

**NATIONAL PRIORITIES LIST SITES:
North and South Dakota**

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

If you wish to purchase copies of any additional State volumes or the National Overview volume, ***Superfund: Focusing on the Nation at Large***, contact:

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INTRODUCTION:

WHY THE SUPERFUND PROGRAM?

As the 1970s came to a close, a series of headline stories gave Americans a look at the dangers of dumping industrial and urban wastes on the land. First there was New York's Love Canal. Hazardous waste buried there over a 25-year period contaminated streams and soil, and endangered the health of nearby residents. The result: evacuation of several hundred people. Then the leaking barrels at the Valley of the Drums in Kentucky attracted public attention, as did the dioxin tainted land and water in Times Beach, Missouri.

In all these cases, human health and the environment were threatened, lives were disrupted, property values depreciated. It became increasingly clear that there were large numbers of serious hazardous waste problems that were falling through the cracks of existing environmental laws. The magnitude of these emerging problems moved Congress to enact the Comprehensive Environmental Response, Compensation, and Liability Act in 1980. CERCLA — commonly known as the Superfund — was the first Federal law established to deal with the dangers posed by the Nation's hazardous waste sites.

After Discovery, the Problem Intensified

Few realized the size of the problem until EPA began the process of site discovery and site evaluation. Not hundreds, but thousands of potential hazardous waste sites existed, and they presented the Nation with some of the most complex pollution problems it had ever faced.

In the 10 years since the Superfund program began, hazardous waste has surfaced as a major environmental concern in every part of the United States. It wasn't just the land that was contaminated by past disposal practices. Chemicals in the soil were spreading into the groundwater (a source of drinking water for many) and into streams, lakes, bays, and wetlands. Toxic vapors contaminated the air at some sites, while at others improperly disposed or stored wastes threatened the health of the surrounding community and the environment.

EPA Identified More than 1,200 Serious Sites

EPA has identified 1,236 hazardous waste sites as the most serious in the Nation. These sites comprise the "National Priorities List": sites targeted for cleanup under the Superfund. But site discoveries continue, and

A BRIEF OVERVIEW

EPA estimates that, while some will be deleted after lengthy cleanups, this list, commonly called the NPL, will continue to grow by approximately 100 sites per year, reaching 2,100 sites by the year 2000.

THE NATIONAL CLEANUP EFFORT IS MUCH MORE THAN THE NPL

From the beginning of the program, Congress recognized that the Federal government could not and should not address all environmental problems stemming from past disposal practices. Therefore, the EPA was directed to set priorities and establish a list of sites to target. Sites on the NPL (1,236) are thus a rela-

INTRODUCTION

tively small subset of a larger inventory of potential hazardous waste sites, but they do comprise the most complex and environmentally compelling cases. EPA has logged more than 32,000 sites on its National hazardous waste inventory, and assesses each site within one year of being logged. In fact, over 90 percent of the sites on the inventory have been assessed. Of the assessed sites, 55 percent have been found to require no further Federal action because they did not pose significant human health or environmental risks. The remaining sites are undergoing further assessment to determine if long-term Federal cleanup activities are appropriate.

EPA IS MAKING PROGRESS ON SITE CLEANUP

The goal of the Superfund program is to tackle immediate dangers first, and then move through the progressive steps necessary to eliminate any long-term risks to public health and the environment.

The Superfund responds immediately to sites posing imminent threats to human health and the environment at both NPL sites and sites not on the NPL. The purpose is to stabilize, prevent, or temper the effects of a hazardous release, or the threat of one. These might include

tire fires or transportation accidents involving the spill of hazardous chemicals. Because they reduce the threat a site poses to human health and the environment, immediate cleanup actions are an integral part of the Superfund program.

Immediate response to imminent threats is one of the Superfund's most noted achievements. Where imminent threats to the public or environment were evident, EPA has completed or monitored emergency actions that attacked the most serious threats to toxic exposure in more than 1,800 cases.

The ultimate goal for a hazardous waste site on the NPL is a permanent solution to an environmental problem that presents a serious (but not an imminent) threat to the public or environment. This often requires a long-term effort. In the last four years, EPA has aggressively accelerated its efforts to perform these long-term cleanups of NPL sites. More cleanups were started in 1987, when the Superfund law was amended, than in any previous year. And in 1989 more sites than ever reached the construction stage of the Superfund cleanup process. Indeed construction starts increased by over 200 percent between late 1986 and 1989! Of the sites currently on the NPL, more than 500 — nearly half

— have had construction cleanup activity. In addition, over 500 more sites are presently in the investigation stage to determine the extent of site contamination, and to identify appropriate cleanup remedies. Many other sites with cleanup remedies selected are poised for the start of cleanup construction activity. Measuring success by "progress through the cleanup pipeline," EPA is clearly gaining momentum.

EPA MAKES SURE CLEANUP WORKS

EPA has gained enough experience in cleanup construction to understand that environmental protection does not end when the remedy is in place. Many complex technologies — like those designed to clean up groundwater — must operate for many years in order to accomplish their objectives.

EPA's hazardous waste site managers are committed to proper operation and maintenance of every remedy constructed. No matter who has been delegated responsibility for monitoring the cleanup work, the EPA will assure that the remedy is carefully followed and that it continues to do its job.

Likewise, EPA does not abandon a site even after the cleanup work is done. Every

five years the Agency reviews each site where residues from hazardous waste cleanup still remain to ensure that public and environmental health are still being safeguarded. EPA will correct any deficiencies discovered and report to the public annually on all five-year reviews conducted that year.

CITIZENS HELP SHAPE DECISIONS

Superfund activities also depend upon local citizen participation. EPA's job is to analyze the hazards and deploy the experts, but the Agency needs citizen input as it makes choices for affected communities.

Because the people in a community with a Superfund site will be those most directly affected by hazardous waste problems and cleanup processes, EPA encourages citizens to get involved in cleanup decisions. Public involvement and comment does influence EPA cleanup plans by providing valuable information about site conditions, community concerns and preferences.

This State volume and the companion National Overview volume provide general Superfund background information and descriptions of activities at each State NPL site. These volumes are

intended to clearly describe what the problems are, what EPA and others participating in site cleanups are doing, and how we as a Nation can move ahead in solving these serious problems.

USING THE STATE AND NATIONAL VOLUMES IN TANDEM

To understand the big picture on hazardous waste cleanup, citizens need to hear about both environmental progress across the country and the cleanup accomplishments closer to home. The public should understand the challenges involved in hazardous waste cleanup and the decisions we must make — as a Nation — in finding the best solutions.

