91
9	Stringfellow	CA	07/22/83
9	Stringfellow	CA	07/17/84
9	Stringfellow	CA	06/25/87
9	Stringfellow	CA	09/30/90
9	Synertek (Building #1)	CA	06/28/91
9	Taputimu Farm	AS	12/27/83
9	Teledyne Semiconductor (Spectra Physics)	CA	03/22/91
9	TRW Microwave, MC (Building 825)	CA	09/11/91
9	Tucson International Airport Area	AZ	08/22/88
9	Valley Wood Preserving	CA	09/27/91
9	Van Waters & Rogers	CA	09/11/91
9	Watkins Johnson (Stewart Division)	CA	06/29/90
9	Westinghouse Electric (Sunnyvale Plant)	CA	10/16/91
Subtotal	**87**		
10	American Lake Gardens (McChord - Area D)	WA	09/19/91
10	Arrcom (Drexler Enterprise)	ID	06/30/92
10	Bangor Naval Submarine Base	WA	09/19/91
10	Bangor Ordnance Disposal (USN Submarine Base)	WA	12/10/91
10	Bunker Hill Mining and Metallurgical Complex	ID	08/30/91
10	Bunker Hill Mining and Metallurgical Complex	ID	09/22/92
10	Colbert Landfill	WA	09/29/87
10	Commencement Bay - Nearshore/Tideflats	WA	12/30/87
10	Commencement Bay - Nearshore/Tideflats	WA	09/30/89
10	Commencement Bay - Nearshore/Tideflats (Operable Unit 7)	WA	12/31/90
10	Commencement Bay - South Tacoma Channel	WA	03/18/83
10	Commencement Bay - South Tacoma Channel	WA	05/03/85
10	Commencement Bay - South Tacoma Channel	WA	03/31/88
10	Eielson Air Force Base	AK	09/29/92
10	Elmendorf Air Force Base	AK	09/01/92
10	FMC Yakima Pit	WA	09/14/90
10	Fort Lewis (Landfill No. 5)	WA	07/10/92
10	Fort Lewis Logistic Center	WA	09/25/90

LIST OF RECORDS OF DECISION (RODs) SIGNED TO DATE FY 1982 - FY 1992 (Continued)

REGION	SITE NAME	STATE	SIGN DATE
10	Frontier Hard Chrome	WA	12/30/87
10	Frontier Hard Chrome	WA	07/05/88
10	Gould	OR	03/31/88
10	Joseph Forest Products	OR	09/30/92
10	Martin Marietta Aluminum	OR	09/29/88
10	McChord AFB (Wash Rack/Treatment)	WA	09/28/92
10	Mountain Home Air Force Base	ID	06/16/92
10	N.A.S. Whidbey Island - Ault Field	WA	04/21/92
10	Northside Landfill	WA	09/30/89
10	Northwest Transformer - Mission Pole	WA	09/15/89
10	Northwest Transformer - Mission Pole (Amendment)	WA	09/30/91
10	Pacific Hide & Fur Recycling	ID	06/28/88
10	Pacific Hide & Fur Recycling (Amendment)	ID	04/29/92
10	Pesticide Lab - Yakima	WA	09/30/92
10	Ponders Corner/Lakewood	WA	06/01/84
10	Ponders Corner/Lakewood	WA	09/30/85
10	Queen City Farms	WA	10/24/85
10	Silver Mountain Mine	WA	03/27/90
10	Teledyne Wah Chang Albany (TWCA)	OR	12/28/89
10	Toftdahl Drum	WA	09/30/86
10	Umatilla Army Depot (Lagoons)	OR	09/25/92
10	Union Pacific Railroad Yard	ID	09/10/91
10	United Chrome Products	OR	09/12/86
10	U.S. DOE Idaho National Engineering Lab (Operable Unit 2)	ID	09/28/92
10	U.S. DOE Idaho National Engineering Lab (Operable Unit 5)	ID	12/05/91
10	U.S. DOE Idaho National Engineering Lab (Operable Unit 22)	ID	09/30/92
10	U.S. DOE Idaho National Engineering Lab (Operable Unit 23)	ID	06/02/92
10	Western Processing	WA	08/05/84
10	Western Processing	WA	09/25/85
10	Western Processing (Amendment)	WA	09/04/86
10	Wyckoff/Eagle Harbor	WA	09/29/92
10	Yakima Plating	WA	09/30/91
Subtotal	**50**		
Total	**1,117**		

