Coastal and Estuarine

Hazardous Waste Site Reports

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Introduction

The National Oceanic and Atmospheric Administration (NOAA) regularly evaluates hazardous waste sites that are proposed for addition to the National Priorities List[1,2] (NPL). This report identifies hazardous waste sites that could impact natural resources for which NOAA acts as a federal trustee under the National Oil and Hazardous Substances Pollution Contingency Plan[3] and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).[4]

These waste site reports are often NOAA's first examination of a site. Following a waste site report, some sites may require a more in-depth assessment called a Preliminary Natural Resource Survey (PNRS). NOAA has published 325 coastal and estuarine hazardous waste site reports (WSRs), 143 PNRS', and three Air Force Reports (Appendix Tables 1 and 2).

Not all hazardous waste sites will affect NOAA trust resources; NOAA is concerned about sites located near trustee resources and their habitats in states along the Atlantic and Pacific oceans, the Gulf of Mexico, and the Great Lakes. NOAA works with the U.S. Environmental Protection Agency (EPA) to identify and assess risks to natural resources and to develop strategies to minimize those risks. Trustee responsibilities also include evaluating cleanup alternatives and restoring habitats.

NOAA's regional Coastal Resource Coordinators (CRCs) will follow up on sites that appear to pose ongoing problems. NOAA uses information from this report to establish priorities for further site investigations. The CRC works with other agencies and trustees to communicate any concerns to EPA. CRCs also review sampling and monitoring plans for the site and help to plan and set objectives for site cleanups. This coordinated approach protects all natural resources, not just those for which NOAA is a steward. The EPA can use the waste site reports to help identify the types of information that may be needed to complete an environmental assessment of the site. Other federal and state trustees can use the reports to help evaluate the potential impacts to their resources.

Each report contains a summary and three distinct sections. The first section, Site Background , describes the site, previous site operations and disposal practices, and pathways of contaminant transport to natural resources. The second section, NOAA Trust Resources, describes the species, habitats, and commercial and recreational fisheries near the site. The final section, Site-Related Contamination, identifies the contaminants of concern to NOAA and describes contaminant distribution at the site.

This report contains a list of acronyms and abbreviations (p. 61) and a glossary of terms (p. 63) that commonly appear throughout the reports. Table 1 in the appendix lists the WSRs that NOAA has published to date, and Table 2 lists all of the sites at which NOAA has been involved that could potentially affect trust resources, as of December 2001. Table 2 also lists the number and variety of hazardous waste reports that the Coastal Protection and Restoration Division has published since 1984, including PNRS and Air Force Reports.

Chemical-Specific Screening Guidelines

Most waste site reports contain a table that focuses on the contaminants in different media that could potentially degrade natural resources. These site-specific tables highlight only a few of the many contaminants often found at hazardous waste sites. We compare the chemical concentrations reported in the tables against published screening guidelines for surface water, sediment, groundwater, and soil. Ambient Water Quality Criteria (AWQC) values[5] are used for surface water and groundwater, Effects Range Low (ERL) values[6] and Threshold Effects Level (TEL) values[7] are used for sediment, and average soil concentrations[8,9,10] are used for soil.

Because contaminant releases from hazardous waste sites to the environment can span many years, we are concerned about long-term effects to natural resources. This is why we compare site contaminant levels against the screening guidelines for chronic effects rather than with the short-term effects.

There are no national criteria for sediment comparable to the AWQC for water. In the absence of national criteria, we compare sediment concentrations against several published screening guidelines.[6,7] Studies that associate contaminant concentrations in sediment with biological effects[6,7,11,12,13,14,15,16] provide guidance for evaluating contaminant concentrations that could harm sediment-dwelling aquatic organisms. However, screening guidelines are often based on effects from individual chemicals. Their application may be difficult when evaluating biological effects that could be attributed to combined effects from multiple chemicals, unrecognized chemicals, or physical parameters that were not measured.

NOAA's National Status and Trends Program has used chemical and toxicological evidence from a number of modeling, field, and laboratory studies to determine the ranges of chemical concentrations associated with toxic biological effects:[6,13]

- No Effects Range - the range of concentrations over which toxic effects are rarely observed;
- Possible Effects Range - the range of concentrations over which toxic effects are occasionally observed
- Probable Effects Range - the range of concentrations over which toxic effects are frequently observed

Two slightly different methods[6,7] were used to determine these chemical ranges. Long and Morgan[6] compiled chemical data associated with adverse biological effects. The data were ranked to determine where the chemical concentration was associated with an adverse effect (Effects Range-Low or ERL)—the lower tenth percentile. Sediment samples were not expected to be toxic when all chemical concentrations were below the ERL values.

MacDonald[7] modified the approach used by Long and Morgan, to include both the "effects" and "no effects" data, whereas Long and Morgan used only the "effects" data. Threshold Effects Levels (TELs) were derived by taking the geometric mean of the 15th percentile of the "effects" data and the 50th percentile of the "no effects" data.

Although different percentiles were used for these two methods, their results closely agree.[13] We advocate neither method over the other and use both screening guidelines to help focus cleanup efforts in areas where natural resources may be at risk from site-related contaminants.

Chemical concentrations in soil that are elevated above background levels can indicate a potential source of contamination. Ideally, screening guidelines for soils would be calculated from a regional data set. In the absence of such data, we compare site soils against the national average values,[8] except for cadmium and silver, which we compare against average concentrations in the earth's crust.[9,10] The soil values are based on averages calculated from soil data collected throughout the U.S. and are used as a reference for comparison purposes only.

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Eastland Woolen Mill

Corinna, Maine

EPA Facility ID: MED980915474

Basin: Lower Kennebec

HUC: 01030003

Executive Summary

The Eastland Woolen Mill site is located on the East Branch Sebasticook River within the Kennebec River basin. This mill produced woolen fabrics from the mid-1930s to 1996 and used chlorobenzene in the dyeing process. Before 1971, the mill discharged wastewater directly to the East Branch Sebasticook River. Soils, groundwater, and river sediments are contaminated with chlorobenzene compounds and trace elements at concentrations that exceed screening guidelines. There are several impassable dams in the Kennebec and Sebasticook River basins, but a program to restore anadromous fish access to the watershed is now underway. New fish passageways at the dams are expected to allow fish access to the site by 2002. A consumption advisory is in effect on the East Branch Sebasticook River due to PCB and dioxin contamination.

Site Background

The Eastland Woolen Mill (EWM) site occupies approximately 8.5 ha (21 acres) in Corinna, Penobscot County, Maine. The East Branch Sebasticook River flows under the EWM site into Sebasticook Lake and continues southwest approximately 8 km (5 mi) to the main stem of the Sebasticook River and an additional 35 km (22 mi) to the Kennebec River. The Kennebec River flows south approximately 77 km (48 mi) to the Gulf of Maine and the Atlantic Ocean (Figure 1).

Operations at the EWM site were primarily conducted in a large manufacturing building that crosses over the East Branch Sebasticook River (Figure 2). There is one dam just north of EWM, a second dam beneath EWM, and a third dam approximately 530 m (1,740 ft) downstream of the EWM site. In addition to the main mill complex, three satellite locations were associated with mill operations: the Moosehead Mill, the School Street Yard, and Lot 88 (Figure 2). Eastland Woolen Mill also owned property referred to as the Old Dump Site along the east side of the river approximately 0.97 km (0.6 miles) downstream from the mill.

The EWM produced woolen fabrics from the mid-1930s until its closure in 1996. Chlorobenzene, which was used in the dyeing process, was stored in a 29,000-liter (7,600 gal) underground storage tank (UST) (USEPA 2000a). Wastewater containing spent chemicals was discharged through a tailrace that lead to the East Branch Sebasticook River, or onto the soil under the mill building (Acheron Engineering Services 1994; MEDEP 1999; USEPA 1999a). In 1971, the waste stream was diverted to a sewage treatment plant without pre-treatment (USEPA 1999a). Three additional current and historical sources of contamination to the river are dye kettles, which were located near the dam in the central manufacturing building, soils near the UST area, and approximately 22,000 kg (48,500 lbs) of chemicals removed from the site during a state emergency removal action in 1997 (USEPA 1999b; USEPA 2000a). The U.S. Environmental Protection Agency listed the EWM on the National Priorities List in April 1999.

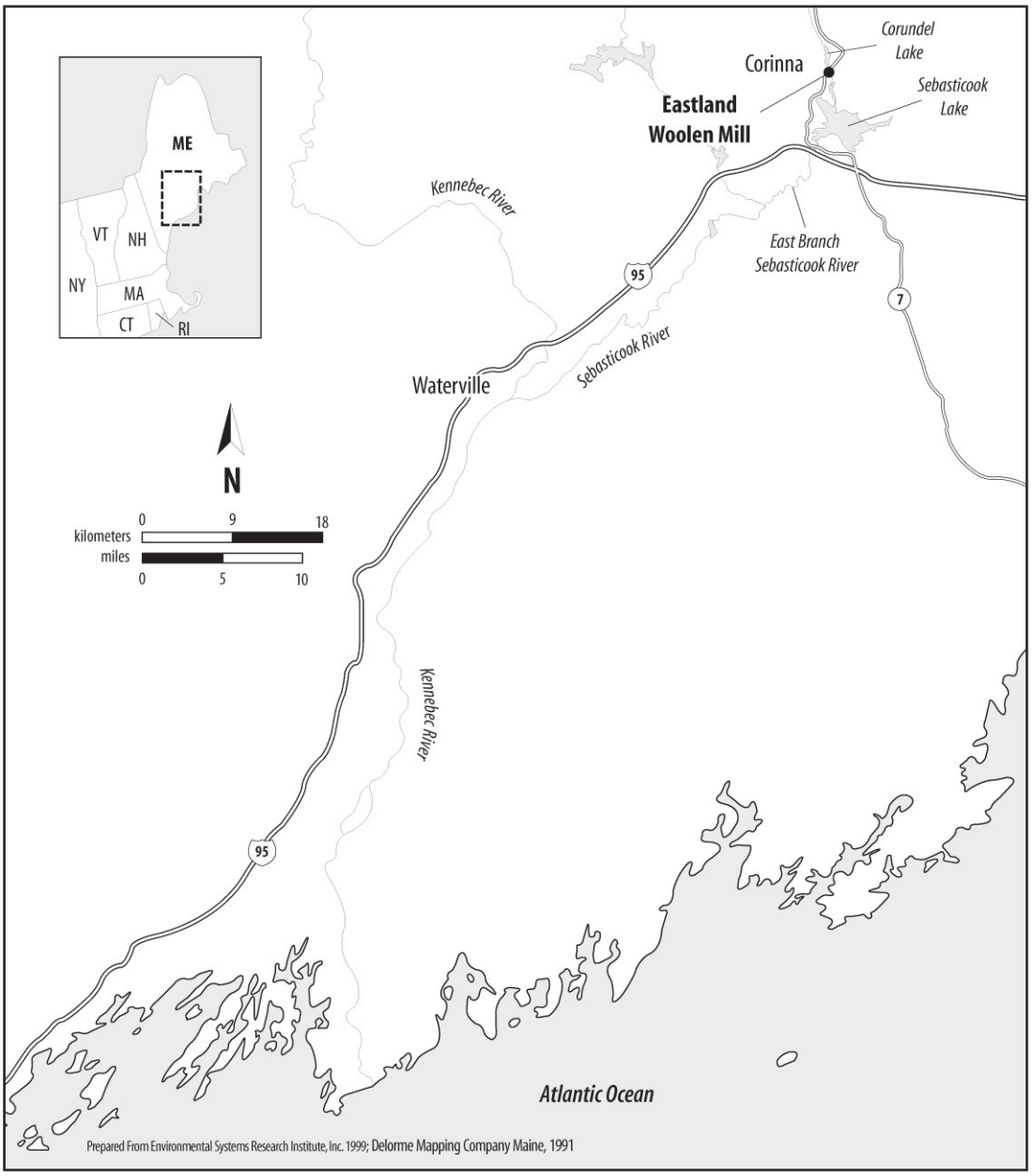

Figure 1. Location of the Eastland Woolen Mill facility, Corinna, Maine.

Direct discharge and groundwater migration are the primary pathways for release of contaminants to the East Branch Sebasticook River. A portion of the EWM site is in the 100-year floodplain. In 1998, the river flooded the property and two floors of the mill building. Groundwater beneath the site is encountered at 1.6 m (5.2 ft) bgs (MEDEP 1999).

NOAA Trust Resources

The NOAA trust habitat of concern is the East Branch Sebasticook River. The East Branch is a moderate-sized and moderate-gradient river ranging widely in width and sediment type because

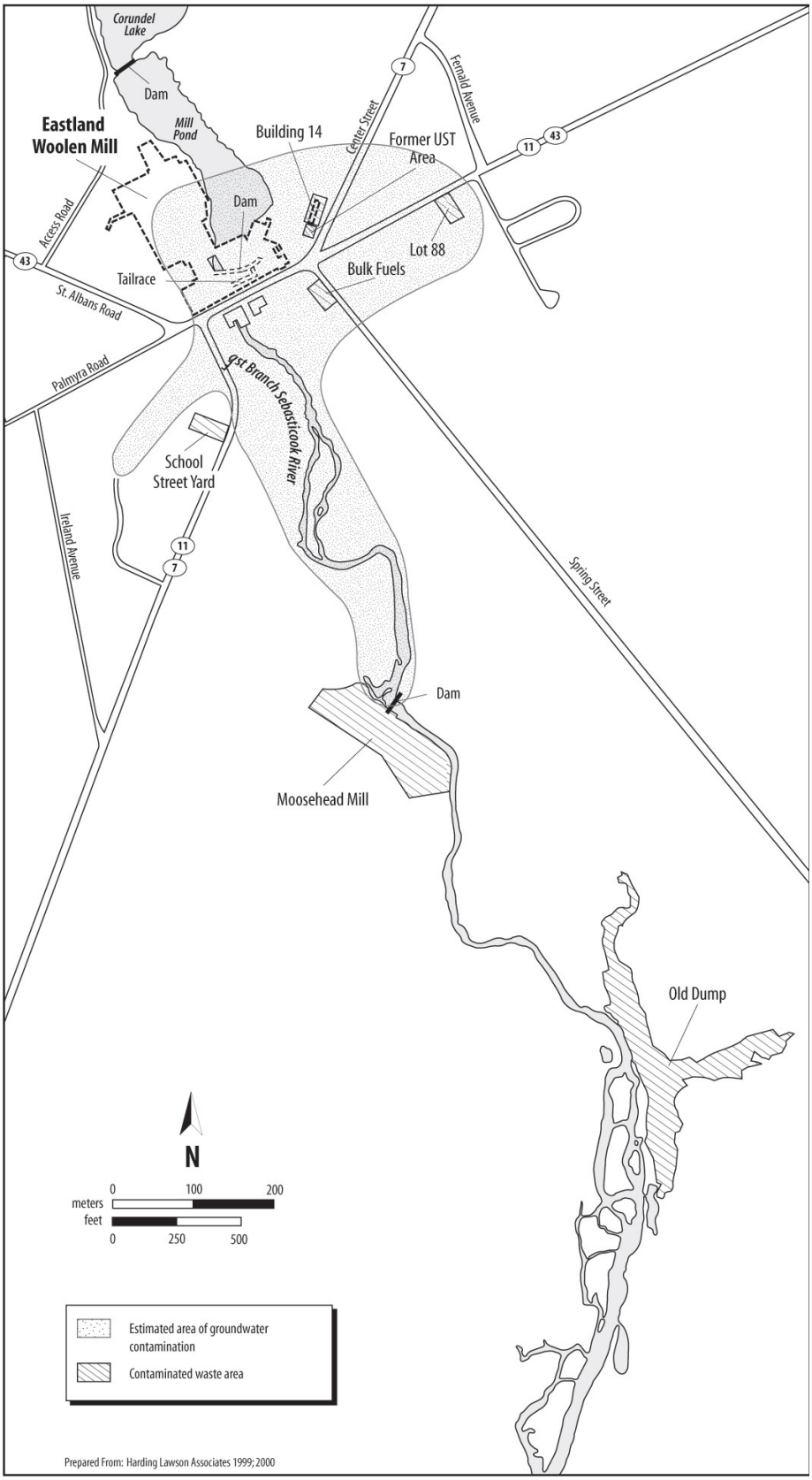

Figure 2. Detail of the Eastland Woolen Mill property.

Table 1. Future use of anadromous resources in the East Branch Sebasticook River after anadromous restoration of dams on the Kennebec River basin (Squires 2000).

Species		Future Habitat Use		
Common Name	Scientific Name	Spawning Ground	Juvenile Nursery	Migratory Corridor
ANADROMOUS FISH				
Alewife	*Alosa pseudoharengus*	◆	◆	◆
Atlantic salmon	*Salmo salar*	◆	◆	◆
Blueback herring	*Alosa aestivalis*	◆	◆	◆

of several dams on the river. Historically, the East Branch was used by several anadromous fish species for spawning and juvenile rearing but dams now block access to most of the river. A program to restore anadromous fish access to the Kennebec River basin is underway. Fish passageways have been built on several dams, and agreements for additional passageways have been made with the State of Maine and electric utilities. Fish passage to the East Branch Sebasticook River is expected to be restored by 2002 (Squires 2000).

The catadromous American eel is the NOAA trust species near the site. Eel enter streams as juveniles and reside in most habitable reaches as adults. Eel can traverse low-head dams, small waterfalls, and other obstructions that block many anadromous fish. After dams are fitted with fish passageways, it is expected that alewife, blueback herring, and Atlantic salmon would use reaches of the river near the EWM site for spawning and juvenile rearing (Squires 2000).

Two fish consumption advisories are in effect for the East Branch Sebasticook River. A statewide fish consumption advisory is in effect for all inland waters due to ubiquitous mercury contamination. A second advisory in effect for the Kennebec watershed includes the East Branch and mainstem Sebasticook rivers, and the Kennebec River, due to PCB and dioxin contamination (EPA 2000b).

Recreational fisheries occur on the East Branch Sebasticook River for warm-water resident species, including those areas affected by the fish consumption advisory for the Kennebec watershed (Squires 2000).

Site-Related Contamination

Field investigations reported contamination of soils, groundwater, and river sediment in and around the EWM property. The primary contaminants of concern to NOAA include chlorobenzene compounds, trace elements, and PAHs. Maximum contaminant concentrations based on investigations by the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers are summarized in Table 2, along with appropriate screening guidelines. These investigations collected over 100 soil and groundwater samples, 16 surface water samples, and at least 30 sediment samples (Harding Lawson Associates 1999, 2000; MEDEP 1999).

Chlorobenzenes and PAHs were detected at substantial concentrations in EWM soils. The greatest concentrations of chlorobenzene-contaminated soils were found in the UST excavation area and in an area 38 m (125 ft) downstream of the mill building wet process area, where direct discharge to the ground and river occurred (Figure 2; MEDEP 1999). Screening guidelines are not available for organic compounds in soil. Trace elements were detected in soils at concentrations that exceeded

Table 2. Maximum concentrations of contaminants of concern found at Eastland Woolen Mill (MEDEP 1999; Harding Lawson Associates 1999; Harding Lawson Associates 2000).

	Soil (mg/kg)		Water (µg/l)			Sediment (mg/kg)	
Contaminant	Soils	Mean U.S.[a]	Ground-water	Surface Water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS							
Arsenic	39	5.2	20	< 3.0	150	16	5.9
Cadmium	4.7	0.06	57	< 1.0	2.2[d]	56	0.596
Chromium	610	37	1.4	5.0	11	390	37.3
Copper	370	17	N/A	34	9[d]	49	35.7
Lead	2,700	16	11	9.0	2.5[d]	330	35
Mercury	1.5	0.058	<0.2	< 0.2	0.77	1.2	0.174
Nickel	55	13	2.1	7.0	52[d]	51	18
Silver	3.1	0.05	<1.0	< 1.0	0.12	0.56	1.0[e]
Zinc	2,800	48	49	29	120[d]	2,600	123.1
ORGANIC COMPOUNDS							
Chlorobenzene	1,800	NA	6,300	0.46	50[f,g]	< 0.25	NA
1,2-Dichlorobenzene	3,300	NA	3,700	0.55	763[f,h]	3.9	NA
1,3-Dichlorobenzene	2,300	NA	660	0.66	NA	1.4	NA
1,4-Dichlorobenzene	3,400	NA	2,700	< 1.0	763[f,h]	4.6	NA
1,2,3-Trichlorobenzene	280	NA	1,100	< 1.0	NA	2.5	NA
1,2,4-Trichlorobenzene	750	NA	4,800	< 1.0	NA	35	NA
Total PAHs	250	NA	ND	ND	NA	74	4.022[e]

NA Screening guidelines not available
N/A Data not available
ND Not detected above the value presented.
a Shacklette and Boerngen (1984), except for cadmium and silver which represent average concentrations in the earth's crust from Lindsay (1979).
b National Recommended Water Quality Criteria (USEPA 1993). Freshwater chronic criteria presented
c TEL; Threshold Effects Level; freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).
d Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L
e TEL not available; marine Effects Range-Low (ERL) presented. ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995).
f Lowest observable effect level
g Value for chemical class
h Value for the summation of all isomers

screening guidelines. The greatest concentrations of trace elements and PAHs in soils were found in the floodplain next to the river.

Several waste samples collected from within the mill building were contaminated with chromium, lead, and several chlorobenzene compounds (Table 2; Harding Lawson Associates 1999). Samples of liquid waste collected from the mill building contained substantial concentrations of arsenic, chromium, lead, and mercury (Table 2; Harding Lawson Associates 1999).

A groundwater plume contaminated with chlorobenzene extends east and southeast from the EWM complex for approximately 490 m (1,600 ft) (Figure 2; USEPA 1999b). Chlorobenzene was detected in groundwater at concentrations two orders of magnitude greater than the AWQC. The greatest concentrations of chlorobenzene in groundwater were detected in the UST excavation area and downgradient of the central mill building (Figure 2; MEDEP).

Chlorobenzenes were detected in river sediment as far as 1.1 km (0.7 mi) downstream from the mill facility and as deep as 3.7 m (12 ft) (MEDEP 1999). All chlorobenzene concentrations in surface water samples were below 1 µg/L, although copper and lead were detected at concentrations slightly greater than the AWQC. Trace elements were detected in river sediment at concentrations that exceeded screening guidelines.

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8 EPA Region 1

Middlesex Sampling Plant

Middlesex, NJ

EPA Facility ID: NJ0890090012

Basin: Raritan

HUC: 02030105

Executive Summary

The Middlesex Sampling Plant (MSP) was used for sampling, analysis, storage, and shipment of uranium, thorium, and beryllium ores from 1943 to 1955. Radioactive substances, trace elements, and PAHs have been measured at elevated concentrations in facility soils. Elevated concentrations of trace elements were detected in surface water and sediment samples collected from the South Drainage Ditch at the MSP. Radioactive substances have also been detected in surface water and sediment, although screening guidelines are not available for comparison. There is an American shad restoration program in the Raritan River, and suitable habitat for alewife in Ambrose and Green brooks. No one has undertaken sampling in Ambrose and Green brooks downstream from the site.

Site Background

The Middlesex Sampling Plant (MSP) covers approximately 3.9 hectares (9.6 acres) in Middlesex, Middlesex County, New Jersey (Figure 1). The property is located about 1.3 km (0.8 miles) from Ambrose Brook, which joins Green Brook 2.9 km (1.8 miles) downstream. Green Brook flows for 0.3 km (0.2 miles) to the Raritan River, which then flows for 25 km (16 miles) before discharging into Raritan Bay.

The MSP property was used primarily for sampling, analysis, storage, and shipment of uranium, thorium, and beryllium ores from 1943 to 1955 under contract with the Atomic Energy Commission and the Manhattan Engineer District. After 1955, the site was used only for storage and limited sampling of thorium residues. Beginning in 1980, the control of contamination associated with the MSP was managed under the U.S. Department of Energy (DOE) Formerly Utilized Sites Remedial Action Program (Redmon 1997). This program was transferred by congressional action to the U.S. Army Corps of Engineers in the fiscal year 1998.

Two former waste sources on the site were identified as the Middlesex Municipal Landfill (MML) Waste Pile and the Vicinity Property (VP) Waste Pile (USEPA 1998). These sources were removed in two separate removal actions. The MML waste pile (23,800 m^3/31,130 cy) was removed in 1998 and the VP waste pile (26,900 m^3/35,180 cy) was removed in 1999 (Carpenter 2000). The MML Pile contained soil contaminated with pitchblende (high-grade uranium ore) that was originally placed at the landfill. The material was returned to MSP for interim storage when radiological surveys at MML showed that remediation was required. The VP Pile consisted of radioactive soil and material from properties in the vicinity that had been contaminated from MSP activities. It also contained material excavated from the South Drainage Ditch during a removal action. Soil and asphalt contaminated during site activities remain on several areas of the site, comprising an estimated volume of 13,000 m^3 (17,000 cy) (U.S. DOE 1995; USEPA 1998; Carpenter 2000).

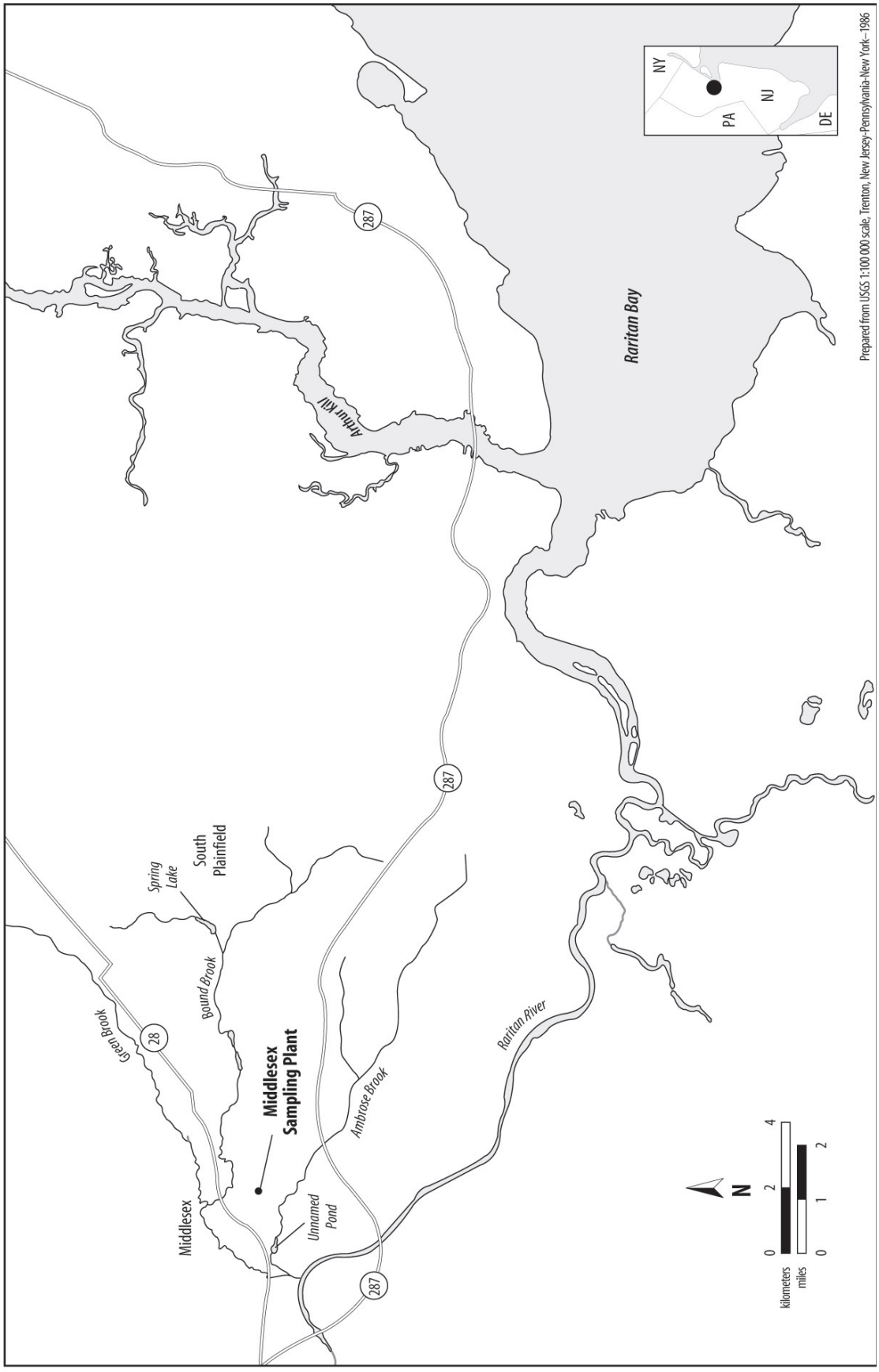

Figure 1. Location of the Middlesex Sampling Plant in Middlesex, New Jersey.

