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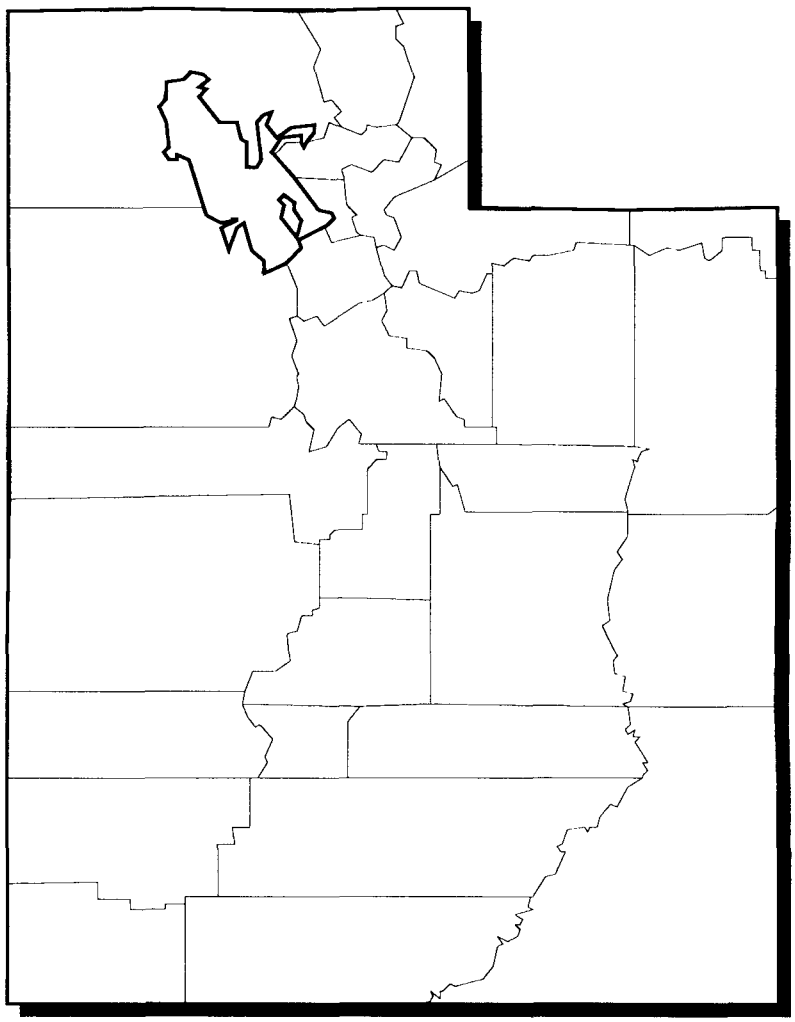
Environmental Protection
Agency

Solid Waste And
Emergency Response
(5102 G)

EPA/540/R-93/041
December 1992
PB93-963243

SUPERFUND: Progress at National Priority List Sites



UTAH
1992 UPDATE

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December 1992

NATIONAL PRIORITIES LIST SITES:

Utah

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Emergency & Remedial Response
Office of Program Management
Washington, DC 20460

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INTRODUCTION

A BRIEF OVERVIEW OF SUPERFUND

During the second half of the Twentieth Century, the environmental consequences of more than 100 years of industrialization in the United States became increasingly clear. Authors such as Rachel Carson wrote passionately about the often-hidden environmental effects of our modern society's widespread use of chemicals and other hazardous materials. Their audience was small at first, but gradually their message spread. Growing concern turned to action, as people learned more about the environment and began to act on their knowledge

The 1970s saw environmental issues burst onto the national scene and take hold in the national consciousness. The first Earth Day was observed in 1970, the year that the U.S. Environmental Protection Agency (EPA) was founded. By the end of the 1970s, Love Canal in New York and the Valley of the Drums in Kentucky had entered the popular lexicon as synonyms for pollution and environmental degradation.

Superfund Is Established

The industrialization that gave Americans the world's highest standard of living also created problems that only a national program could address. By 1980, the U.S. Congress had passed numerous environmental laws, implemented by the EPA, but many serious hazardous waste problems were slipping through the cracks.

Responding to growing concern about public health and environmental threats from uncontrolled releases of hazardous materials, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Popularly known as Superfund, CERCLA had one seemingly simple job—to uncover and clean up hazardous materials spills and contaminated sites.

A Big Job

Few in Congress, the EPA, the environmental community, or the general public knew in 1980 just how big the nation's hazardous materials problem is. Almost everyone thought that Superfund would be a short-lived program requiring relatively few resources to clean up at most a few hundred sites. They were quite mistaken.

As the EPA set to work finding sites and gauging their potential to harm people and the environment, the number of sites grew. Each discovery seemed to lead to another, and today almost 36,000 hazardous waste sites have been investigated as potential hazardous waste sites. They are catalogued in the EPA's computerized database, CERCLIS (for the Comprehensive Environmental Re-

sponse, Compensation, and Liability Information System).

The damage to public health and the environment that each site in CERCLIS might cause is evaluated; many sites have been referred to State and local governments for cleanup. The EPA lists the nation's most serious hazardous waste sites on the National Priorities List, or NPL. (These Superfund sites are eligible for federally-funded cleanup, but whenever possible the EPA makes polluters pay for the contamination they helped create.) The NPL now numbers 1,275 sites, with 50 to 100 added each year. By the end of the century, the NPL may reach as many as 2,100 sites.

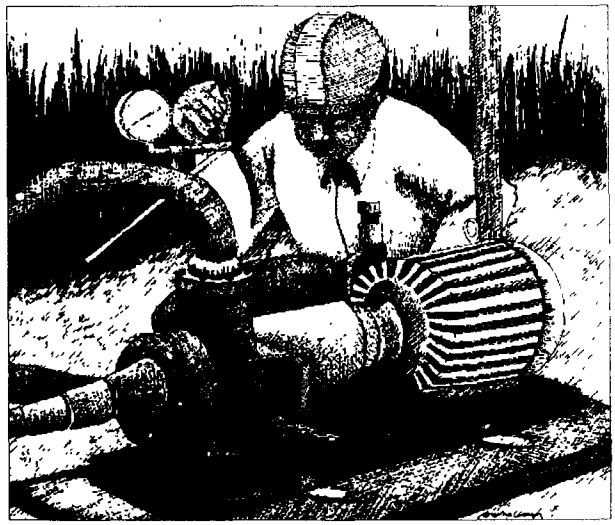
Superfund faces some of the most complex pollution problems ever encountered by an environmental program. Improperly stored or disposed chemicals and the soil they contaminate are one concern. More difficult to correct are the wetlands and bays, and the groundwater, lakes, and rivers often used for drinking water that are contaminated by chemicals spreading through the soil or mixing with storm water runoff. Toxic vapors contaminate the air at some sites, threatening the health of people living and working near by.

Superfund aims to control immediate public health and environmental threats by tackling the worst problems at the worst sites first. Wherever possible, Superfund officials use innovative treatment techniques—many developed or refined by the EPA—to correct hazardous materials problems once and for all. Many of the treatment techniques they use did not exist when the program was created.

The EPA Administrator had challenged Superfund to complete construction necessary for cleanup work at 130 NPL sites by the end of the 1992 federal fiscal year. By September 30, 1992, the end of fiscal year 1992, construction had been completed at a total of 149 NPL sites. Superfund is well on its way of meeting the Administrator's goal of completing construction at 200 NPL sites by the end of fiscal year 1993, and 650 sites by the end of fiscal year 2000.

Quick Cleanup at Non-NPL Sites

Long-standing hazardous waste sites are not Superfund's only concern. The EPA also responds to hazardous spills and other emergencies, hauling away chemicals for proper treatment or disposal. Superfund teams perform or supervise responses at rail and motor vehicle accidents, fires, and other emergencies involving hazardous substances. They also evacuate people living and working near by, if necessary, and provide clean drinking water to people whose own water is contaminated. Removal crews also post warning signs and take other precautions to keep people and animals away from hazardous substances.



Superfund employee prepares equipment for groundwater treatment.

Quick Cleanups, or Removals, are not limited to emergencies. When cleanup crews at contaminated sites find hazardous substances that immediately threaten people or the environment, they act right away to reduce the threat or to remove the chemicals outright. As the EPA implements the Superfund Accelerated Cleanup Model (SACM), more and more sites will undergo quick cleanups, and many of these will be cleaned up completely without ever being included on the NPL. (See "Streamlining Superfund: The Superfund Accelerated Cleanup Model.")

Some of Superfund's most significant gains in public health and environmental protection have been won by the removal program. As of March 31, 1992, the Emergency Response Program had logged more than 2,300 removal completions since Superfund was established.

Superfund employee removing drums from a Superfund site.

The Public's Role

Superfund is unique among federal programs in its commitment to citizen participation. Although the EPA is responsible for determining how dangerous a site is and how best to clean it up, the Agency relies on citizen input as it makes these decisions.

Community residents are often invaluable sources of information about a hazardous waste site, its current and previous owners, and the activities that took place there. Such information can be crucial to experts evaluating a site and its potential dangers.

Residents also comment on EPA cleanup plans by stating their concerns and preferences at public meetings and other forums and in formal, written comments to Agency proposals. The EPA takes these comments and concerns seriously, and has modified many proposals in response to local concerns. For, ultimately, it is the community and its citizens that will live with the results of the EPA's decisions and actions; it is only fair that citizens participate in the process.

A Commitment to Communication

The Superfund program is very serious about public outreach and communication. Community relations coordinators are assigned to each NPL site to help the public understand the potential hazards present, as well as the cleanup alternatives. Local information repositories, such as libraries or other public buildings, have been established near each NPL site to ensure that the public has an opportunity to review all relevant information and the proposed cleanup plans.

The individual State volumes contain summary fact sheets on NPL sites in each State and territory. Together, the fact sheets provide a concise report on site conditions and the progress made toward site cleanups as of March 1992. The EPA revises these volumes periodically to provide an up-to-date record of program activities. A glossary of key terms relating to hazardous waste management and Superfund site cleanup is provided at the back of this book.

INTRODUCTION

Superfund is, of course, a public program, and as such it belongs to everyone of us. This volume, along with other State volumes, comprises the EPA's report on Superfund progress to the program's owners for the year 1992.

STREAMLINING SUPERFUND: THE SUPERFUND ACCELERATED CLEANUP MODEL

Historically, critics and supporters alike have measured Superfund's progress by the number of hazardous waste sites deleted from the NPL. Although easy enough to tally, this approach is too narrow. It misses the major gains Superfund makes by reducing major risks at the nation's worst hazardous sites long before all clean-up work is done and the site deleted. It also ignores the Removal Program's contributions to meeting Superfund's twin mandates of maximizing public health and environmental protection.

Renewing Superfund's commitment to rapid protection from hazardous materials, the EPA is streamlining the program. The Superfund Accelerated Cleanup Model, or SACM, will take Early Actions, such as removing hazardous wastes or contaminated materials, while experts study the site. SACM also will combine similar site studies to reduce the time required to evaluate a site and its threats to people and the environment. This way, immediate public health and environmental threats will be addressed while long-term cleanups are being planned.

Emergencies such as train derailments and motor vehicle accidents will continue to be handled expeditiously. Teams of highly trained technicians will swing into action right away, coordinating the cleanup and removal of hazardous substances to ensure public safety as quickly as possible.

Breaking With Tradition

The traditional Superfund process begins with a lengthy phase of study and site assessment, but SACM will save time by combining separate, yet similar, activities. Each EPA Region will form a Decision Team of site managers, risk assessors, community relations coordinators, lawyers, and other experts to monitor the studies and quickly determine whether a site requires Early Action (taking less than five years), Long-term Action, or both.

While the site studies continue, the Decision Team will begin the short-term work required to correct immediate public health or environmental threats from the site. Besides removing hazardous materials, Early Actions include taking precautions to keep contaminants from moving off the site and restricting access to the site. Early Actions could eliminate most human risk from these sites, and Superfund will further focus its public participation and public information activities on site assessment and Early Action.

Long-Term Solutions

While Early Actions can correct many hazardous waste problems—and provide the bulk of public health and environmental protection—some contamination will take longer to correct. Cleanups of mining sites, wetlands, estuaries, and projects involving incineration of contaminants or restoration of groundwater can take far longer than the three to five years envisioned for Early Actions. Under SACM, these sites will be handled much as they are now.

Also under SACM, the EPA will continue its pursuit of potentially responsible parties who may have caused or contributed to site contamination. Expedited enforcement and procedures for negotiating potentially responsible party settlements will secure their participation. Superfund personnel will continue to oversee clean-up work performed by potentially responsible parties.

HOW SUPERFUND WORKS

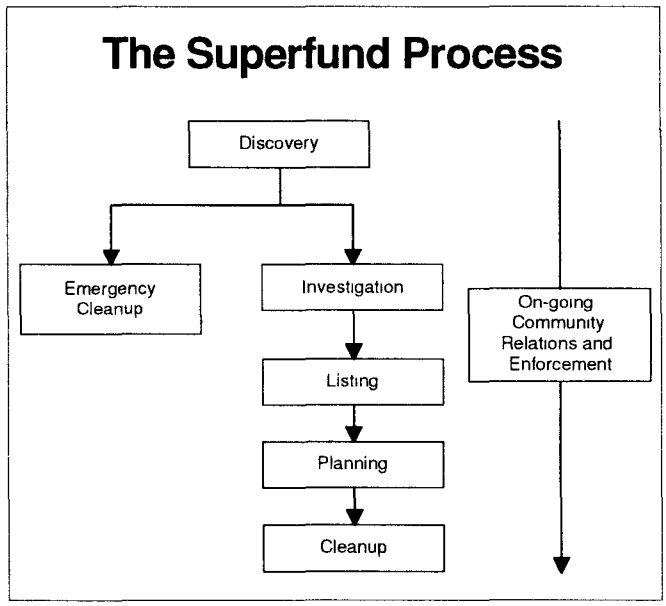
Each Superfund site presents a different set of complex problems. The same hazardous materials and chemicals often contaminate many sites, but the details of each site are different. Almost always, soil is contaminated with one or more chemicals. Their vapors may taint the air over and around the site. Contaminants may travel through the soil and reach underground aquifers which may be used for drinking water, or they may spread over the site to contaminate streams, ponds, and wetlands. The contaminating chemicals may interact with each other, presenting even more complicated cleanup problems.

Superfund's cleanup process is arduous and exacting. It requires the best efforts of hundreds of experts in science and engineering, public health, administration and management, law, and many other fields.

The average NPL site takes from seven to ten years to work its way through the system, from discovery to the start of long-term cleanup. Actual cleanup work can take years, decades if contaminated groundwater must be treated. Of course, imminent threats to public health or the environment are corrected right away.