LIST OF ROD AMENDMENTS AND EXPLANATIONS OF SIGNIFICANT DIFFERENCES

LIST OF AMENDMENTS

FISCAL YEAR	REGION	SITE NAME, STATE	AMENDMENT SIGN DATE	ORIGINAL ROD SIGN DATE
FY86	8	Woodbury Chemical, CO	09/30/86	07/19/85
	10	Western Processing, WA	09/04/86	09/25/85
FY87	1	Picillo Farm, RI	03/03/87	09/30/85
	10	Lakewood (Ponders Corner), WA	11/14/86	09/30/85
FY88	3	Tyson Dump, PA	03/31/88	12/21/84
FY89	1	Tinkhams Garage, NH	03/10/89	09/30/86
	3	Ordnance Works Disposal Areas, WV	09/29/89	03/31/88
	4	Chemtronics, NC	04/26/89	04/05/88
	5	New Brighton/Arden Hills, MN	08/11/89	06/30/86
	5	Outboard Marine, IL	03/31/89	05/15/84
	5	Rose Township, MI	01/18/89	09/30/87
FY90	3	Westline, PA	03/30/90	07/03/86
	4	Coleman-Evans Wood Preserving, FL	09/26/90	09/25/86
	4	Hipps Road Landfill, FL	09/21/90	09/03/86
	4	Zellwood Groundwater Contamination, FL	03/01/90	12/15/87
	5	Pristine, OH	03/30/90	12/31/87
	6	Hardage/Criner, OK	11/22/89	11/14/86
	9	Operating Industries, CA	09/28/90	11/16/87
FY91	2	Love Canal (93rd Street), NY	05/15/91	09/26/88
	3	Heleva Landfill, PA	09/30/91	03/22/85
	4	Aberdeen Pesticide Dumps, NC	09/30/91	06/30/89
	4	Smith's Farm Brooks, KY	09/30/91	09/29/89
	5	Anderson Development Co., MI	09/30/91	09/28/90
	5	Enviro-Chem Corp., IN	06/07/91	09/25/87
	5	Northside Landfill, IN	07/03/91	09/25/87
	5	Novaco Industries, MI	09/05/91	06/27/86
	5	Summit National Liquid Disposal Service, OH	11/02/90	06/30/88
	7	Ellisville Area (Operable Unit 2), MO	09/30/91	09/26/86
	8	Broderick Wood Products (Operable Unit 1), CO	09/24/91	06/30/88
	9	South Bay Asbestos Area (Operable Unit 1), CA	06/26/91	09/29/88
	10	Northwest Transformer (Mission Pole), WA	09/30/91	09/15/89

LIST OF ROD AMENDMENTS AND EXPLANATIONS OF SIGNIFICANT DIFFERENCES (Continued)

LIST OF AMENDMENTS (Continued)

FISCAL YEAR	REGION	SITE NAME, STATE	AMENDMENT SIGN DATE	ORIGINAL ROD SIGN DATE
FY92	4	Whitehouse Waste Oil Pits, FL	06/16/92	05/05/85
	5	Bofors Nobel, MI	07/22/92	09/17/90
	5	MIDCO I, IN	04/13/92	06/30/89
	5	MIDCO II, IN	04/13/92	06/30/89
	5	South Andover (Operable Unit 1), MN	06/09/92	03/30/88
	6	Crystal Chemical, TX	06/16/92	09/27/90
	6	Koppers (Texarkana Plant), TX	03/04/92	09/23/88
	10	Pacific Hide & Fur Recycling, ID	04/29/92	06/28/88

Amendments are those changes which fundamentally alter the overall remedy in the ROD. The lead agency may determine that the significant change fundamentally alters the overall remedy in the ROD, and thus requires an amendment to the ROD. This type of alteration would represent a complete change in the hazardous waste management approach documented in the ROD. For example, the lead agency decides, based on pilot-scale tests, that bioremediation is no longer a feasible technology for this site. Instead, the lead agency determines that thermal destruction and partial containment should be selected. The lead agency will have to amend the ROD by undertaking the public participation and documentation procedures specified in Section 117 of CERCLA. It should be noted that pre-SARA (10/17/86) RODs that are amended will be subject to the statutory requirements of Section 121 of CERCLA (i.e., the clean-up standards).

