

HAZARDOUS WASTE CLEANUP PROGRAM

FISCAL YEAR 1986

ANNUAL REPORT



Washington State Department of Ecology

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DEPARTMENT OF ECOLOGY

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Dear Reader:

There was a time when we took our state's natural resources for granted. Today our environment is threatened by hazardous substances such as automobile wastes, pesticides, household and industrial cleaners, acids, and other toxic chemicals. These substances have contaminated our air, surface water, ground water, and soil.

Washington State is particularly vulnerable to the effects of pollution because ample rainfall, porous soil conditions and abundant waterways are all means of spreading pollutants over great distances very quickly. Ground water, which supplies much of the state's drinking water, is especially vulnerable to pollution.

The Washington State Department of Ecology was created to protect the environment and public health. Working with numerous laws passed in the last decade, Ecology is reversing some of the effects of pollution. Through its Hazardous Waste Cleanup Program, Ecology identifies and works to correct the problems created by past practices of unregulated hazardous waste management and disposal. This report summarizes the work of the Hazardous Waste Cleanup Program during fiscal year 1986.

The Department of Ecology is committed to working with communities to locate and solve problems. Ecology staff meets regularly with citizens who live near hazardous waste sites, encouraging questions, comments and advice. Major cleanup actions are taken only after the public has had an opportunity to comment.

In addition to participating in public meetings, citizens can make a difference by learning which chemicals found at home or work are hazardous and how to dispose of them properly. Ecology has information which can be of assistance, and we hope that you will contact us if you have questions.

Sincerely,

Andrea Beatty Riniker
Director

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Executive Summary

Since the late 1970s, industries that generate, transport, treat, store or dispose of hazardous wastes have been required to meet stringent regulations to make sure that these wastes are managed and disposed of in a proper and safe manner. The legacy of incorrect disposal of hazardous wastes performed prior to or in violation of those regulations has created one of the most serious health and environmental challenges of the decade.

This report reviews the Washington State Department of Ecology Hazardous Waste Cleanup Program's efforts to deal with the problems created by past unregulated releases of hazardous wastes. Over the last fiscal year (July 1, 1985 - June 30, 1986), the Hazardous Waste Cleanup Program:

- Created a data base system containing inventory on more than 550 potential hazardous waste sites.
- Completed preliminary assessments of 262 potential hazardous waste sites.
- Conducted ten site inspections (See Appendix A).
- Prepared five hazard ranking documents.
- Financed emergency cleanup actions at 30 sites. (See Appendix B.)
- Continued work at 47 federal and state priority sites. Appendix D contains detailed information on activities at each site.
- Negotiated cleanup activities to be done at four sites by the responsible parties.
- Initiated court cost recovery actions at three sites.
- Increased emphasis on enforcement strategies.
- Increased program staff to address the expanding number of sites requiring attention.

Washington state has hundreds of potential hazardous waste sites, and many more are expected to be discovered. 200 sites are currently on a priority list for further action, and the ultimate future costs for investigation and cleanup are expected to be several hundred million dollars.

Introduction

Hazardous wastes are the discarded materials of a highly technological society - a society which has enjoyed a multitude of innovations in millions of consumer products. We have all been buying and using these products for years. For many years, chemical substances in Washington and the rest of the country were handled and discarded with little or no concern for their ultimate effects on our environment.



FIG. 1 Hazardous waste sites are often found in unexpected places.

Washington, like many other states, faces a variety of pollution problems as a result of past practices of improper handling and disposal of hazardous wastes. In the past many people chose the cheapest and quickest disposal methods - dumping in landfills or waterways, or merely putting waste in containers and storing it on their plant sites or elsewhere.

Unfortunately, as a society, we knew how to produce and use hazardous substances long before we knew how to dispose of them in a way that would minimize harm to public health or the environment. Millions of tons of hazardous substances had been released into the air, water and soil by the time people realized that tough controls were necessary.

In the last decade, substantial gains have been made in understanding and managing hazardous wastes. Investigation methods, remedial design, construction, and monitoring programs have been developed, as well as effective enforcement tools to get responsible parties to agree to do investigation and remedial work.

Washington State is confronted with hundreds of sites which need remediation. Even though significant progress has been made, the task of cleaning up hazardous waste sites in Washington is a long-term effort. This effort requires millions of dollars and the constant attentiveness of the regulatory agencies and citizens of the state.

Background

The Federal Superfund Law

In 1980, the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), better known as the "Superfund" program was established to help states clean up sites which endanger public health or the environment. The initial Superfund program, administered by EPA, provided \$1.6 billion over a five-year period. Funding for the program came primarily from taxes on petroleum and chemical products.