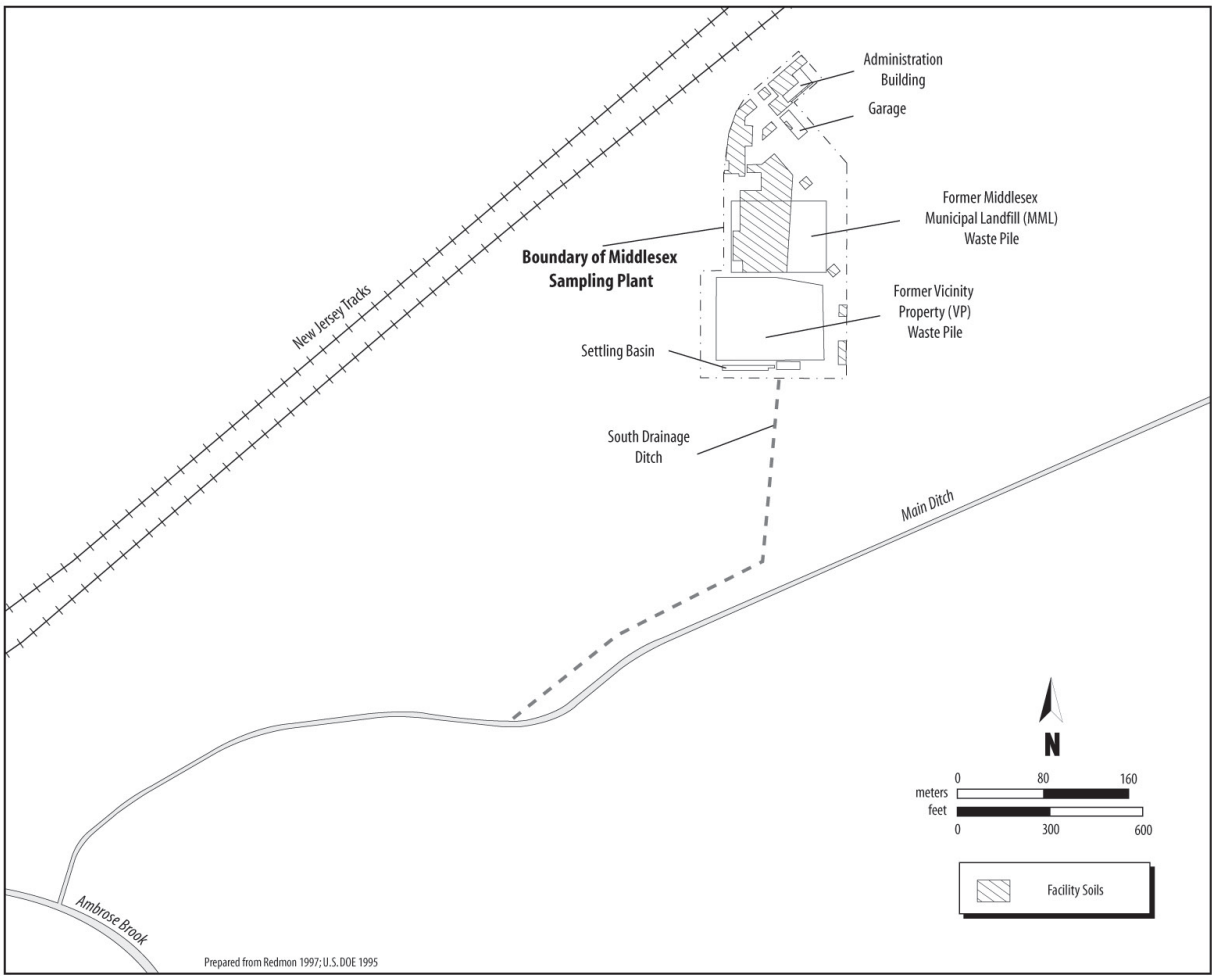

Figure 2. Detail of the Middlesex Sampling Plant.

Beginning in 1980, the U.S. Department of Energy (DOE) conducted investigations and environmental surveillance monitoring studies to determine the nature and extent of contamination from the site. A Hazard Ranking System Evaluation was completed in 1998 and EPA placed the site on the National Priorities List in January 1999.

The primary pathways of contaminant transport from the MSP to NOAA trust resources are surface water runoff and groundwater discharge. An underground drainage system conveys surface runoff from the site to South Drainage Ditch or to an on-site settling basin that also empties into the ditch (Figure 2). The South Drainage Ditch empties into the Main Ditch, which flows into Ambrose Brook. Soils at the site range from 0.45 to 2.4 m (1.5 to 8 ft) deep and are low to moderately permeable. The underlying red shale formation is relatively impermeable. Groundwater in the shallow zone of the aquifer system has a low-flow velocity and is approximately 3 m (10 ft) below the surface. Groundwater beneath the site flows south towards Ambrose Brook (USEPA 1994; U.S. DOE 1995).

NOAA Trust Resources

The NOAA trust habitats of primary concern are the surface water and sediments in Ambrose and Green brooks, small tributary streams within the Raritan River basin. The streams are between 4 and 10 m (13 and 33 ft) wide and 0.3 to 2 m (1 to 6.5 ft) deep. The streams are low-gradient, with warm water fish including sunfish, shiners, bullhead catfish, and carp (Barno 2000).

The catadromous American eel is the trust resource present in Ambrose and Green brooks. A dam forms an unnamed pond about 1 km (0.6 mi) downstream of the Main Ditch, but eel can traverse this dam and use upstream habitats. American eel stay in the habitats throughout the streams from juvenile to adult life stages (Barno 2000).

Over the past century, industrial and urban activities have contaminated the lower Raritan River watershed. For much of this time, fish communities have been composed largely of pollution-tolerant resident species. However, substantial improvements in water quality over the past 10 to 15 years have provided the impetus for an anadromous restoration program on the watershed (Barno 2000).

The New Jersey Department of Environmental Protection (NJDEP) runs an American shad restoration program on the Raritan River. From 1992 to 1997, adult American shad from the Delaware River basin were transplanted to the Raritan River to reestablish a spawning population. Naturally spawning populations of shad are now returning to the Raritan River, and migrate as far upstream as Raritan, where a dam blocks their passage at Nevius Street, approximately 10 km (6 mi) upstream from the confluence of Green Brook and the Raritan River. Water quality improvements have reestablished populations of alewife and striped bass in the Raritan River as far upstream as the Nevius Street dam. Anadromous fish have not been documented in Ambrose or Green brooks, probably because of poor water quality and degraded habitat (Barno 2000).

There are no commercial fisheries in area streams. Striped bass and American shad are fished recreationally in the Raritan River (Barno 2000).

In 1997, the New Jersey Department of Environmental Protection issued a consumption advisory for all fish in the Bound Brook watershed, because of PCB contamination (USEPA 2000). This fish consumption advisory is still in effect.

Site-Related Contamination

A 1983 characterization of MSP soils contains the best-documented data to define the extent of radiological contamination in property soils (U.S. DOE 1995). This investigation involved collecting samples throughout the MSP. In 1991, 33 boreholes were sampled across the property for analysis of trace elements and organic compounds. Ten composite samples from the MML Pile and 20 composite samples from the VP Pile were collected in 1991 for analysis of radioactive substances, trace elements, and organic compounds (U.S. DOE 1995; USEPA 1998).

Since 1982 groundwater has been sampled annually for radioactive substances at the MSP at 19 wells. Twelve wells were sampled for organic compounds from 1985 to 1991. Beginning in 1990, all groundwater wells were analyzed for trace elements. In 1992, the scope was reduced to six on-site wells sampled for radioactive substances, trace elements, and organic compounds (U.S. DOE 1995). Surface water and sediment samples have been monitored at three locations at various times since 1980. Samples were collected in the South Drainage Ditch from the outfall to approximately 800 m (0.5 mi) downstream in the Main Ditch, and have been analyzed for radioactive substances

Table 1. Maximum concentrations of contaminants of concern detected in environmental media collected from the MSP site from data presented in U.S. DOE (1995) and U.S. EPA (1998).

	Soil (mg/kg or pCi/g)		Water (mg/L or pCi/L)			Sediment (mg/kg or pCi/g)	
Contaminant	Soil/Waste Piles	Mean U.S.[a]	Surface Water	Ground-water	AWQC[b]	Sediment	TEL[c]
RADIOACTIVE SUBSTANCES							
Radium-226	740	NA	8.3	7.0	NA	54	NA
Radium-228	NA	NA	7.0	1.6	NA	7.6	NA
Thorium-230	NA	NA	2.6	1.9	NA	3.5	NA
Thorium-232	19	NA	0.42	0.33	NA	5.9	NA
Total uranium	NA	NA	74	30	NA	28	NA
Uranium-238	960	NA	NA	190	NA	120	NA
TRACE ELEMENTS							
Arsenic	500	5.2	4.9	2.4	190	4.9	5.9
Cadmium	2,100	0.06	8	<7	1.1	0.75	0.60
Copper	1,500	17	160	250	12	36	35.7
Lead	19,000	8.1	810	510	3.2	61	35
Silver	NA	0.05	9.3	<10	0.12	<1.6	1.0[d]
Zinc	2,000	48	280	2,200	110	700	123.1
PAHs							
Acenaphthene	0.33	NA	ND	ND	520[e]	NA	0.0067
Acenaphthylene	0.059	NA	ND	ND	300[f,g]	NA	0.00587
Anthracene	2.2	NA	ND	ND	300[f,g]	NA	0.0469
Benzo(a)anthracene	55	NA	ND	ND	300[f,g]	NA	0.0748
Benzo(a)pyrene	62	NA	ND	ND	300[f,g]	NA	0.0888
Benzo(b)fluoranthene	64	NA	ND	ND	300[f,g]	NA	NA
Benzo(g,h,i)perylene	37	NA	ND	ND	300[f,g]	NA	NA
Benzo(k)fluoranthene	36	NA	ND	ND	300[f,g]	NA	NA
Chrysene	60	NA	ND	ND	300[f,g]	NA	0.108
Dibenzo(a,h)anthrancene	33	NA	ND	ND	300[f,g]	NA	0.00622
Fluoranthene	29	NA	ND	ND	3,980[h]	NA	0.113
Fluorene	0.33	NA	ND	ND	300[f,g]	NA	0.0212
Ideno(1,2,3-cd)pyrene	37	NA	ND	ND	300[f,g]	NA	NA
Phenanthrene	9.4	NA	ND	ND	6.3[i]	NA	0.0867
Pyrene	25	NA	ND	ND	300[f,g]	NA	0.153

NA Data or screening guidelines not available.
ND Not detected; detection limit not available.
a Shacklette and Boerngen (1984), except for cadmium and silver which represent average concentrations in the earth's crust from Lindsay (1979).
b Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Freshwater chronic criteria presented. Criterion expressed as a function of total hardness with the exception of arsenic and silver; concentrations shown correspond to hardness of 100 mg/L.
c Threshold Effects Level is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data. The TEL is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).
d TEL not available; Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995).
e Lowest Observable Effect Level.
f Freshwater chronic criteria not available; marine acute value presented.
g Value for chemical class.
h Freshwater chronic criteria not available; freshwater acute value presented.
i Proposed criteria.

and trace elements. Surface water samples have also been analyzed for organic compounds (U.S. DOE 1995).

The primary contaminants of concern to NOAA are radioactive substances, trace elements, and PAHs. Table 1 summarizes the maximum reported contaminant concentrations in each type of environmental media. Although there are no screening guidelines available for radioactivity in soils, maximum concentrations of radium-226 and thorium-232 in soils and waste piles exceeded the DOE guideline of 5 pCi/g for the top 15 cm of soil (Redmon 1997). The maximum concentration of uranium-238 in soil, 960 pCi/g, exceeded the DOE guideline of 100 pCi/g (U.S. DOE 1995). In facility soils and waste piles, maximum concentrations of all trace elements for which data were available exceeded the screening guidelines. Elevated concentrations of PAHs were found in MSP soils and waste piles, although soil screening guidelines are not available for these compounds.

Radioactive substances were detected in groundwater, surface water, and sediment, but screening guidelines are not available. Maximum concentrations of copper, lead, and zinc exceeded their respective AWQC in both groundwater and surface water. The highest concentrations in surface water were generally measured in samples collected at the plant's outfall (Redmon 1997). In sediment, maximum concentrations of cadmium, copper, lead, silver, and zinc exceeded their respective TEL values (Redmon 1997).

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Route 561 Dump

Gibbsboro, New Jersey

EPA Facility ID: NJ0000453514

Basin: Lower Delaware

HUC: 02040202

Executive Summary

The Route 561 Dump is located approximately 16 km (10 mi) east of the Delaware River within the Cooper River watershed. The area was used to dump paint waste and sludges generated by a local paint manufacturer. Soils, groundwater, surface water, and sediments are contaminated with trace elements and PAHs at concentrations that exceed screening guidelines. The habitats of primary concern to NOAA are the surface water and sediments in White Sand Branch, Bridgewood Lake, and Millard Creek. The catadromous American eel is the trust resource present in the Cooper River and its tributaries due to several impassable dams on the river. However, fish passage facilities have been installed at the lowermost dam and will likely be installed on the remaining dams, which would allow anadromous fish access to the upper watershed in the future. A consumption advisory is in effect for all fish, shellfish, and crustaceans in the Cooper River and its tributaries.

Site Background

The Route 561 Dump property consists of approximately 1.2 hectares (2.9 acres) in Gibbsboro, New Jersey (Figure 1). White Sand Branch traverses the property and flows southwesterly approximately 1 km (0.6 mi) to Bridgewood Lake. Bridgewood Lake discharges into Millard Creek, which flows approximately 2 km (1.2 mi) to the Cooper River. The Cooper River flows in a northwesterly direction for approximately 15 km (9 mi) to the Delaware River (Weston 1997).

The Route 561 Dump property was used to dump paint waste and sludges generated by a local paint manufacturer from an unknown date to 1978 (USEPA 1998). There is no information regarding disposal history on the property (Hamill 2000). During a site inspection in 1994, the New Jersey Department of Environmental Protection (NJDEP) found a blue-green material on and beneath the ground surface, and in the surface waters of a wetland located on the property. There is no indication that any substances other than sewage and non-contact refrigeration water have been discharged to the septic system, located in the northeast corner of the property (Figure 2; USEPA 1998).

NJDEP and the U.S. Environmental Protection Agency (EPA) conducted preliminary assessments and site inspections in 1994 and 1995, respectively. In 1997 the property owner conducted a soil removal action followed by capping and revegetation of highly contaminated areas (Hamill 2000). The EPA proposed the Route 561 Dump site for listing on the National Priorities List in July 1998 (USEPA 2000a).

Groundwater discharge and surface water runoff into White Sand Branch are the primary pathways for contaminant migration to NOAA trust resources. White Sand Branch originates from Clement Lake west of the property (Figure 2). The stream flows southwesterly across the property,

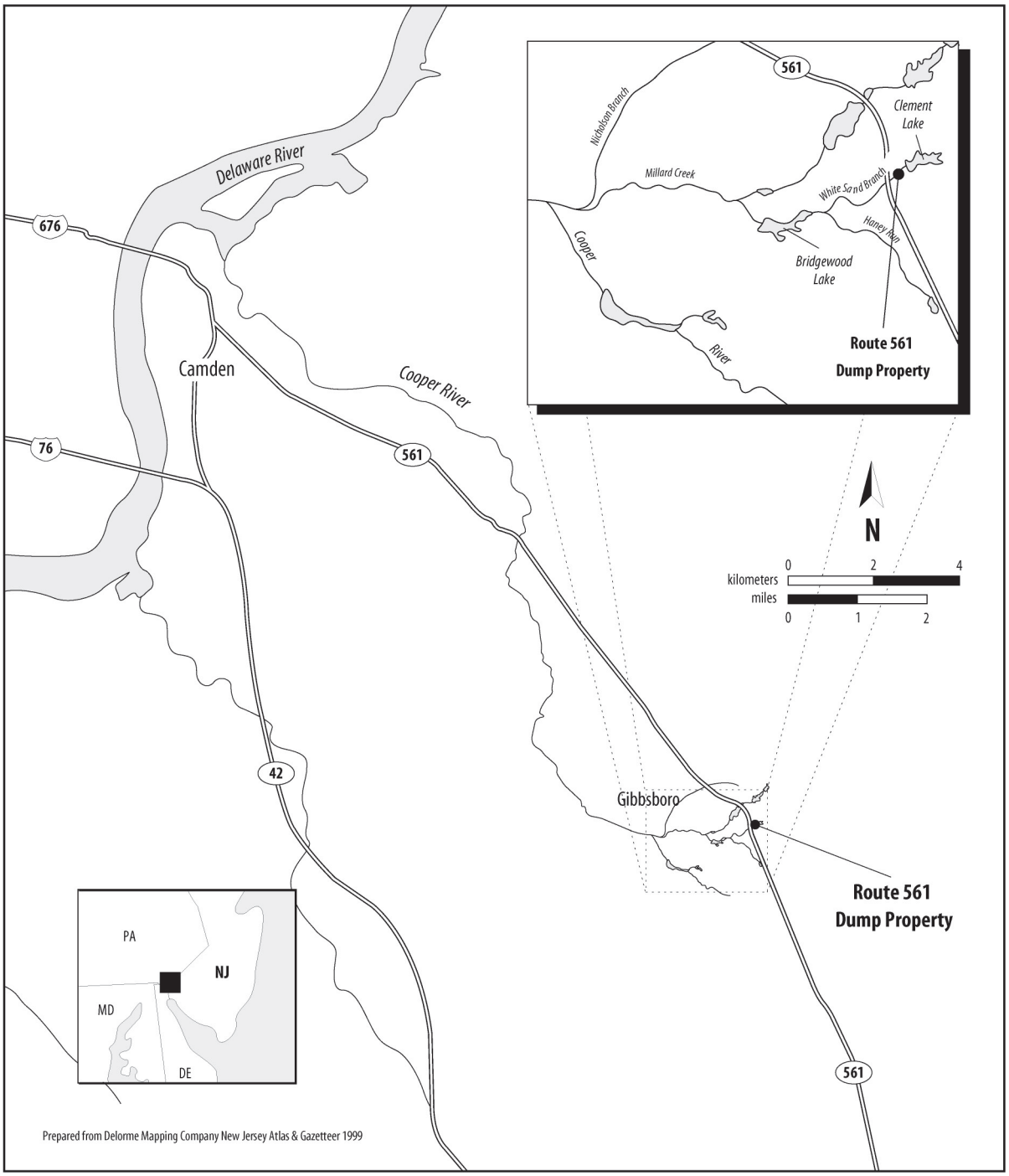

Figure 1. Location of the Route 561 Dump property in Gibbsboro, New Jersey.

briefly loses definition as it flows through a wetland, and reforms at the southern end of the property. The stream leaves the property via a culvert under Route 561 (USEPA 1999a). The 100-year floodplain encompasses the property (USEPA 1997). Groundwater occurs at depths between 0.5 to 2.0 m (1.6 to 6.6 ft) beneath the property within the Potomac-Raritan-Magothy aquifer system (Weston 1997). Groundwater flows northwest on the site. Soils are typically sandy, loose, and highly permeable (USEPA 1997).

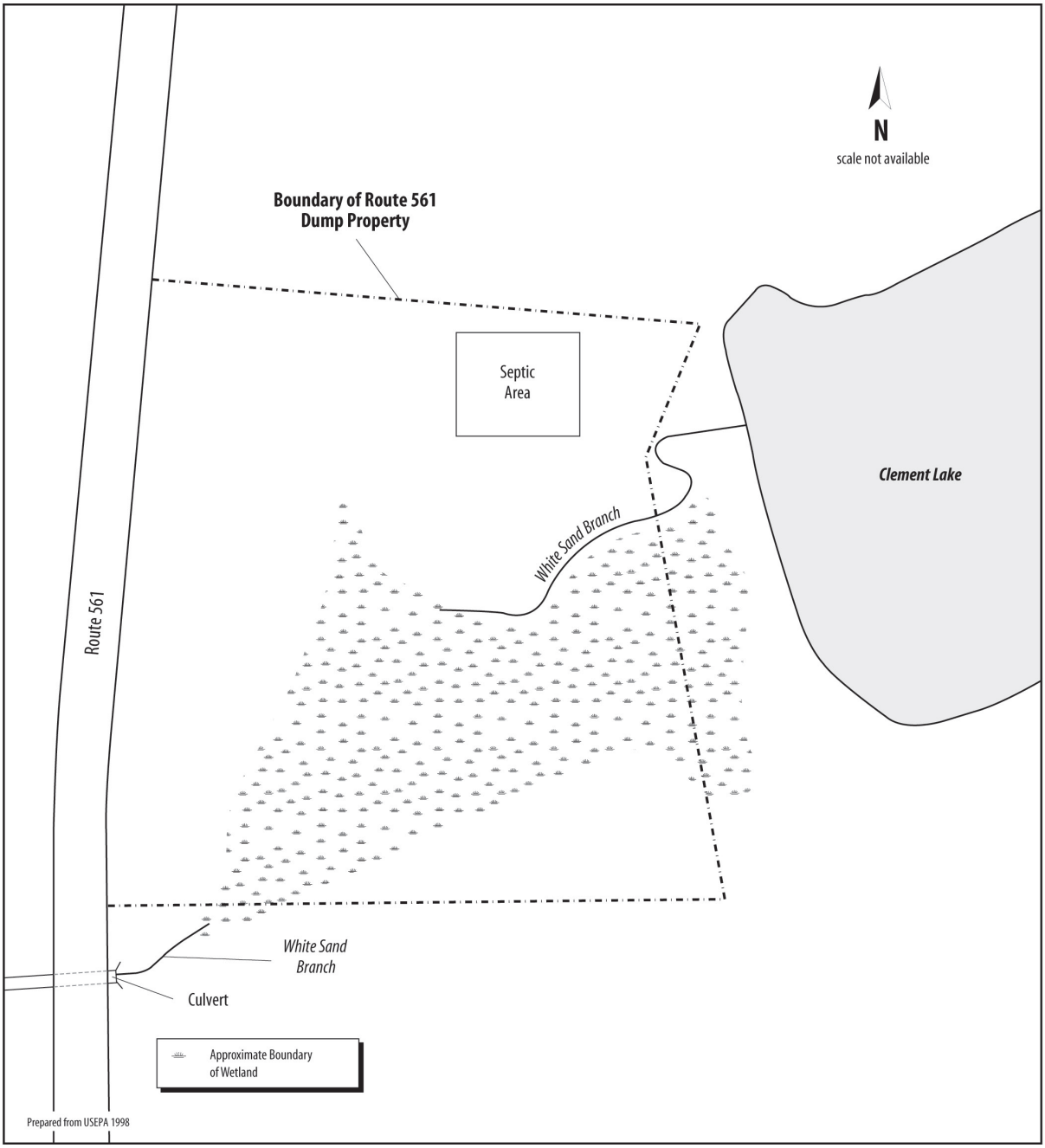

Figure 2. Detail of the Route 561 Dump property.

NOAA Trust Resources

The NOAA trust habitats of primary concern are the surface water and sediments in White Sand Branch, Bridgewood Lake, and Millard Creek. These streams and lakes make up the headwaters of the Cooper River basin, a tributary of the lower Delaware River. The streams are small, generally less than 3 m (10 ft) wide and 1 m (3.3 ft) deep with substrates ranging from silts to sands. Bridgewood Lake is approximately 2 to 3 ha (5 to 7 acres) in size. No information on bottom substrates or depths was available, but the fish communities in both the lake and streams are composed of warm water resident species such as sunfish, catfish, carp, and shiners (Carberry 2000).

Table 1. Maximum concentrations of contaminants of concern found at the Route 561 Dump (McMullan 1995; Sodano 1998; USEPA 1999a).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Ground water	Surface water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS							
Arsenic	130,000	5.2	3,800	5.5	150	6,100	5.9
Cadmium	490	0.06	14	<1.9	2.2[d]	16	0.596
Chromium	18,000	37	2,500	<2.8	11	8,000	37.3
Copper	34,000	17	3,000	4.7	9[d]	1,400	35.7
Lead	190,000	16	37,000	44	2.5[d]	87,000	35
Mercury	9	0.058	1.5	<0.10	0.77	<0.06	0.174
Nickel	16	13	1,400	<8.1	52[d]	3.1	18
Silver	2.6	0.05	N/A	<2.7	0.12	<0.62	1.0[e]
Zinc	870	48	2,700	31	120[d]	14	123.1
Total PAHs							
	11	NA	ND	ND	300[f]	12	4.022[e]

NA Screening guidelines not available
N/A Data not available
ND Not detected; detection limit not available.
< Not detected; value presented is the detection limit.
a Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the earth's crust from Lindsay (1979).
b National Recommended Water Quality Criteria (USEPA 1999b). Freshwater chronic criteria presented.
c TEL; Threshold Effects Level; Freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).
d Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/Le TEL not available; marine Effects Range-Low (ERL) presented. ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al. (1995).
f Lowest observable effect level; value for chemical class; freshwater chronic value not available; marine acute value presented

The catadromous American eel is the NOAA trust resource present in the Cooper River and its tributaries. Anadromous blueback herring and alewife are present near the mouth of the river. Several lowhead dams on the river block upstream migration of anadromous species. The first dam is located approximately 4 km (2 mi) upstream of the mouth and about 16 km (10 mi) downstream of the Route 561 Dump. American eel can traverse lowhead dams and are found throughout the Cooper River basin using the streams and lakes as adult habitat (Carberry 2000).

The installation of fish passage facilities at dams on the Cooper River is presently underway. Fish passage facilities were installed at the lowermost dam in 1998 and are planned at two additional dams. Although several more dams are on the river, it is likely that passage facilities will be installed at these as well, eventually allowing access to the upper Cooper River basin by anadromous fish. Blueback herring and alewife are the anadromous species most likely to use the small streams and lake habitats in the upper basin as spawning areas and juvenile nurseries.

Recreational fisheries in the Cooper River basin are limited. The lakes and streams within the basin are not stocked or managed for recreational fisheries and no commercial fisheries are present (Carberry 2000). A consumption advisory is in effect for all fish, shellfish, and crustaceans in the Cooper River, including its drainage due to PCB, dioxin or chlordane contamination (NJDEP 1999). The fish consumption advisory based on chlordane contamination has been in effect since 1993 (USEPA 2000b).

Site-Related Contamination

Data collected during field investigations indicate that soil, groundwater, surface water, and sediment are contaminated with trace elements and PAHs. Maximum contaminant concentrations from investigations conducted by the NJDEP and the EPA are summarized in Table 1, along with the appropriate screening guidelines. The NJDEP investigation collected 13 soil, one groundwater, four surface water, and three sediment samples (Industrial Corrosion Management Inc. 1994; Sodano 1998). The EPA investigation collected 11 subsurface soil, four surface soil, and four sediment samples. All media were analyzed for trace elements, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), PCBs, and pesticides (McMullan 1995; USEPA 1998).

Trace elements in soils have been detected at concentrations substantially greater than screening guidelines (Table 1). The greatest concentrations of arsenic, copper, lead, and mercury detected in subsurface soils exceed screening guidelines by three to five orders of magnitude. Maximum cadmium and chromium concentrations exceed guidelines by three orders of magnitude. Although soil guidelines are not available, elevated concentrations of PAHs were also detected in soils on the property.

Arsenic, chromium, copper, lead, nickel, and zinc were an order of magnitude greater than the Ambient Water Quality Criteria (AWQC) in the only groundwater sample collected (Table 1). Concentrations of lead in surface waters also exceeded screening guidelines (Table 1). Lead concentrations in surface water increased from 3 µg/L upstream of the property to 44 µg/L downstream (USEPA 1997).

Arsenic, cadmium, chromium, copper, and lead were detected in sediment at concentrations exceeding the screening guidelines. The maximum lead concentrations detected in sediment exceeded guidelines by three orders of magnitude. PAHs were also detected in sediments at concentrations exceeding the screening guidelines (Table 1).

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United States Avenue Burn

Gibbsboro, New Jersey

EPA Facility ID: NJ0001120799

Basin: Lower Delaware

HUC: 02040202

Executive Summary

The United States Avenue Burn property is located approximately 15 km (9 mi) east of the Delaware River within the Cooper River watershed. The area was used to dump and burn waste and to store sludges generated from a local paint manufacturer. The area was also used as a landfill for municipal waste disposal. Soils, groundwater, surface water, and sediments are contaminated with trace elements, PAHs, and pentachlorophenol at concentrations that exceed screening guidelines. The habitats of primary concern to NOAA are the surface water and sediments in White Sand Branch, Haney Run Brook, Bridgewood Lake, and Millard Creek. The catadromous American eel is the trust resource present in the Cooper River and its tributaries due to several impassable dams on the river. However, fish passage facilities have been installed at the lowermost dam and will likely be installed on the remaining dams, which would allow anadromous fish access to the upper watershed in the future. A consumption advisory is in effect for all fish, shellfish, and crustaceans in the Cooper River and its tributaries.