The diagram to the right presents a simplified view of the cleanup process. The major steps in the Superfund process are:

- Site discovery and investigation to identify contaminants and determine whether emergency action is required;
- Emergency site work such as removing contaminants for proper treatment or disposal, and securing the site to keep people and animals away, if warranted by conditions at the site;
- Site evaluation to determine how people living and working nearby, and the environment, may be exposed to site contaminants;
- Detailed studies to determine whether conditions are serious enough to add the site to the National Priorities List of sites eligible for federally funded cleanup under Superfund;
- Selection, design, and implementation of a cleanup plan, after a thorough review of the most effective cleanup options, given site conditions, contaminants present, and their potential threat to public health or the environment.
- Follow-up to ensure that the cleanup work done at the site continues to be effective over the long term.



From the earliest stages, EPA investigators work hard to identify those responsible for the contamination. As their responsibility is established, the EPA negotiates with these "responsible parties" to pay for cleaning up the problem they helped create. This "enforcement first" policy saves Superfund Trust Fund monies for use in cleanups where the responsible parties cannot be identified, or where they are unable to fund cleanup work.

THE VOLUME

How to Use the State Book

The site fact sheets presented in this book are comprehensive summaries that cover a broad range of information. The fact sheets describe hazardous waste sites on the NPL and their locations, as well as the conditions leading to their listing ("Site Description"). The summaries list the types of contaminants that have been discovered and related threats to public and ecological health ("Threats and Contaminants"). "Cleanup Approach" presents an overview of the cleanup activities completed, underway, or planned. The fact sheets conclude with a brief synopsis of how much progress has been made in protecting public health and the environment. The summaries also pinpoint other actions, such as legal efforts to involve polluters responsible for site contamination and community concerns.

The fact sheets are arranged in alphabetical order by site name. Because site cleanup is a dynamic and gradual process, all site information is accurate as of the date shown on the bottom of each page. Progress always is being made at NPL sites, and the EPA periodically will update the site fact sheets to reflect recent actions and will publish updated State volumes. The following two pages show a generic fact sheet and briefly describe the information under each section.

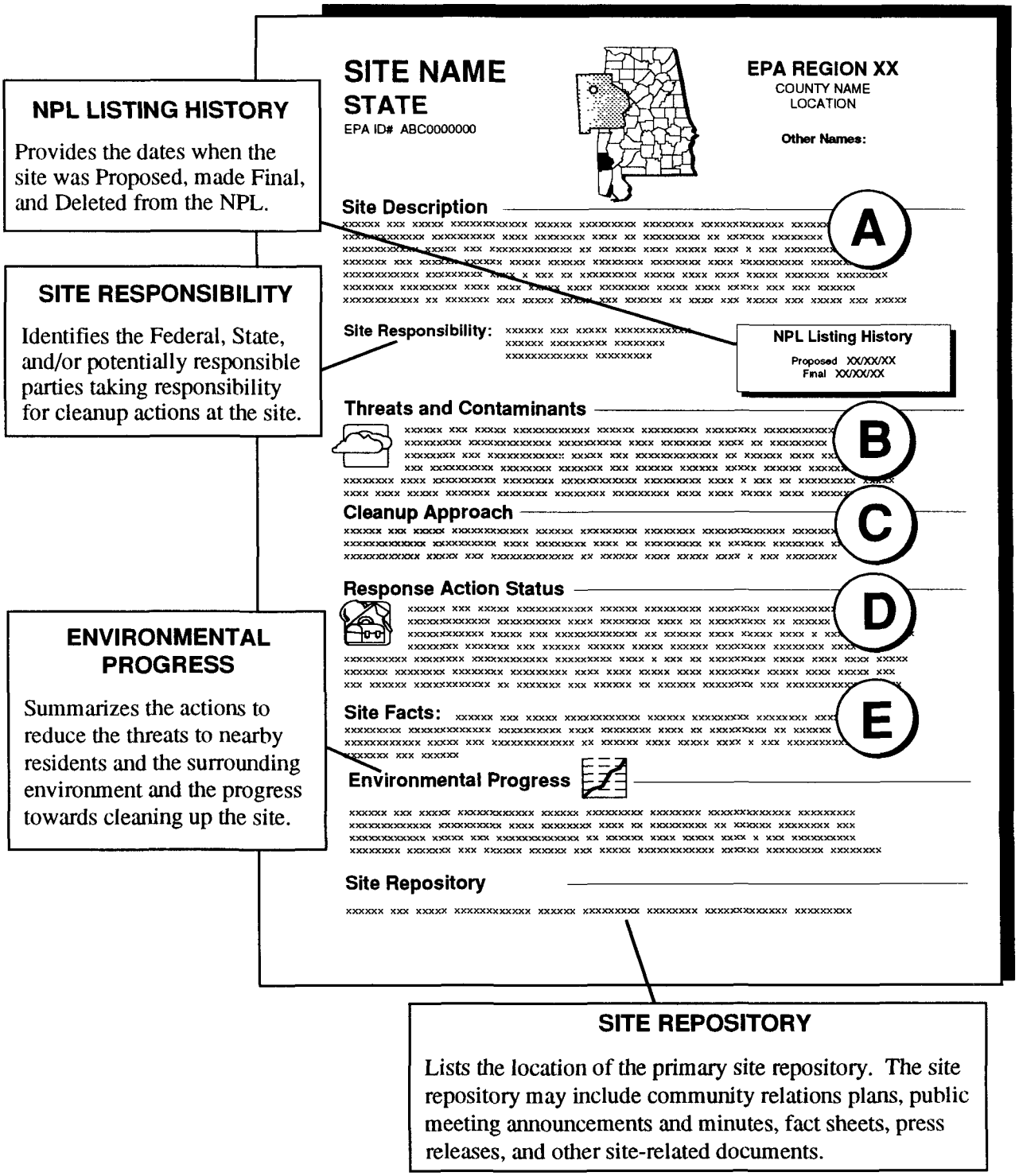
How Can You Use This State Book?

You can use this book to keep informed about the sites that concern you, particularly ones close to home. The EPA is committed to involving the public in the decision making process associated with hazardous waste cleanup. The Agency solicits input from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may be relocated, temporary water supplies may be necessary.

Definitive information on a site can help citizens sift through alternatives and make decisions. To make good choices, you must know what the threats are and how the EPA intends to clean up the site. You must understand the cleanup alternatives being proposed for site cleanup and how residents may be affected by each one. You also need to have some idea of how your community intends to use the site in the future, and you need to know what the community can realistically expect once the cleanup is complete.

The EPA wants to develop cleanup methods that meet community needs, but the Agency only can take local concerns into account if it understands what they are. Information must travel both ways in order for cleanups to be effective and satisfactory. Please take this opportunity to learn more, become involved, and assure that hazardous waste cleanup at "your" site considers your community's concerns.

THE VOLUME


SITE NAME
STATE
EPA ID# ABC0000000
EPA REGION XX
COUNTY NAME
LOCATION
Other Names:
Site Description
A
Site Responsibility:
NPL Listing History
Proposed XX/XX/XX
Final XX/XX/XX
Threats and Contaminants
B
Cleanup Approach
C
Response Action Status
D
Site Facts:
E
Environmental Progress
Site Repository
NPL LISTING HISTORY
Provides the dates when the site was Proposed, made Final, and Deleted from the NPL.
SITE RESPONSIBILITY
Identifies the Federal, State, and/or potentially responsible parties taking responsibility for cleanup actions at the site.
ENVIRONMENTAL PROGRESS
Summarizes the actions to reduce the threats to nearby residents and the surrounding environment and the progress towards cleaning up the site.
SITE REPOSITORY
Lists the location of the primary site repository. The site repository may include community relations plans, public meeting announcements and minutes, fact sheets, press releases, and other site-related documents.

A

SITE DESCRIPTION

This section describes the location and history of the site. It includes descriptions of the most recent activities and past actions at the site that have contributed to the contamination. Population estimates, land usages, and nearby resources give readers background on the local setting surrounding the site.

B

THREATS AND CONTAMINANTS

The major chemical categories of site contamination are noted, as well as which environmental resources are affected. Icons representing each of the affected resources (may include air, groundwater, surface water, soil, and contamination to environmentally sensitive areas) are included in the margins of this section. Potential threats to residents and the surrounding environments arising from the site contamination also are described.

C

CLEANUP APPROACH

This section contains a brief overview of how the site is being cleaned up.

D

RESPONSE ACTION STATUS

Specific actions that have been accomplished or will be undertaken to clean up the site are described here. Cleanup activities at NPL sites are divided into separate phases, depending on the complexity and required actions at the site. Two major types of cleanup activities often are described: initial, immediate, or emergency actions to quickly remove or reduce imminent threats to the community and surrounding areas; and long-term remedial phases directed at final cleanup at the site. Each stage of the cleanup strategy is presented in this section of the summary. Icons representing the stage of the cleanup process (initial actions, site investigations, EPA selection of the cleanup remedy, engineering design phase, cleanup activities underway, and completed cleanup) are located in the margin next to each activity description.

E

SITE FACTS

Additional information on activities and events at the site are included in this section. Often details on legal or administrative actions taken by the EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

THE VOLUME

The "icons," or symbols, accompanying the text allow the reader to see at a glance which environmental resources are affected and the status of cleanup activities at the site.

Icons in the Threats and Contaminants Section

Contaminated *Groundwater* resources in the vicinity or underlying the site. (Groundwater is often used as a drinking water source.)

Contaminated *Surface Water and Sediments* on or near the site. (These include lakes, ponds, streams, and rivers.)

Contaminated *Air* in the vicinity of the site. (Air pollution usually is periodic and involves contaminated dust particles or hazardous gas emissions.)

Contaminated *Soil and Sludges* on or near the site. (This contamination category may include bulk or other surface hazardous wastes found on the site.)

Threatened or contaminated *Environmentally Sensitive Areas* in the vicinity of the site. (Examples include wetlands and coastal areas or critical habitats.)

Icons in the Response Action Status Section

Initial, Immediate, or Emergency Actions have been taken or are underway to eliminate immediate threats at the site.

Site Studies at the site to determine the nature and extent of contamination are planned or underway.

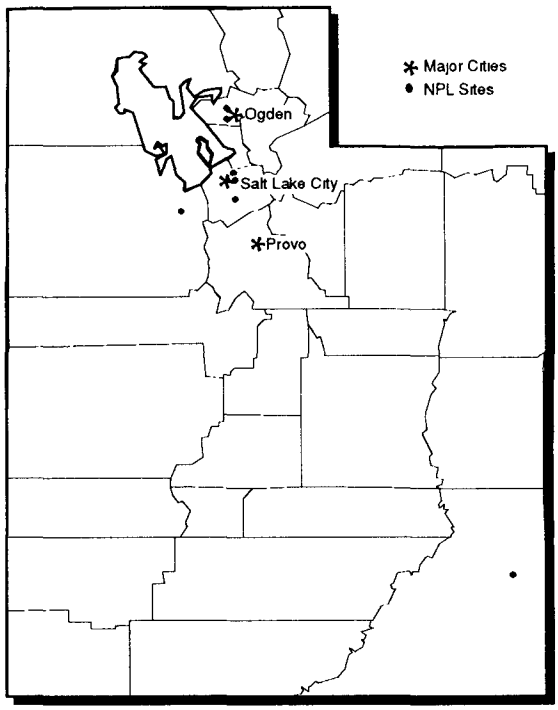
Remedy Selected indicates that site investigations have been concluded, and the EPA has selected a final cleanup remedy for the site or part of the site.

Remedy Design means that engineers are preparing specifications and drawings for the selected cleanup technologies.

Cleanup Ongoing indicates that the selected cleanup remedies for the contaminated site, or part of the site, currently are underway.

Cleanup Complete shows that all cleanup goals have been achieved for the contaminated site or part of the site.

A SUMMARY OF THE STATE PROGRAM



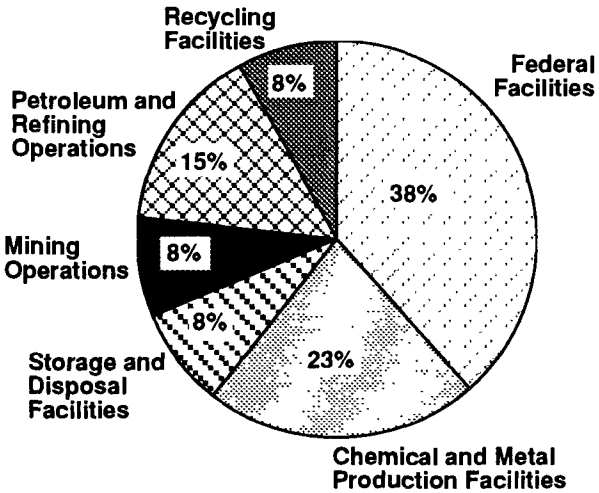
Superfund Activities in Utah

The State of Utah is located within EPA Region 8, which includes the six northern central States extending from the mid-western plains to the Rocky Mountains. The State covers 84,899 square miles. According to the 1990 Census, Utah experienced an 18 percent increase in population between 1980 and 1990, and is ranked thirty-fifth in U.S. population with approximately 1,722,800 residents.

The Utah Hazardous Substances Mitigation Act of 1989, most recently amended in 1991, authorizes the State to compel cleanup activities at Superfund sites. This statute grants the State the authority to make polluters liable for cleanup activities regardless of fault. In practice, the State strongly encourages polluters to conduct cleanup activities themselves with State oversight, since State funding is limited. In those cases where polluters refuse to participate, the State conducts investigations using moneys from the Hazardous Substances Mitigation Fund; actual cleanup activities are either conducted under State enforcement authorities or through the Federal Superfund program. In addition to funding the 10 percent contribution required from the State by the Federal Superfund program, the Hazardous Substances Mitigation Fund can be used for emergency responses, removals, and investigations. The Fund may not be used if the site can be cleaned up under any other State statute. Currently, 11 sites in the State of Utah have been listed as final on the NPL. Two new sites have been proposed for listing in 1992.

The Department of Environmental Quality
implements the Superfund Program in the State of Utah

Activities responsible for hazardous waste contamination in the State of Utah include:



Facts about the 13 NPL sites in Utah:

Immediate Actions (such as removing hazardous substances or restricting site access) were performed at eight sites.