The 1980 law expired on Sept. 30, 1985. Congressional actions have extended the law temporarily and provided short-term funds. A House and Senate conference committee is now working to pass a reauthorization of Superfund. Uncertainties exist regarding when a reauthorized version of CERCLA will be approved, and exactly what the new bill will contain. As a result, states are under pressure to develop reliable and adequate fund sources and comprehensive authority to address hazardous waste cleanup needs. Appendix E contains more details on state and federal hazardous waste legislation.

State Hazardous Waste Cleanup Authority

Under authority of the state Hazardous Waste Fees statute (Chapter 70.105A RCW), Ecology has the power to carry out and respond to all provisions of CERCLA. The Hazardous Waste Cleanup Program works to clean up and restore hazardous waste sites that pose risks to public health, threaten drinking water supplies, or endanger environmentally sensitive areas.

Ecology has state funds available to investigate and cleanup hazardous waste sites independent of federal funding. For the 1985-1987 biennium, the Hazardous Waste Cleanup Program has a \$14.2 million budget from the General Appropriations fund. This independent funding allows Ecology to investigate and clean up state priority sites not eligible for federal Superfund money, conduct emergency projects, and provide matching funds for federal Superfund projects. In addition to the \$14.2 million, Ecology receives funds from the Environmental Protection Agency (EPA) for response at state lead National Priorities List (NPL) sites. Appendix E contains more details on state and federal hazardous waste legislation.

Hazardous Waste Cleanup Program Sites

Before a hazardous waste site is eligible for the federal Superfund program, it must be nominated and placed on the National Priorities List. Sites on the NPL represent those sites throughout the country presenting the greatest threats to public health and the environment. Ecology and the Environmental Protection Agency rank proposed sites according to:

- The potential for harm to humans or the environment from migration of a hazardous substance away from the site by routes involving ground water, surface water or air.

- The potential for harm from substances that can explode or cause fires.
- The potential for harm from direct contact with hazardous substances at the site.

Washington State currently has 19 NPL sites, with nine nominated for addition to the list. After a site is added to the NPL list and becomes eligible for federal money, Ecology or EPA, and in some cases the responsible party(ies), assumes the lead role in the cleanup effort. Several arrangements are possible for cleanup activities:

- Cooperative Agreements between Ecology and EPA. Ecology takes the lead and is responsible for developing a work plan, budget, schedule, and contracting for any services to complete the project. If available, federal funds are transferred to the state to assist in financing the project.
- Superfund/State contracts. EPA assumes responsibility and undertakes the cleanup action with assistance from Ecology. Ecology provides matching funds to EPA to support project costs.
- Responsible Party Cleanup. The responsible party or parties assume responsibility for the cleanup action. Oversight is provided by Ecology and EPA.

During fiscal year 1986 Washington had 28 state priority sites in addition to the NPL sites. These sites are not eligible for Superfund money, but represent a priority for Ecology to investigate and clean up. State appropriations provide funds for the cleanup of state priority sites as well as matching funds for NPL sites.