Site Background

The United States Avenue Burn property consists of approximately 5.3 hectares (13.1 acres) in Gibbsboro, New Jersey within the Cooper River watershed, the headwaters of which originate approximately 1.1 km (0.7 mi) south of the property (Figure 1). Two streams, White Sand Branch and Haney Run Brook, traverse the property and flow into Bridgewood Lake (Figure 2). Bridgewood Lake discharges into Millard Creek, which flows for approximately 2 km (1.2 mi) to the Cooper River. The Cooper River flows northwest for approximately 15 km (9 mi) and discharges into the Delaware River (Weston 1997a).

The U.S. Avenue Burn property is located in and around Blocks 23 and 25 in the town of Gibbsboro (Figure 2). The property was used to dump and burn waste from a local paint manufacturing facility from an unknown date until 1979 (USEPA 2000a). Reports indicate that paint wastes and solvents were dumped and poured onto the ground and then burned (USEPA 1998; USEPA 2000a). Visible wastes at the burn area occupy approximately 2,000 m^2 (21,500 ft^2) and has been enclosed by a fence (Figure 2; Weston 1997a). Portions of Blocks 23 and 25 were used as a landfill for disposal of paint wastes, municipal wastes, and the storage of sludges generated from the former paint manufacturer (USEPA 2000a). The location of the landfill area in Block 23 was not available, although the approximate location of the former landfill area in Block 25 is indicated in Figure 2 (Weston 1997a).

The New Jersey Department of Environmental Protection (NJDEP) first detected contaminated groundwater in 1975 (Weston 1997a). In 1990 NJDEP issued a directive to conduct a Remedial Investigation and Feasibility Study. In 1995, Sherwin-Williams Co., the current property owner,

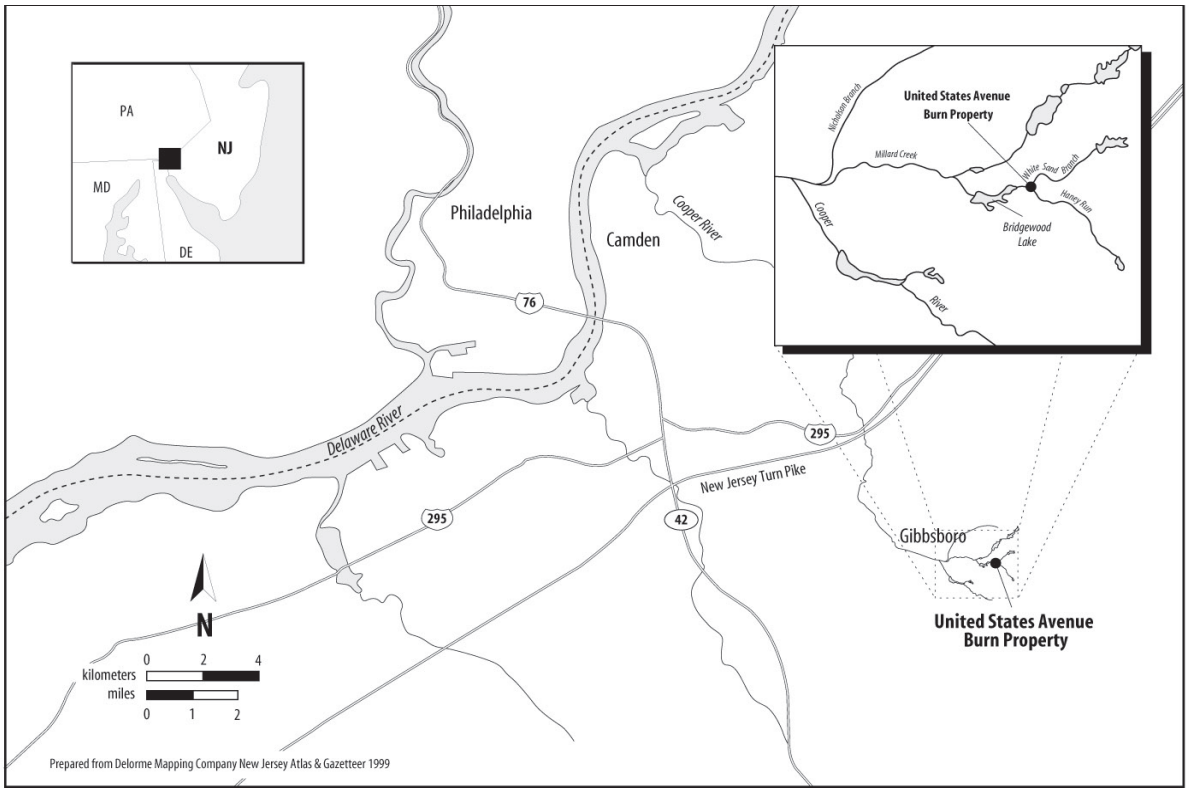

Figure 1. Location of the United States Avenue Burn site property in Gibbsboro, New Jersey.

entered into an Administrative Order of Consent with the U.S. Environmental Protection Agency to conduct a removal action investigation (USEPA 1998). The United States Avenue Burn site was added to the National Priorities List in July 1999 (USEPA 2000a).

Groundwater discharge and surface runoff into streams are the primary pathways for contaminant transport to NOAA trust resources. Soils in the vicinity of the burn area are well drained and moderate to highly permeable (Weston 1997b). Groundwater is encountered between 0.5 to 2 m (1.6 to 6.5 ft) below the surface within the Potomac-Raritan-Magothy aquifer system. Groundwater flow is north-northwest across the site. Most of the site is situated within a wetland area that is hydraulically connected to White Sand Branch (USEPA 1998). Surface runoff from Blocks 23 and 25 discharges into White Sand Branch and Haney Run Brook, respectively (Weston 1997a).

NOAA Trust Resources

The habitats of primary concern to NOAA are the surface water and sediments in White Sand Branch, Haney Run Brook, Bridgewood Lake, and Millard Creek (Figure 1). These streams and lakes make up the headwaters of the Cooper River basin, a tributary of the lower Delaware River. The streams are small, generally less than 3 m (10 ft) wide and 1 m (3 ft) deep, with substrates ranging from silts to sands. Bridgewood Lake is approximately 2 to 3 ha (5 to 7 acres) in size. No information on bottom substrates or depths was available, but the fish communities in both the lake and streams are composed of warmwater resident species such as sunfish, catfish, carp, and shiners (Carberry 2000).

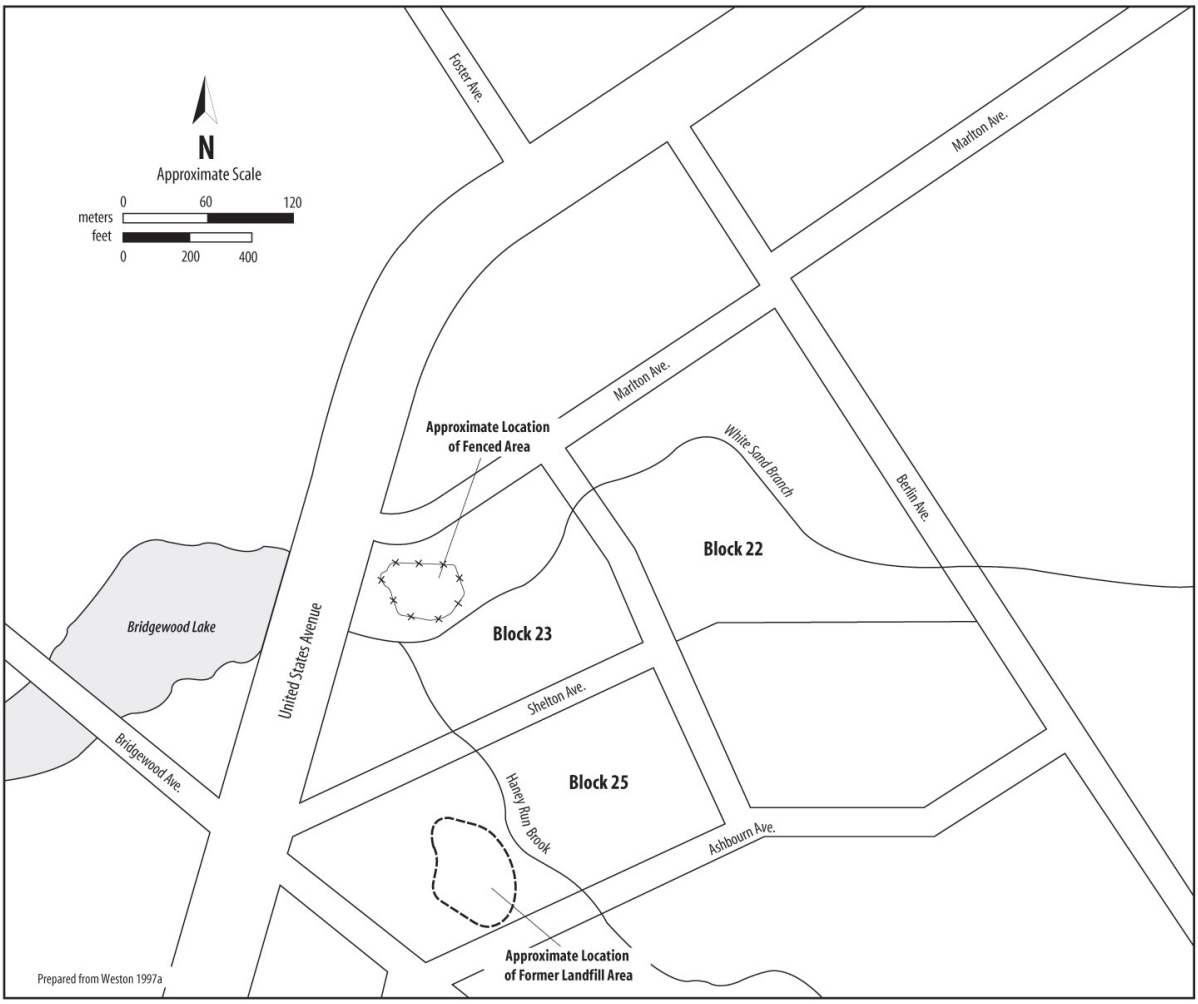

Figure 2. Detail of the United States Avenue Burn site property.

The catadromous American eel is the NOAA trust resource present in the Cooper River and its tributaries. Anadromous blueback herring and alewife are present near the mouth of the river. Several lowhead dams on the river block upstream migration of anadromous species. The first dam is located approximately 4 km (2 mi) upstream of the mouth and about 16 km (10 mi) downstream of the U.S. Avenue Burn property. American eel can traverse lowhead dams and are found throughout the Cooper River basin using the streams and lakes as adult habitat (Carberry 2000).

The installation of fish passage facilities at dams on the Cooper River is underway. Fish passage facilities were installed at the lowermost dam in 1998 and are planned at two additional dams. Although several more dams are on the river, it is likely that passage facilities will be installed at these as well, eventually allowing access to the upper Cooper River basin by anadromous fish. Blueback herring and alewife are the anadromous species most likely to use the small streams and lake habitats in the upper basin as spawning areas and juvenile nurseries.

Recreational fisheries in the Cooper River basin are limited. The lakes and streams within the basin are not stocked or managed for recreational fisheries and no commercial fisheries are present

Table 1. Maximum concentrations of contaminants of concern found at the United States Avenue Burn property (Weston 1997a).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soils	Mean U.S.[a]	Ground-water	Surface Water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS							
Arsenic	590	5.2	830	5.1	150	160	5.9
Cadmium	140	0.06	50	0.70	2.2[d]	3.5	0.596
Chromium	310	37	16	1.5	11	12	37.3
Copper	1,900	17	31	R	9[d]	19	35.7
Lead	240,000	16	270,000	9.7	2.5[d]	2,200	35
Mercury	130	0.058	1.5	0.10	0.77	0.71	0.174
Nickel	50	13	11	2.7	52[d]	13.4	18
Silver	9.6	0.05	8	0.90	0.12	<6.4	1.0[e]
Zinc	99,000	48	130	R	120[d]	210	123.1
PAHs							
Benz(a)anthracene	10	NA	<11	<11	300[f, g]	1.6	0.0317
Chrysene	9.9	NA	<11	<11	300[f, g]	1.7	0.0571
Fluoranthene	21	NA	<11	<11	3980[g, h]	3.4	0.111
Phenanthrene	28	NA	<11	<11	6.3[i]	0.34	0.0419
Pyrene	22	NA	<11	<11	300[f, g]	1.2	0.053
SVOCs							
Pentachlorophenol	3.8	NA	<26	<27	15	<4	0.017[j]

NA Screening guidelines not available
R Sample result did not pass QA/QC standards
< Not detected; value presented is the detection limit.
a Shacklette and Boerngen (1984), except for cadmium and silver which represent average concentrations in the earth's crust from Lindsay (1979).
b National Recommended Water Quality Criteria (USEPA 1999). Freshwater chronic criteria presented.
c TEL; Threshold Effects Level; Freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).
d Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L
e TEL not available; marine Effects Range-Low (ERL) presented. ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al. (1995).
f Freshwater chronic value not available; marine acute value presented; value for chemical class
g Lowest observable effect level
h Freshwater chronic value not available; freshwater acute value presented
i Proposed criteria
j TEL not available; marine Apparent Effects Threshold (AET) presented. The AET represents the concentration above which adverse biological impacts would always be expected. The lowest AET from a set of marine biological indicators was used.

(Carberry 2000). A consumption advisory is in effect for all fish, shellfish, and crustaceans in the Cooper River and its drainage due to PCB, dioxin, or chlordane contamination (NJDEP 1999). A fish consumption advisory based on chlordane contamination has been in effect since 1993 (USEPA 2000b; USEPA 2000c).

Site-Related Contamination

Field investigations indicate contamination of soils, groundwater, surface water, and sediment at the United States Avenue Burn property. During a recent removal action Sherwin-Williams collected 595 soil, five groundwater, five surface water, and 38 sediment samples (Weston 1997a).

The maximum concentrations of the contaminants of concern to NOAA are summarized in Table 1, along with the appropriate screening guidelines. The primary contaminants of concern include trace elements, PAHs, and pentachlorophenol.

Arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were detected in soils at concentrations exceeding screening guidelines (Table 1). Maximum lead concentrations exceeded screening guidelines by four orders of magnitude and have been detected in the surface soils and subsurface soils below the groundwater table. An estimated 36,000 m^3 (47,000 yd^3) of soil are contaminated with lead (Weston 1997a). Elevated concentrations of PAHs and pentachlorophenol were also detected in soils on the property, although screening guidelines are not available.

Lead, mercury, and silver have been detected in groundwater at concentrations exceeding the Ambient Water Quality Criteria (AWQC) by an order of magnitude. Maximum lead concentrations exceeded screening guidelines by four orders of magnitude. Groundwater analyses were conducted on unfiltered samples and represent total trace elements in groundwater (Weston 1997a).

Lead, silver, and pentachlorophenol have been detected in the surface waters of Haney Run Brook at concentrations exceeding screening guidelines (Table 1). All five surface water samples were collected from Haney Run Brook (Weston 1997a).

Arsenic, cadmium, copper, lead, mercury, zinc, pentachlorophenol, and PAHs have been detected in the sediments of White Sand Branch and Haney Run Brook at concentrations exceeding the screening guidelines (Table 1; Weston 1997a). Maximum lead concentrations exceed screening guidelines by two orders of magnitude.

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68th Street Dump/Industrial Enterprises

Rosedale, Maryland

EPA Facility ID: MDD980918387

Basin: Gunpowder-Patapsco

HUC: 02060003

Executive Summary

From 1953 to 1969, a sanitary landfill operated on the 68th Street Dump/Industrial Enterprises property, where illegal dumping also occurred. Refuse, incinerator ash, and waste oils were disposed of at five source areas, and contamination is migrating to several streams that traverse the property. Trace elements have contaminated the soils and sediment at concentrations that exceed screening guidelines. The streams that traverse the site, the Back River, and Chesapeake Bay are the NOAA trust habitats of concern and contain numerous fish and invertebrate resources. Recreational fisheries are present in the streams that traverse the site and in the Back River.

Site Background

The 68th Street Dump/Industrial Enterprises property encompasses approximately 67 ha (165 acres) in Rosedale, Baltimore County, Maryland, adjacent to the Back River, an estuarine embayment of Chesapeake Bay (Figure 1). Several tributaries of the Back River traverse the site, including Herring Run, Redhouse Run, Moores Run, and an unnamed tributary of Herring Run (Figure 2; Weston 1999).

A sanitary landfill operated on the property from 1953 until a 1969 court order ended refuse operations. Illegal disposal activity has been observed as recently as 1993. Operations included the land-filling of industrial and commercial refuse, un-cooled incinerator ash, and disposal of waste oils in several pits. Site inspections reported problems that included uncontrolled fires, inadequate soil cover, nuisance odors, improper disposal of drums, and the migration of oil into adjacent surface waters. In 1979, state inspectors discovered more than 20 buried drums containing substances contaminated with trace elements. Refuse has been disposed of in the floodplain of Herring Run. The excavation of waste pits and the disposal of waste oils had also occurred near the stream (Weston 1999).

In total, five different source areas have been identified on the property: Source 1, the original landfill, adjacent to Herring Run; Source 2, also adjacent to Herring Run just east of Source 1; Source 3, an island situated between two channels of Herring Run; Source 4, adjacent to Redhouse Run; and Source 5, adjacent to an unnamed tributary of Herring Run (Figure 2; Weston 1999).

Pathways for the transport of contaminants off the property include the direct disposal of wastes into the floodplain, overland runoff into the streams, and groundwater. Because land-filling occurred directly in wetlands associated with the streams that traverse the property, wastes are in direct contact with the water table. Contaminated seeps have been observed on the banks of one of the unnamed tributaries (Weston 1999).

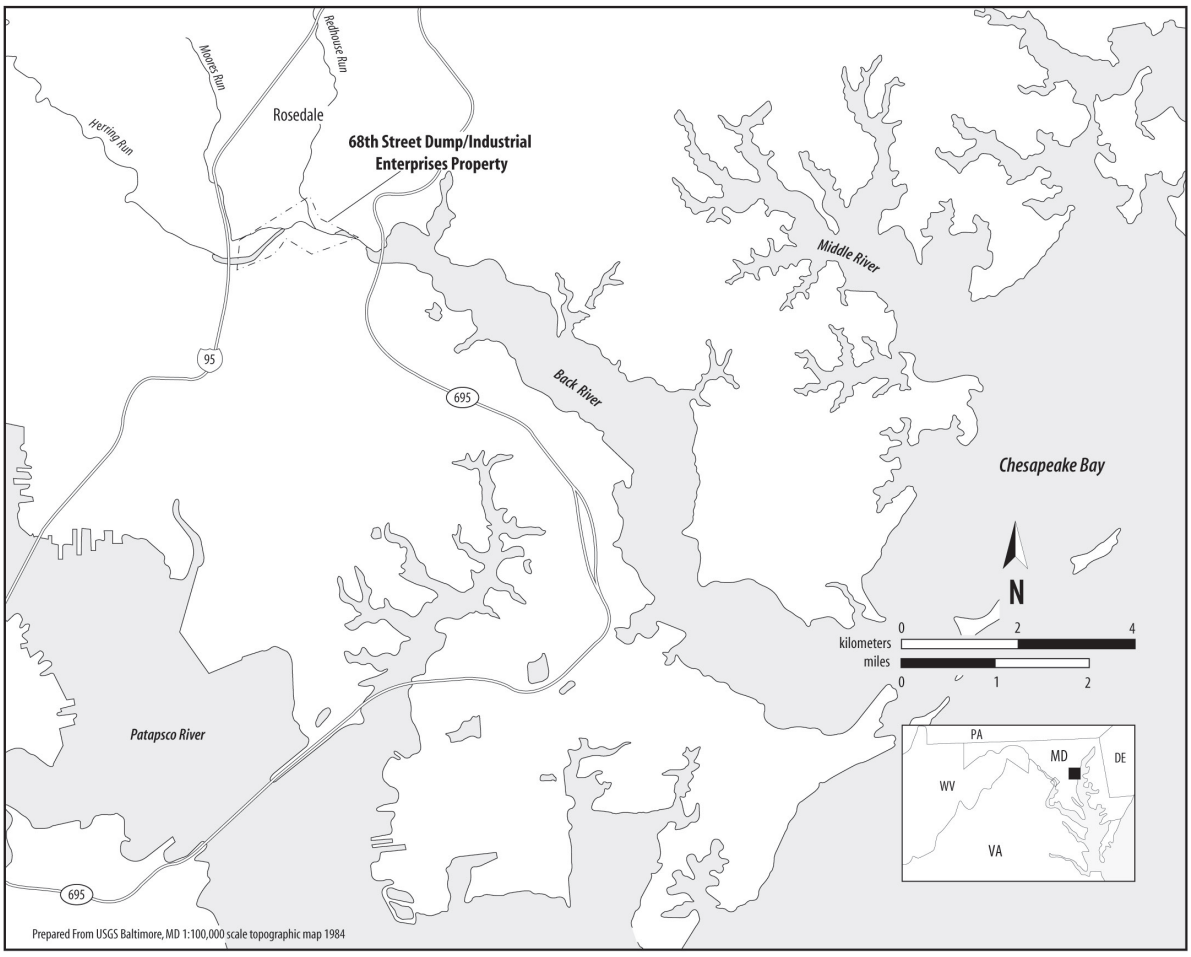

Figure 1. Location of the 68th Street Dump/Industrial Enterprises property in Rosedale, Maryland.

mental Protection Agency National Priorities List in January 1999. An Expanded Site Inspection was completed on the site in 1995 and a Final Hazard Ranking System Report was completed in 1999 (Weston 1999).

NOAA Trust Resources

The NOAA habitats of concern are Herring Run and its tributaries, Redhouse Run, Moores Run, and the Back River. Several anadromous and low-salinity fish and invertebrate species use the tidal streams that traverse the 68th Street Dump/Industrial Enterprises property and numerous estuarine species use the Back River (Weston 1999).

Herring, Moores, and Redhouse runs are tidally influenced in the vicinity of the property, with salinity ranging from 0 to 10 parts per thousand (ppt), depending upon season and precipitation. The tidal streams range from less than 10 to 35 m (< 33 to 115 ft) wide and 1 to 5 m (3 to 16 ft) deep. Sediments are primarily fine sands. The Back River is a shallow inlet of Chesapeake Bay with maximum depths of 10 m (33 ft) with substrate similar to the bay (USGS 1953). Salinity also fluctuates seasonally, averaging between 8 and 10 ppt (Majumdar et al. 1987).

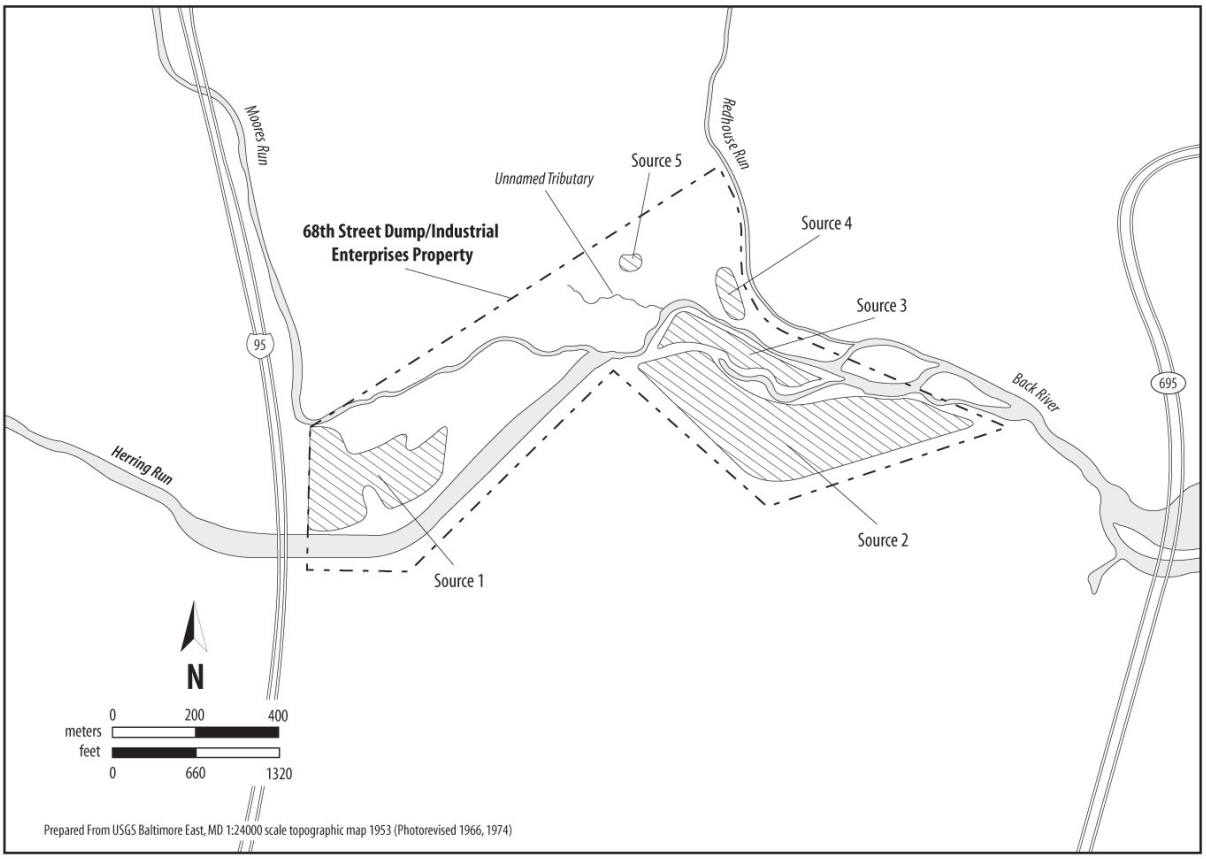

Figure 2. Detail of the 68th Street Dump/Industrial Enterprises property.

Estuarine forage fish tolerant of low salinities are found in the Herring, Moores, and Redhouse runs near the 68th Street Dump/Industrial Enterprises property. Species such as bay anchovy, sheepshead minnow, silversides, oyster toadfish, gobies, and killifishes are year-round residents in the tidal streams and Back River. Species such as bluefish, and the sciaenids (croaker, weakfish, seatrout, spot) are coastal spawners; eggs and larval stages drift offshore and juvenile stages migrate to Chesapeake Bay estuaries and inlets. Because many of these species are long-lived, juveniles may spend several years in estuaries like the Back River. Some adults species are found in the estuary seasonally (Stone et al. 1994).

Several anadromous fish, including alewife, blueback herring, white perch, yellow perch, and striped bass can be found in the Back River on a seasonal basis. Although yellow perch is a freshwater species in most areas of the country, they exhibit anadromous migrations in Chesapeake Bay (Stone et al. 1994). Herring Run has a small run of alewife spawning upstream of the site (Weston 1999).

Several invertebrates are present in the Back River including blue crab, grass shrimp, American oyster, and softshell clam. Juvenile and adult blue crab are abundant; mating and larval stages are also observed in the estuary although females usually migrate to coastal waters to brood and release eggs. Grass shrimp, oyster, and clams spend all life stages in the estuary (Stone et al. 1994).

Although recreational fisheries have been documented on the tidal streams near source areas on the 68th Street Dump/Industrial Enterprises property, the species harvested have not been reported. There are no commercial fisheries in the tidal streams or the Back River (Weston 1999).

Table 1. NOAA trust fish and invertebrate species in the Back River watershed (Majumdar et al. 1987; Stone et al. 1994; Weston 1999).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery[1]
ESTUARINE SPECIES						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Atlantic menhaden	*Brevoortia*		◆	◆		
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆		
Bluefish	*Pomatomus saltatrix*		◆	◆		◆
Cownose ray	*Rhinoptera bonasus*		◆	◆		
Gobies	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Spotted seatrout	*Cynoscion nebulosus*		◆	◆		◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp*	◆	◆	◆		
Summer flounder	*Paralichthys dentatus*		◆	◆		◆
Spot	*Leiostomus xanthurus*		◆	◆		
Weakfish	*Cynoscion regalis*		◆	◆		
ANADROMOUS/CATADROMOUS SPECIES						
Alewife	*Alosa psuedoharengus*					
American eel	*Anguilla rostrata*			◆		
American shad	*Alosa sapidissma*		◆			
Blueback herring	*Alosa aestivalis*		◆			
Striped bass	*Morone saxitilis*		◆		◆	
White perch	*Morone americana*		◆		◆	
Yellow perch	*Perca flavescens*		◆			
INVERTEBRATE SPECIES						
American oyster	*Crassostrea viginica*	◆	◆	◆		◆
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*	◆	◆	◆	◆	◆
Blue mussel	*Mytilis edulis*	◆	◆	◆		
Grass shrimp	*Paleomonetes gugio*	◆	◆	◆		
Softshell clam	*Mya arenaria*	◆	◆	◆		

1: Recreational fisheries present in Chesapeake Bay near the Back River (Majumdar et al. 1987).