ROD AMENDMENTS AND EXPLANATIONS OF SIGNIFICANT DIFFERENCES (Continued)

LIST OF APPROVED EXPLANATIONS OF SIGNIFICANT DIFFERENCES (ESDs)

FISCAL YEAR	REGION	SITE NAME, STATE	ESD SIGN DATE	ORIGINAL ROD SIGN DATE
FY89	2	Love Canal, NY	06/01/89	10/26/87
	2	Sinclair Refinery, NY	01/26/89	09/30/85
	2	Upjohn Facility, PR	04/04/89	09/30/88
	2	Vega Alta Public Supply Wells, PR	03/22/89	09/29/87
	4	Distler Farm and Brickyard, KY	10/26/88	08/19/86
FY90	1	Keefe Environmental Services, NH	06/08/90	03/21/88
	1	McKin, ME	09/12/90	07/22/85
	1	Rose Disposal Pit, MA	11/17/89	09/23/88
	1	Sylvester's, NH	07/10/90	09/22/83
	3	Aladdin Plating, PA	05/07/90	09/27/88
	3	Bally Groundwater Contamination, PA	01/18/90	06/30/89
	3	Delaware City PVC Plant, DE	09/18/91	09/30/86
	3	Strasburg Landfill, PA	01/03/90	06/29/89
	3	U. S. Titanium, VA	09/26/90	11/21/89
	5	Wedzeb Enterprises, IN	08/24/90	06/30/89
	6	Bayou Bonfouca, LA	02/05/90	03/31/87
	10	Pacific Hide & Fur Recycling, ID	09/26/90	06/28/88
FY91	1	Coakley Landfill, NH	03/22/91	06/28/90
	3	Letterkenny Army Depot S.E., PA	08/02/91	06/28/91
	5	Burrows Sanitation Landfill, MI	05/15/91	09/30/86
	5	University of Minnesota (Rosemont Center), MN	08/20/91	06/29/90
	8	Silver Bow Creek/Butte Area, MT	06/24/91	09/28/90
	9	Beckman Instruments (Porterville), CA	03/06/91	09/26/89
	9	Koppers (Oroville Plant), CA	01/29/91	09/28/89
	9	Phoenix-Goodyear (Airport), AZ	01/24/91	09/26/89
	9	San Fernando Valley (Area 1), CA	11/21/90	06/30/89
	10	Commencement Bay/Nearshore Tideflats/Takoma Tar Pits, WA	11/01/91	12/30/87
FY92	1	Hocomonco Pond, MA	07/22/92	09/30/85
	5	Dakhue Sanitary Landfill, MN	04/28/92	06/28/91
	5	Ninth Avenue Dump, IN	10/23/91	09/20/88
	5	Summit National, OH	03/23/92	06/30/88
	7	EI Dupont DeNemours (County Road x23), IA	05/11/92	05/28/91

ROD AMENDMENTS AND EXPLANATIONS OF SIGNIFICANT DIFFERENCES (Continued)

LIST OF APPROVED EXPLANATIONS OF SIGNIFICANT DIFFERENCES (ESDs) (Continued)

FISCAL YEAR	REGION	SITE NAME, STATE	ESD SIGN DATE	ORIGINAL ROD SIGN DATE
FY92	7	Shaw Avenue Dump, IA	03/24/92	09/26/91
	8	Arsenic Trioxide, ND	09/25/92	09/26/86
	10	Lakewood (Ponders Corner), WA	09/15/92	09/30/85
	10	United Chrome Products, OR	12/20/91	09/12/86
	10	FMC Yakima Pit, WA	04/21/93	09/14/90

An ESD (statutory requirement of Section 117(c) of CERCLA) is a significant change to a component of a ROD. It identifies the changes to a ROD and why they are being made. Significant changes usually take place during RD/RA and negotiations with the PRPs. An ESD should be issued concurrently with the consent decree. The lead agency could determine, e.g., that 30 percent more soil should be treated, raising the cost of the remedy from $5 to 7 million dollars.