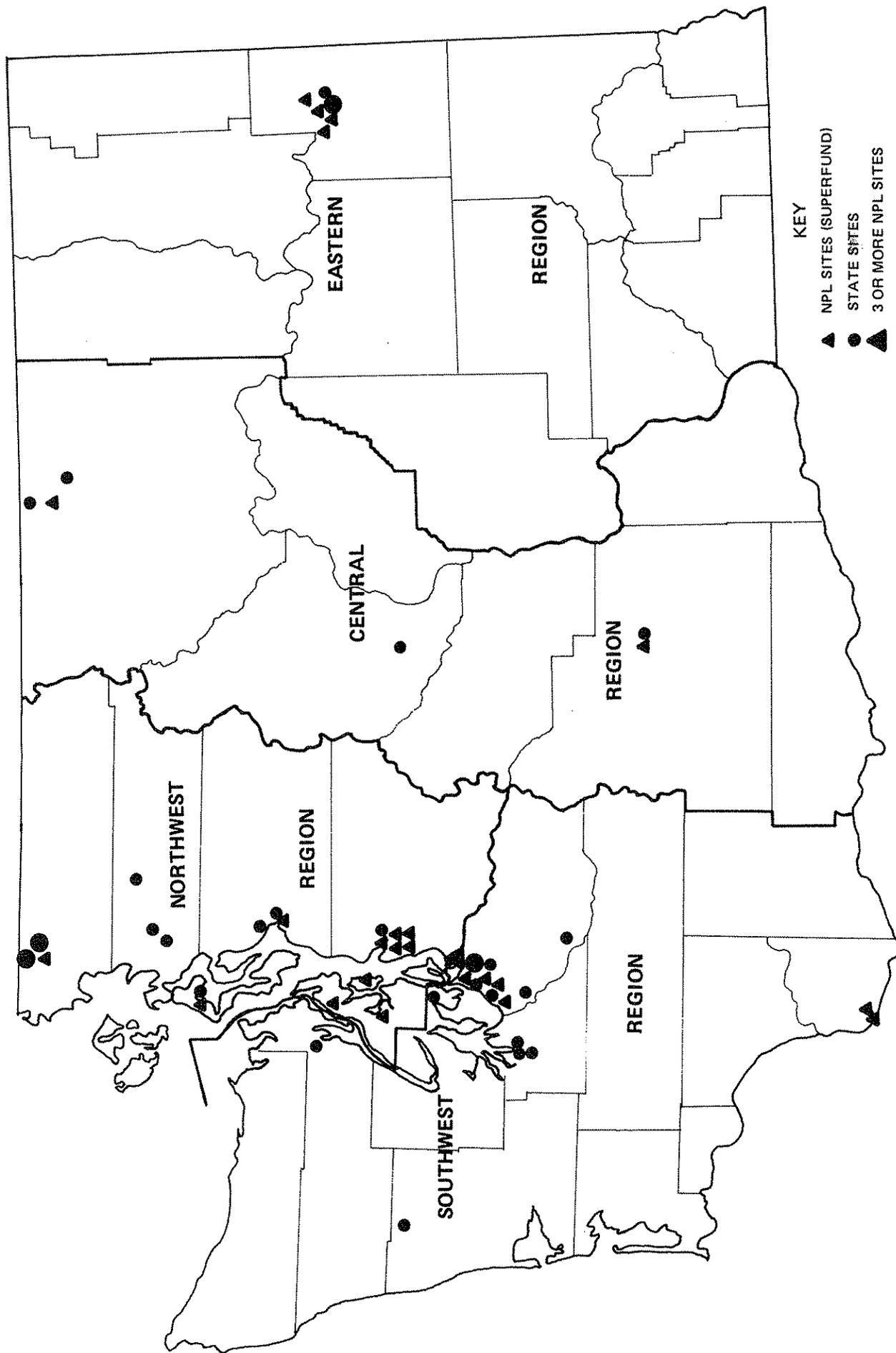


FIG. 2
 DEPARTMENT OF ECOLOGY
 HAZARDOUS WASTE CLEANUP PROGRAM SITES
 FISCAL YEAR 1986

The Hazardous Waste Cleanup Program

Roles and Responsibilities

Responsibilities for clean up activities at hazardous waste sites are carried out by both the regional and Headquarters staff in the Hazardous Waste Programs. Staff in Ecology's four regional offices are responsible for inspecting facilities that generate, store, treat, and dispose of hazardous waste; writing and issuing permits; identifying violators, responding to complaints, and providing technical assistance to the public and regulated facilities. Mechanisms that allow regional staff to compel those responsible for generating, storing, treating, and disposing of wastes to comply with regulations, permits, or clean up contaminated sites include warnings, orders and fines.

Responsibility for a site is at times transferred from the regional Hazardous Waste Program to the Hazardous Waste Cleanup Program located at Ecology's Headquarters offices in Lacey, Washington. Transfers occur when a site is abandoned and there is no apparent responsible party, an enforcement action is taken but the responsible party has failed to comply, or the enforcement action is deferred to EPA.

To identify and correct the problems created by past practices of unregulated or improper hazardous waste disposal, the Hazardous Waste Cleanup Program conducts investigations, emergency removal actions, interim control or containment measures, and long-term remedial actions.

The Hazardous Waste Cleanup Program is composed of three main sections: the Planning and Program Development Section, the Technical and Field Services Section and the Site Management Section. Together, the three sections work to coordinate the planning, technical and managerial aspects of hazardous waste cleanup activities.

Each hazardous waste site is assigned a "team" of professionals from each of the three sections to work on the cleanup of a site. Teams consist of a site manager, engineer, hydrogeologist, attorney, and a community relations specialist who work together to oversee activities at each site. If consultant or contractor services are required, a contract officer is also assigned to the team.

The Hazardous Waste Cleanup Program coordinates its activities with EPA, local governments and state and federal agencies, as well as other programs within Ecology itself. Professional contractors are retained to gather and analyze technical data, to carry out the field work required for the removal of hazardous wastes, and to design and construct the final cleanup alternative.