There have been commercial oyster harvests in Chesapeake Bay adjacent to the Back River (Majumdar et al. 1987).

The State of Maryland has issued a health advisory restricting the consumption of American eel and channel catfish from the Back River because of elevated concentrations of chlordane in edible fish tissue (USEPA 2000).

Table 2. Maximum concentrations of contaminants of concern to NOAA detected in soils and sediments on or near the 68th Street Dump Site/Industrial Enterprises property (Weston 1999).

	Soils (mg/kg)		Stream Sediment (mg/l)				
Contaminant	Source Area	Mean U.S.[a]	Unnamed Tributary	Redhouse Run	Moores Run	Herring Run	TEL/ERL[b] (mg/kg)
Cadmium	100	0.06	ND	ND	ND	ND	0.596
Chromium	370	37	190	25	9.2	ND	37.3
Copper	5,300	17	190	8.8	7.0	74	34.0
Lead	3,000	16	590	30	43	230	35.0
Mercury	2.5	0.058	0.55	ND	ND	0.69	0.15
Nickel	220	13	110	8.3	5.7	52	18.0
Silver	18	0.05	ND	ND	ND	ND	1.0
Zinc	4,600	48	650	61	37	20	123.1
Benzo(a)pyrene	0.93	NA	ND	ND	ND	ND	0.0319
Benzo(g,h,I)perylene	0.92	NA	ND	ND	ND	ND	NA
Phenanthrene	14.0	NA	ND	ND	ND	ND	0.0419
Fluoranthene	20.0	NA	ND	ND	ND	0.9	0.111
Anthracene	4.0	NA	ND	ND	ND	ND	0.0853
Benzo(a)anthracene	11.0	NA	ND	ND	ND	ND	0.0317
Carbozole	ND	NA	ND	ND	ND	ND	NA
Total PCBs	0.83	NA	ND	ND	ND	ND	0.0227

NA: Guidelines not available
ND: Not detected; detection limits not available
a Shacklette and Boerngen (1984), except for silver and cadmium which are average concentrations in the earth's crust as reported by Lindsay (1979).
b TEL; Threshold Effects Level; Freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15-percent concentration in the effects data set) as compiled by Smith et al. (1996). ERL; Effects range-low; Marine sediment value. Concentration representing the lowest 10 percentile for the data in which effects were predicted in studies compiled by Long et al. (1995). In low-salinity areas, the lowest of the two values is the screening guideline.

Site-Related Contamination

Environmental investigations on the site have found contaminated soils and stream sediment. The Hazard Ranking Report identified approximately 20 soil borings and 13 sediment samples collected and evaluated on the property. Groundwater investigations have not been conducted at the site (Weston 1999).

The contaminants of concern to NOAA include the trace elements, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). These substances have been measured in environmental media on the site at concentrations that exceed screening guidelines. Table 2 compares the maximum concentrations of contaminants in environmental media on the site to appropriate screening guidelines.

The maximum concentrations of cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc in subsurface soil samples exceeded soil screening guidelines in Source Areas 1, 3, 4, and 5. The greatest concentrations were observed in Source Area 1, where concentrations of copper, lead, and zinc were above 2,500 mg/kg; exceeding soil screening guidelines by one to two orders of magnitude. In Source Area 4, concentrations of lead and zinc were above 1,500 mg/kg, exceeding

guidelines by an order of magnitude. In Source Area 3, concentrations of chromium, copper, and zinc were lower but still exceeded screening guidelines.

Elevated concentrations of several PAHs were observed in soils of Source Area 4. The maximum concentrations of phenanthrene, fluoranthene, and benzo(a)anthracene all exceeded 10 mg/kg. The PAHs were generally below 1.0 mg/kg at the remaining source areas. PCBs were observed in soils at Source Areas 2 and 5 at concentrations between 0.47 and 0.83 mg/kg. Screening guidelines for soils are not available for the PAHs and PCBs.

Maximum concentrations of chromium, copper, lead, mercury, nickel and zinc in stream sediment exceeded screening guidelines. The greatest concentrations were observed in an unnamed tributary to Herring Run. In this stream chromium, copper, lead, and zinc concentrations ranged from 190 to 650 mg/kg. Concentrations of copper, lead, mercury, and nickel also exceeded sediment screening guidelines in Herring Run. In Redhouse and Moores runs, lead was the only contaminant detected at a concentration exceeding its screening guideline.

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Former Nansemond Ordnance Depot

Suffolk, Virginia

EPA Facility ID: VAD123933426

Basin: Nansemond River

HUC: 02080208

Executive Summary

The Former Nansemond Ordnance Depot site was used for activities related to explosives and ammunitions and is located in Suffolk, Virginia, at the confluence of the Nansemond and James rivers. Surface water and sediment at the site contain concentrations of trace elements, PAHs, and pesticides that exceed screening guidelines. Of particular concern is substantial contamination of a beachfront disposal area. This area is subject to erosion into the James River, which provides habitat for numerous NOAA trust resources. Streeters Creek contains concentrations of PAHs in sediment that pose a risk to aquatic organisms, although information on specific NOAA trust resources in the creek was not available.

Site Background

The Former Nansemond Ordnance Depot (FNOD) is located on a decommissioned 430 hectare (1,062 acre) U.S. military facility in Suffolk, Virginia (Figure 1). The property is bordered to the west by the Nansemond River, to the north by the James River and Hampton Roads, and to the east by Streeters Creek.

The depot was used during World Wars I and II and the intervening years for various activities related to the preparation, processing, storage, shipment, salvage, reconditioning, and disposal of ammunition. It was apparently used after World War II in demobilization, including dumping explosives, ammunition, and chemicals. Numerous areas of concern have been identified at the FNOD (Table 1 and Figure 2). The potential waste sources and affected areas that have been investigated include landfills and disposal areas, burning grounds, an impregnation kit area, on-site water bodies, and offshore areas. The FNOD property is now occupied mostly by Tidewater Community College (TCC), the General Electric (GE) Company, and Interstate 664 (Gannett Fleming 1998a).

Beachfront erosion, surface water runoff, and groundwater migration are the pathways for migration of contaminants to NOAA trust habitats. Of particular concern is the debris on the James River Beach Front Area, which is subject to continued erosion into the river. Surface water ponds and creeks are shown in Figure 2. The majority of stormwater runoff west of I-664 flows through the TCC Lake. The upper surface of the water table ranges from several feet to as much as 12 m (39 ft) or more below land surface. The permeability of the soil is moderately rapid. Information on the direction of groundwater flow was not available (Gannett Fleming 1998a).

The FNOD is currently classified as a Formerly Used Defense Site. The U.S. Army Corps of Engineers is identifying and remediating areas of concern at the site. The FNOD was placed on the National Priorities List in July 1999 (U.S. EPA 2000).

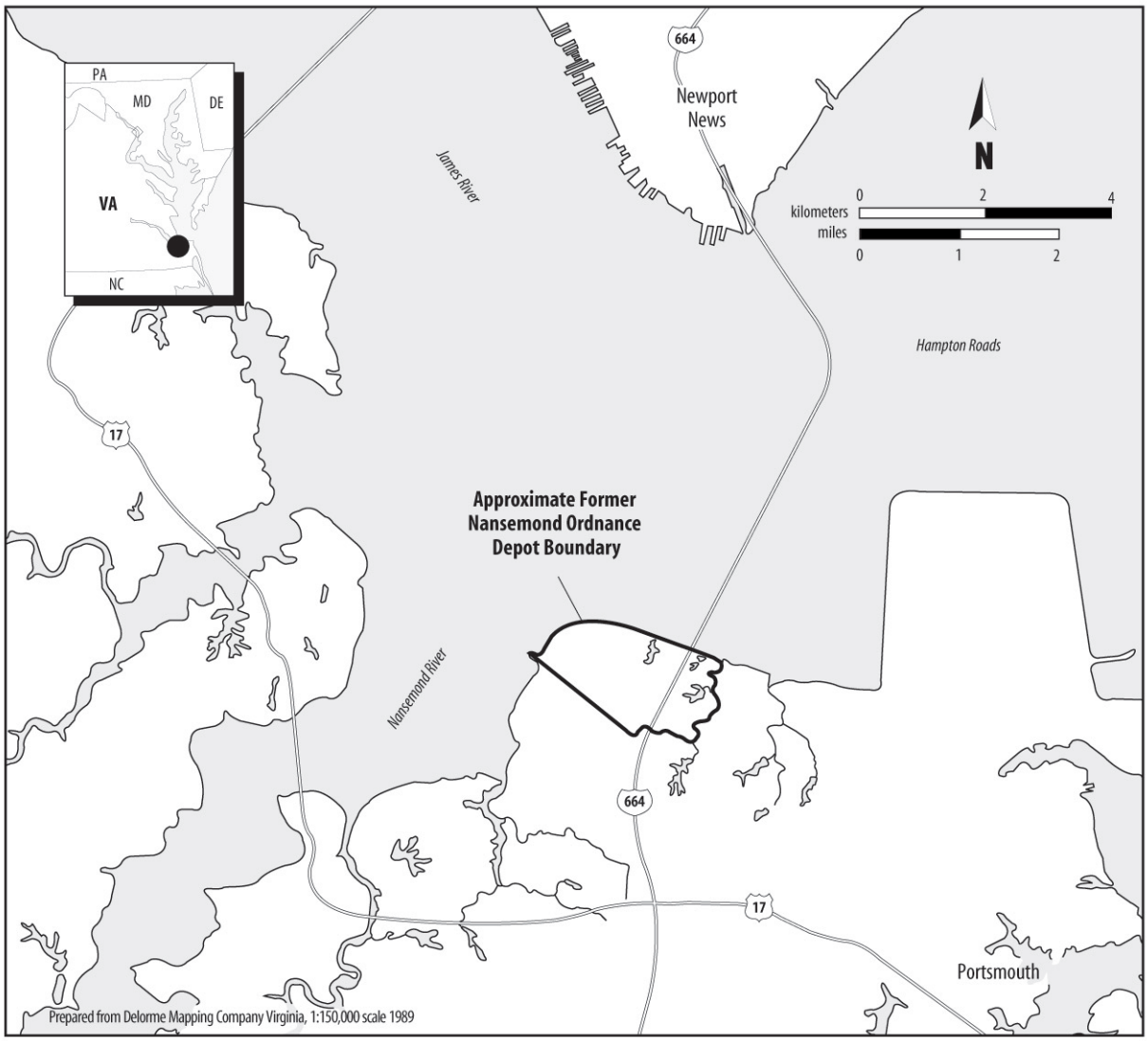

Figure 1. Location of the former Nansemond Ordnance Depot in Suffolk, Virginia.

NOAA Trust Resources

Habitats of primary concern to NOAA are surface waters and associated bottom substrates of the Nansemond River, the James River, and Hampton Roads, both estuaries of Chesapeake Bay. Anadromous fish, estuarine fish, and invertebrates are the resources of concern within the estuaries (Table 2). Estuarine waters of this area range from shallow flats and tidal streams generally less than 2 m (6.5 ft) deep to trenches that are 13 m (43 ft) deep (USGS 1986, 1989). Salinities range from 14 to 20 parts per thousand, and sediments range from silts to sands (Majumdar et al. 1987). No resource information was available for Streeters Creek, a small tidal stream that traverses the edge of the facility (Gillingham personal communication 2000).

Trawl surveys by the Virginia Institute of Marine Science (VIMS) indicate that the estuary provides nursery and adult habitat for numerous estuarine and marine fish. Estuarine residents include bay anchovy, oyster toadfish, sheepshead minnow, killifishes, silversides, Northern pipefish, gobies, and hogchoker (VIMS 1989). All life stages of these species are spent within the estuary and several of the species are highly abundant. Species such as bluefish, mullet, pinfish, butterfish, and the sciae-

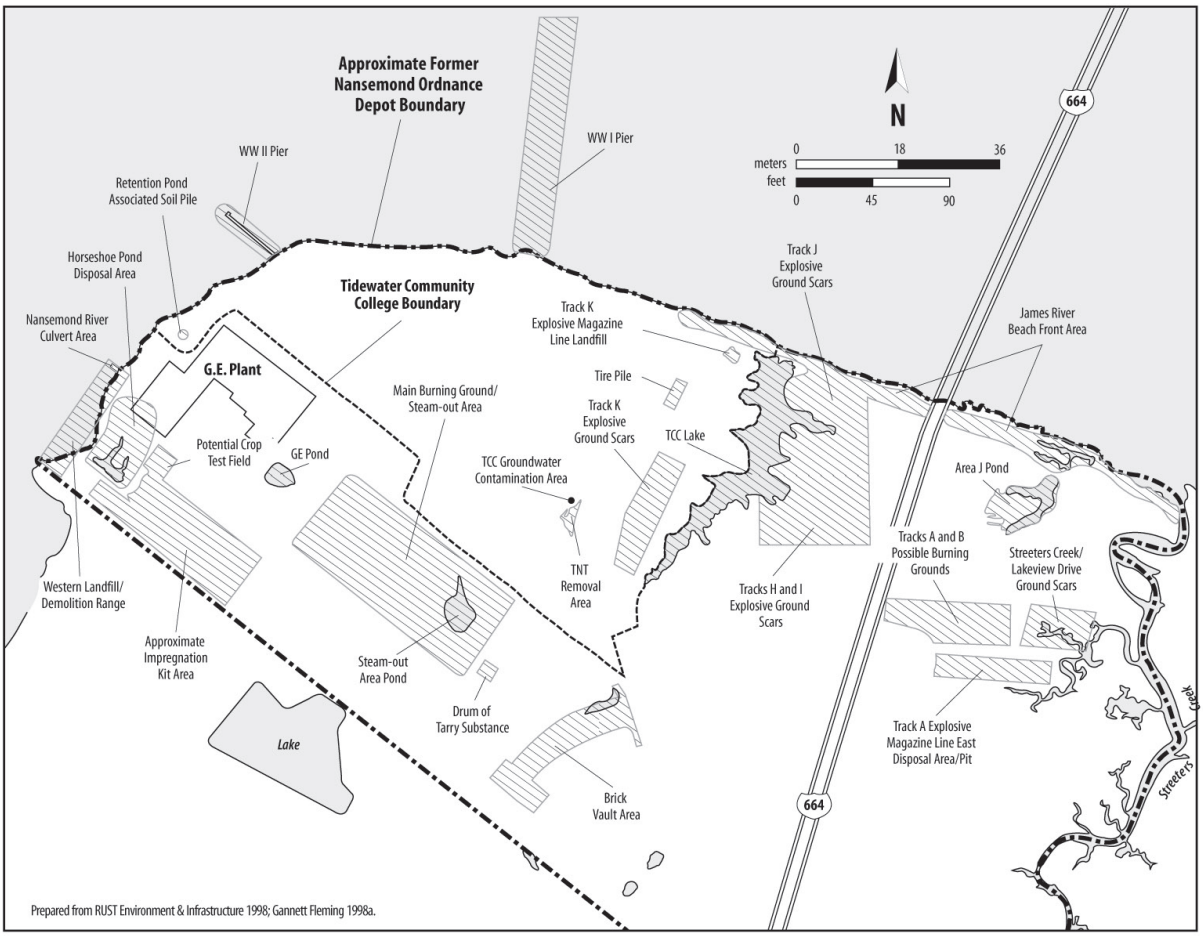

Figure 2. Detail of the Former Nansemond Ordnance Depot Property.

nids (croaker, weakfish, spotted seatrout, spot, drum) are coastal spawners; eggs and larval stages drift offshore and juvenile stages migrate to the estuary. Because many of these species are long-lived, juveniles may spend several years in the estuary. Adults of several of the species also can be found within the estuary seasonally. Bluefish, spot, and Atlantic croaker are particularly abundant in the area (Stone et al. 1994).

Several anadromous fish use the estuaries as a migratory corridor, juvenile nursery, and adult habitat. Juvenile and adult white perch are abundant; the adults spawn in the Nansemond River upstream of the site. Striped bass, particularly juvenile stages, are common in the estuary. Adults may spend time in the area as well, but many move seaward. Blueback herring and alewife also are present in the estuaries, spawning in upper portions of the Nansemond River, upstream of the site. The catadromous American eel is found throughout the Chesapeake basin, with juvenile life stages near the site (Stone et al. 1994).

Several invertebrates are present in the estuary including blue crab, grass shrimp, eastern oyster, and northern quahog. Juvenile and adult blue crab are abundant; mating and larval stages also are observed in the estuary although females usually migrate to coastal waters to brood and release eggs. Grass shrimp, oyster, and quahog spend all life stages in the estuary (Stone et al. 1994).

Substantial commercial and recreational fisheries are present in the Hampton Roads portion of Chesapeake Bay. Popular species include bluefish, croaker, spot, weakfish, flounder, blue crab,

Table 1. Areas of concern at the Former Nansemond Ordnance Depot (Rust Environment & Infrastructure 1998; Gannett Fleming 1998a).

Area of Concern	Description[a]	Available Data[b]
James River Beach Front Area	Used as a disposal area during WW II. Approximately 6 ha (15 acres) of the beach front is littered with miscellaneous debris, including metal machinery parts and German artillery shells.	15 soil samples
TNT Removal Area	Approximately 0.8 to 1.2 ha (2 to 3 acres) used as a disposal and maintenance area for ordnance-related waste, bulk explosives, propellants, small arms ammunition, and scrap metal from about 1917 to 1950. A removal action for contaminated soils was conducted in 1992.	7 soil samples (after the removal action)
Main Burning Ground/Steam-out Area	Used to detonate explosives and clean out TNT from shells during and after WW I and WW II.	4 soil samples
Impregnation Kit Area	Used as a disposal area for WW I impregnation kits and other debris.	23 soil samples
Horseshoe Pond Disposal Area	Used as a disposal and burning area for solid waste and ordnance.	2 soil samples, 5 sediment samples, 5 surface water samples
Western Landfill/ Demolition Range	Area is littered with miscellaneous debris. The activities conducted are not known.	One sediment sample, one surface water sample
Retention Pond-Associated Soil Pile	Ordnance and explosive materials were found while excavating a retention basin on the TCC Campus.	No data were available
TCC Lake	Ammunition magazines, a smokeless powder magazine, a primer/ fuse magazine, a powder exchange, and a tetryl platform once operated around the lake.	6 sediment samples, 6 surface water samples
Area J Pond	The site contains three former smokeless powder magazines and ground scars exist along the edge of the pond.	3 sediment samples, 3 surface water samples
Potential Crop Test Field	Identified as a ground scar and may possibly be a defoliant or biological testing area.	No data were available
Tire Pile	Contains large amounts of stockpiled tires and the area is possibly a former solid waste dump.	One soil sample
Tracks A & B Possible Burning Grounds	TNT and ordnance are suspected to have been burned in this area.	One soil sample
Tracks H, I, J, K Explosive Ground Scars	Mounding and ground scars have been observed around the former explosive magazines.	No data were available
Streeters Creek/ Lakeview Drive Ground Scars	Used for dumping of solid wastes and construction debris.	4 soil samples, 3 sediment samples, 4 surface water samples
Track K Explosive Magazine Line Landfill	Evidence of solid waste has been reported in the area.	No data were available
Track A Explosive Magazine Line East Disposal Area/Pit	The site is believed to have been a solid waste disposal area, and mounding and ground scars have been observed.	No data were available
WW I- and WW II-Era Piers	Used for loading and unloading munitions and engineering materials.	One sediment sample
Brick Vault Area	Contains up to 30 vaults that may have been used for irrigation of crops, steam-out of TNT, and management of waste water generated in the burning ground.	Approx. 48 soil samples, 6 groundwater samples, 4 sediment samples, and 2 surface water samples
GE Pond	Several areas of concern surround the pond.	One sediment sample, one surface water sample
TCC Groundwater Contamination	Groundwater near the TNT disposal area contains explosives and trace elements.	102 soil samples, 16 groundwater samples
Nansemond River Culvert Area	Stormwater runoff flowing through the culvert may be contaminated from soil and groundwater in the area.	One sediment sample, one surface water sample
Drum of Tarry Substance	A drum filled with a black tarry substance of unknown origin.	One soil sample

a: Size of site and dates of operation provided only if the information was available from the documents reviewed.
b: Data from Gannett Fleming (1998a and 1998b).

Table 2. NOAA trust resources in the vicinity of the Former Nansemond Ordnance Depot (Stone et al. 1994; VIMS 1989).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
ANADROMOUS/CATADROMOUS						
Alewife	*Alosa pseudoharengus*		◆			
American eel	*Anguilla rostrata*		◆		◆	
Blueback herring	*Alosa aestivalis*		◆			
Striped bass	*Morone saxatilis*		◆	◆	◆	
White perch	*Morone americana*		◆	◆		
MARINE/ESTUARINE FISH SPECIES						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Atlantic herring	*Clupea harengus*		◆	◆		
Atlantic menhaden	*Brevoortia tyrannus*		◆	◆		
Bay anchovy	*Anchoa mitchilli*		◆	◆		
Black drum	*Pogonias cromis*		◆	◆		
Black sea bass	*Centropristis striata*		◆	◆		
Bluefish	*Pomatomus saltatrix*		◆	◆		◆
Butterfish	*Peprilus triacanthus*		◆	◆		
Cownose ray	*Rhinoptera bonasus*		◆	◆		
Gobies	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Mullets	*Mugil spp.*		◆			
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*		◆			
Pinfish	*Lagodon rhomboides*		◆	◆		
Red drum	*Sciaenops ocellatus*		◆	◆		◆
Red hake	*Urophycis chuss*		◆			
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Scup	*Stenotomus chrysops*		◆			
Spotted seatrout	*Cynoscion nebulosus*		◆	◆		◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp*	◆	◆	◆		
Skates	*Raja spp.*		◆	◆		
Spot	*Leiostomus xanthurus*		◆	◆		◆
Summer flounder	*Paralichthys dentatus*		◆	◆		◆
Tautog	*Tautoga onitis*		◆	◆		
Weakfish	*Cynoscion regalis*		◆	◆		
Windowpane flounder	*Scophthalmus aquosus*		◆	◆		
INVERTEBRATE SPECIES						
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*	◆	◆	◆	◆	◆
Blue mussel	*Mytilis edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		◆
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
Northern quahog	*Mercenaria mercenaria*	◆	◆	◆		◆

oyster, and quahog (Majumdar et al. 1987). Commercial fisheries also occur with the majority of the harvest consisting of blue crab. The Virginia Marine Resources Commission did not have any information on Streeters Creek; however, the tidal stream is not actively managed and fisheries are likely to be limited (Gillingham personal communication 2000). Bivalve harvests are restricted surrounding the FNOD facility because of industrial runoff (Wright personal communication 2000).

Site-Related Contamination

Numerous investigations involving sampling of soils, groundwater, sediment, and surface water have been conducted throughout the site (Gannett Fleming 1998a). The number of samples collected, and the type of matrix sampled is presented in Table 1. Maximum concentrations of contaminants detected at the FNOD, compiled from data in Gannett Fleming (1998a and 1998b) are presented in Table 3. Trace elements, polynuclear aromatic hydrocarbons (PAHs), and pesticides have been detected at concentrations greatly exceeding screening guidelines (Table 3). Ordnance compounds also have been detected, but screening guidelines are not available for these contaminants (Table 4).

The greatest concentrations of arsenic, cadmium, copper, lead, and PAHs found in soil were collected from the James River Beach Front Area, which is subject to erosion into the river. Concentrations of trace elements exceeded average U.S. concentrations by two to three orders of magnitude. Screening guidelines for PAHs in soil are not available, but the PAH concentration exceeded the sediment ERL by two orders of magnitude. The highest concentration of zinc was found in soil from the Impregnation Kit Area. Pesticides and ordnance compounds were detected throughout the FNOD. Maximum concentrations of trinitrotoluene (TNT) and dinitrotoluene (DNT) were found in the vicinity of the TNT Removal Area.

Groundwater samples were collected at the TCC Groundwater Contamination Area and the Brick Vault Area. Numerous ordnance compounds were detected, primarily at the TCC Groundwater Contamination Area. Copper detected in groundwater was an order of magnitude greater than the ambient water quality criteria (AWQC).

Sediment and surface water samples were collected from freshwater ponds and creeks on the FNOD property, including Horseshoe Pond, TCC Lake, Area J Pond, Streeters Creek, the Steam-out Area Pond, a water body near the Brick Vault Area, and a culvert on the western edge of the site draining into the Nansemond River. In addition, four offshore sediment samples have been collected in the James River adjacent to the FNOD.

The maximum sediment concentrations of copper and lead were in samples collected from the Nansemond River Culvert Area. Sediment from Streeters Creek contained total PAH concentrations that substantially exceeded the ERL guideline. Elevated dichlorodiphenyltrichloroethane (DDT) and dichlorodiphenyldichloroethylene (DDE) concentrations were found in sediment from Horseshoe Pond. Surface water samples collected from Horseshoe Pond contained the greatest concentrations of cadmium, nickel, silver, and zinc. Concentrations of lead in surface water from the Brick Vault Area exceeded the AWQC by four orders of magnitude. In the offshore areas, sediment from one location near the James River Beach Front Area had concentrations of copper, lead, and zinc that slightly exceeded their respective screening guidelines.

Table 3. Maximum concentrations of trace elements, PCBs, PAHs, and pesticides detected in samples collected from the Former Nansemond Ordnance Depot (Gannett Fleming 1998a and 1998b).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	On-site Soils	Mean U.S.[a]	Ground-water	Surface water	AWQC[b]	Sediment	ERL or TEL[c]
TRACE ELEMENTS							
Arsenic	700	5.2	11	23	36	18	5.9
Cadmium	21	0.06	<5	5.1	2.2[d]	1.4	0.596
Chromium	120	37	40	49	11	47	37.3
Copper	20,000	17	230	49	3.1	320	34
Lead	4,300	16	37	57,000	2.5[d]	400	46.7
Mercury	1.0	0.058	<0.4	0.52	0.77	0.52	0.15
Nickel	40	13	40	220	8.2	32	18
Silver	4.9	0.05	<5	3.3	0.12	2.7	1.0
Zinc	11,000	48	120	1,900	81	270	123.1
SVOCs							
PCBs	0.48	NA	NA	ND	0.014	ND	0.0227
Total PAHs	750	NA	NA	ND	300[e,f]	150	4.022
PESTICIDES							
Alpha chlordane	0.0012	NA	N/A	ND	0.002[g,h]	0.031	0.0005
DDD	0.14	NA	N/A	ND	0.6[e,f]	0.12	0.002
DDE	0.079	NA	N/A	ND	14[e,f]	0.73	0.00142
DDT	0.50	NA	N/A	ND	0.0005[h]	4.1	0.001
Dieldrin	1.3	NA	N/A	ND	0.00095[h]	0.0005	0.00002
Alpha-BHC	0.0013	NA	N/A	0.024	0.08[i]	0.12	0.00094[i]
Methoxychlor	0.0075	NA	NA	0.075	0.03	ND	NA

NA: Screening guidelines not available.
N/A: Not analyzed.
ND: Not detected; detection limit not available.
a: Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the earth's crust from Lindsay (1979).
b: Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Lower of the marine or freshwater chronic criteria presented unless otherwise noted.
c: The lower of the two guidelines, the marine Effects Range-Low (ERL) or the freshwater Threshold Effects Level (TEL), was chosen. The ERL represents the 10th percentile for the dataset in which effects were observed or predicted in studies compiled by Long et al. (1995; 1998). The TEL is the geometric mean of the 15th percentile of the effects data and the 50th percentile of the no-effects data, and is intended to represent the concentration below which adverse biological effects rarely occurred (Smith et al. 1996).
d: Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L $CaCO_3$.
e: Lowest observable effect level.
f: Marine acute value presented.
g: Value for chlordane.
h: Value has been halved to be comparable to criteria derived by 1985 guidelines.
i: Value for gamma BHC (lindane).

Table 4. Maximum concentrations of ordnance compounds detected at the Former Nansemond Ordnance Depot. There are no screening guidelines for ordnance compounds (Gannett Fleming 1998a and 1998b).

Organic Compounds	Soil (mg/kg)	Groundwater (ug/L)	Surface Water (ug/L)	Sediment (mg/kg)
Dinitrobenzene	0.49	1.8	ND	ND
1,3 Dinitrobenzene	0.11	12	<0.3	<0.05
2-Amino-dinitrotoluene	ND	16	ND	ND
4-Amino-dinitrotoluene	ND	21	ND	ND
2-Amino-4,6-dinitrotoluene	47,000	53	<0.3	<0.05
2,4-Dinitrotoluene	0.54	5.5	<0.3	<0.05
2,6-Dinitrotoluene	ND	2.9	<0.3	<0.05
HMX	ND	1.3	<0.5	<0.1
RDX	ND	13	<2.2	<0.4
Tetryl	ND	3.0	<0.5	<0.1
1,3,5-Trinitrobenzene	4.4	16	<0.3	<0.05
Trinitrotoluene	2,150	125	ND	ND
2,4,6-Trinitrotoluene	650	170	<0.3	<0.05
Nitroglycerin	1.6	ND	ND	ND

ND: Not detected; detection limit not available

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American Brass, Inc.