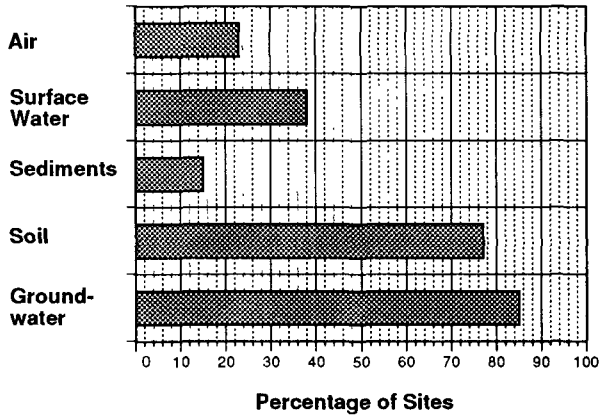
Three sites endanger sensitive environments.

Eleven sites are located near residential areas.

UTAH

Most Sites Have Multiple Contaminants and Contaminated Media:

Media Contaminated at Sites



Contaminants Found at Sites

	Percentage of Sites
Heavy Metals	77%
VOCs	46%
Creosotes	23%
Pesticides/Herbicides	23%
Radiation	15%
Dioxin	15%
Plastics	15%
Petrochemicals/Explosives	8%
PCBs	8%

The Potentially Responsible Party Pays...

In the State of Utah, potentially responsible parties are paying for or conducting cleanup activities at seven sites.

For Further Information on NPL Sites and Hazardous Waste Programs in the State of Utah Please Contact:

☎ EPA Region 8 Public Affairs Branch	For information concerning community involvement	(303) 294-1120
☎ National Response Center	To report a hazardous waste emergency	(800) 424-8802
☎ The Department of Environmental Quality: Division of Environmental Health, Division of Environmental Response and Remediation	For information about the State's responsibility in the Superfund Program	(801) 536-4100
☎ EPA Region 8 Hazardous Waste Management Division	For information about the Regional Superfund Program	(303) 294-7630
☎ EPA Superfund Hotline	For information about the Federal Superfund Program	(800) 424-9068

THE NPL REPORT

PROGRESS TO DATE

The following Progress Report lists all sites currently on, or deleted from, the NPL and briefly summarizes the status of activities for each site at the time this report was prepared. The steps in the Superfund cleanup process are arrayed across the top of the chart, and each site's progress through these steps is represented by an arrow (⇨) indicating the current stage of cleanup.

Large and complex sites often are organized into several cleanup stages. For example, separate cleanup efforts may be required to address the source of the contamination, hazardous substances in the groundwater, and surface water pollution, or to clean up different areas of a large site. In such cases, the chart portrays cleanup progress at the site's *most advanced* stage, reflecting the status of site activities rather than administrative accomplishments.

⇨ An arrow in the "Initial Response" category indicates that an emergency cleanup, immediate action, or initial action has been completed or currently is underway. Emergency or initial actions are taken as an interim measure to provide immediate relief from exposure to hazardous site conditions or to stabilize a site to prevent further contamination.

⇨ A final arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site currently is ongoing or planned.

⇨ A final arrow in the "Remedy Selection" category means that the EPA has selected the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy has been selected. In these cases, the arrows are discontinued at the "Remedy Selection" step and resume in the "Construction Complete" category.

⇨ A final arrow at the "Remedial Design" stage indicates that engineers currently are designing the technical specifications for the selected cleanup remedies and technologies.

⇨ A final arrow in the "Cleanup Ongoing" column means that final cleanup actions have been started at the site and currently are underway.

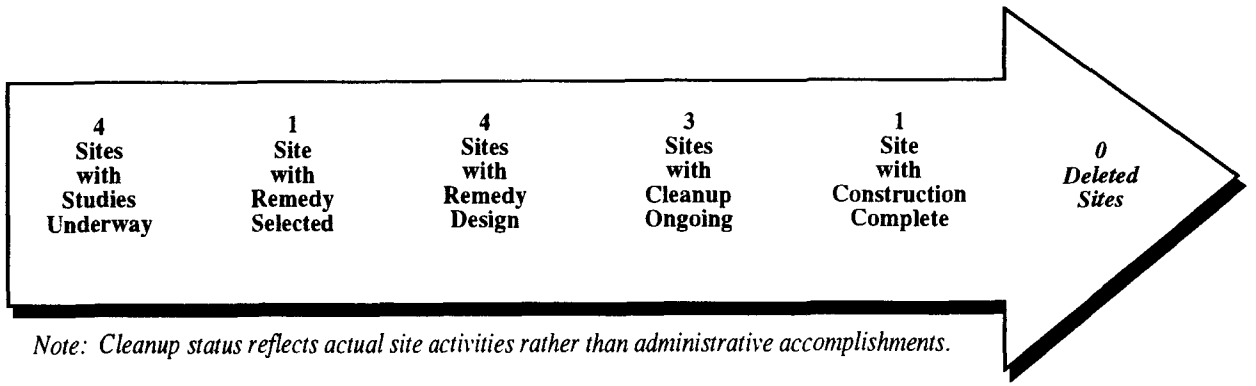
⇨ A final arrow in the "Construction Complete" category is used only when all phases of the site cleanup plan have been performed, and the EPA has determined that no additional construction actions are required at the site. Some sites in this category currently may be undergoing long-term operation and maintenance or monitoring to ensure that the cleanup actions continue to protect human health and the environment.

✓ A check in the "Deleted" category indicates that the site cleanup has met all human health and environmental goals and that the EPA has deleted the site from the NPL.

Further information on the activities and progress at each site is given in the site "Fact Sheets" published in this volume.

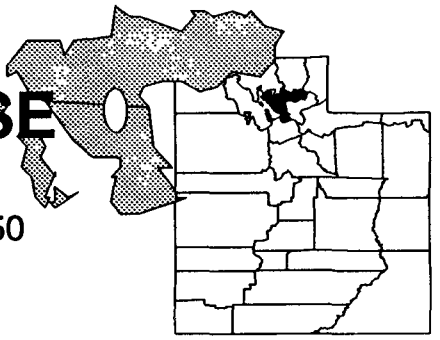
Progress Toward Cleanup at NPL Sites in the State of Utah

Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete	Deleted
HILL AIR FORCE BASE	DAVIS/WEBER	Final	07/01/87		⇨	⇨				
MIDVALE SLAG	SALT LAKE	Final	02/11/91	⇨	⇨					
MONTICELLO MILL TAILINGS (DOE)	SAN JUAN	Final	11/21/89		⇨	⇨	⇨	⇨		
MONTICELLO RADIOACTIVELY CONTAMINATED PROPERTIES	SAN JUAN	Final	06/10/86		⇨	⇨	⇨	⇨		
OGDEN DEFENSE DEPOT	WEBER	Final	07/01/87	⇨	⇨	⇨	⇨			
PETROCHEM RECYCLING CORP./ EKOTEK INC.	SALT LAKE	Proposed	07/29/91	⇨	⇨					
PORTLANDCEMENT (KILN DUST #2&#3)	SALT LAKE	Final	06/10/86	⇨	⇨	⇨	⇨			
RICHARDSON FLAT TAILINGS	SUMMIT	Proposed	02/07/92	⇨	⇨					
ROSE PARK SLUDGE PIT	SALT LAKE	Final	09/08/83		⇨	⇨	⇨	⇨	⇨	
SHARON STEEL (MIDVALE TAILINGS)	SALT LAKE	Final	08/30/90	⇨	⇨	⇨	⇨			
TOOELE ARMY DEPOT (NORTH AREA)	TOOELE	Final	08/30/90		⇨	⇨	⇨	⇨		
UTAH POWER & LIGHT/AMERICAN BARREL	SALT LAKE	Final	10/04/89	⇨	⇨					
WASATCH CHEMICAL CO. (LOT 6)	SALT LAKE	Final	02/11/91	⇨	⇨	⇨	⇨			



Note: Cleanup status reflects actual site activities rather than administrative accomplishments.

HILL AIR FORCE BASE
UTAH
EPA ID# UT0571724350



EPA REGION 8
Davis and Weber Counties
5 miles south of Ogden

Site Description

The 6,665-acre Hill Air Force Base site is used by the Air Force for the overhaul and maintenance of aircraft. Several areas on base have been identified by the Air Force as being contaminated, including four landfills, three chemical disposal pits, Berman Pond, the Industrial Wastewater Treatment Plant (IWTP) Sludge Drying Beds, Fire Training Area One, Bamberger Pond, the Refueling Vehicle Maintenance Facility, and the Toole Army Rail Shop. Industrial and municipal wastes were dumped on base, including volatile organic chemicals (VOCs), electroplating wastes, sludges from the IWTP, waste oils, and petroleum fuel products. Approximately 20,000 people work on Hill Air Force Base; about 15,000 are civilian employees. Most of the residences in the area surrounding the site are connected to the municipal water supply system; however, some private wells and springs are used for drinking water and irrigation.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 07/01/87

Threats and Contaminants

Groundwater in the disposal and pit areas is contaminated with various VOCs and heavy metals. Jet fuels and oils contaminate groundwater near Chemical Disposal Pits #1 and #2. Groundwater located near Chemical Disposal Pit #3 contains high concentrations of VOCs. Surface water located in springs downgradient from Chemical Disposal Pit #3 is contaminated by VOCs. The Toole Army Rail Shop and Bamberger Pond areas are contaminated with VOCs. Potential health threats include drinking or coming in contact with contaminated groundwater or surface water.

Cleanup Approach

This site is being addressed in five long-term remedial phases including cleanup of: Landfills #3 and #4, Chemical Disposal Pits #1 and #2, and the Fire Training Area; Chemical Disposal Pit #3; the IWTP Sludge Drying Beds, the Sodium Hydroxide Tank Leak Area, Berman Pond, and the Refueling Vehicle Maintenance Facility (Building 514); Landfills #1 and #2; and the Toole Army Rail Shop and Bamberger Pond.

Response Action Status

Landfills #3 and #4, Chemical Disposal Pits #1 and #2, and the Fire Training Area: In 1984, a clay cap was placed over Landfill #4, installation began on a slurry wall around the upgradient areas of contamination, and a series of extraction wells were installed. The slurry wall was completed in 1985. In 1986, clay caps were constructed over Landfill #3 and a portion of the chemical disposal pits. A parking lot was installed over the Fire Training Area and the rest of the chemical disposal pits. A total of about 70 acres have been covered. Over 50 million gallons of contaminated groundwater subsequently have been extracted and treated by the Air Force. Off-base migration of contaminants has been significantly reduced. Continued studies into contamination at these areas and the most effective ways to address it underway and are scheduled to be completed in 1994.

Chemical Disposal Pit #3: In 1991, the Air Force began a study to determine the nature and extent of contamination and to identify alternatives for cleanup. Extraction and treatment were chosen as interim measures identified to address a subsurface accumulation of a dense, non-aqueous phase liquid (DNAPL). Final cleanup remedies for the disposal pit area are expected in 1993.

The IWTP Sludge Drying Beds, the Sodium Hydroxide Tank Leak Area, Berman Pond, and the Refueling Vehicle Maintenance Facility (Building 514): Berman Pond has been filled with construction rubble and regraded, and a clay cap was installed over the area. The unlined IWTP Sludge Drying Beds were lined with asphalt and then concrete. The investigation into site contamination and methods to effectively address these areas is being conducted; interim measures for sludges and the leaking tank are expected to be recommended in 1992. Final cleanup remedies are expected in 1994.

Landfills #1 and #2: Investigative work into site contamination and the most effective methods to address Landfills #1 and #2 is underway. Studies of cleanup alternatives are scheduled to be completed in 1993.

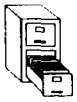
The Toole Army Rail Shop and Bamberger Pond: The investigation into site contamination and the most effective methods to address these areas was initiated by the Air Force in 1989. This investigation is scheduled for completion in 1995.

Site Facts: Hill Air Force Base is participating in the Installation Restoration Program, a specially funded program established by the Department of Defense (DOD) in 1978 to identify, investigate, and control the migration of hazardous contaminants at military and other DOD facilities. In 1991, the EPA and Hill Air Force Base signed a Federal Facilities Agreement, requiring the Air Force to conduct investigations at the site. Ongoing site characterization work may identify additional areas of the site that require cleanup.

Environmental Progress

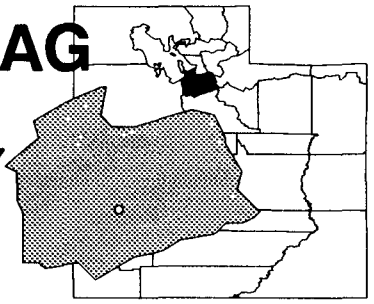
Initial actions have been performed at several of the investigation areas; the installation of a cap, a slurry wall, and extraction wells have significantly reduced the migration of contaminants from the Hill Air Force Base site while further studies and cleanup activities are taking place. In addition, the Air Force has provided alternate water supplies to affected residences while the nature of groundwater contamination is being characterized.

Site Repository



Davis County Library, 155 North Wasatch Drive, Layton, UT 84041

MIDVALE SLAG
UTAH
EPA ID# UTD081834277



EPA REGION 8
Salt Lake County
Midvale

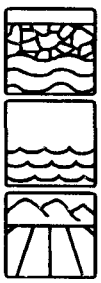
Site Description

The 330-acre Midvale Slag site is a former copper and lead smelting facility. The Midvale Smelter originally was constructed on this site in 1902 as a copper plant. Over the years, the plant was changed to a lead facility, producing gold-lead-silver bullion. From 1918 to 1928, approximately 400,000 tons of lead were produced. The smelter is no longer in operation; however, large piles of slag and other smelter wastes remain on site. The current operators of the site process the slag for use as sandblasting and railroad bed material. Two million tons of slag containing lead, arsenic, and cadmium were present on site until 1991. A substantial amount of slag has been removed and used for road bases, fill, and sandblasting. Access to the site currently is restricted by fences. A clay berm has been constructed to prevent the erosion of slag into the bordering Jordan River. There are approximately 1,500 people within 1/4 mile of the site. The contaminated shallow aquifer on site has been reported to discharge into the Jordan River at some locations. Public and municipal wells located near the site are used for domestic purposes. The Sharon Steel Site, which also is on the NPL, is adjacent to the Midvale Slag site.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 06/10/86
Final Date: 02/11/91

Threats and Contaminants



Groundwater and sediments are contaminated with heavy metals including arsenic, cadmium, lead, and chromium. On-site soils are contaminated with heavy metals, including cadmium, lead, arsenic and chromium. Explosives found on site posed a potential threat to on-site workers until they were removed in 1991. The Jordan River is potentially contaminated from runoff from the site and groundwater discharge. Potential health threats include drinking contaminated groundwater and surface water; coming in direct contact with groundwater, surface water, or slag; or ingesting of contaminated soil.

Cleanup Approach

This site is being address in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: In 1991, the EPA completed initial site cleanup actions to address immediate threats at the site. Abandoned chemicals found in an assay lab were overpacked and removed, and approximately 20 pounds of explosives were detonated. Additionally, the site was fenced to prevent public access.