Financial Considerations

Cleanup activities costing millions of dollars are being carried out at sites across the state. Once it has been determined that a potential hazardous waste site exists, the question arises as to who will pay for the investigation and cleanup. Costs for study and cleanup of a site can range from a few thousand to several million dollars. Money for

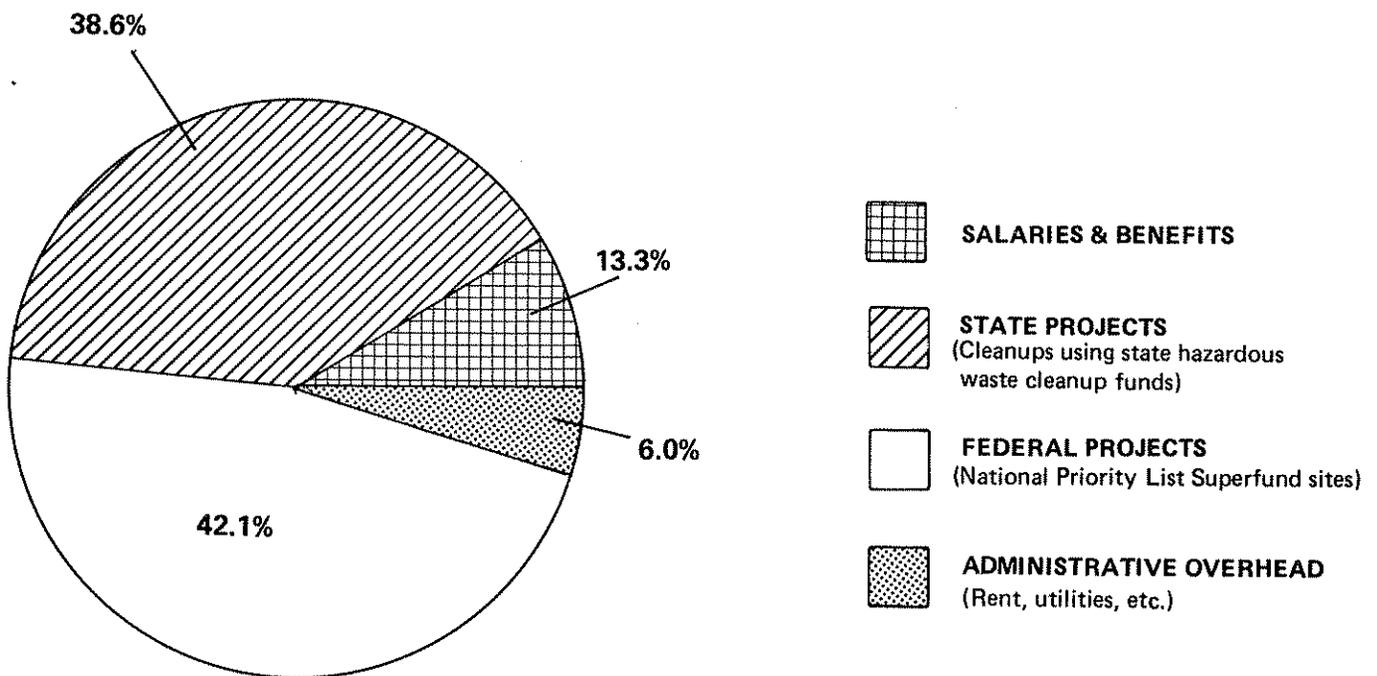
investigations and cleanups can come from three sources: responsible parties, the federal Superfund (CERCLA) and state general fund allocations. Table 1 and Figure 3 show federal and state contributions and expenditures for hazardous waste cleanup in Washington for Fiscal Year 1986.

TABLE 1

Hazardous Waste Cleanup Program
Fiscal Year 1986 Budget Allocation

Federal Allocation	\$ 4,279,782
State Allocation	<u>\$ 5,466,042</u>
TOTAL ALLOCATED BUDGET:	\$ 9,745,824

**FIG. 3
HAZARDOUS WASTE CLEANUP PROGRAM
EXPENDITURES FOR FISCAL YEAR 1986**



The cleanup of a hazardous waste site is an expensive undertaking. Nationally, the average cost per site is about \$8 million, but some sites exceed that amount. Table 2 shows the approximate costs and time schedules for each step of a cleanup.

TABLE 2
ELEMENTS OF A HAZARDOUS WASTE SITE CLEANUP

<u>TIMING</u>	<u>ACTIVITY</u>	<u>ESTIMATED COSTS*</u>
1-3 Months	Preliminary Assessment	\$ 1,000 - 1,500
3-6 Months	Site Inspection	\$ 6,000 - 18,000
1-12 Months	Emergency Removal	\$ 200,000-1,000,000
6-24 Months	Remedial Investigation/ Feasibility Study	\$ 300,000-600,000
3-9 Months	Remedial Design	\$ 300,000-500,000
3-18 Months	Remedial Construction	\$1,000,000-8,000,000
17-72 Months	Total Costs	\$1,807,000-10,119,500**

* Based on EPA National Averages of Superfund sites
**Some sites may exceed these amounts

Elements of a Hazardous Waste Site Cleanup

Hazardous waste sites come in all sizes, shapes and forms. They are in rural as well as industrialized areas, and wastes can be found on or buried in the ground. Often it is difficult to know about hazardous waste sites, and the discovery of a site requires extensive research. This section describes the steps taken from initial discovery to final cleanup of a site.