Headland, Alabama

EPA Facility ID: ALD981868466

Basins: Lower Chattahoochee and Upper Choctawhatchee

HUCs: 03130004 and 03140201

Executive Summary

American Brass, Inc. (ABI) is an inactive foundry in Headland, Alabama approximately 31 km (19 mi) west of the Chattahoochee River and 9.8 km (6.1 mi) southeast of the Choctawhatchee River. Soil, groundwater, surface water, and sediment at the ABI property have been contaminated with trace elements and PCBs at concentrations that exceed screening guidelines. The Choctawhatchee River is one of the only remaining significant habitats of the federally endangered and state protected Gulf sturgeon, and is therefore of primary concern to NOAA. Sampling has not been conducted downstream from the site to determine the extent of contaminant transport from the ABI property to NOAA trust resources.

Site Background

The American Brass, Inc. (ABI) site property occupies approximately 60 hectares (148 acres) in Headland, Alabama. The Choctawhatchee River flows through Florida and into the Gulf of Mexico approximately 170 km (106 mi) southwest of the ABI site. The Chattahoochee River runs along the Georgia-Alabama border into Florida where it flows into the Gulf of Mexico approximately 190 km (118 mi) south of the ABI property.

ABI operated as a smelter/foundry from May 1977 to December 1992 (ADEM 1995). Scrap metals were melted down at ABI to extract brass, which was then produced into ingots. Two by-products of this process were finely crushed slag and furnace dust. The Ball Mill Stockpile and the Slag Storage Area are two locations where these by-products were stored (Figure 2). The exact location of the Ball Mill Stockpile was not available. Retired furnace bricks, saturated with brass, were stored in the Brick Pile located on the east side of the ABI property (ADEM 1995). In addition to these waste piles, above-ground storage tanks (ASTs) known to store fuel oil and diesel are located at the north end of the ABI property (Figure 2). Cooling water and ash from the ABI furnaces were disposed of in a clay-lined settling pond located at the northeast corner of the ABI property (USEPA 1998). Information was not available on whether one of the two ponds identified in Figure 2 was the disposal pond.

The U.S. Environmental Protection Agency (EPA) prepared a Hazard Ranking System package in 1998 and is currently conducting a Remedial Investigation for the ABI site. The Alabama Department of Environmental Management (ADEM) completed a Site Investigation for ABI in 1996. The U.S. EPA placed the ABI site on the National Priorities List in May 1999 (USEPA 2000).

The primary pathway to transport contaminants from the ABI property to NOAA trust resources is via surface water. A portion of the runoff from the site property flows northwest to a small tributary called Dunham Creek that connects to a larger tributary, Blackwood Creek, approximately 5.0

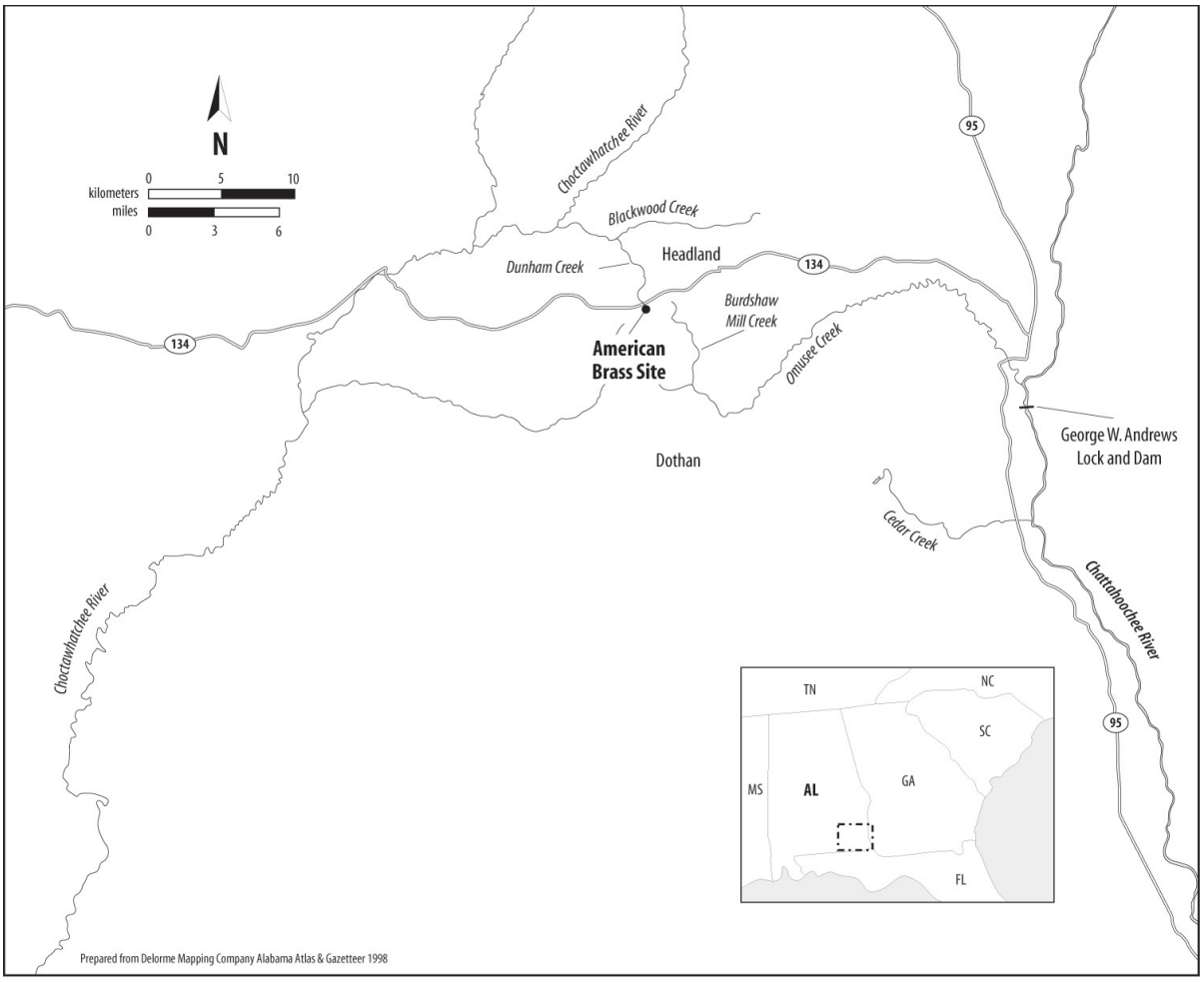

Figure 1. Location of the American Brass Site in Headland, Alabama.

km (3.1 mi) upstream (Figure 1). Blackwood Creek then flows west 4.7 km (2.9 mi) into the Choctawhatchee River. Another potential surface water pathway is via Burdshaw Mill Creek, which originates approximately 2 km (1 mi) east of the ABI site. Approximately 5 km (3 mi) downstream of its origin, Burdshaw Mill Creek connects with the larger Omusee Creek, which then flows 27.6 km (17.1 mi) into the Chattahoochee River (Figure 1). The secondary pathway to transport contaminants from the ABI site to NOAA trust resources is via groundwater. At the site property groundwater flows east and is encountered between 5.5 and 8.8 m (18 and 29 ft) below ground surface.

NOAA Trust Resources

The American Brass facility lies on a surface water divide of the Chattahoochee and Choctawhatchee river basins. Within the Choctawhatchee basin, Dunham and Blackwood creeks are the primary NOAA trust habitats of concern. Very little information was available on these low-gradient, secondary tributary streams.

In the Choctawhatchee River, the trust species of concern to NOAA are the anadromous Gulf sturgeon and Alabama shad, and the catadromous American eel (Table 1). There are no dams on the Choctawhatchee River and, because it is one of the few remaining free-flowing rivers in the region, it provides important spawning habitat for the Gulf sturgeon (Weathers 2000; Figure 1). Due to

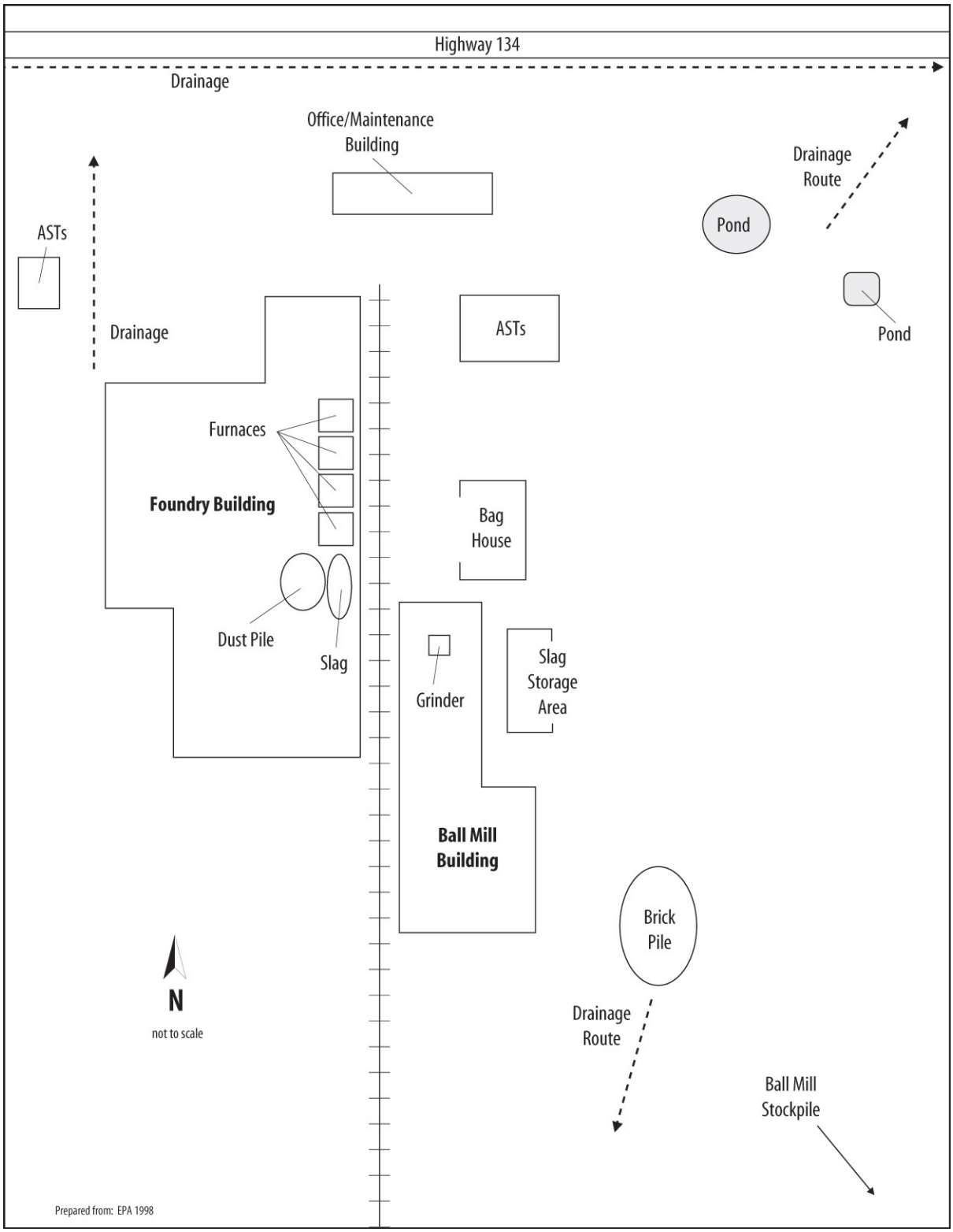

Figure 2. Detail of the American Brass Site.

Table 1. NOAA trust resources of concern in the Chattahoochee and Choctawhatchee rivers downstream from the American Brass Inc., site property (Scheidegger 1996; Weathers 2000).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
ANADROMOUS/CATADROMOUS						
American eel	*Anguilla rostrata*			◆		
Gulf sturgeon[a, b]	*Acipenser oxyrinchusdesotoi*	◆	◆			
Alabama shad	*Alosa alabamae*	◆				

a Federally endangered
b Protected by the State of Alabama

loss of habitat, the Gulf sturgeon is listed as federally endangered by the U.S. Fish and Wildlife Service, and is also listed as protected by the State of Alabama (Weathers 2000). Gulf sturgeon have been collected in the Choctawhatchee approximately 40 km (25 mi) downstream from Dunham Creek, but it is not known how much farther upstream they migrate, or whether they would use Blackwood or Dunham creeks (Scheidegger 1996).

Ongoing studies show that Alabama shad enter the Choctawhatchee River each year to spawn (Scheidegger 1996). Information was not available on the use of the river by Alabama shad near the site property or in Blackwood or Dunham creeks. Although specific information on the presence of American eel in the Choctawhatchee and Chattahoochee rivers was unavailable, it is known that they use the rivers in the southern half of Alabama (Scheidegger 1996).

Gulf sturgeon, Alabama shad, and American eel use the lower reaches of the Chattahoochee River, but several large dams restrict upstream migration of anadromous fish (Weathers 2000). Some incidental passage of fish may occur through the locks, but there is no regular upriver movement of fish for spawning. There are no plans for restoring access to upstream habitat in the Chattahoochee River for anadromous fish (Weathers 2000). There is no commercial or recreational fishing for NOAA trust species in the Choctawhatchee or Chattahoochee rivers (Weathers 2000).

Site-Related Contamination

Samples collected at the ABI property found contaminants in soil, groundwater, surface water, and sediment at concentrations that exceeded screening guidelines (Table 2). In April 1996, 10 soil samples, two sediment samples, and five groundwater samples were collected from the ABI site (PRCEM 1996). Five surface water samples and seven sediment samples were collected as part of the Site Inspection prepared by ADEM in August 1996 (ADEM 1996).

At the ABI property the primary contaminants of concern to NOAA are trace elements. Contaminants of secondary concern are polychlorinated biphenyls (PCBs). Table 2 summarizes maximum concentrations, along with the appropriate screening guidelines.

Cadmium, copper, and zinc were detected in soil from the ABI property at concentrations that exceeded screening guidelines by two orders of magnitude (Table 2; PRCEM 1996). A soil sample collected from the Slag Storage Area (Figure 2) was the source of five out of the six maximum concentrations reported for trace elements (Table 2). The maximum concentration of Aroclor 1260

Table 2. The maximum concentrations of contaminants of concern detected in environmental media collected at or near the ABI site from data presented in ADEM (1996) and PRCEM (1996).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	Mean U.S.[a]	Ground water	Surface water	AWQC[b]	Sediment	TEL[c]
TRACE ELEMENTS							
Cadmium	8.2	0.06	3	3	2.2[d]	90	0.596
Copper	9,000	17	140	3,000	9[d]	11,000	35.7
Lead	1,100	16	31	480	2.5[d]	30,000	35
Nickel	140	13	20	22	52[d]	69	18
Silver	3.1	0.05	ND	ND	0.12	3.5	1.0[e]
Zinc	17,000	48	300	4,700	120[d]	78,000	123.1
PCBs							
Aroclor-1260	7.1	NA	1.5	ND	0.014	ND	0.0341

ND Not detected; detection limit not available.
NA Screening guidelines not available.
a Shacklette and Boerngen (1984), except for cadmium and silver, which represent average concentrations in the earth's crust from Lindsay (1979).
b National recommended ambient water quality criteria (USEPA 1999). Freshwater chronic criteria presented.
c TEL; Threshold Effects Level; freshwater sediment value. Concentration below which adverse effects were rarely observed (geometric mean of the 15-percent concentration in the effects data set) as compiled by Smith et al. (1996).
d Criterion expressed as a function of total hardness; concentrations shown correspond to hardness of 100 mg/L.
e TEL not available; marine Effects Range-Low (ERL) presented. ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al (1995).

(PCB) was detected in soil located near the Bag House (Figure 2; PRCEM 1996). Screening guidelines for PCBs in soil are not available.

Surface water samples collected at the ABI property contained concentrations of copper, lead, and zinc that exceeded the screening guidelines by an order of magnitude (Table 2; ADEM 1996). All the maximum concentrations of trace elements shown in Table 1 were detected in a sample collected from an unnamed creek located near the Ball Mill Stockpile.

Three trace elements found in groundwater at the ABI property were an order of magnitude greater than the screening guidelines. The maximum concentrations of lead and zinc were detected in a monitoring well located north of the Brick Pile (Figure 2; Table 2; PRCEM 1996). The maximum concentration of copper was detected in a residential well approximately 230 m (252 yd) east of the ABI property (Table 2; PRCEM 1996). Aroclor 1260 was detected in the monitoring well located north of the Brick Pile (Figure 2) at a concentration exceeding screening guidelines by an order of magnitude (Table 2).

Six trace elements were detected in sediment at the ABI property at concentrations that exceeded the Threshold Effects Levels (TELs; Table 2). Cadmium, copper, lead, and zinc concentrations were two orders of magnitude greater than the TELs in a sediment sample collected from the settling

pond (PRCEM 1996). Zinc, lead, and copper were detected at concentrations exceeding the TELs in sediment collected from both Dunham Creek and the unnamed creek adjacent to the Ball Mill Stockpile.

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Delatte Metals

Ponchatoula, Tangipahoa Parish, Louisiana

EPA Facility ID: LAD052510344

Basin: Lake Maurepas

HUC: 08070204

Executive Summary

From the 1960s to the early 1990s, Delatte Metals operated battery recycling facilities adjacent to Selsers Creek, which flows to the Lake Pontchartrain estuary. Lead plating from used batteries was smelted into lead ingots at the property. Battery acid was stored in neutralization ponds and wastewaters discharged to drainage ditches that flow to Selsers Creek. Elevated concentrations of lead and other trace elements were observed in soils, groundwater, stream surface water, and stream sediment. The catadromous American eel uses Selsers Creek and numerous other estuarine species are present in the Lake Pontchartrain estuary, approximately 15 km (9 mi) south of the site. Recreational and commercial fisheries are present in Lake Pontchartrain and the federally protected Gulf sturgeon uses the estuary as a migratory corridor to natal streams.

Site Background

The Delatte Metals property is adjacent to Selsers Creek and occupies approximately 8 ha (19 acres) in Ponchatoula, Tangipahoa Parish, Louisiana (Tetra Tech 2000). From the property, Selsers Creek flows for about 3 km (1.8 mi) to an unnamed canal, which flows another 11.5 km (7 mi) to the Lake Ponchartrain estuary (Figure 1).

Two battery recycling facilities operated on the property from the 1960s to about 1992. Operations included demolition of spent batteries to remove lead plates and smelting of plates into lead ingots. Battery acid was stored in neutralization ponds (Figure 2). The former smelter consisted of a rotary furnace that chemically reduced lead compounds, melted the metallic lead, and oxidized the carbon in the battery fragments. The smelting process used coke, recycled slag, battery parts, lead oxide, arsenic, and antimony. Furnace washwater was collected in a concrete sump and discharged to a drainage ditch that drains to Selsers Creek (Figure 2; Tetra Tech 2000).

When the facilities closed, about 6 million empty battery casings and several surface impoundments with either very low (1) or very high pHs (12) were left behind (Tetra Tech 2000). Several removal actions have been undertaken on the property, including the removal of battery casings, closure of surface impoundments, and removal of lead contaminated soils. The U.S. Environmental Protection Agency listed the Delatte Metals property on the National Priorities List in January 1999. A remedial investigation (RI) was completed for the site in January 2000 (Tetra Tech 2000).

The principal pathway for contaminant migration off the property is via surface ditches that traverse the property and discharge to Selsers Creek. A fish kill in Selsers Creek, adjacent to the property, was documented in 1984. The pH of stream water at the time of the fish kill was 1.9. Contaminant migration through the groundwater may also occur; shallow groundwater is encountered from the ground surface to about 8.5 m (28 ft) below ground surface and flows north-north-

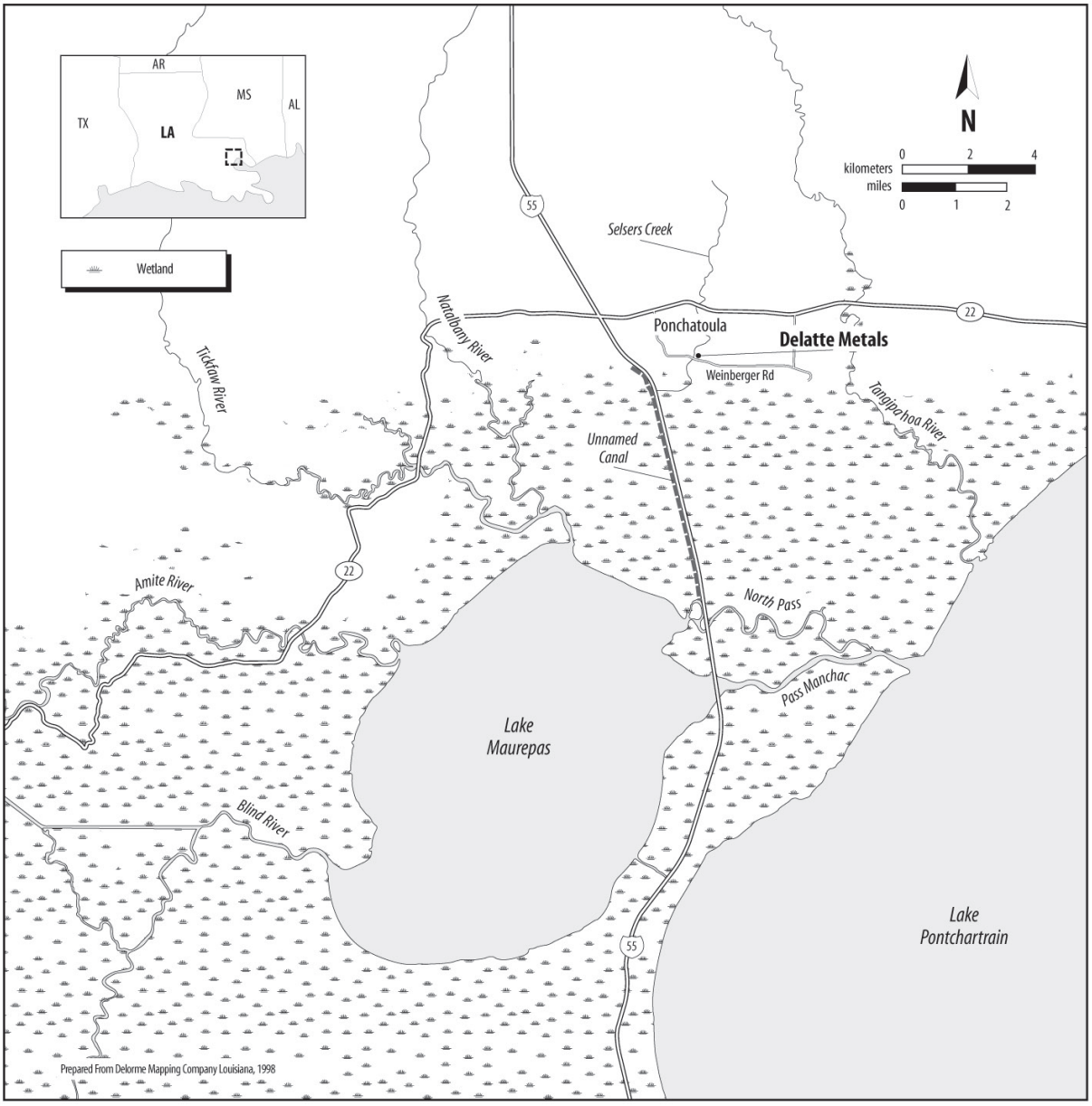

Figure 1. Location of the Delatte Metals property near Ponchatoula, Louisiana.

west toward Selsers Creek. Groundwater flow is estimated to be 0.4 m per day or 155 m per year (1.4 ft per day; 511 ft per year; Tetra Tech 2000).

NOAA Trust Resources

The NOAA trust habitats of concern are lower Selsers Creek, the unnamed canal, North Pass, Pass Manchac, and the Lake Pontchartrain estuary. Selsers Creek is a small, low-gradient freshwater stream that measures approximately 30 meters (100 ft) wide next to the site. The unnamed canal is 40 to 60 m wide (131 to 200 ft), running along Interstate 55 before discharging to North Pass and

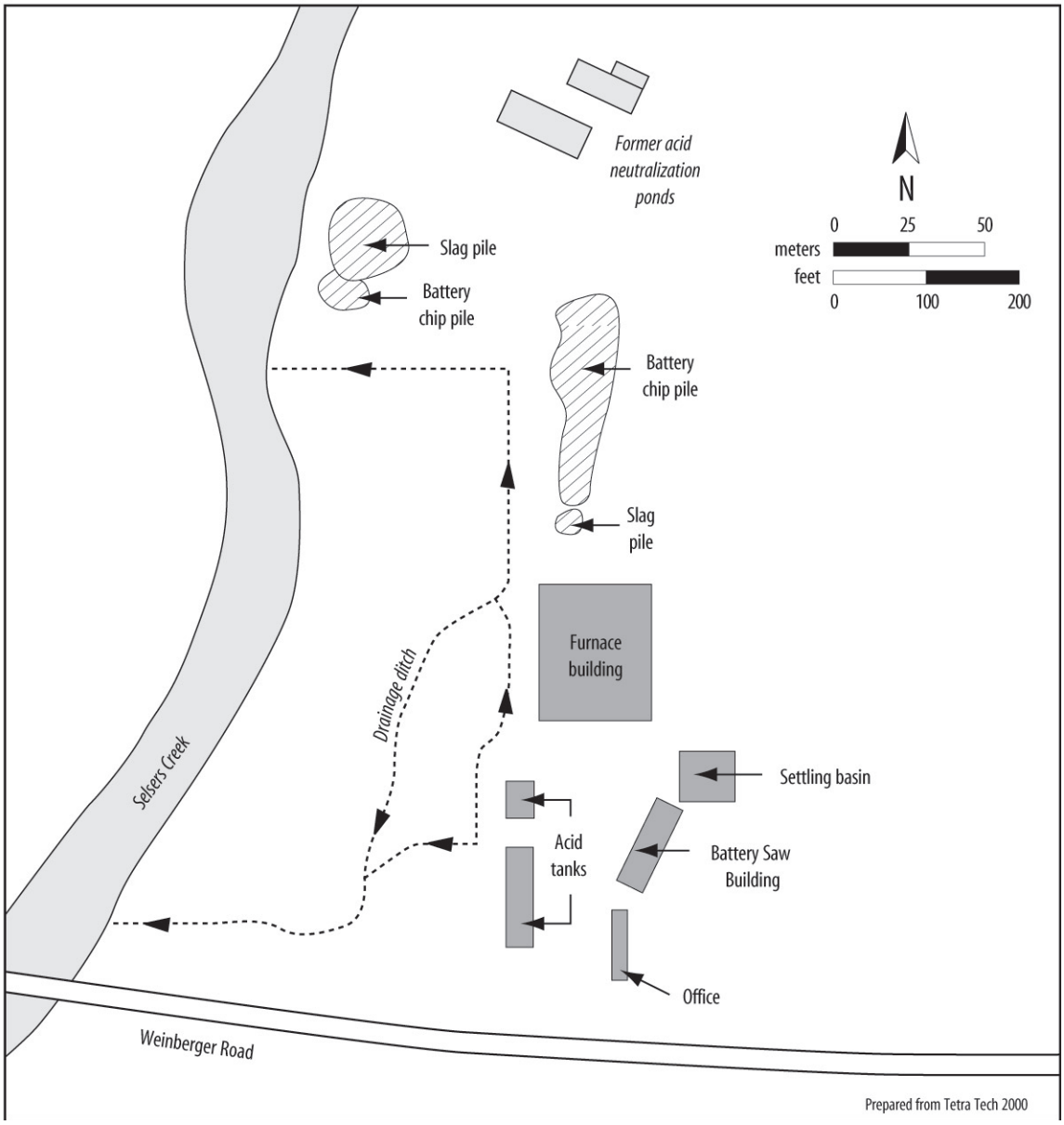

Figure 2. Detail of the Delatte Metals property.

Pass Manchac. North Pass and Pass Manchac are generally less than 50 m (165 ft) wide and are tidally influenced (USGS 1994; Rogilio 2000). These water bodies may receive some saltwater intrusion during the dry season, but salinities are generally less than 5 parts per thousand (ppt). Sediments in Selsers Creek and the canals range from fine sands to silts; water depths are not known (Rogilio 2000).