The National Overview volume — *Superfund: Focusing on the Nation at Large* — accompanies this State volume. The National Overview contains important information to help you understand the magnitude and challenges facing the Superfund program as well as an overview of the National cleanup effort. The sections describe the nature of the hazardous waste problem nationwide, threats and contaminants at NPL sites and their potential effects on human health and the environment, the Superfund program's successes in cleaning up the Nation's

serious hazardous waste sites, and the vital roles of the various participants in the cleanup process.

This State volume compiles site summary fact sheets on each State site being cleaned up under the Superfund program. These sites represent the most serious hazardous waste problems in the Nation, and require the most complicated and costly site solutions yet encountered. Each State book gives a "snapshot" of the conditions and cleanup progress that has been made at each NPL site in the State through the first half of 1990. Conditions change as our cleanup efforts continue, so these site summaries will be updated periodically to include new information on progress being made.

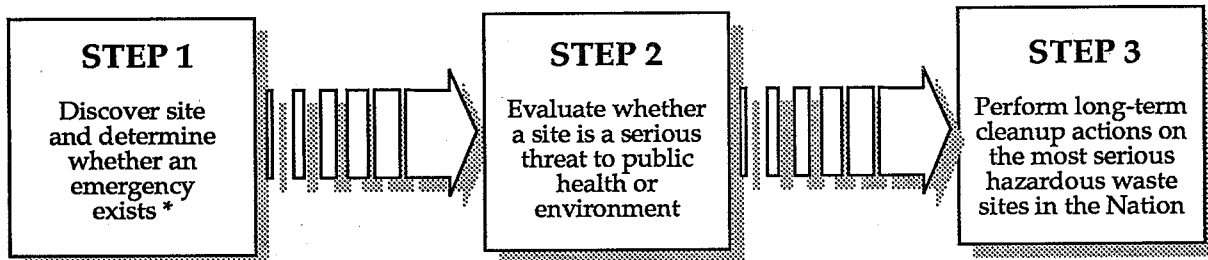
To help you understand the cleanup accomplishments made at these sites, this State volume includes a description of the process for site discovery, threat evaluation and long-term cleanup of Superfund sites. This description — *How Does the Program Work to Clean Up Sites?* — will serve as a good reference point from which to review the cleanup status at specific sites. A glossary also is included at the back of the book that defines key terms used in the site fact sheets as they apply to hazardous waste management.

SUPERFUND:

HOW DOES THE PROGRAM WORK TO CLEAN UP SITES?

The diverse problems posed by the Nation's hazardous waste sites have provided EPA with the challenge to establish a consistent approach for evaluating and cleaning up the Nation's most serious sites. To do this, EPA had to step beyond its traditional role as a regulatory agency to develop processes and guidelines for each step in these technically complex site cleanups. EPA has established procedures to coordinate the efforts of its Washington, D.C. Headquarters program offices and its front-line staff in 10 Regional Offices with the State governments, contractors, and private parties who are participating in site cleanup. An important part of the process is that any time during cleanup, work can be led by EPA or the State or, under their monitoring, by private parties who are potentially responsible for site contamination.

The process for discovery of the site, evaluation of threat, and long-term cleanup of Superfund sites is summarized in the following pages. The phases of each of these steps are highlighted within the description. The flow diagram below provides a summary of this three step process.



** Emergency actions are performed whenever needed in this three-step process*

FIGURE 1

Although this State book provides a current "snapshot" of site progress made only by emergency actions and long-term cleanup actions at Superfund sites, it is important to understand the discovery and evaluation process that leads up to identifying and cleaning up these most serious uncontrolled or abandoned hazardous waste sites in the Nation. This discovery and evaluation process is the starting point for this summary description.

How does EPA learn about potential hazardous waste sites?

What happens if there is an imminent danger?

If there isn't an imminent danger, how does EPA determine what, if any, cleanup actions should be taken?

STEP 1: SITE DISCOVERY AND EMERGENCY EVALUATION

Site discovery occurs in a number of ways. Information comes from concerned citizens — people may notice an odd taste or foul odor in their drinking water, or see half-buried leaking barrels; a hunter may come across a field where waste was dumped illegally. Or there may be an explosion or fire which alerts the State or local authorities to a problem. Routine investigations by State and local governments, and required reporting and inspection of facilities that generate, treat, store, or dispose of hazardous waste also help keep EPA informed about either actual or potential threats of hazardous substance releases. All reported sites or spills are recorded in the Superfund inventory (CERCLIS) for further investigation to determine whether they will require cleanup.

As soon as a potential hazardous waste site is reported, EPA determines whether there is an emergency requiring an immediate cleanup action. If there is, they act as quickly as possible to remove or stabilize the imminent threat. These short-term **emergency actions** range from building a fence around the contaminated area to keep people away or temporarily relocating residents until the danger is addressed, to providing bottled water to residents while their local drinking water supply is being cleaned up, or physically removing wastes for safe disposal.

However, emergency actions can happen at any time an imminent threat or emergency warrants them — for example, if leaking barrels are found when cleanup crews start digging in the ground or if samples of contaminated soils or air show that there may be a threat of fire or explosion, an immediate action is taken.

STEP 2: SITE THREAT EVALUATION

Even after any imminent dangers are taken care of, in most cases contamination may remain at the site. For example, residents may have been supplied with bottled water to take care of their immediate problem of contaminated well water. But now it's time to figure out what is contaminating the drinking water supply and the best way to clean it up. Or

EPA may determine that there is no imminent danger from a site, so now any long-term threats need to be evaluated. In either case, a more comprehensive investigation is needed to determine if a site poses a serious but not imminent danger, and requires a long-term cleanup action.

Once a site is discovered and any needed emergency actions are taken, EPA or the State collects all available background information not only from their own files, but also from local records and U.S. Geological Survey maps. This information is used to identify the site and to perform a **preliminary assessment** of its potential hazards. This is a quick review of readily available information to answer the questions:

- Are hazardous substances likely to be present?
- How are they contained?
- How might contaminants spread?
- How close is the nearest well, home, or natural resource area like a wetland or animal sanctuary?
- What may be harmed — the land, water, air, people, plants, or animals?

Some sites do not require further action because the preliminary assessment shows that they don't threaten public health or the environment. But even in these cases, the sites remain listed in the Superfund inventory for record keeping purposes and future reference. Currently, there are more than 32,000 sites maintained in this inventory.

Inspectors go to the site to collect additional information to evaluate its hazard potential. During this **site inspection**, they look for evidence of hazardous waste, such as leaking drums and dead or discolored vegetation. They may take some samples of soil, well water, river water, and air. Inspectors analyze the ways hazardous materials could be polluting the environment — such as runoff into nearby streams. They also check to see if people (especially children) have access to the site.