Northern Zone: The EPA began a study into the nature and extent of contamination of the northern part of the site in mid-1989. This investigation, which is scheduled for completion in mid-1993, will recommend alternatives for cleanups.

Southern Zone: In late 1991, the EPA began an investigation of the contamination of the southern area of the site. This investigation will help to define contaminants of concern and recommend final cleanup alternatives.

Environmental Progress

Immediate actions to remove explosives and abandoned chemicals at the Midvale Slag site were completed early in 1991. This removal, as well as fencing the site, protects residents and the environment while further investigations are underway and cleanup activities are being planned.

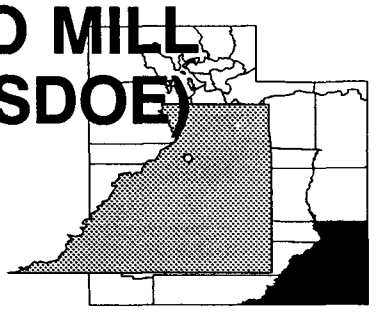
Site Repository

Ruth V. Tyler Public Library, 315 Wood Street, Midvale, UT 84047

MONTICELLO MILL TAILINGS (USDOE)

UTAH

EPA ID# UT3890090035



EPA REGION 8

San Juan County
City of Monticello

Other Names:
AEC Mill Site
Monticello Remedial Action Project

Site Description

The Monticello Mill Tailings (USDOE) site lies in the Montezuma Creek Valley, east of the Abajo Mountains. The inactive ore milling facility, on 78 acres of land, is bordered by the City of Monticello and Bureau of Land Management lands. Approximately 11 acres of the site was the former processing mill and administrative area, and the other 67 acres constituted the mill tailings impoundment area containing an estimated 2 million tons of tailings and contaminated soil. The former ore buying stations and areas contaminated by wind and waterborne particulate material and tailings cover another 300 acres. These areas, known as the Peripheral Properties, contain an estimated 300,000 tons of contaminated materials. The mill was constructed by the Vanadium Corporation of America in 1942 with funds from the Defense Plant Corporation. Initially, vanadium was produced, but in 1943 the mill began production of a uranium/vanadium sludge for the Manhattan Engineer District. In 1948, the Atomic Energy Commission (AEC) bought the site. Uranium milling continued until 1960, when the mill was permanently closed. It is estimated that approximately 900,000 tons of ore were processed at the site. Mill operations were terminated in 1960 and in 1961 the AEC stabilized the tailings piles. In 1964, the mill was dismantled. The population of the City of Monticello is estimated to be 1,900. The City of Monticello has its own water system, supplied by water from springs located on the flanks of the Abajo Mountains. The domestic water source for those people living outside the city limits is groundwater drawn chiefly from wells completed in the Burro Canyon Formation. There is no known contamination of the domestic water supplies attributable to contamination from the mill site.

Site Responsibility: The site is being addressed by Federal actions.

NPL LISTING HISTORY
Proposed Date: 07/14/89
Final Date: 11/21/89

Threats and Contaminants

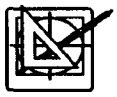
The groundwater and soil are contaminated with uranium; its radioactive decay products, thorium-230, radium-226, radon-222; and heavy metals from tailings deposited on the site. Exposure to uranium through contact with contaminated soil, groundwater, and airborne contaminated dust may be a potential threat to the health of individuals in the area of the site.

Cleanup Approach

The site is being addressed in three long-term remedial phases focusing on cleanup of the tailings piles and former mill site, the peripheral properties, and surface water and groundwater.

Response Action Status

Tailings Piles and Former Mill Site: In 1990, the Department of Energy (DOE) completed an investigation of contamination in the tailings piles and the former mill site. The selected remedy includes removing approximately 1.5 million cubic yards of tailings, ore, and process-related material from their present location, where they are within the flood plain of Montezuma Creek or where they are in contact with the groundwater, to a repository 1 mile south of the present mill tailings site. Once this is accomplished, the repository will be capped to protect the groundwater, isolate the waste from the environment, and control the escape of radon gas. Contaminated runoff will be collected and treated through evaporation of contaminants or reverse osmosis. When cleanup activities are completed, the mill site and the repository area will be revegetated. The design of the repository is currently underway and expected to be completed in 1994. Actual cleanup activities were initiated in 1991.



Peripheral Properties: In 1990, an investigation of the contamination at the peripheral properties was completed. The selected remedy involves excavating approximately 300,000 cubic yards of tailings and removing them to the repository, revegetating the area after the tailings are removed, and limiting access and the potential for future use. Design of this portion of the site remedy is underway. Actual cleanup activities are planned to begin in 1992.

Surface Water and Groundwater: The DOE has begun an investigation to determine the nature and extent of contamination in the surface water and groundwater. Completion of this investigation is not anticipated until the cleanup of the contaminated source materials at the tailing piles is underway. Following completion of the study, a remedy will be selected which will address surface water and groundwater contamination.

Site Facts: The cleanup of the Monticello Mill Tailings site and the Monticello Radioactively Contaminated Properties site is being conducted pursuant to a Federal Facility Agreement (FFA) signed in December 1988.

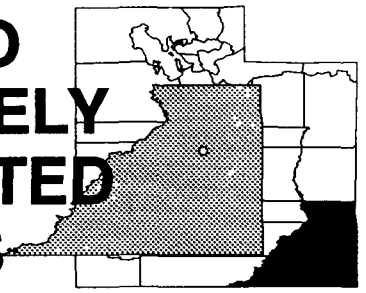
Environmental Progress 

Cleanup activities at the Monticello Mill Tailings (USDOE) site were initiated in August 1991. The DOE, the EPA and the State of Utah are conducting investigations to limit further surface water and groundwater contamination activities to address mill tailing sites, the former mill site, and peripheral properties. The EPA has determined that the site does not pose an immediate threat to the surrounding community or the environment while cleanup activities and further studies are taking place.

Site Repository 

Utah State Department of Health, Bureau of Environmental Response and Remediation, Cannon Health Building, 2nd Floor, 288 North 1460, West Salt Lake City, UT 84116

MONTICELLO RADIOACTIVELY CONTAMINATED PROPERTIES



UTAH

EPA ID# UTD980667208

EPA REGION 8
San Juan County
Monticello

Other Names:
Monticello Remedial Action Project
Monticello Vicinity Properties

Site Description

The Monticello Radioactively Contaminated Properties consist of private and commercial properties in the town of Monticello, covering approximately 4 square miles. An estimated 400 residences have been contaminated with radioactive mill wastes from ore processing operations near the town. During World War II, the Federal government established an ore processing mill to produce vanadium, a steel hardener, for the war effort. Vanadium is not radioactive itself, but it is found in the same ore with uranium and radium; thus, the processing wastes contain significant radioactivity. Soon after its construction, the mill began production of a uranium/vanadium sludge for the Manhattan Engineer District. Uranium production continued until 1960, when the plant was closed and dismantled. Contaminated dust from the mill tailings piles has blown into the city. Tailings from the mill site have been used as construction material and backfill, and as sand mix in concrete. These uses have resulted in the radioactive contamination of numerous properties within Monticello. Approximately 1,900 people live in the town of Monticello. The mill site is located immediately south of the city on the flood plain of Montezuma Creek.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 06/10/86

Threats and Contaminants

Soil is contaminated with uranium. Inhalation of radon-222, direct contact with radionuclides in the tailings and other pathways of exposure to radioactive materials may be harmful to the health of the nearby population. There is currently no contamination of the domestic water supply.

Cleanup Approach

The site is being addressed in a single long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Entire Site: In 1984, the EPA cleaned up two of the most heavily contaminated homes. Since 1984, the Department of Energy (DOE) has been systematically cleaning up the remaining properties. Three families were temporarily relocated during cleanup activities. Cleanup actions have been completed at 90 properties. An additional 300 or more properties are expected to be cleaned up by 1996. In 1990, the EPA selected a remedy to clean up the radioactive properties by excavating the mill tailings around the residences and temporarily disposing of the material at the Monticello Mill Tailings site. A repository will be built to contain the material. The DOE presently is completing the technical specifications for the repository, and construction is scheduled to begin in 1994. Relocation of the contaminated materials is expected to begin in 1995 and to be completed by 1997.

Site Facts: In 1988, the EPA, the DOE, and the State signed an Interagency Agreement. Under this Agreement, the DOE will clean up the contaminated properties. Some property owners will not allow investigations or cleanup of their property.

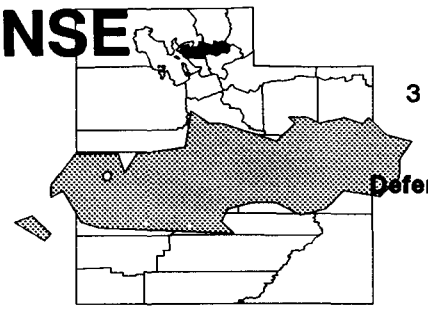
Environmental Progress

The DOE has finished cleaning 100 properties at the Monticello Radioactivity Contaminated Properties site, reducing the potential for exposure to hazardous substances. The DOE currently is completing the technical design for further cleanup activities, including the repository for the mill tailings.

Site Repository

San Jaun County Public Library, 81 North Main Street, Monticello, UT 84535

OGDEN DEFENSE DEPOT
UTAH
EPA ID# UT9210020922



EPA REGION 8
Weber County
3 1/2 miles northwest of Ogden

Other Names:
Defense Depot Ogden Utah (DDOU)

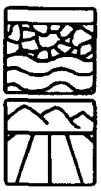
Site Description

Defense Depot Ogden, Utah (DDOU) is located in Weber County and covers approximately 1,139 acres. DDOU is one of seven warehousing and distribution depots operated nationwide by the Defense Logistics Agency. It provides logistics support to the military services, including procurement and supply support, contract administration, and other services. Since DDOU was activated in 1941, it has stored and distributed food, clothing, petroleum products, and general medical, industrial, construction, and electronic supplies to military installations, other DOD agencies, and other Federal agencies. In the past, unknown quantities of both liquid and solid materials (including methyl bromide and mustard gas) have been disposed of at DDOU in burning pits, burial pits, or off-site disposal facilities. The population center of Ogden is located approximately 3 miles southeast from the site. The distance from the site to the nearest residence is about 1,000 feet. The site is located above the Weber Delta Aquifer, which consists of shallow and deep zones. There are no municipal wells in use within the vicinity of DDOU. Pineview Reservoir supplies the City of Ogden with drinking water and is located 10 miles east of the site. DDOU is drained by Mill and Four-mile Creeks, both of which traverse the installation from east to west.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 07/01/87

Threats and Contaminants



On-site groundwater sampling results have identified various volatile organic compounds (VOCs), including trichloroethane (TCE), vinyl chloride (VCL), and dichloroethane in the shallow aquifer. Soil is contaminated with semi-volatile compounds of metals, including arsenic, lead, zinc, cadmium, mercury, and barium; and low concentrations of pesticides. Access to the site is restricted. The site does not currently pose any significant health risk. However, if the contaminated shallow groundwater is used for domestic purposes in the future, there would be a significant potential for health risks.

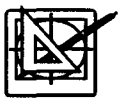
Cleanup Approach

The site is being addressed in five stages: an immediate action and four long-term remedial phases focusing on cleanup of the french drain at the herbicide/pesticide mixing area and the three waste burial sites.

Response Action Status

Immediate Action: During soil excavations in 1988, a team from the Escort and Disposal Detachment at Dugway Proving Ground excavated Burial Site #3. During the soil excavation, vials were recovered and identified as items from both the chemical agent identification and training sets. Defused riot control grenades also were recovered and safely disposed of.

Burial Site #1: Investigations to determine the nature and extent of the contamination and to identify alternative technologies for cleanup of Burial Site #1 were initiated in 1989 and are expected to be completed in mid-1992.



French Drain: The EPA selected a remedy for cleaning up groundwater at the french drain area which includes: extracting contaminated groundwater, treating the extracted groundwater, and reinjecting the treated groundwater. In addition, contaminated soils will be excavated and incinerated off site. Work on the engineering design has been completed. Soil excavation and treatment are underway. Construction of groundwater extraction, treatment, and injection facilities is underway.

Burial Site #3: Investigations to determine the nature and extent of the contamination and to identify methods for cleanup of Burial Site #3 were started in 1990 and are scheduled to be completed in late 1992.

Burial Site #4: Investigations to determine the nature and extent of the contamination and to identify alternative methods for cleanup of Burial Site #4 were begun in 1989 and are slated for completion in late 1992.

Site Facts: In June 1986, DDOU entered into a Memorandum of Agreement with the State of Utah and the EPA to study and evaluate past hazardous wastes and disposal practices at the facility. In 1989, a Federal Facility Agreement (FFA) was signed by DDOU, the EPA and the State of Utah to group the six principal waste disposal areas at DDOU into four cleanup areas.

Environmental Progress

Due to the excavation and removal of contaminated soil, vials, and the defused grenades from Burial Site #3 and excavating and disposing of contaminated soils at the French Drain Area, the potential for exposure to hazardous materials has been significantly reduced. Investigations into the extent of contamination at the other identified areas and appropriate cleanup alternatives are being conducted.

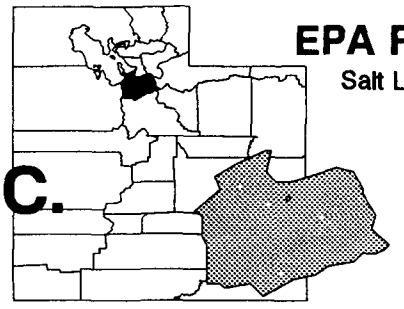
Site Repository

Weber County Library, 2646 Jefferson Avenue, Ogden, UT 84401

PETROCHEM RECYCLING CORP./EKOTEK INC.