Site Discovery: The Site Discovery program is the first comprehensive attempt to identify and inventory potential hazardous waste sites throughout the state that may have been overlooked by existing regulatory agencies. The site identification methodology utilizes historical research, review of current local and state governmental agency records and files, and local interest. A pilot project testing the proposed research methods will be completed in fiscal year 1987.

Preliminary Assessment: A preliminary assessment recommends whether an on-site inspection is required at the site and establishes a level of priority for follow up. The recommendation follows preliminary review of evidence found in existing documents, health records and citizen complaints (i.e. reports of midnight dumping).

Site Inspection: A site inspection is a physical examination of the site where test samples of soil, water, air and potentially hazardous materials may be taken. If, on the basis of this evidence, the site is determined to be hazardous, a more detailed investigation will be conducted. The soil, water and other sample information allows the site to be ranked according to the federal Hazard Ranking System, which determines whether the site qualifies for nomination to the NPL list.

Remedial Investigation: Remedial investigations are carried out in order to fully determine the nature and extent of the problem hazardous substances present at a site. The investigations include developing and carrying out a detailed testing plan which specifies what samples will be taken, where they will be gathered, and how often tests will be conducted.

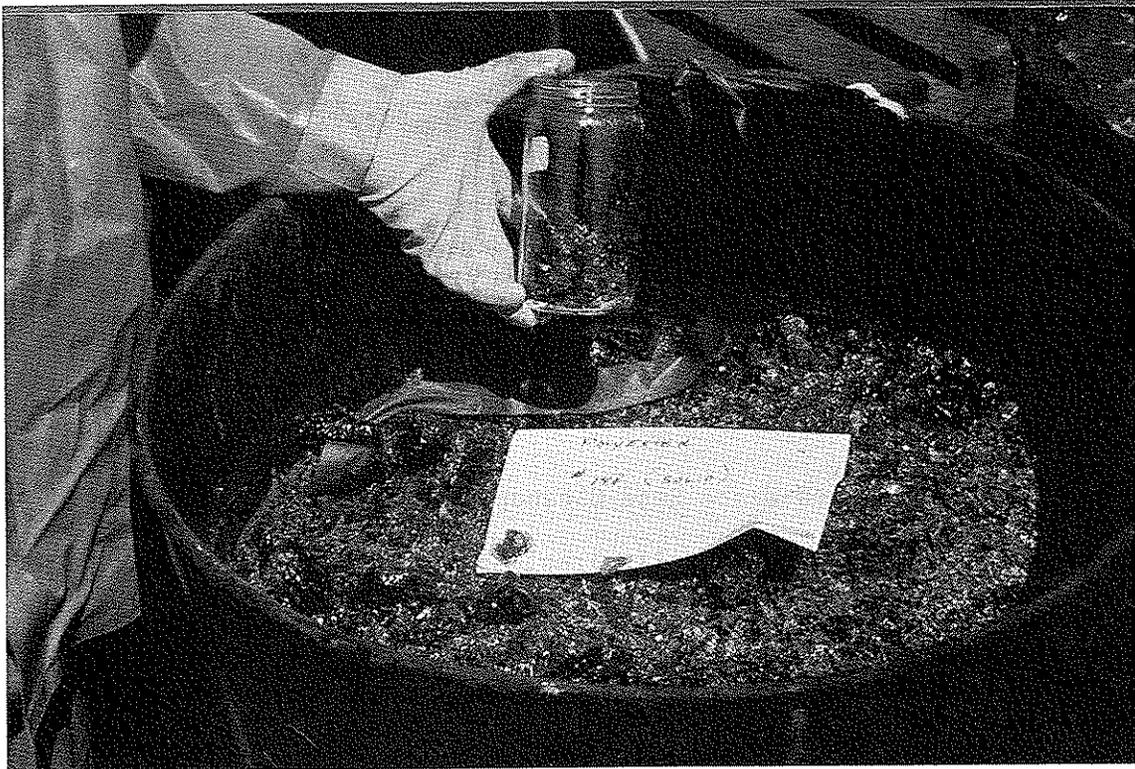


FIG. 4 A Remedial Investigation brings together the most accurate, complete and current information on a site's history and present status.

The sampling and testing process is both time consuming and expensive. Workers and those in the immediate vicinity must be protected from harmful effects when gathering the samples, which must be tested carefully to avoid error. Each step of the gathering and testing must be documented in detail. The rigid documentation is required to obtain legally defensible data and to help recover cleanup expenses from those responsible for the pollution.

At the earliest possible time, Ecology or EPA proceeds to determine who is responsible for the contamination at the site. When a responsible party is found, attempts are made to get the responsible party to undertake the studies and the final cleanup action. If these efforts fail and state funds are spent for the cleanup, legal action may be taken to recover the state's costs. If those responsible cannot be found, or if they are unable or unwilling to perform the cleanup, state or federal monies are used, with cost recovery taking place at a later time.