Information collected during the site inspection is used to identify the sites posing the most serious threats to human health and the environment. This way EPA can meet the

If the preliminary assessment shows that a serious threat *may* exist, what's the next step?

How does EPA use the results of the site inspection?

SUPERFUND

How do people find out whether EPA considers a site a national priority for cleanup using Superfund money?

requirement that Congress gave them to use Superfund monies only on the worst hazardous waste sites in the Nation.

To identify the most serious sites, EPA developed the Hazard Ranking System (HRS). The HRS is the scoring system EPA uses to assess the relative threat from a release or a potential release of hazardous substances from a site to surrounding groundwater, surface water, air, and soil. A site score is based on the likelihood a hazardous substance will be released from the site, the toxicity and amount of hazardous substances at the site, and the people and sensitive environments potentially affected by contamination at the site.

Only sites with high enough health and environmental risk scores are proposed to be added to EPA's National Priorities List (NPL). That's why there are 1,236 sites on the NPL, but there are more than 32,000 sites in the Superfund inventory. Only NPL sites can have a long-term cleanup paid for from the national hazardous waste trust fund — the Superfund. But the Superfund can and does pay for emergency actions performed at any site, whether or not it's on the NPL.

The public can find out whether a site that concerns them is on the NPL by calling their Regional EPA office at the number listed in this book.

The proposed NPL identifies sites that have been evaluated through the scoring process as the most serious problems among uncontrolled or abandoned hazardous waste sites in the U.S. In addition, a site will be added to the NPL if the Agency for Toxic Substances and Disease Registry issues a health advisory recommending that people be moved away from the site. Updated at least once a year, it's only after public comments are considered that these proposed worst sites are officially added to the NPL.

Listing on the NPL does not set the order in which sites will be cleaned up. The order is influenced by the relative priority of the site's health and environmental threats compared to other sites, and such factors as State priorities, engineering capabilities, and available technologies. Many States also have their own list of sites that require cleanup; these often contain sites not on the NPL that are scheduled to be cleaned up with State money. And it should be said again that any emergency action needed at a site can be performed by the Superfund whether or not a site is on the NPL.

STEP 3: LONG-TERM CLEANUP ACTIONS

The ultimate goal for a hazardous waste site on the NPL is a permanent, long-term cleanup. Since every site presents a unique set of challenges, there is no single all-purpose solution. So a five-phase "remedial response" process is used to develop consistent and workable solutions to hazardous waste problems across the Nation:

1. Investigate in detail the extent of the site contamination: **remedial investigation**,
2. Study the range of possible cleanup remedies: **feasibility study**,
3. Decide which remedy to use: **Record of Decision or ROD**,
4. Plan the remedy: **remedial design**, and
5. Carry out the remedy: **remedial action**.

This remedial response process is a long-term effort to provide a permanent solution to an environmental problem that presents a serious, but not an imminent threat to the public or environment.

The first two phases of a long-term cleanup are a combined **remedial investigation and feasibility study (RI/FS)** that determine the nature and extent of contamination at the site, and identify and evaluate cleanup alternatives. These studies may be conducted by EPA or the State or, under their monitoring, by private parties.

Like the initial site inspection described earlier, a remedial investigation involves an examination of site data in order to better define the problem. But the remedial investigation is much more detailed and comprehensive than the initial site inspection.

A remedial investigation can best be described as a carefully designed field study. It includes extensive sampling and laboratory analyses to generate more precise data on the types and quantities of wastes present at the site, the type of soil and water drainage patterns, and specific human health and environmental risks. The result is information that allows EPA to select the cleanup strategy that is best suited to a particular site or to determine that no cleanup is needed.

After a site is added to the NPL, what are the steps to cleanup?

How are cleanup alternatives identified and evaluated?

Placing a site on the NPL does not necessarily mean that cleanup is needed. It is possible for a site to receive an HRS score high enough to be added to the NPL, but not ultimately require cleanup actions. Keep in mind that the purpose of the scoring process is to provide a preliminary and conservative assessment of *potential* risk. During subsequent site investigations, the EPA may find either that there is no real threat or that the site does not pose significant human health or environmental risks.

EPA or the State or, under their monitoring, private parties identify and analyze specific site cleanup needs based on the extensive information collected during the remedial investigation. This analysis of cleanup alternatives is called a *feasibility study*.

Since cleanup actions must be tailored exactly to the needs of each individual site, more than one possible cleanup alternative is always considered. After making sure that all potential cleanup remedies fully protect human health and the environment and comply with Federal and State laws, the advantages and disadvantages of each cleanup alternative are carefully compared. These comparisons are made to determine their effectiveness in the short- and long-term, their use of permanent treatment solutions, and their technical feasibility and cost.

To the maximum extent practicable, the remedy must be a permanent solution and use treatment technologies to destroy principal site contaminants. But remedies such as containing the waste on site or removing the source of the problem (like leaking barrels) are often considered effective. Often special pilot studies are conducted to determine the effectiveness and feasibility of using a particular technology to clean up a site. Therefore, the combined remedial investigation and feasibility study can take between 10 and 30 months to complete, depending on the size and complexity of the problem.

Does the public have a say in the final cleanup decision?

Yes. The Superfund law requires that the public be given the opportunity to comment on the proposed cleanup plan. Their concerns are carefully considered before a final decision is made.

The results of the remedial investigation and feasibility study, which also point out the recommended cleanup choice, are published in a report for public review and comment. EPA or the State encourages the public to review the information and take an active role in the final cleanup decision. Fact sheets and announcements in local papers let the community know where they can get copies of the study and other reference documents concerning the site.

The public has a minimum of 30 days to comment on the proposed cleanup plan after it is published. These comments can either be written or given verbally at public meetings that EPA or the State are required to hold. Neither EPA nor the State can select the final cleanup remedy without evaluating and providing written answers to specific community comments and concerns. This "responsiveness summary" is part of EPA's write-up of the final remedy decision, called the Record of Decision or ROD.

The ROD is a public document that explains the cleanup remedy chosen and the reason it was selected. Since sites frequently are large and must be cleaned up in stages, a ROD may be necessary for each contaminated resource or area of the site. This may be necessary when contaminants have spread into the soil, water and air, and affect such sensitive areas as wetlands, or when the site is large and cleaned up in stages. This often means that a number of remedies using different cleanup technologies are needed to clean up a single site.

Yes. Before a specific cleanup action is carried out, it must be designed in detail to meet specific site needs. This stage of the cleanup is called the **remedial design**. The design phase provides the details on how the selected remedy will be engineered and constructed.