DESCRIPTION OF TREATMENT TECHNOLOGIES AND OTHER ACTIONS FOR SOURCE AND GROUND WATER CONTROL

SOURCE CONTROL TECHNOLOGIES

Treatment technologies 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 or Ex Situ Bioremediation - involves comingling excavated organic-contaminated soil, sludge, or sediments, 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) - is a destruction 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, water soluble products. The transformation of contaminants within the soil produces compounds that are more readily removed from the soil.

C. Thermal Destruction

Thermal destruction technologies 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.

- 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 Flushing - is an in-ground extraction process that uses a flushing agent, e.g., water to extract contaminants. The process has been used to flush soil, waste and groundwater.

- In Situ Vacuum/Soil Vapor Extraction - is an in-ground 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 to capture and treat the off-gases, streams.

- Soil Washing - is a water-based process for mechanically scrubbing soils ex situ to remove undesirable contaminants. The process removes contaminants from soils in one of two ways: by dissolving or suspending them in the wash solution (which is later treated by conventional wastewater treatment methods) or by concentrating them into a smaller volume of soil through simple particle size separation techniques (similar to those used in sand and gravel operations.)

B. Thermal Desorption

Thermal Desorption uses heat to extract volatile organics from the media 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 Thermal Desorption - involves the injection of steam or hot air into soil to volatilize VOCs. VOCs rise to the surface where they are condensed or trapped on activated carbon. Other techniques may include radio frequency heating.

III. 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:

- 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 sorption.

- 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.

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 specific technologies listed are those identified in the RODs.

I. CHEMICAL/PHYSICAL

- 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.

- Air Sparging - involves injecting gas into the aquifer to attach to volatile contaminants as it percolates up through the ground water, and is captured with a vapor extraction system.

- 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.

- Carbon Adsorption - is a physiochemical process that involves using activated carbon as a sorbent to primarily remove 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 based on the size of the carbon particles: granular and powdered.

- 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).

- 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 ground water, including straining, flocculation, and sedimentation.

- 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.

- 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).

- 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 have a stronger affinity to the resin, and 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.

- 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.

- Precipitation - is a physiochemical 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.

- 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.

- 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 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.

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

II. BIOLOGICAL

- 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).

- 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 pumping and reinjection system and is often limited by the ability to provide additional oxygen and nutrients to the bacteria.

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.

SOURCE AND GROUND WATER OTHER ACTIONS

Ground Water:

- Alternate Water Supply - involves either constructing a new water line from an existing water system, or drilling a new water supply well(s) in an uncontaminated area, then connecting the residential systems to the new line or well(s). This term also includes providing bottled water to residents, usually temporarily, until construction of a new, more permanent water supply system is completed.

- Natural Attenuation - involves allowing natural, physical, chemical and biological processes to degrade contaminants and lower contamination concentrations over time until cleanup levels are met.

Source Control:

- Capping - involves the construction of a protective cover over a landfill or other area containing wastes or contamination. The objectives of capping include: (1) prevention of surface exposure of the wastes, thereby preventing air and surface water contamination and the risk of direct contact with humans or the environment, (2) reduction or elimination of infiltration of rain water or other precipitation into the waste, thereby reducing the volume of leachate that is generated.