UTAH

EPA ID# UTD093119196



EPA REGION 8

Salt Lake County

Site Description

The 6 1/2 acre Petrochem Recycling Corp./Ekotek Inc. site is bordered on the north by a junkyard, on the east and west by industrial and commercial properties, and on the south by a residential community of approximately 50 homes. The facility was initially operated as an oil refinery from 1953 to 1978. In 1978, it was converted into a hazardous waste storage/treatment and petroleum recycling facility which operated until February 1988. Sources of contamination at the site include approximately 60 above-ground tanks, 1,200 drums and smaller containers, three surface impoundments, an underground drain field, numerous piles and pits of waste material, underground tanks, incineration furnaces, and contaminated soil. Groundwater below the facility is unconfined and hydraulically connected to aquifers underlying the Salt Lake Valley. Public wells within 4 miles of the site draw water from these aquifers and serve an estimated 28,000 people. Additional wells within 4 miles of the site are used by commercial food producers. In November 1990, contaminants were detected in the air, threatening an estimated 11,400 people who live and work within a mile of the site. The habitat of the two endangered species, the pelegrine falcon and the bald eagle, and wetlands are located within 3 miles of the site.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 07/29/91

Threats and Contaminants

Observed releases of chlorinated solvents to the shallow unconfined aquifer and volatile and semi-volatile organic compounds (VOCs) to the air migration pathway have been documented. Other on-site contaminants include polynuclear aromatic hydrocarbons (PAHs), phthalates, pesticides, polychlorinated biphenyls (PCBs), dioxin, furans, and heavy metals such as arsenic, chromium, lead and mercury. On-site workers, urban residents and trespassers could be adversely affected through direct contact with the soils or sediment, by drinking contaminated groundwater, or inhaling contaminated air.

Cleanup Approach

This site is being addressed in two stages: initial actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Initial Actions: In 1988, the EPA initiated an emergency removal action to address the release of hazardous substances from the site. The EPA's activities included the stabilization and containment of hazardous wastes at the site and maintenance of site security. Since that time, the EPA has been involved in the investigation and assessment of site conditions and negotiations with a potentially responsibly parties' committee. The EPA has provided oversight of the emergency surface removal actions conducted by the committee. These actions have included extensive sampling and evaluation of the extent of contamination at the site including samples taken from neighborhood yards, construction of a perimeter fence, and 24-hour site security. Also, extensive sampling was conducted to categorize the types of wastes found at the site and to delineate the extent of contamination, treatment, and subsequent disposal of over 500,000 gallons of hazardous liquids and contaminated storm water, disposal of all drums, and removal of debris and sludges found at the site.

Entire Site: The parties potentially responsible for site contamination are expected to initiate an extensive investigation into the nature and extent of hazardous materials present at the site in late 1992. This study, scheduled to be completed in 1995, also will result in the selection of remedies to cleanup the site.

Site Facts: A Notice of Violation was filed by the Utah Bureau of Solid and Hazardous Waste and the Bureau of Air Quality to Petrochem Recycling in 1988. Operations were shut down as a result of this notice. General and Special Notice letters were mailed individually to 470 potentially responsible parties in preparation for negotiations. A committee of potentially responsible parties, which was formed during the removal action, has developed one of the first potentially responsible party-generated early de minimus offers for settlement with smaller contributors at the site.

Environmental Progress

Removal of tanks, drums, and chemicals along with prevention of contaminated surface water run-off and security provisions have greatly reduced the potential for exposure to contaminated materials at the Petrochem Recycling Corp./Ekotek Inc. Site, while further investigations and cleanup activities are taking place.

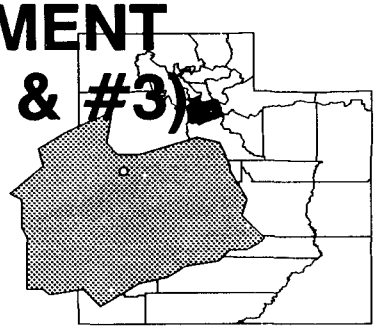
Site Repository 

Not established.

PORTLAND CEMENT (KILN DUST #2 & #3)

UTAH

EPA ID# UTD980718670



EPA REGION 8

Salt Lake County
Salt Lake City

Other Names:
Lone Star Industries

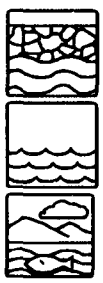
Site Description

The Portland Cement (Kiln Dust #2 & #3) site consists of three disposal sites located on 71 acres that were used for the disposal of spent cement kiln dust and old kiln chromate bricks. The cement kiln dust and bricks are stored in piles on the surface, exposing them to transport by wind and water. The company disposed of the cement kiln dust and old kiln chromate bricks in the greater Salt Lake City area until 1983, including disposal since the mid-1960s at areas #2 and #3 and the west area. The dust, an alkaline by-product of cement manufacturing collected in baghouses from the kiln stacks, contains concentrations of lead and arsenic. The old kiln bricks contain elevated levels of heavy metals. Commercial and industrialized areas are located around the site. Four homes are located on the western side of the site. The Jordan River Surplus Canal and City Drain are surface water bodies adjacent to the site. A large residential area east of the site contains two elementary schools. An estimated 12,000 people live within a mile of the site.

Site Responsibility: This site is being addressed through a combination of Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 06/10/86

Threats and Contaminants



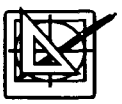
Groundwater and the nearby surface water are contaminated with heavy metals including arsenic, cadmium, chromium, lead, and molybdenum. Both also have high pH levels. Inhalation of the extremely fine dust particles may cause potential health threats to area residents and workers cleaning up the site. Potential health risks may exist for individuals touching or drinking the contaminated groundwater. Wildlife in the area also may be threatened by the contaminants. Other nearby surface waters, including the Surplus Canal and City Drain, and the upper aquifer may be threatened by the site contamination.

Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on the cement kiln dust, and the soils and residual contamination.

Response Action Status

Immediate Actions: The site was fenced by the potentially responsible parties to prevent access to contaminated materials. A dust suppressant is applied on an as-needed basis to prevent dust from blowing off the site.



Cement Kiln Dust: The EPA selected a remedy for cleanup of the cement kiln dust in mid-1990. The selected remedy includes removing and shipping the cement kiln dust off site for disposal at an EPA-approved landfill. Groundwater will be monitored and, if necessary, the EPA will select a separate remedy for its cleanup. The EPA and the State began the design of the remedy in 1991. Cleanup activities are scheduled to begin in 1994.

Soils and Residual Contamination: In 1991, the State, under an agreement with the EPA, undertook a study of soil contamination and any residual contamination from the kiln dust. A remedy was selected in 1992 consisting of removal of contaminated soil and kiln dust residual, and solidification and off-site disposal of the soil. Design activities are scheduled to begin in late 1992.

Site Facts: A Consent Decree was signed in March 1991 by the EPA, the Utah Department of Health, and Lone Star Industries for design and cleanup actions associated with the cement kiln dust. However, the U.S. Department of Justice did not accept the Decree and subsequent negotiations with Lonestar failed to produce a settlement. The EPA and the Utah Department of Environmental Quality (UDEQ) are proceeding with a federally sponsored design and cleanup.

Environmental Progress

Actions taken to fence the site and apply a dust suppressant to the site surface help prevent possible contact with contamination both on site and off site at the Portland Cement (Kiln Dust #2 & #3) site. These actions also removed any immediate threat to the surrounding community and the environment while cleanup and design activities are being planned.

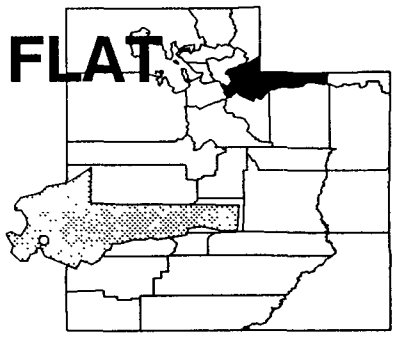
Site Repository

Salt Lake City Public Library, Chapman Branch Library, 577 South Ninth Street, West Salt Lake City, UT 84104

RICHARDSON FLAT TAILINGS

UTAH

EPA ID# UTD980952840



EPA REGION 8

Summit County
1.5 miles north of Park City

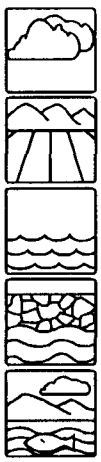
Site Description

Contamination at the Richardson Flat Tailings site, approximately 160 acres in size, can be traced back to two disposal areas. The first of these areas is a dam at which tailings from the Keetley Ontario Mine and other metal mining operations owned by United Park City Mines (UPCM) were deposited. Disposal of mine tailings most recently occurred from 1975 to 1981 by Park City Ventures and Noranda Mining, Inc. These two companies constructed and operated mining facilities on property they leased from UPCM. The second disposal area is a 6-acre "flood plains tailings pile" that has existed at the site since 1953. This pile of tailings, located immediately west of a tailings pond on the bank of Silver Creek, was observed slumping into an on-site diversion ditch and Silver Creek from 1989 to 1990. Approximately 300 acres of pastureland are irrigated by water diverted from this creek. Silver Creek has been classified as a cold water fishery by the State and is bordered by wetlands. An estimated 4,500 people live within 4 miles of the site. The Richardson Flat Tailing site was originally proposed to the NPL in 1989. Although the site did not become final at that time, it was again proposed, in 1992 for two reasons. First the site definition has changed somewhat to include the floodplain tailings as a source of contamination. Second, the site was re-scored using the revised Hazard Ranking System model.

Site Responsibility: This site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 02/07/92

Threats and Contaminants



Air, soils, surface water, groundwater and on-site tailings have been found to be contaminated with heavy metals including arsenic, cadmium, copper, lead, selenium, silver, and zinc. An estimate of between 2 and 7 million tons of tailings are contained by a dam at the tailings disposal area. Individuals could be at risk of inhaling contaminated air or ingesting or touching contaminated soils, surface water or groundwater.

Cleanup Approach

This site is being addressed in two stages: initial actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Initial Actions: One of the parties potentially responsible for the contamination at the site, United Park City mines, has voluntarily covered the tailings deposit areas with clean topsoil. In addition, they have erected a fence around the entire site to provide security.

Entire Site: In 1992, the EPA began preliminary sampling of the air, surface water, groundwater, and Silver Creek sediments at the site to determine the nature and extent of site contamination. A more intensive study is scheduled to begin in 1993.

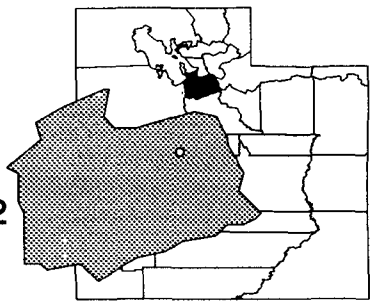
Environmental Progress

Fencing of the site and covering the tailings with topsoil has reduced the risk at the Richardson Flat Tailings site while additional investigations are conducted and activities are planned for permanent cleanup of the site.

Site Repository

Not established.

ROSE PARK SLUDGE PIT
UTAH
EPA ID# UTD980635452



EPA REGION 8
Salt Lake County
Salt Lake City

Site Description

The Rose Park Sludge Pit site is approximately 2 acres in size and is located in a Salt Lake City park which also includes a baseball field, tennis courts, soccer fields, and a golf course. The area was used by predecessors of Amoco Oil Co. for the disposal of petroleum wastes from the early 1920s until 1957. Refinery sludges were placed into unlined storage pits. The City bought the property in 1957 and covered the site. During park development grading operations, site contamination was discovered when a bulldozer broke through the cover and re-exposed the sludge. The area surrounding the site consists of residential, recreational, and industrial areas.

Site Responsibility: This site is being addressed through Federal, State, municipal, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 10/23/81
Final Date: 09/08/83

Threats and Contaminants

Refinery sludges were contaminated with polycyclic aromatic hydrocarbons (PAHs) and sulfur dioxide. Physical contact with the highly acidic refinery sludges was a potential health threat. Groundwater contamination from migration of the sludge was possible. However, the area is now capped and the sludges do not pose a threat to the public or the environment. A five year review will be prepared in 1992 to evaluate the continuing effectiveness of the remedy.

Cleanup Approach

The site is being addressed in a single long-term remedial phase focusing on containment of the contaminants on site.

Response Action Status

Entire Site: Construction of a lined clay cap and slurry wall over and around the site was completed in 1983. Revegetation was completed in spring 1984. The site cleanup was completed as of 1985. However, groundwater monitoring is being continued by the Salt Lake City and County Health Departments for a period of 30 years. At an annual monitoring meeting held in 1989, it was concluded that the present groundwater operation and maintenance criteria were not adequate to determine the effectiveness of the remedy. The plan was subsequently resubmitted and approved. In January 1990, Amoco submitted a plan to monitor groundwater flow around the containment area. The first phase of the monitoring was completed. The second phase, completed in 1992, included the installation of new groundwater quality monitoring wells. A five year review was prepared in 1992 and confirmed the effectiveness of the site cleanup.

Environmental Progress

The cap and slurry wall have contained the sludges and have prevented contamination of groundwater resources. All planned cleanup activities for the Rose Park Sludge Pit site have been completed. The State will continue to monitor groundwater to ensure that no contamination is released into the groundwater and that the site will not pose a threat to human health or the environment.

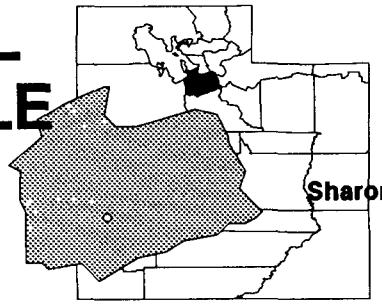
Site Repository

Utah State Department of Health, Bureau of Environmental Response and Remediation, Cannon Health Building, 2nd Floor, 288 North 1460, West Salt Lake City UT 84116

SHARON STEEL CORP. (MIDVALE TAILINGS)

UTAH

EPA ID# UTD980951388



EPA REGION 8

Salt Lake County
Midvale

Other Names:
Sharon Steel Corp. (Midvale Smelter)

Site Description

The Sharon Steel Corp. (Midvale Tailings) site is a former milling and smelting operation covering 268 acres in Midvale. Operations began in 1905, with the smelter closing in 1958 and the milling operations closing in 1971. Sulfide concentrates of lead, copper, zinc, and other metals were extracted from ore during the milling operations. Wastes from this process resulted in an estimated accumulation of 10 million tons of mine tailings piles on the site, which are 40 to 50 feet deep. The State first became involved at the mill in 1982, when it learned that nearby residents were gathering the windblown tailings for use in gardens and children's sandboxes. The State tested the "sand" from the gardens and sandboxes and found high levels of lead. The U.S. Geological Survey (USGS) found arsenic in groundwater underneath the site. Approximately 1,400 people live within 1/4 mile of the site; roughly 8,000 people live within 1 mile. The Jordan River supplies water to 160 acres of farm land through 10 irrigation intakes within 3 miles of the site. Two smaller drainage ditches, the North Jordan Canal and Galena Canal, are nearby. A 22-acre wetland and several small ponds also are on the mill site. The deep aquifer underlying the site is a source of drinking water for the metropolitan Salt Lake City area. Municipal wells that draw from this aquifer are within 3 miles of the site.