Projects to clean up a hazardous waste site may appear to be like any other major construction project but, in fact, the likely presence of combinations of dangerous chemicals demands special construction planning and procedures. Therefore, the design of the remedy can take anywhere from 6 months to 2 years to complete. This blueprint for site cleanup includes not only the details on every aspect of the construction work, but a description of the types of hazardous wastes expected at the

If every cleanup action needs to be tailored to a site, does the design of the remedy need to be tailored too?

Once the design is complete, how long does it take to actually clean up the site and how much does it cost?

Once the cleanup action is complete, is the site automatically "deleted" from the NPL?

site, special plans for environmental protection, worker safety, regulatory compliance, and equipment decontamination.

The time and cost for performing the site cleanup — called the **remedial action** — are as varied as the remedies themselves. In a few cases, the only action needed may be to remove drums of hazardous waste and decontaminate them — an action that takes limited time and money. In most cases, however, a remedial action may involve different and expensive measures that can take a long time.

For example, cleaning polluted groundwater or dredging contaminated river bottoms can take several years of complex engineering work before contamination is reduced to safe levels. Sometimes the selected cleanup remedy described in the ROD may need to be modified because of new contaminant information discovered or difficulties that were faced during the early cleanup activities. Taking into account these differences, a remedial cleanup action takes an average of 18 months to complete and costs an average of \$26 million per site.

No. The deletion of a site from the NPL is anything but automatic. For example, cleanup of contaminated groundwater may take up to 20 years or longer. Also, in some cases the **long-term monitoring** of the remedy is required to ensure that it is effective. After construction of certain remedies, operation and maintenance (e.g., maintenance of ground cover, groundwater monitoring, etc.) or continued pumping and treating of groundwater, may be required to ensure that the remedy continues to prevent future health hazards or environmental damage, and ultimately meets the cleanup goals specified in the ROD. Sites in this final monitoring or operational stage of the cleanup process are designated as "construction completed".

It's not until a site cleanup meets all the goals and monitoring requirements of the selected remedy that EPA can officially propose the site for "deletion" from the NPL. And it's not until public comments are taken into consideration that a site can actually be deleted from the NPL. Deletions that have occurred are included in the "Construction Complete" category in the progress report found later in this book.

Yes. Based on the belief that "the polluters should pay," after a site is placed on the NPL, the EPA makes a thorough effort to identify and find those responsible for causing contamination problems at a site. Although EPA is willing to negotiate with these private parties and encourages voluntary cleanup, it has the authority under the Superfund law to legally force those potentially responsible for site hazards to take specific cleanup actions. All work performed by these parties is closely guided and monitored by EPA, and must meet the same standards required for actions financed through the Superfund.

Because these enforcement actions can be lengthy, EPA may decide to use Superfund monies to make sure a site is cleaned up without unnecessary delay. For example, if a site presents an imminent threat to public health and the environment, or if conditions at a site may worsen, it could be necessary to start the cleanup right away. Those responsible for causing site contamination are liable under the law for repaying the money EPA spends in cleaning up the site.

Whenever possible, EPA and the Department of Justice use their legal enforcement authorities to require responsible parties to pay for site cleanups, thereby preserving the Superfund for emergency actions and sites where no responsible parties can be identified.

Can EPA make parties responsible for the contamination pay?

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 National Priorities List (NPL) and their locations, as well as the conditions leading to their listing ("Site Description"). They 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 on 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 following two pages show a generic fact sheet and briefly describes the information under each section. The square "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.

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. (Pollution is usually periodic and involves contaminated dust particles or hazardous gas emissions.)



Contaminated Soil and Sludges on or near the site.



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

Icons in the *Response Action Status* Section



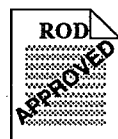
Initial Actions have been taken or are underway to eliminate immediate threats at the site.



Site Studies at the site are planned or underway.

HOW TO:

USING THE STATE VOLUME



Remedy Selected indicates that site investigations have been concluded and 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 — are currently underway.



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

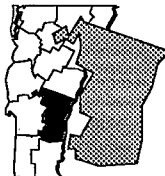
Site Responsibility

Identifies the Federal, State, and/or potentially responsible parties that are taking responsibility for cleanup actions at the site.

SITE NAME

STATE

EPA ID# ABC00000000



EPA REGION
CONGRESSIONAL DIST
County Name
Location

Aliases:

Site Description

NPL Listing History

Dates when the site was Proposed, made Final, and Deleted from the NPL

Site Responsibility:

NPL LISTING HISTORY

Threats and Contaminants



Cleanup Approach

Response Action Status





Site Facts:

Environmental Progress



Environmental Progress

A summary of the actions to reduce the threats to nearby residents and the surrounding environment; progress towards cleaning up the site and goals of the cleanup plan are given here.

WHAT THE FACT SHEETS CONTAIN

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. Throughout the site description and other sections of the site summary, technical or unfamiliar terms that are *italicized* are presented in the glossary at the end of the book. Please refer to the glossary for more detailed explanation or definition of the terms.

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 are also described. Specific contaminants and contaminant groupings are *italicized* and explained in more detail in the glossary.

Cleanup Approach

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

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 are often 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.

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 EPA to achieve site cleanup or other facts pertaining to community involvement with the site cleanup process are reported here.

How To

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 is always being made at NPL sites, and EPA will periodically update the Site Fact Sheets to reflect recent actions and publish updated State volumes.

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. EPA is committed to involving the public in the decisionmaking process associated with hazardous waste cleanup. The Agency solicits input

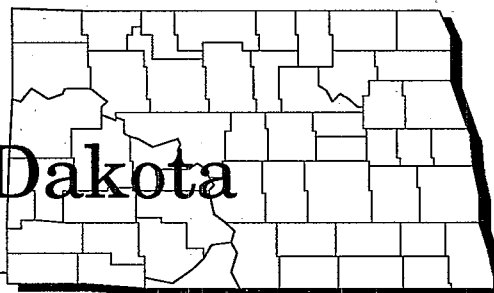
from area residents in communities affected by Superfund sites. Citizens are likely to be affected not only by hazardous site conditions, but also by the remedies that combat them. Site cleanups take many forms and can affect communities in different ways. Local traffic may be rerouted, residents may 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 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 to know what the community can realistically expect once the cleanup is complete.

EPA wants to develop cleanup methods that meet community needs, but the Agency can only 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.

NPL Sites in State of North Dakota



North Dakota lies in the West North Central section of the United States, situated exactly in the middle of North America. The State is bordered on the north by Canada, the east by Minnesota, the south by South Dakota, and the Montana to the west. North Dakota covers 70,702 square miles and consists of the Missouri Plateau of the Great Plains in the west, and the Central Lowland in the east, which comprises the Red River Valley and the Rolling Drift Plain. The State experienced a 2.2 percent increase in population through the 1980s and currently has approximately 667,000 residents, ranking 46th in U.S. populations. Principal state industries include agriculture, mining, tourism, and the manufacture of farm equipment and processed foods.