Lake Pontchartrain is a low-salinity estuary of the Gulf of Mexico. Depths are shallow, generally less than 5 m (16 ft) and sediments range from sands to silts (USGS 1983; Rogilio 2000). Salinities range from near-freshwater in the northwestern portions of the estuary to over 20 ppt in the southeastern portion nearest the entrance to the Gulf of Mexico. Lake Maurepas is tidal fresh water (Rogilio 2000). Depth and salinity for the lake were not available at the time of this review.

Vast freshwater emergent wetlands occupy areas north of Lake Pontchartrain and Lake Maurepas (Figure 1). Freshwater emergent species *Panicum hemitomon*, *Sagittaria falcate*, *Eleocharis spp*., and *Alternanthera philoxeroides* dominate much of these wetlands (Gosselink 1984). Cypress swamp wetlands are immediately south of the Delatte Metals property (Tetra Tech 2000).

The catadromous American eel, the only NOAA trust species present in Selsers Creek and the unnamed canal, uses the habitats for adult residence (Rogilio 2000). Numerous anadromous, estuarine, and marine fish, and invertebrate species are present in Lake Ponchartrain; selected species are presented in Table 1.

Gulf sturgeon and gizzard shad are anadromous species that use river basins draining to Lakes Ponchartrain and Maurepas. In 1991, the Gulf sturgeon was listed as threatened under the Endangered Species Act of 1972 (USFWS 2000). Gulf sturgeon spend the majority of their adult lives in large river basins, such as the Amite, Trickfaw, Natalbany, Blind, and Tangipahoa rivers (Figure 1). Spawning occurs in the spring with a seaward outmigration occurring during the late fall. Gulf sturgeon use Lake Pontchartrain as a migratory corridor during these time periods (Rogilio 2000; USFWS 2000). Shad spawn in freshwater sloughs, ponds, lakes, and rivers during the spring and juveniles rear in fresh water. Adults reside in Lake Ponchartrain and coastal areas, but generally remain in estuarine waters between 4 and 20 ppt (Pattillo et al. 1997).

Species such as hardhead catfish, sheepshead minnow, gulf killifish, silversides, bay anchovy, and gobies are small forage species that reside in Lake Pontchartrain year-round. Spotted seatrout are larger estuarine predators that also inhabit the estuary during all life stages (Pattillo et al. 1997).

The remainder of marine species spawn in coastal shelf areas with larval drift into Lake Ponchartrain, which is used as a juvenile nursery. Adults are also found in Lake Ponchartrain on a seasonal basis. Species such as gulf menhaden and crevalle jack use the estuary for juvenile rearing, but adults largely occupy coastal areas (Pattillo et al. 1997).

Several invertebrate species are common to abundant in Lake Pontchartrain. Shellfish such as rangia and oyster, as well as grass shrimp, spend all life stages in the estuary. Blue crab reside in Lake Pontchartrain as juveniles and adults. Mating has also been reported, although females usually move to coastal areas to hatch and release eggs. Crab larval stages are pelagic and coastal, drifting with the currents back to estuaries where they settle to the bottom and remain. Blue crab, particularly males and juveniles, will often occupy waters of very low salinity or fresh water and may be found in the canals. Brown and white shrimp generally occupy Lake Pontchartrain as juveniles, but adults are present seasonally. Spawning occurs in coastal waters. Bay squid occupy the higher-salinity zones of Lake Ponchartrain (< 17 ppt), moving to coastal areas during spawning periods and during the cooler months (Pattillo et al. 1997).

Recreational and commercial fisheries are present in Lake Pontchartrain for species such as blue crab, oyster, seatrout, sheepshead, and drum. Recreational fisheries in the canals primarily target freshwater species, such as largemouth bass and catfish (Rogilio 2000).

Site-Related Contamination

Environmental investigations on the Delatte Metals property have found soil, groundwater, and stream sediment contamination at concentrations exceeding screening guidelines (Table 2). The RI collected samples from over 150 soil borings, 29 monitoring wells, and 49 sediment and surface water stations on and downgradient of the property. Most samples were analyzed for volatile and

Table 1. Fish and invertebrate species commonly found in the Lake Ponchartrain estuary (Pattillo et al. 1997; Rogilio 2000).

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
ANADROMOUS/CATADROMOUS SPECIES						
American eel	*Anguilla rostrata*			◆		
Gizzard shad	*Dorosoma cepedianum*			◆		
Gulf sturgeon	*Acipenser oxyrhynchus desotoi*			◆		
MARINE/ESTUARINE FISH SPECIES						
Atlantic croaker	*Micropogonias undulatus*		◆	◆		◆
Bull shark	*Carcharhinus leucas*		◆	◆		
Bay anchovy	*Anchoa mitchilli*	◆	◆	◆		
Black drum	*Pogonias cromis*		◆	◆	◆	◆
Code goby	*Gobiosoma robustum*	◆	◆	◆		
Crevalle jack	*Caranx hippos*		◆			
Gulf killifish	*Fundulus grandis*	◆	◆	◆		
Gulf menhaden	*Brevoortia patronus*		◆			
Hardhead catfish	*Arius felis*	◆	◆	◆		
Pinfish	*Lagodon rhomboides*		◆	◆		
Red drum	*Sciaenops ocellatus*		◆	◆	◆	◆
Sand seatrout	*Cynoscion arenarius*		◆	◆		◆
Sheepshead	*Archosargus probatocephalus*		◆	◆	◆	◆
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silver perch	*Bairdiella chrysoura*		◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Southern flounder	*Paralichthys lethostigma*		◆	◆		◆
Spot	*Leiostomus xanthurus*		◆	◆		
Spotted seatrout	*Cynoscion nebulosus*	◆	◆	◆	◆	◆
Striped mullet	*Mugil cephalus*		◆	◆		
Tarpon	*Megalops atlanticus*		◆	◆		
INVERTEBRATE SPECIES						
Bay squid	*Lolliguncula brevis*		◆	◆		
Blue crab	*Callinectes sapidus*		◆	◆	◆	◆
Brown shrimp	*Farfante penaeus aztecus*[a]		◆	◆		
Common rangia	*Rangia cuneata*	◆	◆	◆		◆
Eastern oyster	*Crassostrea virginica*	◆	◆	◆	◆	
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
White shrimp	*Litopenaeus setiferus*[b]		◆	◆		

a: Formerly *Penaeus aztecus*
b: Formerly *Penaeus setiferus*

semi-volatile organic compounds, polychlorinated biphenyls (PCBs)/pesticides, and trace elements (Tetra Tech 2000).

The contaminants of concern to NOAA are trace elements, particularly lead. Table 2 presents maximum concentrations of contaminants of concern, along with appropriate screening guideline

Table 2. Maximum concentrations of contaminants of concern in environmental media at the Delatte Metals property (Tetra Tech 2000).

	Soil (mg/kg)		Water (µg/L)			Sediment (mg/kg)	
Contaminant	Soil	U.S. Average Soils[a]	Ground water	Surface water	AWQC[b]	Sediment	TEL[c]
Arsenic	2,100	5.2	N/A	N/A	150	67	5.9
Cadmium	200	0.06	4,700	190	2.2	461	0.596
Chromium	630	37	N/A	N/A	11	164	37.3
Lead	22,000	16	2,300	3,100	2.5	55,000	35
Nickel	N/A	13	6,100	N/A	52	N/A	18
Silver	57	0.05	N/A	N/A	0.12	N/A	1.0d
Zinc	1,300	48	11,000	452	120	643	123.1
pH	3.1	NA	2.1	5.2	NA	3.7	NA

NA Screening guidelines not available
N/A Data not available
a Shacklette and Boerngen (1984), except for silver and cadmium which are average concentrations in the earth's crust as reported by Lindsay (1979).
b Ambient water quality criteria for the protection of aquatic organisms (USEPA 1999). Freshwater chronic criteria presented. Criterion expressed as a function of total hardness with the exception of arsenic and silver; concentrations shown correspond to hardness of 100 mg/L.
c TEL; Theshold Effects Level; freshwater sediment value. Concentrations below which adverse effects were rarely observed (geometric mean of the 15 percent concentration in the effects data set) as compiled by Smith et al. (1996).
d TEL not available; Effects Range-Low (ERL) value presented. The ERL represents the 10th percentile for the data set in which effects were observed or predicted in studies compiled by Long et al. (1995; 1998).

values. Several trace elements have been observed in soils, groundwater, surface water, and sediments at concentrations exceeding screening guidelines.

Elevated concentrations of lead were widespread in property soils. Maximum lead concentrations exceeded soil screening guidelines by over four orders of magnitude (Table 2). Nearly 40 surface and subsurface soil samples collected on the property exceeded 1,600 mg/kg, which is two orders of magnitude above the screening guideline. Maximum concentrations of cadmium, chromium, silver, and zinc also exceeded soil screening guidelines (Table 2).

Elevated concentrations of lead were also detected in the groundwater beneath the property. Maximum concentrations of lead in groundwater exceeded the AWQC of 2.5 µg/L by nearly three orders of magnitude (Table 2). Over 20 groundwater samples exceeded ambient water quality criteria (AWQC) by two orders of magnitude. Groundwater concentrations of cadmium, nickel, and zinc also exceeded AWQC guidelines (Table 2).

Low pH has been observed in the shallow groundwater beneath the site. Forty of the 51 groundwater samples collected in the shallowest water bearing zone were below a pH of 4.0. Low pH conditions can increase the mobility of trace elements in aquatic systems (Smith et al. 1995).

The trace elements have migrated to surface water pathways and habitats, elevating concentrations in surface water and sediment. The greatest concentrations were observed in the drainage ditches leading to Selsers Creek (Table 2). In both surface water and sediment from the drainage

ditches, lead and cadmium were found at the greatest concentrations relative to their screening guidelines, exceeding those guidelines by one to three orders of magnitude (Table 2). Other trace elements of concern in the drainage ditches based on a comparison to screening guidelines include arsenic, chromium, and zinc (Table 2). In Selsers Creek, concentrations of lead and cadmium in surface water and sediment exceeded their respective screening guidelines (Table 2).

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Acronyms and abbreviations

AST above-ground storage tank

AWQC Ambient water quality criteria for the protection of aquatic life

bgs below ground surface

BHC benzene hexachloride

BNA base, neutral, and acid-extractable organic compounds

BOD biological oxygen demand

BSL brine sludge lagoon

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980

CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System

cfs cubic feet per second

cm centimeter

COC contaminant of concern

COD chemical oxygen demand

COE U.S. Army Corps of Engineers

CRC Coastal Resource Coordinator

DDD dichlorodiphenyldichloroethane

DDE dichlorodiphenyldichloroethylene

DDT dichlorodiphenyltrichloroethane

DNAPL dense non-aqueous phase liquid

DNT dinitrotoluene

DOD U.S. Department of Defense

DOI U.S. Department of the Interior

EPA U.S. Environmental Protection Agency

ERL Effects Range - Low

ERM Effects Range - Median

HMX cyclotetramethylene tetranitramine

HRS Hazard Ranking System

HUC Hydrologic Unit Code

kg kilogram

km kilometer

L liter

LNAPL light, non-aqueous phase liquid

LOEL lowest observed effects level

m meter

m3/second cubic meter per second

µg/g micrograms per gram (ppm)

µg/kg micrograms per kilogram (ppb)

µg/L micrograms per liter (ppb)

µR/hr microroentgens per hour

mg milligram

mg/kg milligrams per kilogram (ppm)

mg/L milligrams per liter (ppm)

mR/hr milliroentgens per hour

NAPL non-aqueous phase liquid

NFA no further action

NOAA National Oceanic and Atmospheric Administration

NPDES National Pollutant Discharge Elimination System

NPL National Priorities List

OU operable unit

PAH polynuclear aromatic hydrocarbon

PA/SI Preliminary Assessment/Site Investigation

PCB polychlorinated biphenyl

PCE perchloroethylene (aka tetrachloroethylene)

pCi/g picocuries per gram

PCP pentachlorophenol

PNRS Preliminary Natural Resource Survey

ppb parts per billion

ppm parts per million

ppt parts per thousand or parts per trillion

PRP Potentially Responsible Party

PVC polyvinyl chloride

RCRA Resource Conservation and Recovery Act

RD/RA Remedial Design/Remedial Action

RDX cyclonite

RI/FS Remedial Investigation/Feasibility Study

ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SVOC	semi-volatile organic compound
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCL	Target Compound List
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
TSS	total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
<	less than
>	greater than

Glossary of terms

Anadromous Migrating from marine waters to breed in freshwater. Examples of anadromous fish include salmon, river herring (alewife), and striped bass.

Catadromous Living in fresh water but migrating to marine waters to breed. An example is the American eel.

Chemical affinity An attraction or force between particles that causes them to combine.

Contaminant partitioning In general, it is the tendency of a contaminant to be in the air, water, soil, or sediment based on the relative chemical affinities of that contaminant.

Hectare 2.471 acres or 10,000 square meters (m^2).

HUC Hydrologic Unit Code. The U.S. is divided into hydrologic units for water-resources planning and data management. Hydrologic units represent natural and human-imposed stream-drainage areas. Each HUC is a unique eight-digit number.

The first two digits indicate the major geographic area or region, the second two digits indicate the sub-region, the third two digits indicate the accounting units, and the fourth two digits indicate the cataloging units. Cataloging units are also called "watersheds."

NPL National Priorities List (NPL) is a list of sites where hazardous wastes have been found and the initial evaluation shows a significant risk to human health or the environment. NPL sites are often called "Superfund sites" because Superfund money can be used by EPA to investigate and cleanup these sites.

Superfund Money collected from a special tax on chemicals and raw petroleum that is appropriated by Congress. These funds are used to investigate, evaluate, and clean up the worst hazardous waste sites in the U.S. These sites are listed on the NPL.

Trustee Responsible for maintaining the original characteristics of our land, water, and the plants and animals that live there. NOAA is a federal trustee for natural resources that spend any portion of their life cycle in a marine or estuarine environment; and their habitats.

Watershed The region draining into a river, river system, or other body of water.

Appendix

Appendix

Table 1. List of the 322 hazardous Waste Site Reports published by NOAA to date. Sites in bold italics are included in this volume.

Region 1

Connecticut	Date	EPA Facility ID
Barkhamsted-New Hartford Landfill	1989	CTD980732333
Beacon Heights Landfill	1984	CTD072122062
Gallup's Quarry	1989	CTD108960972
Kellogg-Deering Well Field	1987	CTD980670814
New London Submarine Base	1990	CTD980906515
O'Sullivans Island	1984	CTD980667992
Raymark Industries, Inc.	1996	CTD001186618
Yaworski Waste Lagoon	1985	CTD009774969
Massachusetts		
Atlas Tack Corp.	1989	MAD001026319
Blackburn and Union Privileges	1993	MAD982191363
Charles-George Reclamation Landfill	1987	MAD003809266
GE-Housatonic River	1999	MAD002084093
Groveland Wells	1987	MAD980732317
Hanscom Field/Hanscom Air Force Base	1995	MA8570024424
Haverhill Municipal Landfill	1985	MAD980523336
Industri-Plex	1987	MAD076580950
Materials Technology Laboratory (USArmy)	1995	MA0213820939
Natick Laboratory Army Research, D&E Center	1995	MA1210020631
New Bedford Site	1984	MAD980731335
Nyanza Chemical Waste Dump	1987	MAD990685422
Plymouth Harbor/Cannon Engineering Corp.	1984	MAD980525232
South Weymouth Naval Air Station	1995	MA2170022022
Sullivan's Ledge	1987	MAD980731343

Region 1 *cont.*

Maine	Date	EPA Facility ID
Brunswick Naval Air Station	1987	ME8170022018
Eastland Woolen Mill	***2002***	***MED980915474***
McKin Company	1984	MED980524078
O'Connor Company	1984	MED980731475
Portsmouth Naval Shipyard	1995	ME7170022019
Saco Municipal Landfill	1989	MED980504393
New Hampshire		
Beede Waste Oil	1997	NHD018958140
Coakley Landfill	1985	NHD064424153
Dover Municipal Landfill	1987	NHD980520191
Fletcher's Paint Works & Storage	1989	NHD001079649
Grugnale Waste Disposal Site	1985	NHD069911030
New Hampshire Plating Co.	1992	NHD001091453
Pease Air Force Base	1990	NH7570024847
Savage Municipal Water Supply	1985	NHD980671002
Sylvester	1985	NHD099363541
Rhode Island		
Davis Liquid Waste	1987	RID980523070
Davisville Naval Construction Battalion Center	1990	RI6170022036
Newport Naval Education & Training Center	1990	RI6170085470
Peterson/Puritan, Inc.	1987	RID055176283
Picillo Farm	1987	RID980579056
Rose Hill Regional Landfill	1989	RID980521025
Stamina Mills, Inc.	1987	RID980731442
West Kingston Town Dump/URI Disposal	1992	RID981063993
Western Sand & Gravel	1987	RID009764929
Vermont		
BFI Sanitary Landfill (Rockingham)	1989	VTD980520092
Old Springfield Landfill	1987	VTD000860239

Region 2

New Jersey	Date	EPA Facility ID
Albert Steel Drum	1984	NJD000525154
American Cyanamid Co.	1985	NJD002173276
Atlantic Development 11	1984	NJD980528731
Bog Creek Farm	1984	NJD063157150
Brick Township Landfill	1984	NJD980505176
Brook Industrial Park	1989	NJD078251675
Chemical Control	1984	NJD000607481
Chemical Insecticide Corp.	1990	NJD980484653
Chipman Chemical Co.	1985	NJD980528897
Ciba-Geigy Corp.	1984	NJD001502517
Cornell Dubilier Electronics, Inc.	1999	NJD981557879
Cosden Chemical Coatings Corp.	1987	NJD000565531
Curcio Scrap Metal, Inc.	1987	NJD011717584
De Rewal Chemical Co.	1985	NJD980761373
Denzer & Schafer X-Ray Co.	1984	NJD046644407
Diamond Alkali Co.	1984	NJD980528996
Federal Aviation Admin. Tech. Center	1990	NJ9690510020
Garden State Cleaners Co.	1989	NJD053280160
Global Sanitary Landfill	1989	NJD063160667
Hercules, Inc. (Gibbstown Plant)	1984	NJD002349058
Higgins Disposal	1989	NJD053102232
Higgins Farm	1989	NJD981490261
Horseshoe Road	1984, 1995	NJD980663678
Ideal Cooperage Inc.	1984	NJD980532907
Industrial Latex Corp.	1989	NJD981178411
Jackson Township Landfill	1984	NJD980505283
Kauffman & Minteer, Inc.	1989	NJD002493054
Kin-Buc Landfill	1984	NJD049860836
Koppers Co. Inc./Seaboard Plant	1984	NJD002445112
Krysowaty Farm	1985	NJD980529838
LCP Chemicals, Inc.	1999	NJD079303020
Middlesex Sampling Plant (DOE)	***2002***	***NJ0890090012***
Mobil Chemical Co.	1984	NJD000606756
NL Industries	1984	NJD061843249
Perth Amboy PCB's	1984	NJD980653901

Region 2 *cont.*

New Jersey *cont.*	Date	EPA Facility ID
PJP Landfill	1984	NJD980505648
Price Landfill	1984	NJD070281175
Puchack Well Field	1999	NJD981084767
PVSC Sanitary Landfill	1984	NJD980529671
Roebling Steel Co.	1984	NJD073732257
Roosevelt Drive-In	1984	NJD030250484
Route 561 Dump	***2002***	***NJ0000453514***
Sayreville Landfill	1984	NJD980505754
Scientific Chemical Processing	1984	NJD070565403
South Jersey Clothing Co.	1989	NJD980766828
Syncon Resins	1984	NJD064263817
United States Avenue Burn	***2002***	***NJ0001120799***
Universal Oil Products (Chemical Division)	1984	NJD002005106
Ventron/Velsicol	1984	NJD980529879
White Chemical Corp.	1984	NJD001239185
Williams Property	1984	NJD980529945
Zschiegner Refining Company	1999	NJD986643153

New York		
Action Anodizing, Plating, & Polishing Corp.	1989	NYD072366453
Applied Environmental Services	1985	NYD980535652
Brookhaven National Laboratory (USDOE)	1990	NY7890008975
C & J Disposal Leasing Co. Dump	1989	NYD981561954
Carroll & Dubies Sewage Disposal	1989	NYD010968014
Jones Sanitation	1987	NYD980534556
Li Tungsten Corp.	1992	NYD986882660
Liberty Industrial Finishing	1985	NYD000337295
Marathon Battery Corp.	1984	NYD010959757
Mattiace Petrochemical Co., Inc.	1989	NYD000512459
North Sea Municipal Landfill	1985	NYD980762520
Peter Cooper	1999	NYD980530265
Port Washington Landfill	1984	NYD980654206
Rowe Industries Groundwater Contamination	1987	NYD981486954
Sidney Landfill	1989	NYD980507677

Region 2 *cont.*

Puerto Rico	Date	EPA Facility ID
Clear Ambient Services Co.	1984	PRD090416132
Frontera Creek	1984	PRD980640965
Naval Security Group Activity	1989	PR4170027383
V&M/Albaladejo Farms	1997	PRD987366101
Virgin Islands		
Island Chemical Corp./V.I. Chemical Corp.	1996	VID980651095
Tutu Wellfield	1993	VID982272569

Region 3

Washington, D.C.		
Washington Navy Yard	1999	DC9170024310
Delaware		
Army Creek Landfill	1984	DED980494496
Coker's Sanitation Service Landfills	1986	DED980704860
Delaware City PVC Plant	1984	DE0001912757
Delaware Sand & Gravel	1984	DED000605972
Dover Air Force Base	1987	DE8570024010
Dover Gas Light Co.	1987	DED980693550
E.I. Du Pont Newport Landfill	1987	DED980555122
Halby Chemical .	1986	DED980830954
Kent County Landfill	1989	DED980705727
Koppers Co. Facilities Site	1990	DED980552244
NCR Corp., Millsboro	1986	DED043958388
New Castle Spill Site	1984	DED058980442
New Castle Steel	1984	DED980705255
Old Brine Sludge Landfill	1984	DED980704894
Pigeon Point Landfill	1987	DED980494603
Sealand Limited	1989	DED981035520
Standard Chlorine Co.	1986	DED041212473

Region 3 *cont.*

Delaware *cont.*	**Date**	**EPA Facility ID**
Sussex Co. Landfill #5	1989	DED980494637
Tybouts Corner Landfill	1984	DED000606079
Wildcat Landfill	1984	DED980704951

Maryland

68th Street Dump / Industrial Enterprises	***2002***	***MDD980918387***
Anne Arundel County Landfill	1989	MDD980705057
Bush Valley Landfill	1989	MDD980504195
Central Chemical Corporation	1999	MDD003061447
Indian Head Naval Surface Warfare Center	1984	MD7170024684
Joy Reclamation Co.	1984	MDD030321178
Ordnance Products, Inc.	1995	MDD982364341
Sand, Gravel & Stone Site	1984	MDD980705164
Southern Maryland Wood Treating	1987	MDD980704852
U.S. Agricultural Center Beltsville (2 tenants)	1995	MD0120508940
USA Aberdeen - Edgewood	1986	MD2210020036
USA Aberdeen - Michaelsville	1986	MD3210021355
USA Fort George Meade	1997	MD9210020567
USN Patuxent Naval Air Station	1996	MD7170024536
Woodlawn Co. Landfill	1987	MDD980504344

Pennsylvania

Austin Avenue Radiation Site	1993	PAD987341716
Boarhead Farms	1989	PAD047726161
Bridesburg Dump	1984	PAD980508402
Butler Mine Tunnel	1987	PAD980508451
Crater Resources, Inc./Keystone Coke Co./Alan Wood	1993	PAD980419097
Croydon TCE Spill	1986	PAD981035009
Douglassville Disposal	1987	PAD002384865
Elizabethtown Landfill	1989	PAD980539712
Enterprise Avenue	1984	PAD980552913
FMC Marcus Hook	1996	PAD987323458
Foote Mineral Co.	1993	PAD077087989
Hellertown Manufacturing Co.	1987	PAD002390748

Region 3 *cont.*

Pennsylvania *cont.*	**Date**	**EPA Facility ID**
Jack's Creek/Sitkin Smelting & Refining, Inc.	1989	PAD980829493
Keyser Ave. Borehole	1989	PAD981036049
Metal Bank of America	1984	PAD046557096
Occidental Chemical Corp./Firestone Tire and Rubber Co.	1989	PAD980229298
Paoli Rail Yard	1987	PAD980692594
Publicker/Cuyahoga Wrecking Plant	1990	PAD981939200
Raymark	1996	PAD039017694
Recticon/Allied Steel	1989	PAD002353969
Revere Chemical Co.	1986	PAD051395499
Rohm and Haas Landfill	1986	PAD091637975
Salford Quarry	1997	PAD980693204
Tinicum National Environmental Center	1986	PA6143515447
Tysons Dump #1	1985	PAD980692024
UGI Corp. Gas Manufacturing Plant	1995	PAD980539126
USN Ships Parts Control Center	1996	PA3170022104
Wade (ABM)	1984	PAD980539407
Virginia		
Abex Corp.	1989	VAD980551683
Arrowhead Associates Inc./Scovill Corp.	1989	VAD042916361
Atlantic Wood Industries, Inc.	1987	VAD990710410
C & R Battery Co., Inc.	1987	VAD049957913
Chisman Creek	1984	VAD980712913
Former Nansemond Ordnance Depot	***2002***	***VAD123933426***
Marine Corps Combat and Development Command	1995	VA1170024722
Nansemond Ordnance Depot	2000	VAD123933426
NASA-Langley Research Center	1995	VA2800005033
Naval Surface Warfare Center - Dahlgren	1993	VA7170024684
Naval Weapons Station - Yorktown	1993	VA8170024170
Saunders Supply Co.	1987	VAD003117389
USA Fort Eustis	1996	VA6210020321
USN Naval Shipyard Norfolk	1999	VA1170024813
USN Norfolk Naval Base	1997	VA6170061463

Region 4

Alabama	Date	EPA Facility ID
American Brass, Inc.	***2002***	***ALD981868466***
Ciba-Geigy Corp. (McIntosh Plant)	1990	ALD001221902
Olin Corp. (McIntosh Plant)	1990	ALD008188708
Redwing Carriers, Inc. (Saraland)	1989	ALD980844385

Florida		
Agrico Chemical Co.	1989	FLD980221857
American Creosote Works (Pensacola Plant)	1984	FLD008161994
Broward County-21st Manor Dump	1992	FLD981930506
Chemform, Inc.	1990	FLD080174402
Harris Corp. (Palm Bay Plant)	1986	FLD000602334
Helena Chemical Co. (Tampa Plant)	1993	FLD053502696
MRI Corporation	1997	FLD088787585
Munisport Landfill	1984	FLD084535442
Pensacola Naval Air Station	1990	FL9170024567
Pickettville Road Landfill	1984	FLD980556351
Sixty-Second Street Dump	1984	FLD980728877
Standard Auto Bumper Corp.	1989	FLD004126520
Stauffer Chemical Co. (Tampa Plant)	1993	FLD004092532
Stauffer Chemical Co. (Tarpon Springs)	1993	FLD010596013
USAF Tyndall Air Force Base	1997	FL1570024124
USN Air Station Cecil Field	1990	FL5170022474
USN NAS Jacksonville	1990	FL6170024412
USN Naval Air Station Whiting Field Site 5	1996	FL2170023244
Woodbury Chemical Co. (Princeton Plant)	1989	FLD004146346

Georgia		
Brunswick Wood Preserving	1997	GAD981024466
Escambia Wood - Camilla	1999	GAD008212409
Terry Creek Dredge Spoil/Hercules Outfall	1997	GAD982112658

Region 4 *cont.*

Mississippi	Date	EPA Facility ID
Chemfax, Inc.	1995	MSD008154486
Gautier Oil Co., Inc.	1989	MSD098596489
North Carolina		
ABC One Hour Cleaners	1989	NCD024644494
Camp Lejeune Military Res. (USNavy)	1989	NC6170022580
FCX, Inc. (Washington Plant)	1989	NCD981475932
New Hanover County Airport Burn Pit	1989	NCD981021157
Potter's Septic Tank Service Pits	1989	NCD981023260
South Carolina		
Geiger (C&M Oil)	1984	SCD980711279
Helena Chemical Co. Landfill	1989	SCD058753971
Koppers Co., Inc. (Charleston Plant)	1993	SCD980310239
Savannah River Site (USDOE)	1990	SC1890008989
Wamchem, Inc.	1984	SCD037405362

Region 6

Louisiana		
Bayou Sorrel Site	1984	LAD980745541
Delatte Metals	***2002***	***LAD052510344***
Madisonville Creosote Works	1997	LAD981522998
Texas		
Alcoa (Point Comfort)/Lavaca Bay	1995	TXD008123168
Bailey Waste Disposal	1985	TXD980864649
Brio Refining, Inc.	1989	TXD980625453
Crystal Chemical Co.	1989	TXD990707010
Dixie Oil Processors, Inc.	1989	TXD089793046
French, Ltd.	1989	TXD980514814