Interim Remedial Measure: At many sites, measures must be taken immediately to control the release of a substance or provide an immediate resolution to a serious problem such as contaminated drinking water. An interim remedial measure may be put into operation before a final remedial action has been selected.

Feasibility Study: Cleanup actions can range from simple removal of chemical drums to complicated remedial actions. The feasibility study evaluates alternatives for remedial actions, considering issues such as cost, environmental and community impact, and technical reliability of the control measures. Alternatives are presented to area residents and the public for review and comment before a final cleanup alternative is chosen.

Remedial Design: When a final alternative for cleanup is chosen, the remedial design must be developed. This is the comprehensive design of the chosen cleanup alternative, including engineering plans and specifications for construction and implementation of the alternative.

Remedial Action: Remedial actions are cleanup activities that are long term and usually more expensive than rapid emergency cleanups, but are aimed at permanent solutions. Specific activities include construction of permanent containment or treatment systems, removal of contaminated materials or soil, or supplying uncontaminated drinking water to a contaminated area.

Operation and Maintenance: Long term maintenance of the site is necessary to be sure that all equipment is in good repair, and to monitor the effectiveness of the chosen cleanup technology. The length of time for these activities varies by site and cleanup technology.

Cost Recovery: Under both the federal Superfund law and the state Hazardous Waste Fees statute (Chapter 70.105A RCW), costs incurred to clean up, stabilize or study a site may be recovered from a responsible party.

How Clean is Clean

Ecology's "How Clean is Clean" policy provides a framework to determine the cleanup level for materials at hazardous waste sites that threaten public health or the environment. The cleanup levels derived from this policy are goals that will be used in the Feasibility Study to evaluate the most appropriate remedial action. Other factors that must be considered in setting cleanup goals, in addition to public health issues and environmental significance of the contamination, include:

- potential for exposure to the contamination
- availability and reliability of treatment technologies
- availability of disposal options and associated environmental costs
- economic considerations.

Safety and Medical Monitoring Programs

To protect the people working on a site and nearby neighbors, health and safety plans are required for each site. The plans include the level of personal protection to be used, location and route to nearest medical facility, emergency phone numbers, site security provisions, decontamination and clean areas on site, and monitoring equipment needed on site.

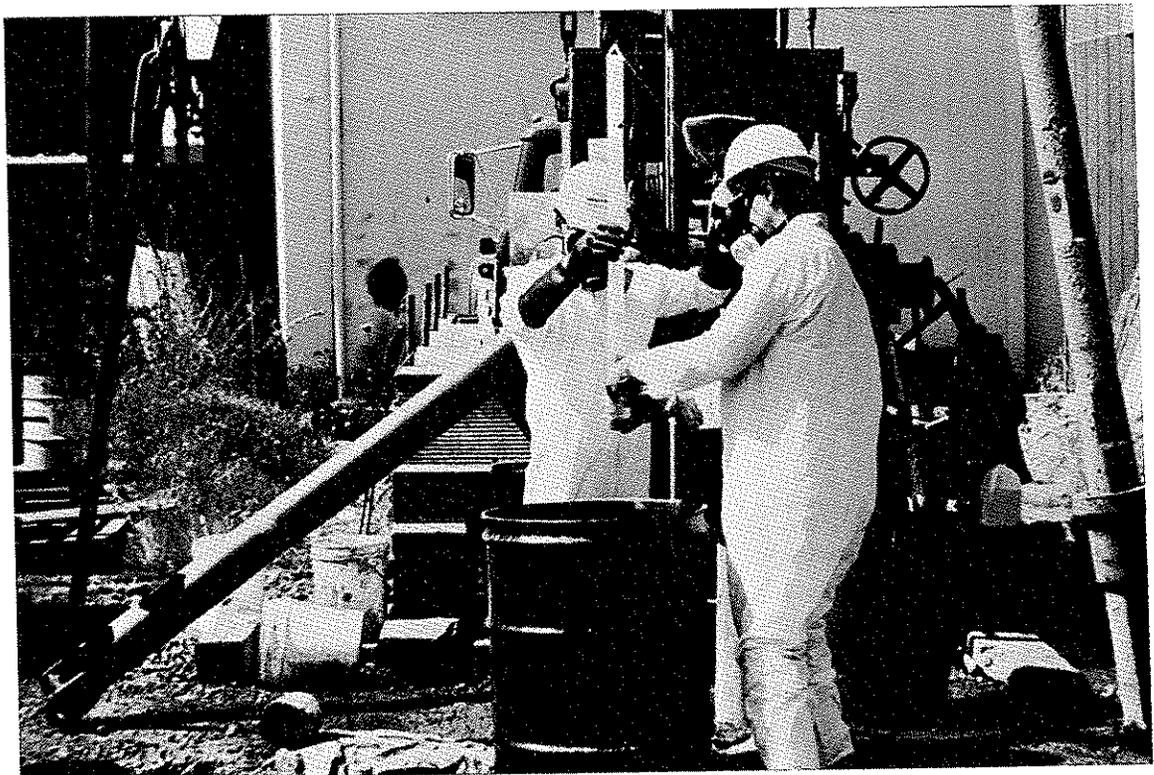


FIG. 5 Hazardous waste sites must be investigated cautiously by highly qualified, trained personnel.