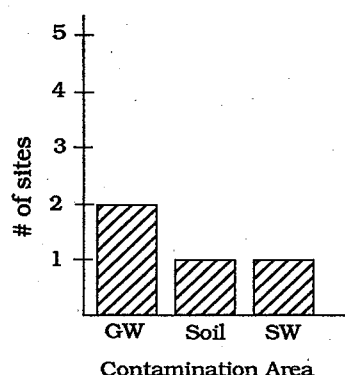
How Many North Dakota Sites Are on the NPL?

Proposed Sites	0
Final Sites	2
Deleted Sites	0
	2

Where Are the NPL Sites Located?

Cong. District 01	2 sites
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How are Sites Contaminated and What are the Principal* Chemicals ?



Groundwater: Heavy metals (inorganics), volatile organic compounds (VOCs), pesticides and radiation.



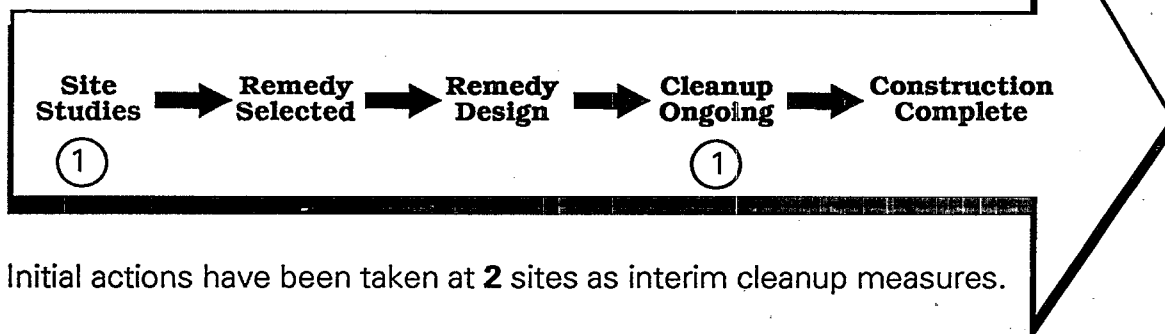
Soil: Heavy metals (inorganics), and volatile organic compounds (VOCs).



Surface Water: Heavy metals (inorganics), and volatile organic compounds (VOCs).

*Appear at 50% or more sites

Where are the Sites in the Superfund Cleanup Process*?



Who Do I Call with Questions?

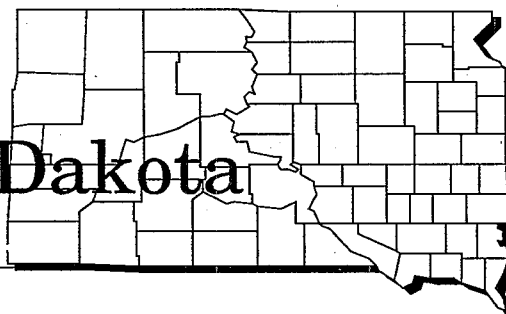
The following pages describe each NPL site in North Dakota, providing specific information on threats and contaminants, cleanup activities, and environmental progress. Should you have questions, please call one of the offices listed below:

North Dakota Superfund Office	(701) 224-2366
EPA Region VIII Superfund Office	(303) 293-1720
EPA Region VIII Superfund Community Relations	(303) 294-1144
EPA Headquarters Public Information Center	(202) 475-7751
EPA Superfund Hotline	(800) 424-9346

*Cleanup status reflects phase of site activities rather than administrative accomplishments.



NPL Sites in State of South Dakota



South Dakota is a North West Central state bordered on the north by North Dakota, on the east by Minnesota and Iowa, on the south by Nebraska, and Wyoming and Montana to the west. The State covers 77,116 square miles consisting of the Prairie Plains in the east, the rolling hills of the Great Plains in the west, and the Black Hills in the southwest corner. South Dakota experienced a 3.2 percent increase in population through the 1980s and currently has approximately 713,000 residents, ranking 45th in U.S. populations. Principal state industries include agriculture, services, and manufacturing. North Dakota produces food and kindred products, machinery, and electric and electronic equipment.

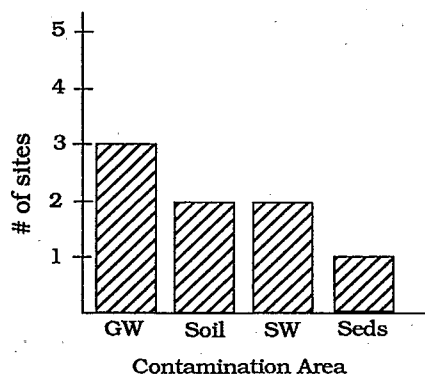
How Many South Dakota Sites Are on the NPL?

Proposed Sites	2
Final Sites	1
Deleted Sites	0
	<u>3</u>

Where Are the NPL Sites Located?

Cong. District 01 3 sites

How are Sites Contaminated and What are the Principal* Chemicals?



Groundwater: Heavy metals (inorganics), volatile organic compounds (VOCs), pesticides, radiation, and other inorganics.



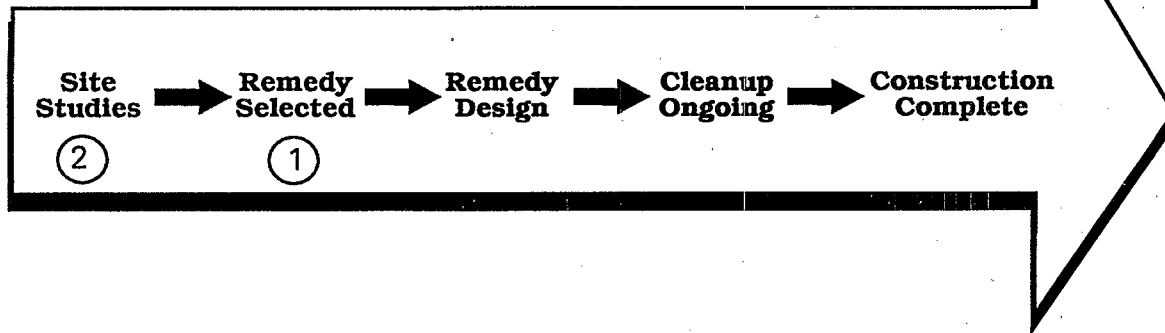
Soil: Heavy metals (inorganics).