Region 6 *cont.*

Texas *cont.*	**Date**	**EPA Facility ID**
Highlands Acid Pit	1989	TXD980514996
Motco, Inc.	1984	TXD980629851
Sikes Disposal Pits	1989	TXD980513956
State Marine	1999	TXD099801102
Tex-Tin Corp.	1989	TXD062113329

Region 9

American Somoa

Taputimu Farm	1984	ASD980637656

California

Alameda Naval Air Station	1989	CA2170023236
Camp Pendleton Marine Corps Base	1990	CA2170023533
Coast Wood Preserving	1984	CAD063015887
Concord Naval Weapons Station	1989, 1993	CA7170024528
Cooper Drum Co.	1993	CAD055753370
CTS Printex, Inc.	1989	CAD009212838
Del Amo Facility	1992	CAD029544731
Del Norte Pesticide Storage	1984	CAD000626176
El Toro Marine Corps Air Station	1989	CA6170023208
Fort Ord	1990	CA7210020676
GBF, Inc., Dump	1989, 1993	CAD980498562
Hewlett-Packard (620-640 Page Mill Road)	1989	CAD980884209
Intersil Inc./Siemens Components	1989	CAD041472341
Iron Mountain Mine	1989	CAD980498612
Jasco Chemical Corp.	1989	CAD009103318
Liquid Gold Oil Corp.	1984	CAT000646208
McCormick & Baxter Creosoting Co.	1993	CAD009106527
MGM Brakes	1984	CAD000074120
Moffett Naval Air Station	1986	CA2170090078
Montrose Chemical Corp.	1985	CAD008242711

Region 9 *cont.*

California *cont.*	**Date**	**EPA Facility ID**
Pacific Coast Pipe Lines	1989	CAD980636781
Rhone-Poulenc, Inc./Zoecon Corp.	1985	CAT000611350
Riverbank Army Ammunition Plant	1989	CA7210020759
Sola Optical USA, Inc.	1989	CAD981171523
South Bay Asbestos Area	1985	CAD980894885
Travis Air Force Base	1990	CA5570024575
Treasure Island Naval Station - Hunters Pt. Annex	1989	CA1170090087
Guam		
Andersen Air Force Base	1993	GU6571999519
Hawaii		
Del Monte Corporation (Oahu Plantation)	1995	HID980637631
Pearl City Landfill	1984	HID980585178
Pearl Harbor Naval Station	1992	HI2170024341

Region 10

Alaska		
Adak Naval Air Station	1993	AK4170024323
Elmendorf Air Force Base	1990	AK8570028649
Fort Richardson (US Army)	1995	AK6214522157
Standard Steel & Metals Salvage Yard (USDOT)	1990	AKD980978787
Idaho		
Blackbird Mine	1995	IDD980725832

Region 10 *cont.*

Oregon	Date	EPA Facility ID
Allied Plating, Inc.	1987	ORD009051442
Gould, Inc.	1984	ORD095003687
Martin-Marietta Aluminum Co.	1987	ORD052221025
McCormick & Baxter Creosoting Co. (Portland)	1995	ORD009020603
Northwest Pipe & Casing Co.	1993	ORD980988307
Reynolds Metals Co.	1996	ORD009412677
Rhone Poulenc Inc.	1984	ORD990659492
Teledyne Wah Chang	1985	ORD050955848
Union Pacific Railroad Co. Tie-Treating Plant	1990	ORD009049412
Washington		
Alcoa (Vancouver Smelter)	1989	WAD009045279
American Crossarm & Conduit Co.	1989	WAD057311094
Bangor Naval Submarine Base	1990	WA5170027291
Bonneville Power Administration Ross Complex (USDOE)	1990	WA1891406349
Centralia Municipal Landfill	1989	WAD980836662
Commencement Bay, Near Shore/Tide Flats	1984	WAD980726368
Commencement Bay, South Tacoma Channel	1984	WAD980726301
Hamilton Island Landfill (USA/COE)	1992	WA5210890096
Hanford 100-Area (USDOE)	1989	WA3890090076
Harbor Island (Lead)	1984	WAD980722839
Jackson Park Housing Complex (USNavy)	1995	WA3170090044
Naval Air Station, Whidbey Island (Ault Field)	1986	WA5170090059
Naval Air Station, Whidbey Island (Seaplane Base)	1986	WA6170090058
Northwest Transformer (South Harkness Street)	1989	WAD027315621
Oeser Company	1997	WAD008957243
Old Navy Dump/Manchester Lab (USEPA/NOAA)	1996	WA8680030931
Pacific Sound Resources	1995	WAD009248287
Puget Sound Naval Shipyard Complex	1995	WA2170023418
Quendall Terminals	1985	WAD980639215
Seattle Municipal Landfill (Kent Highlands)	1989	WAD980639462
Tulalip Landfill	1992	WAD980639256
Western Processing Co., Inc.	1984	WAD009487513
Wyckoff Co./Eagle Harbor (2 areas)	1986	WAD009248295

Table 2. List of hazardous waste site reports considered by NOAA at this reporting (total of 928), and of Waste Site Reports (WSR), Preliminary Natural Resource Surveys (PNRS), and U.S. Air Force (USAF) reports published by NOAA to date. Sites in bold italic are included in this volume.

Region 1

Connecticut	WSR	PNRS	USAF	EPA Facility ID
29 Pomperaug Road				CTD983884412
Army Engine Plant/Stratford				CT3213822924
Barkhamsted-New Hartford Landfill	1989			CTD980732333
Beacon Heights Landfill	1984			CTD072122062
Black Rock Shipyard				CT0001407865
Broad Brook Mill				CT0002055887
Dexter Corp.				CTD001155761
Gallup's Quarry	1989			CTD108960972
Hamilton Standard				CTD001145341
Kellogg-Deering Well Field	1987			CTD980670814
Laurel Park, Inc.		1988		CTD980521165
Linemaster Switch Corp.				CTD001153923
New London Submarine Base	1990			CTD980906515
Nutmeg Valley Road				CTD980669261
Old Southington Landfill				CTD980670806
O'Sullivans Island	1984			CTD980667992
Pharmacia & Upjohn Company				CTD001168533
Precision Plating Corp.				CTD051316313
Raymark Industries, Inc.	1996			CTD001186618
Revere Textile Prints Corp.				CTD004532610
Sikorsky Aircraft Division UTC				CTD001449784
Solvents Recovery Service of New England				CTD009717604
Remington Arms Company Incorporated				CTD001453216
Yaworski Waste Lagoon	1985	1989		CTD009774969

Massachusetts				
Atlas Tack Corp.	1989			MAD001026319
Baird & McGuire				MAD001041987
Blackburn and Union Privileges	1993			MAD982191363
Boston Gas Co. Lng Plt				MAD087137329

Region 1 *cont.*

Massachusetts *cont.*	WSR	PNRS	USAF	EPA Facility ID
Cannon Engineering Corp. (CEC)		1988		MAD079510780
Charles-George Reclamation Landfill	1987	1988		MAD003809266
Eastern Gas & Fuel				MAD981063142
Fort Devens				MA7210025154
Fort Devens-Sudbury Training Annex				MAD980520670
GE - Housatonic River	1999			MAD002084093
Groveland Wells	1987	1988		MAD980732317
Hanscom Field/Hanscom Air Force Base	1995			MA8570024424
Haverhill Municipal Landfill	1985			MAD980523336
Hocomonco Pond				MAD980732341
Holyoke Gas Works (Former)				MAD985298108
Industri-Plex	1987	1988		MAD076580950
Iron Horse Park				MAD051787323
Materials Technology Laboratory (USArmy)	1995			MA0213820939
Natick Laboratory Army Research, D&E Center	1995			MA1210020631
Naval Weapons Industrial Reserve Plant				MA6170023570
New Bedford Harbor				MA2690390024
New Bedford Site (Acushnet Estuary)	1984			MAD980731335
Norwood PCB's				MAD980670566
Nuclear Metals				MAD062166335
Nyanza Chemical Waste Dump	1987	1993		MAD990685422
Otis Air National Guard Base/Camp Edwards				MA2570024487
Plymouth Harbor/Cannon Engineering Corp.	1984	1990		MAD980525232
PSC Resources				MAD980731483
Re-Solve, Inc.				MAD980520621
Rose Disposal Pit				MAD980524169
Salem Acres		1991		MAD980525240
Shpack Landfill				MAD980503973
Silresim Chemical Corp.				MAD000192393
South Weymouth Naval Air Station	1995			MA2170022022
Sullivan's Ledge	1987	1989		MAD980731343
Sutton Brook Disposal Area				MAD980520696
W. R. Grace and Co., Inc. (Acton Plant)				MAD001002252
Wells G&H		1990		MAD980732168
Zeneca Specialties				MAD051505477

Region 1 *cont.*

Maine	WSR	PNRS	USAF	EPA Facility ID
Brunswick Naval Air Station	1987	1991		ME8170022018
Eastern Surplus Co.				MED981073711
Eastland Woolen Mill	***2002***			***MED980915474***
Holtrachem				MED000242701
Loring Air Force Base				ME9570024522
Maine Yankee Atomic Power Company				MED071749329
McKin Company	1984			MED980524078
O'Connor Company	1984			MED980731475
O'Connor Company Main Office				MED018980227
Pinette's Salvage Yard				MED980732291
Portsmouth Naval Shipyard	1995			ME7170022019
Saco Municipal Landfill	1989			MED980504393
Saco Tannery Waste Pits				MED980520241
Union Chemical Co., Inc				MED042143883
Winthrop Landfill				MED980504435

New Hampshire				
Auburn Road Landfill		1989		NHD980524086
Beede Waste Oil	1997			NHD018958140
Coakley Landfill	1985	1989		NHD064424153
Dover Municipal Landfill	1987	1990		NHD980520191
Fletcher's Paint Works & Storage	1989			NHD001079649
Gilson Road Tar Pit				NHD980503304
Grugnale Waste Disposal Site	1985			NHD069911030
Kearsarge Metallurgical Corp.				NHD062002001
Keefe Environmental Services				NHD092059112
Mohawk Tannery				NHD981889629
Mottolo Pig Farm				NHD980503361
New Hampshire Plating Co.	1992			NHD001091453
Ottati & Goss/Kingston Steel Drum				NHD990717647
Pease Air Force Base	1990	1991		NH7570024847
Savage Municipal Water Supply	1985			NHD980671002
Somersworth Sanitary Landfill				NHD980520225
South Municipal Water Supply Well				NHD980671069

Region 1 *cont.*

New Hampshire *cont.*	WSR	PNRS	USAF	EPA Facility ID
Sylvester	1985			NHD099363541
Tibbetts Road				NHD989090469
Tinkham Garage				NHD062004569
Town Garage/Radio Beacon				NHD981063860
Rhode Island				
Central Landfill				RID980520183
Centredale Manor Restoration Project				RID981203755
Davis (GSR) Landfill				RID980731459
Davis Liquid Waste	1987			RID980523070
Davisville Naval Construction Battalion Center	1990	1994		RI6170022036
Landfill & Resource Recovery, Inc. (L&RR)				RID093212439
Newport Naval Education & Training Center	1990	1994		RI6170085470
Peterson/Puritan, Inc.	1987	1990		RID055176283
Picillo Farm	1987	1988		RID980579056
Rose Hill Regional Landfill	1989	1994		RID980521025
Stamina Mills, Inc.	1987	1990		RID980731442
West Kingston Town Dump/URI Disposal	1992			RID981063993
Western Sand & Gravel	1987			RID009764929
Vermont				
Bennington Municipal Sanitary Landfill				VTD981064223
BFI Sanitary Landfill (Rockingham)	1989			VTD980520092
Burgess Brothers Landfill				VTD003965415
Darling Hill Dump				VTD980520118
Ely Mine				VTD988366571
Elizabeth Mine				VTD988366621
Old Springfield Landfill	1987	1988		VTD000860239
Parker Sanitary Landfill				VTD981062441
Pine Street Canal				VTD980523062
Tansitor Electronics, Inc				VTD000509174

Region 2

New Jersey	WSR	PNRS	USAF	EPA Facility ID
A.O. Polymer				NJD030253355
Albert Steel Drum	1984			NJD000525154
Allied Corp.				NJD980530604
American Cyanamid Co.	1985			NJD002173276
Asbestos Dump				NJD980654149
Atlantic Aviation Corp.				NJD011308988
Atlantic Development 11	1984			NJD980528731
Bog Creek Farm	1984	1992		NJD063157150
Brick Township Landfill	1984			NJD980505176
Bridgeport Rental & Oil Services		1990		NJD053292652
Brook Industrial Park	1989			NJD078251675
Burnt Fly Bog		1992		NJD980504997
Chemical Control	1984			NJD000607481
Chemical Insecticide Corp.	1990	1992		NJD980484653
Chemical Leaman Tank Lines, Inc		1989		NJD047321443
Chemsol, Inc				NJD980528889
Chipman Chemical Co.	1985			NJD980528897
Ciba-Geigy Corp.	1984	1989		NJD001502517
Cinnaminson Ground Water Contamination				NJD980785638
Combe Landfill South				NJD094966611
Cornell Dubilier Electronics, Inc.	1999			NJD981557879
Cosden Chemical Coatings Corp.	1987			NJD000565531
CPS/Madison Industries		1990		NJD002141190
Curcio Scrap Metal, Inc.	1987			NJD011717584
De Rewal Chemical Co.	1985			NJD980761373
Delilah Road				NJD980529002
Denzer & Schafer X-Ray Co.	1984	1992		NJD046644407
Diamond Alkali Co.	1984			NJD980528996
Diamond Head Oil Refinery Div.				NJD092226000
Diamond Shamrock Corp.				NJD002442408
D'Imperio Property				NJD980529416
E.I. DuPont de Nemours				NJD002385730
Ellis Property				NJD980529085
Emmell's Septic Landfill				NJD980772727
Evor Phillips Leasing		1992		NJD980654222

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA Facility ID
Ewan Property				NJD980761365
Federal Aviation Admin. Tech. Center	1990			NJ9690510020
Federal Creosote				NJD0001900281
Fort Dix (Landfill Site)				NJ2210020275
Franklin Burn Site				NJD986570992
Fried Industries				NJD041828906
GAF Corp.				NJD980771638
GAF Corp. - Gloucester City				NJD043292606
Garden State Cleaners Co.	1989			NJD053280160
Global Sanitary Landfill	1989	1991		NJD063160667
Goose Farm				NJD980530109
Grand Street Mercury				NJ0001327733
Helen Kramer Landfill		1990		NJD980505366
Hercules, Inc. (Gibbstown Plant)	1984	1993		NJD002349058
Higgins Disposal	1989			NJD053102232
Higgins Farm	1989			NJD981490261
Hopkins Farm				NJD980532840
Horseshoe Road	1984, 1995			NJD980663678
Iceland Coin Laundry and Dry Cleaning				NJ0001360882
Ideal Cooperage Inc.	1984			NJD980532907
Imperial Oil Co., Inc./Champion Chemical				NJD980654099
Industrial Latex Corp.	1989			NJD981178411
ISP Environmental Services, Inc.				NJD002185973
Jackson Township Landfill	1984			NJD980505283
JIS Landfill				NJD097400998
Kauffman & Minteer, Inc.	1989			NJD002493054
Kin-Buc Landfill	1984	1990		NJD049860836
King of Prussia				NJD980505341
Koppers Co. Inc./Seaboard Plant	1984			NJD002445112
Krysowaty Farm	1985			NJD980529838
LCP Chemicals, Inc.	1999			NJD079303020
Lightman Drum Company				NJD014743678
Lipari Landfill				NJD980505416
Lone Pine Landfill		1992		NJD980505424

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA Facility ID
Lustrelon Inc.				NJD008388951
M&T Delisa Landfill				NJD085632164
Mannheim Avenue Dump				NJD980654180
Martin Aaron, Inc.				NJD014623854
Matteo Brothers				NJD011770013
Maywood Chemical Co.				NJD980529762
McGuire Air Force Base				NJ0570024018
Metaltec/Aerosystems				NJD002517472
Middlesex Sampling Plant (DOE)	***2002***			***NJ0890090012***
Military Ocean Terminal (Landfill)				NJ0210022752
Mobil Chemical Co.	1984			NJD000606756
Monroe Township Landfill				NJD980505671
Myers Property				NJD980654198
Nascolite Corp.				NJD002362705
Naval Air Engineering Center				NJ7170023744
Naval Weapons Station Earle (Site A)				NJ0170022172
NL Industries	1984	1992		NJD061843249
Pepe Field				NJD980529598
Perth Amboy PCB's	1984			NJD980653901
PJP Landfill	1984	1990		NJD980505648
Pohatcong Valley Groundwater Contamination				NJD981179047
Pomona Oaks Residential Wells				NJD980769350
Price Landfill	1984	1993		NJD070281175
Puchack Well Field	1999			NJD981084767
Pulverizing Services				NJD980582142
PVSC Sanitary Landfill	1984			NJD980529671
Quanta Resources				NJD000606442
Raritan Arsenal				NJD986589190
Reich Farms				NJD980529713
Renora, Inc.				NJD070415005
Rhone-Poulenc Chemical Co.				NJD099293326
Ringwood Mines/Landfill				NJD980529739
Roebling Steel Co.	1984	1990		NJD073732257
Roosevelt Drive-In	1984			NJD030250484
Route 561 Dump	***2002***			***NJ0000453514***

Region 2 *cont.*

New Jersey *cont.*	WSR	PNRS	USAF	EPA Facility ID
Safety-Kleen (Rollins Environmental)				NJD053288239
Sayreville Landfill	1984	1990		NJD980505754
Scientific Chemical Processing	1984	1989		NJD070565403
Sharkey Landfill		1990		NJD980505762
Shield Alloy Corp.				NJD002365930
South Jersey Clothing Co.	1989			NJD980766828
Swope Oil & Chemical Co.				NJD041743220
Syncon Resins	1984	1992		NJD064263817
Tabernacle Drum Dump				NJD980761357
Troy Chemical				NJD002144517
United States Avenue Burn	***2002***			***NJ0001120799***
Universal Oil Products (Chemical Division)	1984			NJD002005106
Upper Deerfield Township Sanitary Landfill				NJD980761399
Ventron/Velsicol	1984			NJD980529879
Vineland Chemical Co., Inc		1990		NJD002385664
W.R. Grace/Wayne Interim Storage (USDOE)				NJ1891837980
Waldick Aerospace Devices, Inc.		1990		NJD054981337
Welsbach & General Gas Mantle (Camden Radiation)				NJD986620995
White Chemical Corp.	1984			NJD001239185
White Chemical Corp.				NJD980755623
Williams Property	1984	1992		NJD980529945
Wilson Farm				NJD980532824
Witco Chemical Corp. (Oakland Plant)				NJD045653854
Woodland Route 532 Dump				NJD980505887
Woodland Route 72 Dump				NJD980505879
Zschiegner Refining Company	1999			NJD986643153

New York				
93rd Street School				NYD980780829
Action Anodizing, Plating, & Polishing Corp.	1989			NYD072366453
Alcoa Aggregation Site				NYD980506232
American Thermostat Co. Superfund Site				NYD002066330
Anchor Chemicals				NYD001485226
Applied Environmental Services	1985	1991		NYD980535652

Region 2 *cont.*

New York *cont.*	WSR	PNRS	USAF	EPA Facility ID
BEC Trucking		1990		NYD980768675
Bioclinical Laboratories, Inc.				NYD980768683
Brewster Well Field				NYD980652275
Brookhaven National Laboratory (USDOE)	1990			NY7890008975
Byron Barrel & Drum				NYD980780670
C & J Disposal Leasing Co. Dump	1989			NYD981561954
Carroll & Dubies Sewage Disposal	1989			NYD010968014
Circuitron Corp.				NYD981184229
Claremont Polychemical				NYD002044584
Clothier Disposal				NYD000511576
Colesville Municipal Landfill				NYD980768691
Computer Circuits				NYD125499673
Consolidated Iron and Metal				NY0002455756
Cornwall LF.				NYD982276933
Croton Point Sanitary Landfill				NYD980508048
Dupont/Necco Park				NYD980532162
Endicott Village Well Field				NYD980780746
FMC Corp.				NYD000511857
Forest Glen Mobile Home Subdivision				NYD981560923
Fort Totten				NY2213720897
Fulton Terminals				NYD980593099
G.E. Moreau				NYD980528335
General Motors (Central Foundry Division)		1989		NYD091972554
Genzale Plating Co.				NYD002050110
Goldisc Recordings, Inc.				NYD980768717
Griffiss Air Force Base (Former)-AFBCA/OL-X				NY4571924451
Harbor at Hastings Associates				NY0001817097
Haviland Complex				NYD980785661
Hertel Landfill				NYD980780779
Hooker (102nd Street)				NYD980506810
Hooker Chemical/Ruco Polymer Corp.				NYD002920312
Hooker Hyde Park				NYD000831644
Hooker S Area				NYD980651087

Region 2 *cont.*

New York *cont.*	WSR	PNRS	USAF	EPA Facility ID
Hudson Coal Tar				NYD987039104
Hudson River PCB's		1989		NYD980763841
Jackson Steel				NYD001344456
Johnstown City Landfill				NYD980506927
Jones Chemicals, Inc.				NYD000813428
Jones Sanitation	1987			NYD980534556
Lawrence Aviation Industries Inc.				NYD002041531
Li Tungsten Corp.	1992	1993		NYD986882660
Liberty Heat Treating Co. Inc.				NYD053169694
Liberty Industrial Finishing	1985	1993		NYD000337295
Love Canal				NYD000606947
Ludlow Sand & Gravel				NYD013468939
Malta Rocket Fuel Area				NYD980535124
Marathon Battery Corp.	1984	1989		NYD010959757
Mattiace Petrochemical Co., Inc.	1989	1990		NYD000512459
Mercury Refining Inc.				NYD048148175
Nepera Chemical Co., Inc.				NYD002014595
Newstead Site				NYD986883387
Niagara County Refuse				NYD000514257
Niagara Mohawk Power Co. (Saratoga Springs)				NYD980664361
North Sea Municipal Landfill	1985	1989		NYD980762520
Old Roosevelt Field Contaminated GW Area				NYSFN0204234
Pasley Solvents & Chemicals, Inc.				NYD991292004
Pennsylvania Ave. Municipal Landfill				NY6141790018
Peter Cooper	1999			NYD980530265
Pfohl Brothers Landfill				NYD986875979
Pollution Abatement Services				NYD000511659
Port Washington Landfill	1984	1989		NYD980654206
Preferred Plating Corp.				NYD980768774
Reynolds Metals Co.		1996		NYD002245967
Richardson Hill Road Landfill/Pond				NYD980507735
Rowe Industries Groundwater Contamination	1987	1991		NYD981486954
Sidney Landfill	1989			NYD980507677

Region 2 *cont.*

New York *cont.*	WSR	PNRS	USAF	EPA Facility ID
Sinclair Refinery				NYD980535215
Smithtown Groundwater Contamination				NY0002318889
Solvent Savers				NYD980421176
Stanton Cleaners				NYD047650197
Suffern Village Well Field				NYD980780878
Syosset Landfill				NYD000511360
Tri-Cities Barrel Co., Inc.				NYD980509285
Tronic Plating Co., Inc.				NYD002059517
Volney Municipal Landfill				NYD980509376
Wallkill Landfill				NYD980535496
Warwick Landfill				NYD980506679
Wide Beach Development				NYD980652259
York Oil Co.				NYD000511733
Puerto Rico				
Clear Ambient Services Co.	1984			PRD090416132
Frontera Creek	1984	1991		PRD980640965
GE Wiring Devices				PRD090282757
Juncos Landfill				PRD980512362
Naval Security Group Activity	1989	1991		PR4170027383
Upjohn Facility				PRD980301154
V&M/Albaladejo Farms	1997			PRD987366101
Vega Alta Public Supply Wells				PRD980763775
Vega Baja Solid Waste Disposal				PRD980512669
Virgin Islands				
Island Chemical Corp./V.I. Chemical Corp.	1996			VID980651095
Tutu Wellfield	1993			VID982272569

Region 3

Washington, D.C.	WSR	PNRS	USAF	EPA Facility ID
Poplar Point Nursery				DCN000305662
Washington Gas Light Co.				DCD077797793
Washington Navy Yard	1999			DC9170024310

Delaware				
12th Street Landfill				DESFN0305510
Army Creek Landfill	1984			DED980494496
Chem-Solv, Inc				DED980714141
Coker's Sanitation Service Landfills	1986	1990		DED980704860
Delaware City PVC Plant	1984			DE0001912757
Delaware Sand & Gravel	1984			DED000605972
Dover Air Force Base	1987	1989		DE8570024010
Dover Gas Light Co.	1987			DED980693550
E.I. Du Pont Newport Landfill	1987	1991, 1992		DED980555122
Halby Chemical	1986	1990		DED980830954
Harvey & Knott Drum, Inc				DED980713093
Kent County Landfill	1989			DED980705727
Koppers Co. Facilities Site	1990			DED980552244
NCR Corp., Millsboro	1986			DED043958388
New Castle Spill Site	1984	1989		DED058980442
New Castle Steel	1984			DED980705255
NVF (Yorklyn)				DE0002014975
Old Brine Sludge Landfill	1984			DED980704894
Pigeon Point Landfill	1987			DED980494603
Sealand Limited	1989			DED981035520
Standard Chlorine Co.	1986			DED041212473
Sussex Co. Landfill #5	1989			DED980494637
Tybouts Corner Landfill	1984			DED000606079
Tyler Refrigeration Pit				DED980705545
Wildcat Landfill	1984			DED980704951

Maryland				
68th Street Dump/Industrial Enterprises	***2002***			***MDD980918387***
Allied Chemical				MDD069396711

Region 3 *cont.*

Maryland *cont.*	WSR	PNRS	USAF	EPA Facility ID
Anne Arundel County Landfill	1989			MDD980705057
Bethlehem Steel Sparrows Point Plant				MDD053945432
Brandywine DRMO				MD9570024803
Bush Valley Landfill	1989	1993		MDD980504195
Central Chemical Corporation	1999			MDD003061447
Chemical Metals Industries, Inc.				MDD980555478
Hawkins Pt / MD. Port Admin.				MDD000731356
Indian Head Naval Surface Warfare Center	1984	1997		MD7170024684
Joy Reclamation Co.	1984			MDD030321178
Kane & Lombard Street Drums				MDD980923783
Maryland Port Admin.				MDD030324073
Mid-Atlantic Wood Preservers, Inc				MDD064882889
Naval Surface Warfare Center - White Oak				MD0170023444
Naval Training Center Bainbridge				MDD985397256
Ordnance Products, Inc.	1995			MDD982364341
Sand, Gravel & Stone Site	1984	1990		MDD980705164
Southern Maryland Wood Treating	1987			MDD980704852
Spectron, Inc		1997		MDD000218008
U.S. Agricultural Center Beltsville (2 Tenants)	1995			MD0120508940
USA Aberdeen - Edgewood	1986			MD2210020036
USA Aberdeen - Edgewood: Bush River Watershed		1994		MD2210020036
USA Aberdeen - Edgewood: Gun Powder River Watershed	1994			MD2210020036
USA Aberdeen - Michaelsville	1986			MD3210021355
USA Aberdeen - Michaelsville: Romney Creek Watershed		1994		MD3210021355
USA Fort George Meade	1997			MD9210020567
USAF Andrews Air Force Base			1994	MD0570024000
USN Patuxent Naval Air Station	1996			MD7170024536
Woodlawn Co. Landfill	1987			MDD980504344

Pennsylvania	
A.I.W. Frank/Mid-County Mustang	PAD004351003
Allied Signal Aerospace Co. Guidance and Control Systems	PAD003047974
Ambler Asbestos Piles	PAD000436436

Region 3 *cont.*

Pennsylvania *cont.*	WSR	PNRS	USAF	EPA Facility ID
American Electronic Lab, Inc				PAD009224981
AMP Inc, Global Envir Services				PAD980693048
Austin Avenue Radiation Site	1993			PAD987341716
Bally Engineered Structure Incorporated				PAD061105128
Bell Landfill				PAD980705107
Berkley Products				PAD980538649
Berks Landfill Corp.				PAD000651810
Berks Sand Pit				PAD980691794
Boarhead Farms	1989			PAD047726161
Bridesburg Dump	1984			PAD980508402
Brodhead Creek				PAD980691760
Brown's Battery Breaking		1991		PAD980831812
Butler Mine Tunnel	1987			PAD980508451
Butz Landfill				PAD981034705
Crater Resources, Inc./Keystone Coke Co./Alan Wood	1993			PAD980419097
Croydon TCE Spill	1986			PAD981035009
Delta Quarries & Disposal Inc./Stotler Landfill				PAD981038052
Douglassville Disposal	1987			PAD002384865
Drake Chemical				PAD003058047
Dublin TCE Site				PAD981740004
Eastern Diversified Metals				PAD980830533
Elizabethtown Landfill	1989			PAD980539712
Enterprise Avenue	1984			PAD980552913
FMC Marcus Hook	1996			PAD987323458
Foote Mineral Co.	1993			PAD077087989
GMT Microelectronics				PAD093730174
Hamburg Lead Site				PAD987332541
Havertown PCP Site				PAD002338010
Hebelka Auto Salvage Yard				PAD980829329
Hellertown Manufacturing Co.	1987			PAD002390748
Henderson Road		1989		PAD009862939
Industrial Lane				PAD980508493
Jack's Creek/Sitkin Smelting & Refining, Inc.	1989			PAD980829493
Keyser Ave. Borehole	1989			PAD981036049