Employees working with or responding to hazardous substances incidents are required to complete extensive safety and personal protection classes. The training provides information on the protection and safety of personnel engaged in field operations dealing with hazardous substances, and increases their expertise and familiarity with accepted procedures for cleanup activities at hazardous waste sites.

The Hazardous Waste Cleanup Program has established a voluntary, agency-wide medical monitoring program for employees, which monitors the health of employees who may be exposed to hazardous substances during the course of their work. The Medical Monitoring Program provides information that can be used to identify exposures which may adversely affect health and aids in evaluating the effectiveness of protective equipment and safety procedures used by employees. Services are provided by the Occupational Medicine Program at Harborview Hospital in Seattle. To date, 97 employees have participated in the program.

Examples of Cleanup Activities

ARGONNE ROAD
Spokane, Spokane County

Concern

The Argonne Road is a state priority site. The concerns are a) the contamination of domestic water supply wells with tetrachloroethylene, and b) the potential contamination of Spokane's sole source supply of drinking water, the Spokane-Rathdrum Prairie Aquifer. The contaminant is primarily tetrachloroethylene and other related compounds, which are suspected human carcinogens. Tetrachloroethylene is a widely used solvent with particular use as a dry cleaning agent, a degreaser, a chemical intermediate, a fumigant, and medically as an anthelmintic (worm medicine).

History

- . Contaminated domestic water supply wells were discovered approximately six years ago.
- . Source of contamination is unknown, however, the probable input is the Boneko septage disposal site (closed 4/84) located nearby and upgradient of Argonne Road.

Past Actions

- . In 1985 a water main line was constructed (Pasadena Park Irrigation District) from Bigelow Gulch to supply the affected residences with a clean source of water. This interim remedial measure cost approximately \$100,000.
- . In mid-1985 the USGS produced a draft evaluation of contaminant and hydrogeologic data of the site.

Current Actions

- . Monitoring of existing wells continues.
- . On site investigations, by Ecology and the USGS, to determine the extent of the plume and proximity to the aquifer, will begin in June. Approximate cost for the investigation is \$165,000, with half to be paid by USGS.

"BUFFALO" DON MURPHY SITE
Tacoma, Pierce County

Concern

The "Buffalo" Don Murphy site is of concern due to many priority pollutants found in soil samples recently taken from the property.

History

- . "Buffalo" Don Murphy stored as many as 800 drums of chemical wastes from the Reichhold Chemical Company on his property.
- . All of the drums were removed from the site in the late 1970's.
- . Ecology has written an enforcement order requiring Reichhold and the present site owner to fence, investigate, and clean up the site.

Past Actions

- . In September 1985, Ecology conducted an investigation at the site and collected samples of soil.
 - Sample analyses showed that soil on the site contained numerous polychlorinated phenolic compounds, such as pentachlorophenol which is commonly used as a wood preservative.
 - Preliminary tests of the samples showed the presence of polynuclear aromatic hydrocarbons (phenanthrene and anthracene), byproducts produced when organic materials burn.
- . Ecology has collected further samples on site to test for dioxins and furans.
- . All of the substances being tested for at this time are priority toxic pollutants.

Current Actions

- . Ecology and the Environmental Protection Agency have developed an off-site sampling plan which will evaluate whether chemicals have migrated from the site.
- . Soil samples will be taken from around the perimeter of the site and water samples from nearby drinking water wells will be analyzed.

COLBERT LANDFILL
Colbert, Spokane County

Concern

Colbert Landfill is on the National Priorities List. Private wells in the vicinity have shown levels of 1,1,1-trichloroethane and other contaminants. The primary contaminant of concern is 1,1,1-trichloroethane. It is used as a degreaser for cold cleaning, dip-cleaning, and bucket cleaning of metals, a dry-cleaning agent, a vapor degreasing agent, and a propellant. It affects skin, eyes, cardiovascular system, and central nervous system.