Surface Water and Sediments: Heavy metals (inorganics), volatile organic compounds (VOCs), creosotes (inorganics), and pesticides, radiation, and other inorganics.

*Appear at 33% or more sites

Where are the Sites in the Superfund Cleanup Process*?



Who Do I Call with Questions?

The following pages describe each NPL site in South Dakota, providing specific information on threats and contaminants, cleanup activities, and environmental progress. Should you have questions, please call one of the offices listed below:

South Dakota Superfund Office	(605) 773-3153
EPA Region VIII Superfund Office	(303) 293-1720
EPA Region VIII Superfund Community Relations	(303) 294-1144
EPA Headquarters Public Information Center	(202) 475-7751
EPA Superfund Hotline	(800) 424-9346

*Cleanup status reflects phase of site activities rather than administrative accomplishments.



The NPL Progress Report

The following Progress Report lists the State 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 (➡) which indicates the current stage of cleanup at the site.

Large and complex sites are often 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 or initial action has been completed or is currently 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.
- ➡ An arrow in the "Site Studies" category indicates that an investigation to determine the nature and extent of the contamination at the site is currently ongoing or planned to begin in 1991.
- ➡ An 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 is selected. In these cases, the arrows in the Progress Report are discontinued at the "Remedy Selection" step and resume in the final "Construction Complete" category.
- ➡ An arrow at the "Remedial Design" stage indicates that engineers are currently designing the technical specifications for the selected cleanup remedies and technologies.
- ➡ An arrow marking the "Cleanup Ongoing" category means that final cleanup actions have been started at the site and are currently underway.
- ➡ A 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 may currently be undergoing long-term pumping and treating of groundwater, operation and maintenance or monitoring to ensure that the completed cleanup actions continue to protect human health and the environment.

The sites are listed in alphabetical order. 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 North Dakota

Page	Site Name	County	NPL	Date	Initial Response	Site Studies	Remedy Selected	Remedy Design	Cleanup Ongoing	Construction Complete
1	ARSENIC TRIOXIDE SITE	RICHMOND	Final	09/08/83	➡	➡	➡	➡	➡	
3	MINOT LANDFILL	WARD	Final	03/31/89	➡	➡				

Progress Toward Cleanup at NPL Sites in the State of South Dakota

5	ELLSWORTH AIR FORCE BASE	PENNINGTON	Prop	10/26/89		➡				
7	WHITEWOOD CREEK	LAWRENCE	Final	09/08/83		➡	➡			
9	WILLIAMS PIPE LINE DISPOSAL PIT	MINNEHAHA	Prop	10/26/89		➡				

NPL:

SITE
FACT
SHEETS

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

2. The second part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

3. The third part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

4. The fourth part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

5. The fifth part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

6. The sixth part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

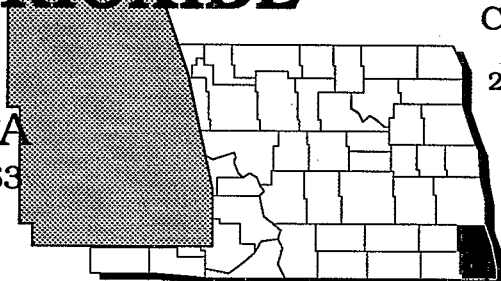
7. The seventh part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

8. The eighth part of the document is a letter from the President to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term. The letter is written in a formal, dignified style, and it is one of the most important documents in American history.

ARSENIC TRIOXIDE SITE

NORTH DAKOTA

EPA ID# NDD980716963



REGION 8
CONGRESSIONAL DIST. 01
Richmond County
20 townships in Richland, Ransom,
and Sargent Counties

Site Description

The Arsenic Trioxide site consists of 20 townships covering approximately 500 square miles of land. Heavy grasshopper infestations of agricultural crops in the 1930s resulted in widespread and frequent applications of arsenic-based pesticides. In 1979, it was discovered that the public and private water supplies for the City of Lidgerwood exceeded the maximum contaminant level for arsenic. Naturally occurring arsenic in shale found in the area may also have contributed to the contamination problem. Approximately 4,500 people reside in the area. In 1970, 278 homes in Lidgerwood that used private wells were considered to be at a health risk due to arsenic exposure. Presently, groundwater is used for agricultural and domestic purposes.

Site Responsibility: The site is being addressed through a combination of Federal and State actions.

NPL LISTING HISTORY

Proposed Date: 10/23/81

Final Date: 09/08/83

Threats and Contaminants



The groundwater is contaminated with arsenic as a result of the use of arsenic-based pesticides. People who drink from private wells in the area could be adversely affected. Public water supplies in several small cities are being addressed, including the cities of Lidgerwood and Wyndmere.

Cleanup Approach

This site is being addressed in three stages: initial actions and two *long-term remedial phases* focusing on the cleanup of the rural areas water system and treatment of the water supplies of Lidgerwood and Wyndmere.

Response Action Status



Initial Actions: In 1986, 10,000 square feet of contaminated surface area were covered with clay. Individual treatment units were installed in 116 private wells, and five residences were hooked up to a rural water supply system. Also, an abandoned bait station was cleaned up. In 1988 and 1989, the City of Lidgerwood's water treatment plant was repaired and the filter sand was changed. A design to upgrade this treatment plant has been approved by the State.



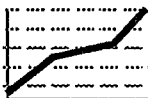
Rural Areas Water System: Based on the results of the site investigation, the EPA has selected to expand the construction and hookup of homes to the new rural water treatment and distribution system to be constructed by the State of North Dakota in 1990 and to evaluate institutional controls on well use and well drilling.



Lidgerwood/Wyndmere: Based on the results of the site investigation, the EPA is assisting the City of Lidgerwood with its efforts to improve its water treatment plant. Construction to improve the Lidgerwood water treatment plant began in 1989 and is scheduled for completion in 1990. The EPA has also provided funds to the City of Wyndmere to increase its water treatment plant's capability to handle periods of high demand. Site work began in 1989 at the Wyndmere water treatment system and the plant began operations that same year. Treated water is now being pumped to city water users. The treatment plant's operating procedures and equipment will continue to be monitored for 1 year, under State request, to ensure that the treatment plant consistently operates as designed and produces high quality, colorless drinking water. In 1990, the City of Lidgerwood, the North Dakota State Department of Health, and the EPA conducted an inspection of the treatment plant; additional minor modifications are required.

Site Facts: In 1982, a *Cooperative Agreement* was awarded to the North Dakota State Department of Health to conduct a remedial investigation. In 1985, the State of North Dakota was awarded a second Cooperative Agreement to conduct an investigation into the nature and extent of site contamination as well as the most effective methods to cleanup the site.