Site Responsibility: This site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 08/30/90

Threats and Contaminants

The shallow groundwater is contaminated with heavy metals such as arsenic, iron, manganese, and zinc from the mill site. Sediments from the Jordan River, which is classified by the State for cold-water game fishing and recreation other than swimming, are contaminated with heavy metals. The wetlands on the site contain heavy metals and zinc tailings. Soil is contaminated with heavy metals including lead, arsenic, cadmium, and zinc. The greatest potential health threat to the nearby population is exposure to lead and arsenic through direct contact with or inhalation of contaminated soils, including dust; children playing in nearby neighborhood soils or sandboxes are especially at risk.

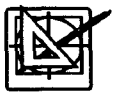
Cleanup Approach

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on cleanup of the mill site and grounds, and the vicinity property.

Response Action Status

Immediate Actions: In 1989, the party potentially responsible for the site contamination installed a fence around the site.

Mill Site and Grounds: The EPA has completed studies to determine the nature and extent of groundwater and soil contamination at the mill site. The EPA, with the assistance of the Bureau of Mines, currently is evaluating the selected treatment methods prior to final remedy selection in late 1992.



Vicinity Property: The remedy selected by the EPA in late 1990 to address soil contamination in the vicinity of the site includes excavating contaminated soil and storing the soil on site until final disposal. The excavated soil will be replaced with clean fill and revegetated. The State is managing the design of the remedy, which is expected to be completed in 1992. Cleanup activities are expected to begin in 1992.

Environmental Progress

By constructing a fence to restrict access to the mill site and grounds, the potentially responsible parties and the EPA have reduced the possibility of direct exposure to the contaminants on the Sharon Steel Corp. (Midvale Tailings) site. Investigations leading to permanent solutions for cleaning up the soil and groundwater at the site and the surrounding affected areas are being completed, with design of cleanup actions underway.

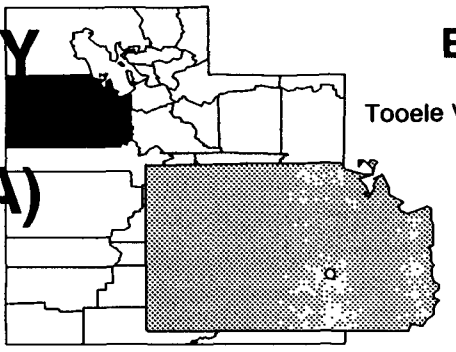
Site Repository

Ruth V. Tyler Public Library, 315 Wood Street, Midvale, UT 84047

TOOELE ARMY DEPOT (NORTH AREA)

UTAH

EPA ID# UT3213820894



EPA REGION 8

Tooele County

Tooele Valley, 2 miles south of Tooele

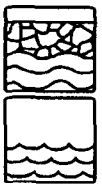
Site Description

The 24,732-acre Tooele Army Depot site, established in 1942, is one of the major ammunition storage and equipment maintenance installations in the United States. Disposal practices at the site have included discharge of waste to unlined evaporation or percolation ponds, neutralization and thermal destruction of chemical agents and munitions, detonation and burning, and burial of these materials at the demilitarization range. A Post-closure permit for the Industrial Waste Lagoon (IWL) addresses 47 Solid Waste Management Units (SWMU). Thirty of these units are being addressed under the Resource Conservation and Recovery Act (RCRA) and are divided into three areas: the Industrial Waste Lagoon, Known Release SWMUs, and Suspected Release SWMUs. The remaining 17 units are grouped into seven areas which are being addressed by Superfund. The City of Tooele has a population of 15,000. The deep regional aquifer, used as a drinking water source by area communities, is contaminated beneath the area of the Depot and several hundred yards beyond the north property boundary.

Site Responsibility: This site is being addressed through Federal actions.

NPL LISTING HISTORY
Proposed Date: 10/15/84
Final Date: 08/30/90

Threats and Contaminants



On-site groundwater is contaminated with heavy metals and volatile organic compounds (VOCs) including trichloroethylene (TCE). On-site contamination of the Industrial Waste Lagoon and wastewater ditches includes some low-level organic contamination and relatively high levels of the heavy metals cadmium, chromium, lead, and selenium. A release of TCE and TNT-related compounds also was identified on the site. The potential health threat to people includes drinking contaminated groundwater and direct contact with the groundwater and stream sediments. Because the site is a secured military installation, public access is restricted.

Cleanup Approach

The site is being addressed in several long-term remedial phases focusing on groundwater cleanup and cleanup of the entire site.

Response Action Status

Groundwater: The Army has completed a Groundwater Quality Assessment and Corrective Action Plan for groundwater cleanup at the Industrial Waste Lagoon. The Army, the EPA, and the Utah Department of Environmental Quality (UDEQ) began extraction and treatment of groundwater in early 1992.

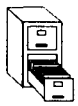
Entire Site: The Army has begun investigations to identify releases of hazardous chemicals and cleanup alternatives at 10 areas of contamination on the site. Three of these are being addressed under RCRA and the remaining areas are being addressed by Superfund. Investigations will determine the nature and extent of the contamination and will identify alternatives for final cleanup at these areas.

Site Facts: The Tooele Army Depot-North Area (TEAD-N), Utah Department of Environmental Quality (UDEQ), and the EPA signed a Federal Facility Agreement in 1991. TEAD-N is participating in the Installation Restoration Program, a specially funded program developed in 1978 by the Department of Defense (DOD) to identify, control, and investigate hazardous wastes on military or other DOD installations.

Environmental Progress

Extraction and treatment of the groundwater performed by the Army, in conjunction with the EPA and the UDEQ, has reduced threats to public health while studies leading to site cleanup are ongoing.

Site Repository

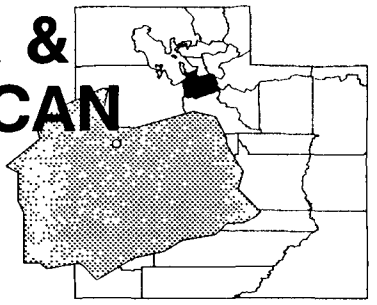


Utah State Department of Health, Bureau of Environmental Response and Remediation, Cannon Health Building, 2nd Floor, 288 North 1460, West Salt Lake City, UT 84116

UTAH POWER & LIGHT/AMERICAN BARREL CO.

UTAH

EPA ID# UTD980667240



EPA REGION 8

Salt Lake County
Salt Lake City

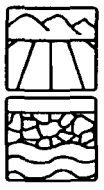
Site Description

The 2 1/2-acre Utah Power & Light/American Barrel Co. site was used as a barrel storage, recycling, and reconditioning facility. Empty barrels at one time contained various volatile organic compounds (VOCs), degreasers, and solvents. Prior to the barrel operation, the site was used by Utah Power and Light as a creosote pole treating facility and as a coal gasification plant in the late 1800s. Approximately 39,700 people live within 2 miles of the site. Four schools are located within 1 mile. The nearest residence is 225 feet away. One municipal well and one private well are located within 1 mile of the site. A drainage ditch runs along the eastern fence of the site. Water conveyed by the ditch is believed to percolate into the ground within several yards of the site.

Site Responsibility: This site is being addressed through Federal and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 05/05/89
Final Date: 10/04/89

Threats and Contaminants



Soils contain polycyclic aromatic hydrocarbons (PAHs) from wood treating and coal gasification operations, phthalates, VOCs, and heavy metals including chromium, copper, lead, and zinc. Groundwater contains VOCs including benzene, styrene, toluene, and xylene. Potential health risks may exist for individuals who accidentally ingest or come into direct contact with contaminated soil and groundwater.

Cleanup Approach

This site is being addressed in two stages: an immediate action and a long-term remedial phase focusing on soil and groundwater cleanup.

Response Action Status

Immediate Action: In 1988, under EPA monitoring, the parties potentially responsible for the site contamination removed 50,000 barrels containing VOCs, solvents, and herbicide residues to a federally approved facility.

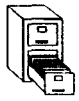
Soil and Groundwater: The potentially responsible parties initiated an investigation in 1990 to determine the type and extent of groundwater and soil contamination and to identify possible cleanup alternatives. Sampling and site characterization were completed in 1991. A study to evaluate options for cleaning up the contaminants at the site is proceeding and will be completed in 1992. Once this investigation phase is completed, the EPA will review the study findings and will select the final cleanup remedies for contaminated soils and groundwater resources.

Site Facts: The EPA and the potentially responsible parties signed an Administrative Order on Consent in August 1990, under which the parties agreed to conduct the soil and groundwater investigation.

Environmental Progress

The removal of waste barrels containing VOCs, solvents, and herbicide residues has greatly reduced the potential for exposure to hazardous materials at the Utah Power & Light/American Barrel site while investigations continue and cleanup activities are being planned.

Site Repository

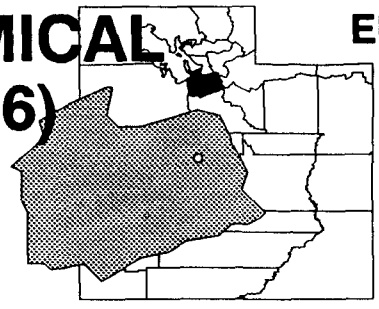


Salt Lake City Public Library, Chapman Branch Library, 577 South Ninth Street, West Salt Lake City, UT 84104

WASATCH CHEMICAL COMPANY (LOT 6)

UTAH

EPA ID# UTD000716399



EPA REGION 8

Salt Lake County
Salt Lake City

Site Description

The 15-acre Wasatch Chemical Company (Lot 6) site was used for the formulation of various pesticides, herbicides, and industrial chemical products in the early 1960s. Approximately 2,300 cubic yards of waste were disposed of in a concrete pond and drums on the site. During an inspection in 1985, the State found 48 drums holding ignitable and reactive liquids and 13 pressurized gas cylinders in deteriorated condition. Additional wastes from the operation are believed to have been discharged into a street ditch, which eventually drains into the Great Salt Lake. Approximately 85,000 people live within a 3-mile radius of the site. The closest residence is 1/4 mile away. Although previously accessible to trespassers, the site is now secured.

Site Responsibility: This site is being addressed through Federal, State, and potentially responsible parties' actions.

NPL LISTING HISTORY
Proposed Date: 01/22/87
Final Date: 02/11/91

Threats and Contaminants

Groundwater underlying the site contains volatile organic compounds (VOCs) and herbicides. Soils and sludges contain VOCs, pesticides, herbicides, and dioxin. Low levels of pesticides were detected in surface water; however, these may have resulted from an off-site source. Potential health risks may exist for individuals who accidentally ingest or touch contaminated surface water, groundwater, sludges, or soils.

Cleanup Approach

This site is being addressed in two stages: immediate actions and a long-term remedial phase focusing on cleanup of the entire site.

Response Action Status

Immediate Actions: The EPA removed abandoned gas cylinders from the site in 1986 and detonated them at a State-owned site. The parties potentially responsible for the contamination constructed a dioxin storage facility. Abandoned drums were repackaged and stored in the facility along with certain surface soils removed from Lot 6. Dioxin-contaminated soils have been temporarily capped, awaiting final remedial action.

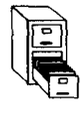
Entire Site: In early 1991, the potentially responsible parties completed an investigation, under State monitoring, to determine the type and extent of soil, surface water, and groundwater contamination. The remedy selected in early 1991 includes the consolidation of contaminated soils, sludges, and other wastes in an evaporation pond formerly used at the site and in-place vitrification of these materials. Contaminated groundwater will be removed through extraction wells and trenches, treated by air stripping and carbon absorption, and discharged to a sewer system. Additionally, institutional controls will prevent the use of contaminated groundwater. Design of the selected remedy began in late 1991 and is expected to be completed in late 1993.

Site Facts: In 1986, the State of Utah and the EPA negotiated a Consent Order for removal of the drums. A Consent Decree was signed in 1988 with one of the potentially responsible parties agreeing to complete a site investigation. A Consent Decree was signed in September 1991 with certain potentially responsible parties to complete design and cleanup activities.

Environmental Progress

The removal of gas cylinders and safe storage of abandoned drums have greatly reduced the potential for exposure to contaminated materials at the Wasatch Chemical Company (Lot 6) site while the remedy is being designed.

Site Repository



Salt Lake City Public Library, Chapman Branch Library, 577 South Ninth Street, West Salt Lake City, 84104

GLOSSARY

Terms Used in the NPL Book

This glossary defines terms used throughout the NPL Volumes. The terms and abbreviations contained in this glossary apply specifically to work performed under the Superfund program in the context of hazardous waste management. These terms may have other meanings when used in a different context. A table of common toxic chemicals found at NPL sites, their sources, and their potential threats is located on page G-15

Acids: Substances, characterized by low pH (less than 7.0), that are used in chemical manufacturing. Acids in high concentration can be very corrosive and react with many inorganic and organic substances. These reactions possibly may create toxic compounds or release heavy metal contaminants that remain in the environment long after the acid is neutralized.

Administrative Order On Consent: A legal and enforceable agreement between the EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties (PRPs) agree to perform or pay for site studies or cleanups. It also describes the oversight rules, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. This Order is signed by PRPs and the government; it does not require approval by a judge.

Administrative Order [Unilateral]: A legally binding document issued by the EPA, directing the parties potentially responsible to perform site cleanups or studies (generally, the EPA does not issue Unilateral Orders for site studies). This type of Order is not signed by the PRPs and does not require approval by a judge.

Aeration: A process that promotes breakdown of contaminants in soil or water by exposing them to air.

Agency for Toxic Substances and Disease Registry (ATSDR): The Federal agency within the U.S. Public Health Service charged with carrying out the health-related responsibilities of CERCLA.

Air Stripping: A process whereby volatile organic chemicals (VOCs) are removed from contaminated material by forcing a stream of air through the contaminated material in a pressurized vessel. The contaminants are evaporated into the air stream. The air may be further treated before it is released into the atmosphere.

Ambient Air: Any unconfined part of the atmosphere. Refers to the air that may be inhaled by workers or residents in the vicinity of contaminated air sources.

Applicable or Relevant and Appropriate Requirements (ARARs): Federal, State, or local laws which apply to Superfund activities at NPL sites. Both emergency and long-term actions must comply with these laws or provide sound reasons for allowing a waiver. ARARs must be identified for each site relative to the characteristics of the site, the substances found at the site, or the cleanup alternatives being considered for the site.

GLOSSARY

Aquifer: An underground layer of rock, sand, or gravel capable of storing water within cracks and pore spaces, or between grains. When water contained within an aquifer is of sufficient quantity and quality, it can be tapped and used for drinking or other purposes. The water contained in the aquifer is called groundwater. A "sole source aquifer" supplies 50 percent or more of the drinking water of an area.

Artesian (Well): A well made by drilling into the earth until water is reached, which, due to internal pressure, flows up like a fountain.