- Flaring - is a combustion reaction that thermally oxidizes (burns) flammable gaseous substances into products that generally include ash, carbon dioxide and other gases, water vapor and heat through exposure to open flame. Supplementary fuels may be needed to sustain continuous combustion. Flares are commonly used during landfill closures to dispose of vented and landfill gases, or in remedial

treatment technologies producing simple hydrocarbon emissions. Although flares provide sufficient destruction capabilities for conventional hydrocarbon emissions (methane, landfill gas), environmental destruction efficiencies for many gaseous total organic hydrocarbon (TOC) compounds are generally too stringent to be met by flaring.

- Slurry Wall - involves digging a deep trench and backfilling the trench with "slurry" — a wet mixture of soil and bentonite clay or similar material that swells when wetted. The slurry mixture expands in the trench, creating a relatively impermeable wall that inhibits the lateral flow of ground water. The effectiveness of a slurry wall in controlling lateral flow can be greatly enhanced if the bottom of the well is keyed into a naturally occurring horizontal flow barrier beneath the site, such as a clay layer, or other relatively impermeable hydrogeologic unit.

- Venting - is often used in landfills to allow any gases generated by the buried decomposing wastes to be collected and removed, either for treatment or for release into the atmosphere. Venting prevents the dangerous buildup of potentially explosive gases within the landfill; excess gas accumulation can also damage the integrity of the final cover/cap. In older landfills without liners, if the gases cannot escape through venting, they may migrate out through the subsurface and come out in nearby wells, basements, and streams.

LIST OF SUPERFUND ACRONYMS

AA	-	Assistant Administrator
AASWER	-	Assistant Administrator Solid Waste Emergency Response (OSWER)
ACL	-	Alternate Contaminant Level
ADP	-	Automated Data Processing
AER	-	Appropriate Extent Remedy
ALT	-	Alternate
AM	-	Action Memorandum
AO	-	Administrative Order
AOA	-	Advice of Allowance
AOC	-	Administrative Order on Consent
APR	-	Approved
AR	-	Administrative Record
ARARs	-	Applicable or Relevant and Appropriate Requirements
ARCS	-	Alternate Remedial Contracting Strategy
ATSDR	-	Agency for Toxic Substances and Disease Registry
ATTIC	-	Alternate Treatment Technology Information Center
BDAT	-	Best Demonstrated Available Treatment Technology
CA	-	Cooperative Agreement
CAA	-	Clean Air Act
CD	-	Consent Decree
CDC	-	Centers for Disease Control
CEPP	-	Chemical Emergency Preparedness Program
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	-	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	-	Code of Federal Regulations
CLP	-	Contract Laboratory Program
CO	-	Contracting Officer
CORA	-	Cost of Remedial Action
CPCA	-	Core Program Cooperative Agreement
CRP	-	Community Relations Plan
CWA	-	Clean Water Act
DNAPLs	-	Dense Non-Aqueous Phase Liquids
DOC	-	Department of Commerce
DOD	-	Department of Defense
DOE	-	Department of Energy
DOI	-	Department of Interior
DOJ	-	Department of Justice
DOL	-	Department of Labor
DOS	-	Department of State
DOT	-	Department of Transportation
DPO	-	Deputy Project Officer
EA	-	Endangerment Assessment
EADS	-	Environmental Assessment Data System
EDD	-	Enforcement Decision Document
EMIS	-	Enforcement Management Information System
EMSL-LV	-	Environmental Monitoring Systems Laboratory - Las Vegas
EO	-	Executive Order
EPA	-	Environmental Protection Agency

LIST OF SUPERFUND ACRONYMS (Continued)