Environmental Progress



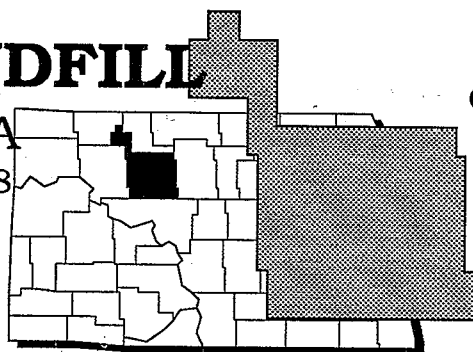
The EPA and the State have taken action to install water treatment facilities and provide waterline hookups to affected residents. These actions have eliminated the potential for area residents to access contaminated drinking water supplies. The EPA and the State will continue to monitor water quality and to provide required modifications to treatment facilities.



MINOT LANDFILL

NORTH DAKOTA

EPA ID# NDD980959548



REGION 8

CONGRESSIONAL DIST. 01

Ward County

Minot

Alias:

Old Minot Landfill

Site Description

The 45-acre Minot Landfill was privately owned but was operated by the City of Minot from 1962 to 1971. The *landfill* received refuse from several nearby industries from 1962 to 1970. While the exact composition of the disposal materials is not known, available sources indicate that oily wastes, spent battery casings, calcium carbide, lime *sludge* from acetylene production, and wastes from the construction of nearby missile sites are probable elements of the wastes. *Runoff* from the site area flows toward the Souris River, a source of drinking water for the City of Minot with a population of approximately 33,000 people. Additional residential and commercial development has been proposed for the area. The nearest home and business are approximately 750 feet from the site.

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

NPL LISTING HISTORY

Proposed Date: 06/24/88

Final Date: 03/31/89

Threats and Contaminants

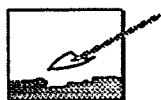


Hazardous compounds detected in on-site groundwater include barium, arsenic, and manganese. Two monitoring wells *downgradient* of the burial *cells* contain various *volatile organic compounds* (VOCs). Soils contain chlorinated organics and inorganic contaminants similar to those in groundwater. Surface water analysis showed the presence of zinc, toluene, benzene compounds, and xylene. Potential risks may exist for individuals touching or drinking the contaminated groundwater or *leachate*. The Souris River may be threatened by runoff from the site.

Cleanup Approach

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

Response Action Status



Initial Action: The City of Minot has installed a fence around the landfill. Parties potentially responsible for site contamination have completed additional fencing and surface erosion control measures at the site to halt pesticides and metal contamination in the landfill from *seeping* to the surface.



Entire Site: The EPA is scheduled to conduct an investigation in 1990 to determine the extent of the groundwater contamination at the site and to identify alternative technologies to clean up the groundwater and areas surrounding the site. Cleanup is scheduled to begin soon thereafter.

Environmental Progress



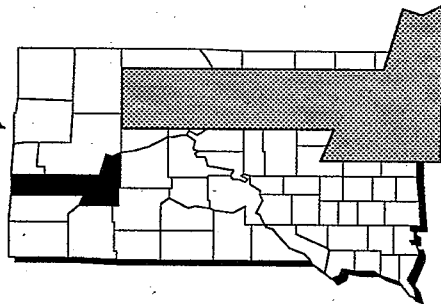
The installation of a fence has restricted access to the site and reduced the potential for exposure to hazardous substances at the Minot Landfill site. Surface erosion control measures have been completed to prevent the possible *migration* of contaminants to the Souris River while further cleanup investigations are scheduled to begin.



ELLSWORTH AIR FORCE BASE

SOUTH DAKOTA

EPA ID# SD2571924644



REGION 8

CONGRESSIONAL DIST. 01

Meade and Pennington Counties

11 miles northeast of Rapid City

Site Description

The 4,858-acre Ellsworth Air Force Base was established in 1942 and is now the site of the 44th Strategic Missile Wing of the Strategic Air Command (SAC). Activities at the base generate a variety of chlorinated solvents, waste oils contaminated with solvents, pesticides, and other hazardous wastes that the Department of Defense (DOD) disposed of at various areas on the base throughout its history of operations. The EPA has identified 5 contaminated areas at the base. Of these, 4 are unlined *landfills* and one is the burn pit for the Fire Protection Training area. The DOD has identified an additional 13 contaminated areas on site. Between 1987 and 1988, the U.S. Army Corps of Engineers monitored the groundwater on site and found that wells *downslope* from two landfills and burn pit are contaminated with *volatile organic compounds* (VOCs) and heavy metals. Approximately 1,600 people obtain drinking water from wells within 3 miles of the site. The nearest surface water *intake* is approximately 6,400 feet from the site.

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

NPL LISTING HISTORY

Proposed Date: 10/26/89

Threats and Contaminants



Groundwater, soil, and surface water on site are contaminated with VOCs and heavy metals including arsenic and chromium. People who drink contaminated surface water or groundwater could be exposed to site-related contaminants.

Cleanup Approach

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

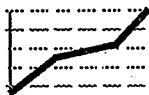
Response Action Status



Entire Site: The DOD began a study into the nature and extent of contamination at the site in 1985, which is scheduled to be completed in 1992. Technologies that best address contamination at the site will be selected based on this study. The EPA plans to select the final cleanup technologies for site contamination by 1992.

Site Facts: Currently, Ellsworth Air Force Base is participating in the DOD's *Installation Restoration Program* (IRP) that Congress initiated in 1978 to address contamination on lands owned by the military or other DOD installations.

Environmental Progress



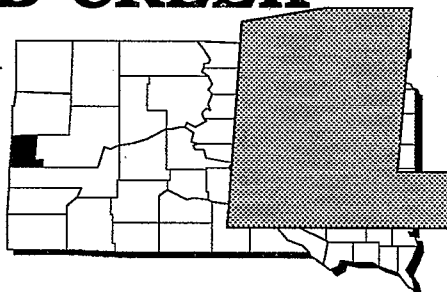
At the time this summary was written, the Ellsworth Air Force Base site had just obtained NPL status and it was too early to discuss environmental progress. The EPA will be performing a study to assess the need for any intermediate actions required to make the site safer while waiting for cleanup actions to begin. Results of this assessment will be described in our next edition.