Region 3 *cont.*

Pennsylvania *cont.*	WSR	PNRS	USAF	EPA Facility ID
Kimberton				PAD980691703
Lackawanna Refuse				PAD980508667
Lansdowne Radiation Site				PAD980830921
Letterkenny Army Depot (PDO Area)				PA2210090054
Letterkenny Army Depot (SE Area)				PA6213820503
Lord-Shope Landfill				PAD980508931
Lower Darby Creek Area				PASFN0305521
Malvern TCE				PAD014353445
Marjol Operation				PAD003041910
Metal Bank of America	1984	1990		PAD046557096
Metropolitan Mirror and Glass				PAD982366957
Middletown Air Field				PAD980538763
Mill Creek Dump				PAD980231690
Modern Sanitation Landfill				PAD980539068
Moyers Landfill				PAD980508766
MW Manufacturing				PAD980691372
National Vulcanized Fiber				PAD107214116
Naval Air Development Center (8 Areas)				PA6170024545
North Penn - Area 1				PAD096834494
North Penn - Area 12				PAD057152365
North Penn - Area 2				PAD002342475
North Penn - Area 5				PAD980692693
North Penn - Area 6				PAD980926976
North Penn - Area 7				PAD002498632
Novak Sanitary Landfill				PAD079160842
Occidental Chemical Corp./Firestone Tire and Rubber Co.	1989			PAD980229298
Old Wilmington Road GW Contamination				PAD981938939
Palmerton Zinc Pile				PAD002395887
Paoli Rail Yard	1987	1991		PAD980692594
Publicker/Cuyahoga Wrecking Plant	1990			PAD981939200
Raymark	1996			PAD039017694
Recticon/Allied Steel	1989			PAD002353969
Reeser's Landfill				PAD980829261
Revere Chemical Co.	1986			PAD051395499
Rohm and Haas Landfill	1986			PAD091637975

Region 3 *cont.*

Pennsylvania *cont.*	**WSR**	**PNRS**	**USAF**	**EPA Facility ID**
Sable Diamonds/US Metal & Coins				PAD982364234
Saegertown Industrial Area				PAD980692487
Salford Quarry	1997			PAD980693204
Shriver's Corner				PAD980830889
Stanley Kessler				PAD014269971
Strasburg Landfill				PAD000441337
Textron Lycoming				PAD003053709
Tinicum National Environmental Center	1986			PA6143515447
Tonolli Corp.				PAD073613663
Tysons Dump #1	1985			PAD980692024
UGI Corp. Gas Manufacturing Plant	1995			PAD980539126
USN Philadelphia Naval Shipyard				PA4170022418
USN Ships Parts Control Center	1996			PA3170022104
Wade (ABM)	1984			PAD980539407
Walsh Landfill				PAD980829527
Whitmoyer Laboratories				PAD003005014
Willow Grove Naval Air and Air Reserve Station				PAD987277837
Virginia				
Abex Corp.	1989			VAD980551683
Arrowhead Associates Inc./Scovill Corp.	1989			VAD042916361
Atlantic Wood Industries, Inc.	1987	1990		VAD990710410
C & R Battery Co., Inc.	1987			VAD049957913
Chisman Creek	1984			VAD980712913
Clarke L.A. & Son				VAD007972482
Former Nansemond Ordnance Depot	***2002***			***VAD123933426***
H & H Inc., Burn Pit				VAD980539878
Hampton Roads Welders Site				VAD988197133
Kim-Stan Landfill				VAD077923449
Marine Corps Combat and Development Command	1995			VA1170024722
Nansemond Ordnance Depot	2000			VAD123933426
NASA Wallops Island				VA8800010763
NASA-Langley Research Center	1995	1997		VA2800005033

Region 3 *cont.*

Virginia *cont.*	WSR	PNRS	USAF	EPA Facility ID
Naval Amphibious Base Little Creek				VA5170022482
Naval Surface Warfare Center - Dahlgren	1993			VA7170024684
Naval Weapons Station - Yorktown	1993	1997		VA8170024170
NWS Yorktown - Cheatham Annex				VA3170024605
Rentokil, Inc. (Virginia Wood Preserving Division)				VAD071040752
Richmond, Fredericksburg & Potomac Railroad		1994		VAD020312013
Saunders Supply Co.	1987			VAD003117389
St Juliens Creek Annex (U.S. Navy)				VA5170000181
Suffolk City Landfill				VAD980917983
U.S. Defense General Supply Center				VA3971520751
USA Fort Eustis	1996			VA6210020321
USA Woodbridge Research Facility				VA7210020981
USAF Langley Air Force Base 5		1997		VA2800005033
USN Naval Shipyard Norfolk	1999			VA1170024813
USN Norfolk Naval Base	1997			VA6170061463
USN Radio Transmitting Facility				VA9170022488

Region 4

Alabama				
Alabama Wood Treating Corp. Inc.				ALD058221326
American Brass, Inc.	***2002***			***ALD981868466***
Ciba-Geigy Corp. (McIntosh Plant)	1990			ALD001221902
Gulf Oil Co.				ALD000604249
Interstate Lead Co. (ILCO)				ALD041906173
Olin Corp. (McIntosh Plant)	1990			ALD008188708
Redwing Carriers, Inc. (Saraland)	1989			ALD980844385
Stauffer Chemical Co. (Cold Creek Plant)		1990		ALD095688875

Region 4 *cont.*

Alabama *cont.*	WSR	PNRS	USAF	EPA Facility ID
Stauffer Chemical Co. (Lemoyne Plant)				ALD008161176
T.H. Agriculture & Nutrition (Montgomery)				ALD007454085
US Naval Outlying Barin Field				AL2170024630
USAF Maxwell Air Force Base				AL0570024182

Florida				
Agrico Chemical Co.	1989			FLD980221857
Airco Plating Co.				FLD004145140
Alaric Area GW Plume				FLD012978862
American Creosote Works (Pensacola Plant)	1984	1989		FLD008161994
Anaconda Aluminum Co./Milgo Electronics				FLD020536538
Anodyne, Inc				FLD981014368
B&B Chemical Co., Inc				FLD004574190
Bay Drum				FLD088783865
Beulah Landfill				FLD980494660
BMI-Textron				FLD052172954
Broward County-21st Manor Dump	1992			FLD981930506
Cabot/Koppers				FLD980709356
Cascade Park Gasification Plant				FLD981931959
Chemform, Inc.	1990			FLD080174402
Chevron Chemical Co. (Ortho Division)				FLD004064242
Coleman-Evans Wood Preserving Co.				FLD991279894
Cypress Garden Skis				FLD029505161
Davie Landfill				FLD980602288
Dubose Oil Products Co.				FLD000833368
Florida Petroleum Processors				FLD984184127
Florida Steel Corp.				FLD050432251
Gardinier Inc/ Ft Meade Mine				FLD000827428
Harris Corp. (Palm Bay Plant)	1986	1990		FLD000602334
Helena Chemical Co. (Tampa Plant)	1993			FLD053502696
Hipps Road Landfill				FLD980709802
Hollingsworth Solderless Terminal				FLD004119681
Kassauf-Kimerling Battery Disposal				FLD980727820
Madison County Sanitary Landfill				FLD981019235

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA Facility ID
MRI Corporation	1997			FLD088787585
Munisport Landfill	1984			FLD084535442
Normandy Park Apartments				FLD984229773
Peak Oil Co./Bay Drum Co.				FLD004091807
Peele-Dixie Wellfield Site				FLD984259374
Pensacola Naval Air Station	1990			FL9170024567
Pepper Steel & Alloys, Inc				FLD032544587
Pickettville Road Landfill	1984	1990		FLD980556351
Piper Aircraft/Vero Beach Water & Sewer				FLD004054284
Pleasant Grove Landfill				FLD984169763
Reeves SE Corp. Southeastern Wire Div.				FLD000824888
Reeves Southeast Galvanizing Corp.				FLD000824896
Sapp Battery Salvage		1989		FLD980602882
Schuylkill Metals Corp.				FLD062794003
Sherwood Medical Industries				FLD043861392
Sixty-Second Street Dump	1984	1989		FLD980728877
Solitron Devices, Inc				FLD032845778
Solitron Microwave				FLD045459526
Southern Solvents, Inc				FL0001209840
St. Augustine Gas Company				FLD101835528
Standard Auto Bumper Corp.	1989			FLD004126520
Stauffer Chemical Co. (Tampa Plant)	1993			FLD004092532
Stauffer Chemical Co. (Tarpon Springs)	1993			FLD010596013
Sydney Mine Sludge Ponds		1989		FLD000648055
Taylor Road Landfill				FLD980494959
Trans Circuits, Inc.				FLD091471904
US NASA Kennedy Space Center				FL6800014585
USAF Cape Canaveral AFB				FL2800016121
USAF Eglin AFB Armament Division				FL8570024366
USAF Homestead AFB				FL7570024037
USAF MacDill AFB				FL2971590003
USAF NAS Key West (Boca Chica)				FL6170022952
USAF Patrick AFB				FL2570024404
USAF Tyndall Air Force Base	1997			FL1570024124
USCG Station Key West				FL1690331300

Region 4 *cont.*

Florida *cont.*	WSR	PNRS	USAF	EPA Facility ID
USN Air Station Cecil Field	1990			FL5170022474
USN NAS Jacksonville	1990			FL6170024412
USN Naval Air Station Mayport				FL9170024260
USN Naval Air Station Whiting Field Site 5	1996			FL2170023244
USN Naval Coastal Systems Ctr.				FL8170023792
Whitehouse Oil Pits				FLD980602767
Wilson Concepts of Florida, Inc				FLD041184383
Wingate Road Municipal Incinerator Dump				FLD981021470
Woodbury Chemical Co. (Princeton Plant)	1989			FLD004146346
Zellwood Ground Water Contamination				FLD049985302
Georgia				
Brunswick Wood Preserving	1997			GAD981024466
Cedartown Industries, Inc				GAD095840674
Cedartown Municipal Landfill				GAD980495402
Diamond Shamrock Corp. Landfill				GAD990741092
Escambia Wood - Camilla	1999			GAD008212409
Firestone Tire & Rubber Co. (Albany Plant)				GAD990855074
Hercules 009 Landfill				GAD980556906
Hercules Inc				GAD004065520
International Paper Co.				GAD000827444
LCP Chemicals Georgia Inc		1995		GAD099303182
Marine Corps Logistics Base				GA7170023694
Mathis Brothers Landfill				GAD980838619
Monsanto Corp. (Augusta Plant)				GAD001700699
New Sterling Landfill				GAD980495451
Robins Air Force Base				GA1570024330
T.H. Agriculture & Nutrition (Albany)				GAD042101261
Terry Creek Dredge Spoil/Hercules Outfall	1997			GAD982112658
Woolfolk Chemical Works, Inc				GAD003269578

Region 4 *cont.*

Mississippi	WSR	PNRS	USAF	EPA Facility ID
Chemfax, Inc.	1995			MSD008154486
Davis Timber Company				MSD046497012
Gautier Oil Co., Inc.	1989			MSD098596489
Naval Construction Battalion Center				MS2170022626
Southeast Mississippi Industrial Council				MSD980403240
Tennessee Gas Pipeline/CS 530				MSD991277542
USAF Keesler AFB				MS2570024164
North Carolina				
ABC One Hour Cleaners	1989			NCD024644494
Camp Lejeune Military Res. (USNavy)	1989			NC6170022580
Charles Macon Lagoon & Drum Storage				NCD980840409
Cherry Point Marine Corps Air Station				NC1170027261
Dockery Property				NCD980840342
FCX, Inc. (Washington Plant)	1989			NCD981475932
Geigy Chemical Corp. (Aberdeen Plant)				NCD981927502
General Electric Co./Shepherd Farm				NCD079044426
Georgia-Pacific Corporation Hardwood Sawmill				NCD000813592
Koppers Co. Inc. (Morrisville Plant)				NCD003200383
National Starch & Chemical Corp.				NCD991278953
New Hanover County Airport Burn Pit	1989			NCD981021157
Old ATC Refinery				NCD986186518
Potter's Septic Tank Service Pits	1989			NCD981023260
Reasor Chemical Company				NCD986187094
Triangle Pacific				NDC087336335
Weyerhaeuser Co. Landfill				NCD980601587
South Carolina				
Allied Terminals				SC0000861054
Beaufort County Landfill				SCD980844260
Calhoun Park Area		1993		SCD987581337
Carolawn, Inc				SCD980558316
Charleston Landfill				SCD980846034
Columbia Nitrogen				SC0001040393

Region 4 *cont.*

South Carolina *cont.*	WSR	PNRS	USAF	EPA Facility ID
Geiger (C&M Oil)	1984			SCD980711279
Helena Chemical Co. Landfill	1989			SCD058753971
International Paper Co.				SCD055915086
Kalama Specialty Chemicals				SCD094995503
Koppers Co., Inc. (Charleston Plant)	1993			SCD980310239
Leonard Chemical Co., Inc				SCD991279324
Lexington County Landfill Area				SCD980558043
Macalloy Corporation				SCD003360476
Palmetto Recycling, Inc				SCD037398120
Para-Chem Southern, Inc				SCD002601656
Parris Island Marine Corps Recruit Depot		1995		SC6170022762
Savannah River Site (USDOE)	1990			SC1890008989
USDOI Charleston Harbor Site		1993		SCD987572674
USN Charleston Naval Weapons Station				SC8170022620
USN Naval Shipyard - Charleston				SC0170022560
Wamchem, Inc.	1984			SCD037405362

Region 5

Illinois	
Fort Sheridan	IL8214020838
Great Lakes Naval Training Center	NA
Outboard Marine Corp.	ILD000802827
Yeoman Creek Landfill	ILD980500102

Indiana	
Grand Calumet/IHC Area of Concern	IND980500573

Region 5 *cont.*

Michigan	WSR	PNRS	USAF	EPA Facility ID
Allied Paper/Portage Creek/Kalamazoo River				MID006007306
Cannelton Industries				MID980678627
Deer Lake				MID980679799
Ford Motor Co.				MID005057005
Hooker Montague Plant				MID006014906
Manistique River/Harbor, Area of Concern				MID981192628
Muskegon Chem Co.				MID072569510
Packaging Corp. of America				MID980794747
Shiawassee River				MID980794473
Thunder Bay				MID985640630
Torch Lake				MID980901946
Minnesota				
St Louis River/Interlake				MND039045430
Ohio				
Ashtabula River				NA
Fields Brook				OHD980614572
Wisconsin				
Ashland/NSP Lakefront Site				WISFN0507952
Boerke Site				WID981189632
Fort Howard Paper Co. Lagoons				WID006136659
Fort Howard Steel Incorporated				WID006141402
Fox River NRDA/PCB Releases				WI0001954841
Kohler Co. Landfill				WID006073225
Moss-American (Kerr-McGee Oil Co.)				WID039052626
Sheboygan Harbor & River				WID980996367

Region 6

Louisiana

American Creosote Works, Inc. (Winnfield Plant)			LAD000239814
Bayou Bonfouca			LAD980745632
Bayou d'Inde			LAD981916570
Bayou Sorrel Site	1984		LAD980745541
Bayou Verdine, Occidental Chemical			LAD985195346
Calcasieu Estuary			LA0002368173
Calcasieu Parish Landfill			LAD980501423
Delatte Metals	***2002***		***LAD052510344***
Devil's Swamp Lake			LAD985202464
Gulf State Utilities-North Ryan Street			LAD985169317
Madisonville Creosote Works	1997		LAD981522998
Mallard Bay Landing Bulk Plant			LA0000187518
New Orleans Naval Air Station			LA6170022788
Petro-Processors of Louisiana, Inc.			LAD057482713
Ponchatoula Battery Company			LAD062644232
PPG Industries Inc.			LAD008086506
Shell Oil Co. (Norce Mfg Complex)			LAD008186579
Southern Shipbuilding Corp.			LAD008149015

Texas

Alcoa (Point Comfort)/Lavaca Bay	1995		TXD008123168
Bailey Waste Disposal	1985	1989	TXD980864649
Brio Refining, Inc.	1989	1989	TXD980625453
Chevron Products Co.			TXD008090409
Corpus Christi Naval Air Station			TX7170022787
Crystal Chemical Co.	1989	1989	TXD990707010
Dixie Oil Processors, Inc.	1989	1989	TXD089793046
French, Ltd.	1989	1989	TXD980514814
Geneva Industries/Fuhrmann Energy			TXD980748453
Harris (Farley Street)			TXD980745582
Highlands Acid Pit	1989		TXD980514996

Region 6 *cont.*

Texas *cont.*	WSR	PNRS	USAF	EPA Facility ID
International Creosoting				TXD980625636
Malone Service Co. - Swan Lake Plant				TXD980864789
Motco, Inc.	1984			TXD980629851
North Cavalcade Street				TXD980873343
Palmer Barge Line				TXD068104561
Patrick Bayou				TX0000605329
Petro-Chemical Systems (Turtle Bayou)				TXD980873350
Sheridan Disposal Services				TXD062132147
Sikes Disposal Pits	1989			TXD980513956
South Cavalcade Street				TXD980810386
Sprague Road Groundwater				TX0001407444
Star Lake Canal Site - Port Neches				TX0001414341
State Marine	1999			TXD099801102
Tex-Tin Corp.	1989			TXD062113329
Triangle Chemical Co.				TXD055143705

Region 9

American Somoa				
Taputimu Farm	1984			ASD980637656

California				
Aerojet General Corp.				CAD980358832
Alameda Naval Air Station	1989			CA2170023236
Bolsa Chica Lowlands				NA
Brown & Bryant, Inc. (Arvin Plant)				CAD052384021
Camp Pendleton Marine Corps Base	1990	1992		CA2170023533

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA Facility ID
Caretaker Site Office Treasure Island				CA7170023330
Casmalia Resources				CAD020748125
Chevron USA Richmond Ref				CAD009114919
Coast Wood Preserving	1984			CAD063015887
Concord Naval Weapons Station	1989, 1993	1990		CA7170024528
Cooper Drum Co.	1993			CAD055753370
Crazy Horse Sanitary Landfill				CAD980498455
CTS Printex, Inc.	1989			CAD009212838
Del Amo Facility	1992			CAD029544731
Del Norte Pesticide Storage	1984			CAD000626176
El Toro Marine Corps Air Station	1989			CA6170023208
Fairchild Semiconductor Corp. (Mt View)				CAD095989778
Farallon Islands		1990		CAD981159585
Fleet Industrial Supply Center Oakland				CA4170090027
Fort Ord	1990	1992		CA7210020676
Fresno Municipal Sanitary Landfill				CAD980636914
GBF, Inc., Dump	1989, 1993			CAD980498562
Gray Eagle Mine				CAD000629923
Hamilton Army Airfield				CA3570024288
Hewlett-Packard (620-640 Page Mill Road)	1989			CAD980884209
Hexcel Corporation				CAD058783952
Intersil Inc./Siemens Components	1989			CAD041472341
Iron Mountain Mine	1989	1989		CAD980498612
J.H. Baxter & Co.				CAD000625731
Jasco Chemical Corp.	1989			CAD009103318
Jet Propulsion Laboratory (NASA)				CA9800013030
Kaiser Steel Corp. (Fontana Plant)				CAD008274938
Kearney-KPF				CAD981429715
Liquid Gold Oil Corp.	1984			CAT000646208
Long Beach Naval Station				CA2170023194
Louisiana-Pacific Corp.				CAD065021594
Mare Island Naval Shipyard				CA7170024775
McCormick & Baxter Creosoting Co.	1993			CAD009106527
McNamara & Peepe Sawmill				CA0001097088
M-E-W Study Area				CAD982463812

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA Facility ID
MGM Brakes	1984			CAD000074120
Modesto Ground Water Contamination				CAD981997752
Moffett Naval Air Station	1986			CA2170090078
Montrose Chemical Corp.	1985			CAD008242711
Naval Air Station Lemore				CA3170024381
Naval Shipyard Long Beach				CA1170090483
Naval Supply Center Pt Molate Site				CA0170090021
Newmark Ground Water Contamination				CAD981434517
North Island Naval Air Station				CA7170090016
Oakland Naval Supply Ctr./Alameda Facility				CA1170090012
Pacific Coast Pipe Lines	1989			CAD980636781
Pacific Missile Test Center				CA9170027271
Point Loma Naval Complex				CA1170090236
Port Hueneme Naval Constr Battalion Ctr				CA6170023323
Presidio of San Francisco				CA7210020791
Ralph Gray Trucking Co.				CAD981995947
Redwood Shore Landfill				CAD982462343
Rhone-Poulenc, Inc./Zoecon Corp.	1985			CAT000611350
Riverbank Army Ammunition Plant	1989			CA7210020759
Romic Chem Corp.				CAD009452657
Sacramento Army Depot				CA0210020780
San Diego Naval Training Center				CA7170090057
Seal Beach Naval Weapons Sta.				CA0170024491
Shell Oil Co. Martinez				CAD009164021
Simpson-Shasta Ranch				CAD980637482
Sola Optical USA, Inc.	1989			CAD981171523
Solvent Service, Inc.				CAD059494310
South Bay Asbestos Area	1985			CAD980894885
Spectra-Physics, Inc.				CAD009138488
Sulphur Bank Mercury Mine				CAD980893275
Synertek, Inc. (Building 1)				CAD990832735
Tosco Corp Avon Ref				CAD000072751
Travis Air Force Base	1990			CA5570024575
Treasure Island Naval Station - Hunters Pt. Annex	1989	1989		CA1170090087

Region 9 *cont.*

California *cont.*	WSR	PNRS	USAF	EPA Facility ID
TRW Microwave, Inc (Building 825)				CAD009159088
United Heckathorn Co.				CAD981436363
Vandenberg AFB			1994	CA9570025149
Guam				
Andersen Air Force Base	1993			GU6571999519
Apra Harbor Naval Complex				GU7170090008
Naval Air Station Agana				GU0170027320
Naval Sta Guam				GU7170027323
Hawaii				
ABC Chem Corp.				HID033233305
Barbers Point Naval Station				HI1170024326
Bellows Air Force Station				HI3570028719
Chemwood Treatment Co., Inc.				HID981424138
Del Monte Corporation (Oahu Plantation)	1995			HID980637631
Hawaiian Western Steel Limited				HID981581788
Hickam Air Force Base				HI8570028722
Honolulu Skeet Club				HI0000768382
Johnston Atoll				HI4210090003
Kahoolawe Island				HI6170090074
Kailua-Kona Landfill				HID980497184
Kapaa Ldfl				HID980497176
Kewalo Incin Ash Dump				HID980497226
Kure Atoll, U.S. Coast Guard				HID984470039
Marine Corps Base Hawaii				HI6170022762
Naval Submarine Base				HI3170024340
Pearl City Landfill	1984			HID980585178
Pearl Harbor Naval Complex				HI4170090076
Pearl Harbor Naval Station	1992	1993		HI2170024341
Tern Island				NA
USCG Base Honolulu				HID984469890
Waiakea Pond/Hawaiian Cane Prdts Plant		1990		HID982400475

Region 9 *cont.*

Trust Territories	WSR	PNRS	USAF	EPA Facility ID
PCB Wastes				TTD980637987
U.S. Minor Outlying Islands				
Midway Island Naval Air Station				UM6170027332
Wake Island				
Wake Island Air Field				WQ0570090001

Region 10

Alaska				
Adak Naval Air Station	1993			AK4170024323
Alaska Pulp Corp.		1995		AKD009252487
Dutch Harbor Sediment Site				AKSFN1002080
Elmendorf Air Force Base	1990	1990	1994	AK8570028649
Fort Richardson (US Army)	1995			AK6214522157
Fort Wainwright				AK6210022426
Kennicott Copper Mining Co.				AKD983073123
Ketchikan Pulp Co.				AKD009252230
King Salmon AFS				AK3570028669
Klag Bay Site				AK0002364768
Standard Steel & Metals Salvage Yard (USDOT)	1990	1990		AKD980978787
USAF Eareckson AFS				AK9570028705
USDOC NOAA Nat Marine Fisheries Svc				AK0131490021
USNAVY Barrow Naval Arctic Research Lab				AK2170027245
Idaho				
Blackbird Mine	1995	1994		IDD980725832
Grouse Creek Mine				IDD000643254
St Maries Creosote				IDSFN1002095
Stibnite/Yellow Pine Mining Area				IDD980665459

Region 10 *cont.*

Oregon	WSR	PNRS	USAF	EPA Facility ID
Allied Plating, Inc.	1987	1988		ORD009051442
Coos Bay				OR0001389972
East Multnomah County Ground Water Contamination				ORD987185030
Gould, Inc.	1984	1988		ORD095003687
Hoy's Marine LLC				ORD987190840
Joseph Forest Products				ORD068782820
Martin-Marietta Aluminum Co.	1987	1988		ORD052221025
McCormick & Baxter Creosoting Co. (Portland Plant)	1995	1995		ORD009020603
Northwest Pipe & Casing Co.	1993			ORD980988307
Portland Harbor				OR0001297969
Reynolds Metals Co.	1996			ORD009412677
Rhone Poulenc Inc.	1984			ORD990659492
Taylor Lumber and Treating, Inc.		1991		ORD009042532
Teledyne Wah Chang	1985	1988		ORD050955848
Union Pacific Railroad Co. Tie-Treating Plant	1990	1990		ORD009049412

Washington				
Alcoa (Vancouver Smelter)	1989	1989		WAD009045279
American Crossarm & Conduit Co.	1989	1988		WAD057311094
Asarco Inc.				WAD010187896
Bangor Naval Submarine Base	1990	1991		WA5170027291
Bangor Ordnance Disposal (USNavy)		1991		WA7170027265
Boeing Company Plant 2				WAD009256819
Bonneville Power Administration: Ross Complex (USDOE)	1990	1990		WA1891406349
Boomsnub/Airco				WAD009624453
Centralia Municipal Landfill	1989	1989		WAD980836662
Commencement Bay, Near Shore/Tide Flats	1984	1988		WAD980726368
Commencement Bay, South Tacoma Channel	1984			WAD980726301
Hamilton /Labree Roads GW Contamination				WASFN1002174
Hamilton Island Landfill (USA/COE)	1992	1991		WA5210890096
Hanford 100-Area (USDOE)	1989	1988		WA3890090076
Hansville Landfill				WAD000711804

Region 10 *cont.*

Washington *cont.*	WSR	PNRS	USAF	EPA Facility ID
Harbor Island (Lead)	1984	1989		WAD980722839
Jackson Park Housing Complex (USNavy)	1995			WA3170090044
Lower Duwamish Waterway				WA0002329285
Naval Air Station, Whidbey Island (Ault Field)	1986	1989		WA5170090059
Naval Air Station, Whidbey Island (Seaplane Base)	1986	1989		WA6170090058
Naval Undersea Warfare Engineering Station (4 Waste Areas)		1989		WA1170023419
Northwest Transformer (South Harkness Street)	1989	1988		WAD027315621
Oeser Company	1997			WAD008957243
Old Navy Dump/Manchester Lab (USEPA/NOAA)	1996	1995		WA8680030931
Olympic View Sanitary Landfill				WAD042804971
Pacific Sound Resources (Wyckoff West Seattle)	1995	1992		WAD009248287
Pacific Wood Treating				WAD009422411
Palermo Well Field Groundwater Contamination				WA0000026534
Puget Sound Naval Shipyard Complex	1995			WA2170023418
Quendall Terminals	1985			WAD980639215
Rayonier Inc Port Angeles Mill				WAD000490169
Seattle Municipal Landfill (Kent Highlands)	1989	1988		WAD980639462
South Tacoma Field				WAD980724173
Strandley/Manning Site		1992		WAD980976328
Tulalip Landfill	1992	1991		WAD980639256
United Marine Shipyards				WAD009264284
US Navy Puget Sound FISC Dept.				WA2170023426
Vancouver Water Station #1 Contamination				WAD988519708
Washington Natural Gas - Seattle Plant		1996		WAD980639280
Western Processing Co., Inc.	1984			WAD009487513
Weyerhaeuser Co.				WAD009041450
WPNSTA Seal Beach Det. Port Hadlock		1995		WA4170090001
Wyckoff Co./Eagle Harbor (2 areas)	1986	1988		WAD009248295

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