ERA - Expedited Response Action
ERCS - Emergency Response Cleanup Services
ERD - Emergency Response Division
ERT - Emergency Response Team
ESD - Explanation of Significant Differences
EW - Expert Witness
FE - Federal Enforcement
FEMA - Federal Emergency Management Agency
FIT - Field Investigation Team
FNSI - Finding of No Significant Impact
FOIA - Freedom of Information Act
FR - Federal Register
FRP - Funding Recommendations Package
FS - Feasibility Study
FWPCA - Federal Water Pollution Control Act
FY - Fiscal Year
HHS - (Department of) Health and Human Services
HI - Hazard Index
HQ - EPA Headquarters
HRS - Hazard Ranking System
HSCD - Hazardous Site Control Division
HSED - Hazardous Site Evaluation Division
IAG - Interagency Agreement
IFMS - Integrated Financial Management System
IMC - Information Management Coordinator
IPL - Interim Priority List
IR - Immediate Removal
IRM - Initial Remedial Measure
IRP - Installation Restoration Program (DOD)
LOE - Level of Effort
MCL - Maximum Contaminant Level (or background)
MCLG - Maximum Contaminant Level Goal
MEP - Maximum Extent Possible
MOU - Memorandum of Understanding
MSCA - Multi-Site Cooperative Agreement
NAAQS - National Ambient Air Quality Standard
NAPL - Non-Aqueous Phase Liquid
NBAR - Non-Binding Allocation of Responsibility
NCC - National Computer Center
NCLP - National Contract Laboratory Program
NCP - National Oil and Hazardous Substances Pollution Contingency Plan
NDD - Negotiation Decision Document
NEPA - National Environmental Policy Act
NESHAP - National Emissions Standard for Hazardous Air Pollutant
NFRAP - No Further Remedial Action Planned
NIOSH - National Institute of Occupational Safety and Health
NOAA - National Oceanic Atmospheric Administration
NOTIS - 103(c) Notifications
NPDES - National Pollution Discharge and Elimination System

LIST OF SUPERFUND ACRONYMS (Continued)

NPL - National Priorities List
NRC - National Response Center
NRT - National Response Team
O&M - Operations and Maintenance
O&M/LTR - Operations and Maintenance/Long Term Response
OERR - Office of Emergency and Remedial Response
OGC - Office of General Counsel (EPA)
OIG - Office of the Inspector General (EPA)
OMB - Office of Management and Budget
OPM - Office of Program Management (EPA/OERR)
ORC - Office of Regional Counsel (EPA)
ORD - Office of Research and Development
OSC - On-Scene Coordinator
OSHA - Occupational Safety and Health Administration
OSW - Office of Solid Waste
OSWER - Office of Solid Waste and Emergency Response
OU - Operable Unit
OWPE - Office of Waste Programs Enforcement
PA - Preliminary Assessment
PCBs - Polychlorinated Biphenyls
PCMD - Procurement and Contracts Management Division
PO - Project Officer (HQ)
POTW - Publicly Owned Treatment Works
PR - Planned Removal
PR - Procurement Request
PRP - Potentially Responsible Party
PTS - Project Tracking System
QA/QC - Quality Assurance/Quality Control
RA - Remedial Action
RCRA - Resource Conservation Recovery Act of 1976
RD - Remedial Design
RFP - Request for Proposals
RI - Remedial Investigation
RI/FS - Remedial Investigation/Feasibility Study
ROD - Record of Decision
RP - Responsible Party
RPM - Regional Project Manager
RPO - Regional Project Manager
RQ - Risk Quotient
RTP - Research Triangle Park
SACM - Superfund Accelerated Cleanup Model
SARA - Superfund Amendments and Reauthorization Act of 1986
SCAP - Superfund Comprehensive Accomplishments Plan
SDWA - Safe Drinking Water Act
SI - Site Investigation
SMOA - State Memorandum of Agreement
SOW - Statement of Work
SPO - State Project Officer
SRO - Superfund Revitalization Office

LIST OF SUPERFUND ACRONYMS (Continued)

SSC	-	State Superfund Contract
STARS	-	Strategic Targeted Activities for Results System (formerly SPSS)
START	-	Superfund Technology Assistance Response Team
TAG	-	Technical Assistance Grants
TAP	-	Treatability Assistance Program
TAT	-	Technical Assistance Team
TBD	-	Toxicological Data Base
TCLP	-	Toxicity Characterisitic Leaching Procedure
TSCA	-	Toxic Substances Control Act
USACE	-	United States Army Corps of Engineers
USCG	-	United States Coast Guard
USDA	-	United States Department of Agriculture
USFWS	-	United States Fish and Wildlife Service
USGS	-	U.S. Geological Survey
VOCs	-	Volatile Organic Compounds
WA	-	Work Assignment

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