WHITEWOOD CREEK

SOUTH DAKOTA

EPA ID# SDD980717136



REGION 8

CONGRESSIONAL DIST. 01

Lawrence, Meade, and Butte Counties

Along an 18-mile stretch of the
Whitewood Creek floodplain

Site Description

The Whitewood Creek site contains approximately 11 million tons of mining-related wastes such as *mine tailings* containing toxic metals. Since the 1870s, millions of tons of mine waste have been discharged from gold mining operations and deposited along the Whitewood Creek floodplain. Wastes continued to be discharged to Whitewood Creek until 1977, when the only mine in the area that still followed this practice closed. The EPA has detected arsenic in shallow groundwater in amounts above the standards set for drinking water. Whitewood Creek contains low amounts of site-related contaminants, and local residents use it to water livestock and for fishing. Approximately 1,400 people live within a 1-mile radius of the site. The site lies within the boundary of the Town of Whitewood.

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

NPL LISTING HISTORY

Proposed Date: 10/23/81

Final Date: 09/08/83

Threats and Contaminants

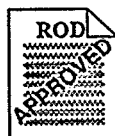


Groundwater, surface water, and soils contain heavy metals including arsenic, cadmium, chromium, lead, selenium, and cyanide. Soils are also contaminated with sulfates. People could potentially be exposed to site-related contaminants by drinking or touching contaminated groundwater, surface water, or soil. In 1974 and 1975, approximately 50 Holstein cattle from a dairy operation next to Whitewood Creek died of unknown causes. Later, a study that the South Dakota State University conducted showed that the cattle had died of arsenic poisoning, caused by eating corn contaminated with mining wastes.

Cleanup Approach

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

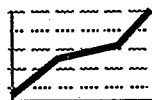
Response Action Status



Entire Site: In 1990, the EPA selected a remedy to clean up the site which includes: (1) removing and covering the contaminated soil at the existing residential properties; (2) continuing the monitoring of Whitewood Creek; and (3) establishing institutional controls to limit future uses of contaminated areas. The institutional controls involve continuing the ban on water wells in the 100-year floodplain, zoning regulations to prohibit development in the tailings deposits areas, and an educational program informing future buyers of the condition of the properties within the site. Cleanup actions will begin once the design for the soil removal and covering has been completed.

Site Facts: By 1977, Homestake Mining Company was the only operator continuing to discharge wastes into Whitewood Creek when other milling operations ceased. In 1982, the EPA, South Dakota Department of Water and Natural Resources, and Homestake Mining Company entered into an agreement to conduct a study of the site. The study investigated the quality of surface waters, groundwater, soils, *sediments*, and vegetation in the site area and selected aquatic life of Whitewood Creek.

Environmental Progress



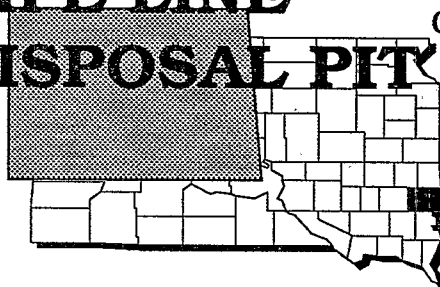
After adding this site to the NPL, the EPA performed preliminary investigations and determined that no immediate actions were required at the Whitewood Creek site while planned cleanup activities are being finalized and conducted.



WILLIAMS PIPE LINE COMPANY DISPOSAL PIT

SOUTH DAKOTA

EPA ID# SDD000823559



REGION 8
CONGRESSIONAL DIST. 01
Minnehaha County
Sioux Falls

Site Description

The 50-acre Williams Pipe Line Company Disposal Pit site operated as a disposal pit in the 1970s for leaded *stillbottoms* and storage tank *sludge*. The facility was an unlined pit where the company disposed of metals, oily wastes, pesticides, and solvents. The company burned the wastes in the pit periodically until the 1970s. The pit is now dry and covered with a plastic sheet. From 1986 to 1987, the EPA tested the *sediments* in the pit for contaminants and determined that they contained *volatile organic compounds* (VOCs), heavy metals, pesticides, and *polycyclic aromatic hydrocarbons* (PAHs). The EPA found that groundwater near the pit is contaminated with pesticides and heavy metals. Approximately 33,500 people live within 3 miles of the site. Approximately 100,000 people in the Sioux Falls area obtain drinking water from two sets of public wells that are within 3 miles of the site. The site is directly west of a housing development and is 2 miles west of the Big Sioux River and Skunk River.

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

NPL LISTING HISTORY

Proposed Date: 10/26/89

Threats and Contaminants



Groundwater underlying the disposal pit contains pesticides and lead. Sediments in the pit are contaminated with various heavy metals, VOCs, PAHs, and pesticides. People who use or come into direct contact with contaminated groundwater or sediments could be exposed to hazardous chemicals from the site.

Cleanup Approach

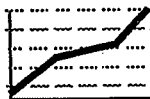
This site is being addressed in a single *long-term remedial phase* focusing on cleanup of the entire site.

Response Action Status



Entire Site: The EPA is scheduled to begin a study into the nature and extent of contamination at the site in 1991. The EPA will use the results of this study to select cleanup technologies to address contaminated groundwater and sediments at the site.

Environmental Progress



At the time this summary was written, the Williams Pipe Line Company Disposal Pit site had just obtained NPL status and it was too early to discuss environmental progress. The EPA will be performing a study to assess the need for any intermediate actions required to make the site safer while waiting for cleanup actions to begin. Results of this assessment will be described in our next edition.



GLOSSARY:

TERMS USED IN THE FACT SHEETS

This glossary defines the italicized terms used in the site fact sheets for the States of North and South Dakota. The terms and abbreviations contained in this glossary are often defined in the context of hazardous waste management as described in the site fact sheets, and apply specifically to work performed under the Superfund program. Thus, these terms may have other meanings when used in a different context.

Administrative Order On Consent: A legal and enforceable agreement between EPA and the parties potentially responsible for site contamination. Under the terms of the Order, the potentially responsible parties 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.

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.

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

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.

Downslope: [see Downgradient].

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 where a water supply is drawn from, such as from a river or waterbed.

GLOSSARY

Landfill: A disposal facility where waste is placed in or on land.

Leachate [n]: The liquid that trickles through or drains from waste, carrying soluble components from the waste. **Leach, Leaching [v.t.]:** The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

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 a number of these phases.

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

Mine (or Mill) Tailings: A fine, sandy residue left from ore milling operations. Tailings often contain high concentrations of lead and arsenic or other heavy metals.

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.

Potentially Responsible Parties (PRPs): Parties, including owners, who may have contributed to the contamination at a Superfund site and may be liable for costs of response actions. Parties are considered PRPs until they admit liability or a court makes a determination of liability. This means that PRPs may sign a consent decree or administrative order on consent [see Administrative Order on Consent] to participate in site cleanup activity without admitting liability.

Runoff: The discharge of water over land into surface water. It can carry pollutants from the air and land into receiving waters

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

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

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

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

Volatile Organic Compounds (VOCs): VOCs are made 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.