Asbestos: A mineral fiber that can pollute air or water and is known to cause cancer or asbestosis when inhaled.

Attenuation: The naturally occurring process by which a compound is reduced in concentration over time through adsorption, degradation, dilution, or transformation.

Background Level: The amount of a substance typically found in the air, water, or soil from natural, as opposed to human, sources.

Baghouse Dust: Dust accumulated in removing particulates from the air by passing it through cloth bags in an enclosure.

Bases: Substances characterized by high pH (greater than 7.0), which tend to be corrosive in chemical reactions. When bases are mixed with acids, they neutralize each other, forming salts.

Berm: A ledge, wall, or a mound of earth used to prevent the migration of contaminants.

Bioaccumulate: The process by which some contaminants or toxic chemicals gradually collect and increase in concentration in living tissue, such as in plants, fish, or people, as they breathe contaminated air, drink contaminated water, or eat contaminated food.

Biological Treatment: The use of bacteria or other microbial organisms to break down toxic organic materials into carbon dioxide and water.

Bioremediation: A cleanup process using naturally occurring or specially cultivated microorganisms to digest contaminants and break them down into non-hazardous components.

Bog: A type of wetland that is covered with peat moss deposits. Bogs depend primarily on moisture from the air for their water source, are usually acidic, and are rich in plant residue [see Wetland].

Boom: A floating device used to contain oil floating on a body of water or to restrict the potential overflow of waste liquids from containment structures.

Borehole: A hole that is drilled into the ground and used to sample soil or ground-water.

Borrow Pit: An excavated area where soil, sand, or gravel has been dug up for use elsewhere.

Cap: A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap generally is mounded or sloped so water will drain off.

Carbon Adsorption: A treatment system in which contaminants are removed from groundwater and surface water by forcing water through tanks containing activated carbon, a specially treated material that attracts and holds or retains contaminants.

Carbon Disulfide: A degreasing agent formerly used extensively for parts washing. This compound has both inorganic and organic

properties, which increase cleaning efficiency. However, these properties also cause chemical reactions that increase the hazard to human health and the environment.

Carbon Treatment: [see Carbon Adsorption].

Cell: In solid waste disposal, one of a series of holes in a landfill where waste is dumped, compacted, and covered with layers of dirt.

CERCLA: [see Comprehensive Environmental Response, Compensation, and Liability Act].

Characterization: The sampling, monitoring, and analysis of a site to determine the extent and nature of toxic releases. Characterization provides the basis for acquiring the necessary technical information to develop, screen, analyze, and select appropriate cleanup techniques.

Chemical Fixation: The use of chemicals to bind contaminants, thereby reducing the potential for leaching or other movement.

Chromated Copper Arsenate: An insecticide/herbicide formed from salts of three toxic metals: copper, chromium, and arsenic. This salt is used extensively as a wood preservative in pressure-treating operations. It is highly toxic and water-soluble, making it a relatively mobile contaminant in the environment.

Cleanup: Actions taken to eliminate a release or threat of release of a hazardous substance. The term "cleanup" sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Closure: The process by which a landfill stops accepting wastes and is shut down under Federal guidelines that ensure the protection of the public and the environment.

Comment Period: A specific interval during which the public can review and comment on various documents and EPA actions related to site cleanup. For example, a comment period is provided when the EPA proposes to add sites to the NPL. Also, there is minimum 3-week comment period for community members to review and comment on the remedy proposed to clean up a site.

Community Relations: The EPA effort to establish and maintain two-way communication with the public. The goals of community relations programs include creating an understanding of EPA programs and related actions, assuring public input into decision-making processes related to affected communities, and making certain that the Agency is aware of, and responsive to, public concerns. Specific community relations activities are required in relation to Superfund cleanup actions [see Comment Period].

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Congress enacted the CERCLA, known as Superfund, in 1980 to respond directly to hazardous waste problems that may pose a threat to the public health and the environment. The EPA administers the Superfund program.

Confluence: The place where two bodies of water, such as streams or rivers, come together.

Confined Aquifer: An aquifer in which groundwater is confined under pressure that is significantly greater than atmospheric pressure.

Consent Decree: A legal document, approved and issued by a judge, formalizing an agreement between the EPA and the parties potentially responsible for site contamination. The decree describes cleanup actions that the potentially responsible parties are required to perform, or the costs incurred by the government that the parties will reimburse, and the roles, responsibilities, and enforcement options that the government may exercise in the event of non-compliance by potentially responsible parties. If a settlement between the EPA and a potentially responsible party includes cleanup actions, it must be in the form of a Consent Decree. A Consent Decree is subject to a public comment period.

Consent Order: [see Administrative Order on Consent].

Containment: The process of enclosing or containing hazardous substances in a structure, typically in a pond or a lagoon, to prevent the migration of contaminants into the environment.

Contaminant: Any physical, chemical, biological, or radiological material or substance whose quantity, location, or nature produces undesirable health or environmental effects.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or other accident that releases toxic chemicals, hazardous wastes, or radioactive materials into the environment.

Cooperative Agreement: A contract between the EPA and the States, wherein a State agrees to manage or monitor certain site cleanup responsibilities and other activities on a cost-sharing basis.

Cost Recovery: A legal process by which potentially responsible parties can be required to pay back the Superfund program for money it spends on any cleanup actions [see Potentially Responsible Parties].

Cover: Vegetation or other material placed over a landfill or other waste material. It can be designed to reduce movement of water into the waste and to prevent erosion that could cause the movement of contaminants.

Creosotes: Chemicals used in wood preserving operations and produced by distillation of tar, including polycyclic aromatic hydrocarbons and polynuclear aromatic hydrocarbons [see PAHs and PNAs]. Contaminating sediments, soils, and surface water, creosotes may cause skin ulcerations and cancer through prolonged exposure.

Culvert: A pipe used for drainage under a road, railroad track, path, or through an embankment.

Decommission: To revoke a license to operate and take out of service.

Degradation: The process by which a chemical is reduced to a less complex form.

Degrease: To remove grease from wastes, soils, or chemicals, usually using solvents.

Deletion: A site is eligible for deletion from the NPL when Superfund response actions at the site are complete. A site is deleted from the NPL when a notice is published in the Federal Register.

De minimis: This legal phrase pertains to settlements with parties who contributed small amounts of hazardous waste to a site. This process allows the EPA to settle with small, or *de minimis* contributors, as a single group rather than as individuals, saving time, money, and effort.

Dewater: To remove water from wastes, soils, or chemicals.

Dike: A low wall that can act as a barrier to prevent a spill from spreading.

Dioxin: An organic chemical by-product of pesticide manufacture which is known to be one of the most toxic man-made chemicals.

Disposal: Final placement or destruction of toxic, radioactive, or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or incineration.

Downgradient: A downward hydrologic slope that causes groundwater to move toward lower elevations. Therefore, wells *downgradient* of a contaminated groundwater source are prone to receiving pollutants.

Ecological Assessment: A study of the impact of man-made or natural activity on living creatures and their environment.

Effluent: Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Emission: Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

Emulsifiers: Substances that help in mixing materials that do not normally mix; e.g., oil and water.

Endangerment Assessment: A study conducted to determine the risks posed to public health or the environment by contamination at NPL sites. The EPA or the State conducts the study when a legal action is to be taken to direct the potentially responsible parties to clean up a site or pay for the cleanup. An endangerment assessment supplements an investigation of the site hazards.

Enforcement: EPA, State, or local legal actions taken against parties to facilitate settlements; to compel compliance with laws, rules, regulations, or agreements; or to obtain penalties or criminal sanctions for violations. Enforcement procedures may vary, depending on the specific requirements of different environmental laws and related regulatory requirements. Under CERCLA, for example, the EPA will seek to require potentially responsible parties to clean up a Superfund site or pay for the cleanup [see Cost Recovery].

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or surface runoff, but can be intensified by such land-related practices as farming, residential or industrial development, road building, or timber-cutting. Erosion may spread surface contamination to off-site locations.

Estuary (estuarine): Areas where fresh water from rivers and salt water from nearshore ocean waters are mixed. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These water ecosystems shelter and feed marine life, birds, and wildlife.

Evaporation Ponds: Areas where sewage sludge or other watery wastes are dumped and allowed to dry out.

Feasibility Study: The analysis of the potential cleanup alternatives for a site. The feasibility study usually starts as soon as the remedial investigation is underway. In this volume, the feasibility study is referred to as a site study [see also Remedial Investigation].

Filtration: A treatment process for removing solid (particulate) matter from water by passing the water through sand, activated carbon, or a man-made filter. The process is often used to remove particles that contain contaminants.

Flood Plain: An area along a river, formed from sediment deposited by floods. Flood plains periodically are innundated by natural floods, which can spread contamination.

Flue Gas: The air that is emitted from a chimney after combustion in the burner occurs. The gas can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles, and many chemical pollutants.

Fly Ash: Non-combustible residue that results from the combustion of flue gases. It can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, as well as many other chemical pollutants.

French Drain System: A crushed rock drain system constructed of perforated pipes, which is used to drain and disperse wastewater.

Gasification (coal): The conversion of soft coal into gas for use as a fuel.

General Notice Letter: [See Notice Letter].

Generator: A facility that emits pollutants into the air or releases hazardous wastes into water or soil.

Good Faith Offer: A voluntary offer, generally in response to a Special Notice letter, made by a potentially responsible party, consisting of a written proposal demonstrating a potentially responsible party's qualifications and willingness to perform a site study or cleanup.

Groundwater: Water that fills pores in soils or openings in rocks to the point of saturation. In aquifers, groundwater occurs in sufficient quantities for use as drinking and irrigation water and other purposes.

Groundwater Quality Assessment: The process of analyzing the chemical characteristics of groundwater to determine whether any hazardous materials exist.

Halogens: Reactive non-metals, such as chlorine and bromine. Halogens are very good oxidizing agents and, therefore, have many industrial uses. They are rarely found by themselves; however, many chemicals such as polychlorinated biphenyls (PCBs), some volatile organic compounds (VOCs), and dioxin are reactive because of the presence of halogens.

Hazard Ranking System (HRS): The principal screening tool used by the EPA to evaluate relative risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. The HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater and on other factors such as nearby population. The HRS score is the primary factor in deciding if the site should be on the NPL.

Hazardous Waste: By-products of society that can pose a substantial present or potential hazard to human health and the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Heavy Metals: Metallic elements with high atomic weights, such as arsenic, lead, mercury, and cadmium. Heavy metals are very hazardous even at low concentrations and tend to accumulate in the food chain.

Herbicide: A chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hot Spot: An area or vicinity of a site containing exceptionally high levels of contamination.

Hydrocarbons: Chemical compounds that consist entirely of hydrogen and carbon.

Hydrology: The properties, distribution, and circulation of water.

Hydrogeology: The geology of groundwater, with particular emphasis on the chemistry and movement of water.

Impoundment: A body of water or sludge confined by a dam, dike, floodgate, or other barrier.

Incineration: A group of treatment technologies involving destruction of waste by controlled burning at high temperatures, e.g., burning sludge to reduce the remaining residues to a non-burnable ash that can be disposed of safely on land, in some waters, or in underground locations.

Infiltration: The movement of water or other liquid down through soil from precipitation (rain or snow) or from application of wastewater to the land surface.

Influent: Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Injection Well: A well into which waste fluids are placed, under pressure, for purposes of disposal.

Inorganic Chemicals: Chemical substances of mineral origin, not of basic carbon structure.

Installation Restoration Program: The specially funded program established in 1978 under which the Department of Defense has been identifying and evaluating its hazardous waste sites and controlling the migration of hazardous contaminants from those sites.

Intake: The source from where a water supply is drawn, such as from a river or water body.

Interagency Agreement: A written agreement between the EPA and a Federal agency that has the lead for site cleanup activities, setting forth the roles and responsibilities of the agencies for performing and overseeing the activities. States often are parties to interagency agreements.

Interim (Permit) Status: Conditions under which hazardous waste treatment, storage, and disposal facilities, that were operating when regulations under the RCRA became final in 1980, are temporarily allowed by the EPA to continue to operate while awaiting denial or issuance of a permanent permit. The facility must comply with certain regulations to maintain interim status.

Lagoon: A shallow pond or liquid waste containment structure. Lagoons typically are used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Landfarm: To apply waste to land or incorporate waste into the surface soil, such as fertilizer or soil conditioner. This practice commonly is used for disposal of composted wastes and sludges.

Landfill: A disposal facility where waste is placed in or on land. *Sanitary* landfills are disposal sites for non-hazardous solid wastes. The waste is spread in layers, compacted to the smallest practical volume, and covered with soil at the end of each operating day. Secure *chemical* landfills are disposal sites for hazardous waste. They are designed to minimize the chance of release of hazardous substances into the environment [see Resource Conservation and Recovery Act].

Leach, Leaching [v.t.]: The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste.

Leachate Collection System: A system that gathers liquid that has leaked into a landfill or other waste disposal area and pumps it to the surface for treatment.

Liner: A relatively impermeable barrier designed to prevent leachate (waste residue) from leaking from a landfill. Liner materials include plastic and dense clay.

Long-term Remedial Phase: Distinct, often incremental, steps that are taken to solve site pollution problems. Depending on the complexity, site cleanup activities can be separated into several of these phases.

Long-term Response Action: An action which requires a continuous period of on-site activity before cleanup goals are achieved. These actions typically include the extraction and treatment of groundwater and monitoring actions.

Marsh: A type of wetland that does not contain peat moss deposits and is dominated by vegetation. Marshes may be either fresh or saltwater and tidal or non-tidal [see Wetland].

Migration: The movement of oil, gas, contaminants, water, or other liquids through porous and permeable soils or rock.

Mill Tailings: [See Mine Tailings].

Mine Tailings: A fine, sandy residue left from mining operations. Tailings often contain high concentrations of lead, uranium, and arsenic or other heavy metals.

Mitigation: Actions taken to improve site conditions by limiting, reducing, or controlling toxicity and contamination sources.

Modeling: A technique using a mathematical or physical representation of a system or theory that tests the effects that changes on system components have on the overall performance of the system.

Monitoring Wells: Special wells drilled at specific locations within, or surrounding, a hazardous waste site where groundwater can be sampled at selected depths and studied to obtain such information as the direction in which groundwater flows and the types and amounts of contaminates present.

National Priorities List (NPL): The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term cleanup under Superfund. The EPA is required to update the NPL at least once a year.

Natural Attenuation: [See Attenuation].

Neutrals: Organic compounds that have a relatively neutral pH, complex structure and, due to their organic bases, are easily absorbed into the environment. Water is the most commonly known neutral, however, naphthalene, pyrene, and trichlorobenzene also are examples of neutrals.

Nitroaromatics: Common components of explosive materials, which will explode if activated by very high temperatures or pressures; 2,4,6-Trinitrotoluene (TNT) is a nitroaromatic.

Notice Letter: A General Notice Letter notifies the parties potentially responsible for site contamination of their possible liability. A Special Notice Letter begins a 60-day formal period of negotiation during which the EPA is not allowed to start work at a site or initiate enforcement actions against potentially responsible parties, although the EPA may undertake certain investigatory and planning activities.

The 60-day period may be extended if the EPA receives a good faith offer from the PRPs within that period. [See also Good Faith Offer].

On-Scene Coordinator (OSC): The predesignated EPA, Coast Guard, or Department of Defense official who coordinates and directs Superfund removal actions or Clean Water Act oil- or hazardous-spill corrective actions.

Operation and Maintenance: Activities conducted at a site after a cleanup action is completed to ensure that the cleanup or containment system is functioning properly.

Organic Chemicals/Compounds: Chemical substances containing mainly carbon, hydrogen, and oxygen.

Outfall: The place where wastewater is discharged into receiving waters.

Overpacking: Process used for isolating large volumes of waste by jacketing or encapsulating waste to prevent further spread or leakage of contaminating materials. Leaking drums may be contained within oversized barrels as an interim measure prior to removal and final disposal.

Pentachlorophenol (PCP): A synthetic, modified petrochemical that may be used as a wood preservative because of its toxicity to termites and fungi. It is a common component of creosotes and can cause cancer.

Perched (groundwater): Groundwater separated from another underlying body of groundwater by a confining layer, often clay or rock.

Percolation: The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing downward to groundwater.

Pesticide: A substance or mixture of substances intended to prevent, destroy, or repel any pest. If misused, pesticides can accumulate in the foodchain and contaminate the environment.

Petrochemicals: Chemical substances produced from petroleum in refinery operations and as fuel oil residues. These include fluoranthene, chrysene, mineral spirits, and refined oils. Petrochemicals are the bases from which volatile organic compounds (VOCs), plastics, and many pesticides are made. These chemical substances often are toxic to humans and the environment.

Phenols: Organic compounds that are used in plastics manufacturing and are by-products of petroleum refining, tanning, textile, dye, and resin manufacturing. Phenols are highly poisonous.

Physical Chemical Separation: The treatment process of adding a chemical to a substance to separate the compounds for further treatment or disposal.

Pilot Testing: A small-scale test of a proposed treatment system in the field to determine its ability to clean up specific contaminants.

Plugging: The process of stopping the flow of water, oil, or gas into or out of the ground through a borehole or well penetrating the ground.

Plume: A body of contaminated groundwater flowing from a specific source. The movement of the groundwater is influenced by such factors as local groundwater flow patterns, the character of the aquifer in which groundwater is contained, and the density of contaminants [see Migration].

Pollution: Generally, the presence of matter or energy whose nature, location, or quantity produces undesired health or environmental effects.

Polycyclic Aromatic Hydrocarbons or Polyaromatic Hydrocarbons (PAHs): PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

Polychlorinated Biphenyls (PCBs): A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, microscope immersion oils, and caulking compounds. PCBs also are produced in certain combustion processes. PCBs are extremely persistent in the environment because they are very stable, non-reactive, and highly heat resistant. Chronic exposure to PCBs is believed to cause liver damage. It also is known to bioaccumulate in fatty tissues. PCB use and sale was banned in 1979 with the passage of the Toxic Substances Control Act.

Polynuclear Aromatic Hydrocarbons (PNAs): PNAs, such as naphthalene, and biphenyls, are a group of highly reactive organic compounds that are a common component of creosotes, which can be carcinogenic.

Polyvinyl Chloride (PVC): A plastic made from the gaseous substance vinyl chloride. PVC is used to make pipes, records, raincoats, and floor tiles. Health risks from high concentrations of vinyl chloride include liver cancer and lung cancer, as well as cancer of the lymphatic and nervous systems.

Potable Water: Water that is safe for drinking and cooking.

Potentially Responsible Parties (PRPs): Parties associated with a Superfund site who may be liable for the cost of remedying the release of hazardous substances. This may include owners or operators of the site or transporters who disposed of materials at the site. PRPs may admit liability, or liability may be determined by a court of law. PRPs may sign a Consent Decree or Administrative Order on Consent to participate in the site cleanup without admitting liability.

Precipitation: The removal of solids from liquid waste so that the solid and liquid portions can be disposed of safely; the removal of particles from airborne emissions. Electrochemical precipitation is the use of an anode or cathode to remove the hazardous chemicals. Chemical precipitation involves the addition of some substance to cause the solid portion to separate.

Preliminary Assessment: The process of collecting and reviewing available information about a known or suspected waste site or release to determine if a threat or potential threat exists.

Pump and Treat: A groundwater cleanup technique involving the extracting of contaminated groundwater from the subsurface and the removal of contaminants, using one of several treatment technologies.

Radionuclides: Elements, including radium and uranium-235 and -238, which break down and produce radioactive substances due to their unstable atomic structure. Some are man-made, and others are naturally occurring in the environment. Radon, the gaseous form of radium, decays to form alpha particle radiation, which cannot be absorbed through skin. However, it can be inhaled, which allows alpha particles to affect unprotected tissues directly and thus cause cancer. Radiation also occurs naturally through the breakdown of granite.

RCRA: [See Resource Conservation and Recovery Act].

Recharge Area: A land area where rainwater saturates the ground and soaks through the earth to reach an aquifer.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used to clean up sites listed on the NPL. It is based on information generated during the remedial investigation and feasibility study and consideration of public comments and community concerns.

Recovery Wells: Wells used to withdraw contaminants or contaminated groundwater.

Recycle: The process of minimizing waste generation by recovering usable products that might otherwise become waste.

Remedial Action (RA): The actual construction or implementation phase of a Superfund site cleanup following the remedial design [see Cleanup].

Remedial Design: A phase of site cleanup where engineers design the technical specifications for cleanup remedies and technologies.

Remedial Investigation: An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish the criteria for cleaning up the site, identify the preliminary alternatives for cleanup actions, and support the technical and cost analyses of the alternatives. The remedial investigation is usually done with the feasibility study. In this volume, the remedial investigation is referred to as a site study [see also Feasibility Study].

Remedial Project Manager (RPM): The EPA or State official responsible for overseeing cleanup actions at the site.

Remedy Selection: The selection of the final cleanup strategy for the site. At the few sites where the EPA has determined that initial response actions have eliminated site contamination, or that any remaining contamination will be naturally dispersed without further cleanup activities, a "No Action" remedy is selected [see Record of Decision].

Removal Action: Short-term immediate actions taken to address releases of hazardous substances [see Cleanup].

Residual: The amount of a pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or the particulates remaining in air after the air passes through a scrubber.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Retention Pond: A small body of liquid used for disposing of wastes and containing overflow from production facilities. Sometimes retention ponds are used to expand the capacity of such structures as lagoons the store waste.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land and spread contaminants from its source.

Scrubber: An air pollution control device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

Sediment: The layer of soil, sand, and minerals at the bottom of surface waters such as streams, lakes, and rivers, that absorbs contaminants.

Seeps: Specific points where releases of liquid, usually leachate, form from waste disposal areas, particularly along the lower edges of landfills.

Seepage Pits: A hole, shaft, or cavity in the ground used for the storage of liquids, usually in the form of leachate, from waste disposal areas. The liquid gradually leaves the pit by moving through the surrounding soil.

Septage: Residue remaining in a septic tank after the treatment process.

Sinkhole: A hollow depression in the land surface in which drainage collects; associated with underground caves and passages that facilitate the movement of liquids.

Site Characterization: The technical process used to evaluate the nature and extent of environmental contamination, which is necessary for choosing and designing cleanup measures and monitoring their effectiveness.

Site Inspection: The collection of information from a hazardous waste site to determine the extent and severity of hazards posed by the site. It follows, and is more extensive than, a preliminary assessment. The purpose is to gather information necessary to score the site, using the Hazard Ranking System, and to determine if the site presents an immediate threat that requires a prompt removal action.

Slag: The fused refuse or dross separated from a metal in the process of smelting.

Sludge: Semi-solid residues from industrial or water treatment processes that may be contaminated with hazardous materials.

Slurry Wall: Barriers used to contain the flow of contaminated groundwater or subsurface liquids. Slurry walls are constructed by digging a trench around a contaminated area and filling the trench with an impermeable material that prevents water from passing through it. The groundwater or contaminated liquids trapped within the area surrounded by the slurry wall can be extracted and treated.

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate the metal. Emissions from smelters are known to cause pollution.

Soil Gas: Gaseous elements and compounds that occur in the small spaces between particles of soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Vapor Extraction: A treatment process that uses vacuum wells to remove hazardous gases from soil.

Soil Washing: A water-based process for mechanically scrubbing soils in-place to remove undesirable materials. There are two approaches: dissolving or suspending them in the wash solution for later treatment by conventional methods, and concentrating them into a smaller volume of soil through simple particle size separation techniques [see Solvent Extraction].

Stabilization: The process of changing an active substance into inert, harmless material, or physical activities at a site that act to limit the further spread of contamination without actual reduction of toxicity.

Solidification/Stabilization: A chemical or physical reduction of the mobility of hazardous constituents. Mobility is reduced through the binding of hazardous constituents into a solid mass with low permeability and resistance to leaching.

Solvent: A substance capable of dissolving another substance to form a solution. The primary uses of industrial solvents are as cleaners for degreasing, in paints, and in pharmaceuticals. Many solvents are flammable and toxic to varying degrees.

Solvent Extraction: A means of separating hazardous contaminants from soils, sludges, and sediment, thereby reducing the volume of the hazardous waste that must be treated. It generally is used as one in a series of unit operations. An organic chemical is used to dissolve contaminants as opposed to water-based compounds, which usually are used in soil washing.

Sorption: The action of soaking up or attracting substances. It is used in many pollution control systems.

Special Notice Letter: [See Notice Letter].

Stillbottom: Residues left over from the process of recovering spent solvents.

Stripping: A process used to remove volatile contaminants from a substance [see Air Stripping].

Sumps: A pit or tank that catches liquid runoff for drainage or disposal.

Superfund: The program operated under the legislative authority of the CERCLA and Superfund Amendments and Reauthorization Act (SARA) to update and improve environmental laws. The program has the authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The "Superfund" is a trust fund that finances cleanup actions at hazardous waste sites.

Surge Tanks: A holding structure used to absorb irregularities in flow of liquids, including liquid waste materials.

Swamp: A type of wetland that is dominated by woody vegetation and does not accumulate peat moss deposits. Swamps may be fresh or saltwater and tidal or non-tidal [see Wetlands].

Thermal Treatment: The use of heat to remove or destroy contaminants from soil.

Treatability Studies: Testing a treatment method on contaminated groundwater, soil, etc., to determine whether and how well the method will work.

Trichloroethylene (TCE): A stable, colorless liquid with a low boiling point. TCE has many industrial applications, including use as a solvent and as a metal degreasing agent. TCE may be toxic to people when inhaled, ingested, or through skin contact and can damage vital organs, especially the liver [see Volatile Organic Compounds].

Unilateral [Administrative] Order: [see Administrative Order].

Upgradient: An upward hydrologic slope; demarks areas that are higher than contaminated areas and, therefore, are not prone to contamination by the movement of polluted groundwater.

Vacuum Extraction: A technology used to remove volatile organic compounds (VOCs) from soils. Vacuum pumps are connected to a series of wells drilled to just above the water table. The wells are sealed tightly at the soil surface, and the vacuum established in the soil draws VOC-contaminated air from the soil pores into the well, as fresh air is drawn down from the surface of the soil.

Vegetated Soil Cap: A cap constructed with graded soils and seed for vegetative growth, to prevent erosion [see Cap].

Vitrification: The process of electrically melting wastes and soils or sludges to bind the waste in a glassy, solid material more durable than granite or marble and resistant to leaching.

Volatile Organic Compounds (VOCs): VOCs are manufactured as secondary petrochemicals. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and groundwater.

Waste Treatment Plant: A facility that uses a series of tanks, screens, filters, and other treatment processes to remove pollutants from water.

Wastewater: The spent or used water from individual homes or industries.

Watershed: The land area that drains into a stream or other water body.

Water Table: The upper surface of the groundwater.

Weir: A barrier to divert water or other liquids.

Wetland: An area that is regularly saturated by surface or groundwater and, under normal circumstances, is capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are nontidal and freshwater. Coastal wetlands are an integral component of estuaries.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Some Common Contaminants at NPL Sites

Contaminant Category	Example Chemical Types	Sources	Potential Health Threats*
Heavy Metals	Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Chromium, Lead, Manganese, Mercury, Nickel, Silver, Selenium, Zinc	Electroplating, batteries, paint pigments, photography, smelting, thermometers, fluorescent lights, solvent recovery	Tumors, cancers, and kidney, brain, neurological, bone and liver damage
Volatile Organic Compounds (VOCs)	Trichloroethylene (TCE), Perchloroethylene (PCE), Acetone, Benzene, Ketone, Methyl chloride, Toluene, Vinyl Chloride, Dichlorethylene	Solvents and degreasers, gasoline octane enhancers, oils and paints, dry cleaning fluids, chemical manufacturing.	Cancers, kidney and liver damage, impairment of the nervous system resulting in sleepiness and headaches, leukemia
Pesticides/ Herbicides	Chlordane, DDT 4-4, DDE, Heptachlor, Aldrin, Endrin, Atrazine, Dieldrin, Toxaphene	Agricultural applications, pesticide and herbicide production	Various effects ranging from nausea to nervous disorders. Dioxin is a common by-product of the manufacture of pesticides and is both highly toxic and a suspected carcinogen.
Polychlorinated biphenyls (PCBs)	—	Electric transformers and capacitors, insulators and coolants, adhesives, caulking compounds, carbonless copy paper, hydraulic fluids.	Cancer and liver damage.
Creosotes	Polyaromatic hydrocarbons (PAHs), Polynuclear aromatics (PNAs), Phenolic Tars, Pentachlorophenol (PCP)	Wood preserving, fossil fuel combustion	Cancers and skin ulcerations with prolonged exposure
Radiation (Radionuclides)	Radium-226, Radon, Uranium-235, Uranium-238	Mine tailings, radium products, natural decay of granites	Cancer

Sources: *Toxic Chemicals—What They Are, How They Affect You (EPA, Region 5)*
Glossary of Environmental Terms (EPA, 1988)

**The potential for risk due to these contaminants is linked to a number of factors; for example, the length and level of exposure and environmental and health factors such as age.*

* U.S. G.P.O.:1993-341-835:81045