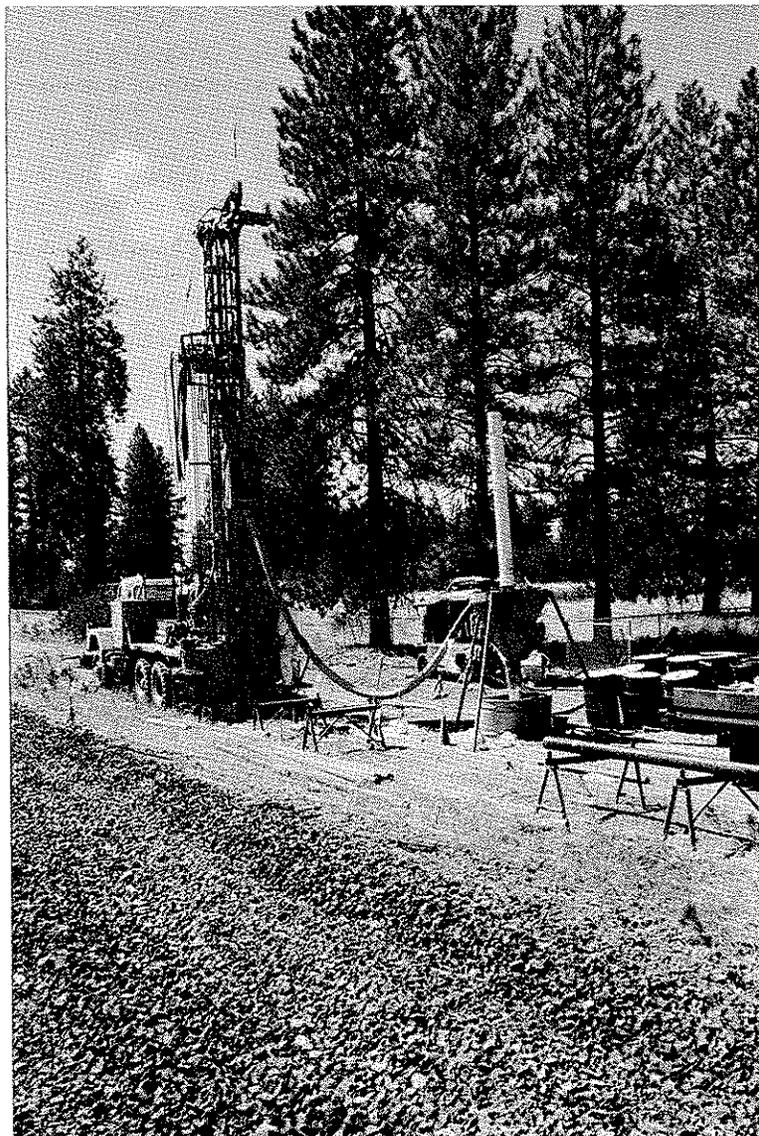


FIG. 6 Ground water monitoring wells on and around the Colbert Landfill help Ecology personnel determine appropriate cleanup actions.

History

- . The 40 acre site was a landfill that received industrial solvents from the Key Tronic Corporation over a five year period.
- . The landfill is still operating (but not accepting any hazardous materials). It is scheduled to close within a year.

Past Actions

- . Residences have been/or are being connected to alternate drinking water supplies if 1,1,1-trichloroethane levels in their wells exceed 200 parts per billion and the residence is within 500 feet of a water main.
- . A remedial investigation has been completed. The draft report was received in June 1986.
- . A public meeting was held in May 1986 to discuss the results of the remedial investigation and the schedule of the feasibility study.

Current Actions

- . A feasibility study regarding appropriate cleanup actions is underway and will be completed in Fall 1986.
- . Ongoing monitoring of wells is being conducted by the responsible parties (Spokane County and Key Tronic Corporation).
- . A public meeting will be held after the feasibility study is completed, in conjunction with a 30-day public comment period.

COMMENCEMENT BAY

WATERWAYS/ShORELINE AND RUSTON/VASHON PROJECTS

Tacoma, Pierce County

Concern

Commencement Bay is on the National Priorities List. The project has been divided into two studies: 1) Waterways Shoreline - the primary concern is chemical contamination in water and sediments and its effect on the marine environment, and 2) Ruston/Vashon - the primary concern is exposure to arsenic in areas near the ASARCO smelter. The concerns that triggered the Commencement Bay Superfund Investigation were:

- . Elevated sediment concentrations of organic and inorganic chemicals.
- . Evidence of biological effects of sediment contamination, including the presence of abnormalities in fish; and
- . Potential impacts on public health from the consumption of contaminated fish and shellfish from the area.

Many of the substances under investigation are toxic, mutagenic, carcinogenic, or accumulate in biological tissue.

History

- . Commencement Bay is an embayment of approximately 9 square miles which was industrialized beginning in the late 1800s.
- . Since initial industrialization, hazardous substances and waste material have been released into the terrestrial, freshwater, ground water, and marine environments.

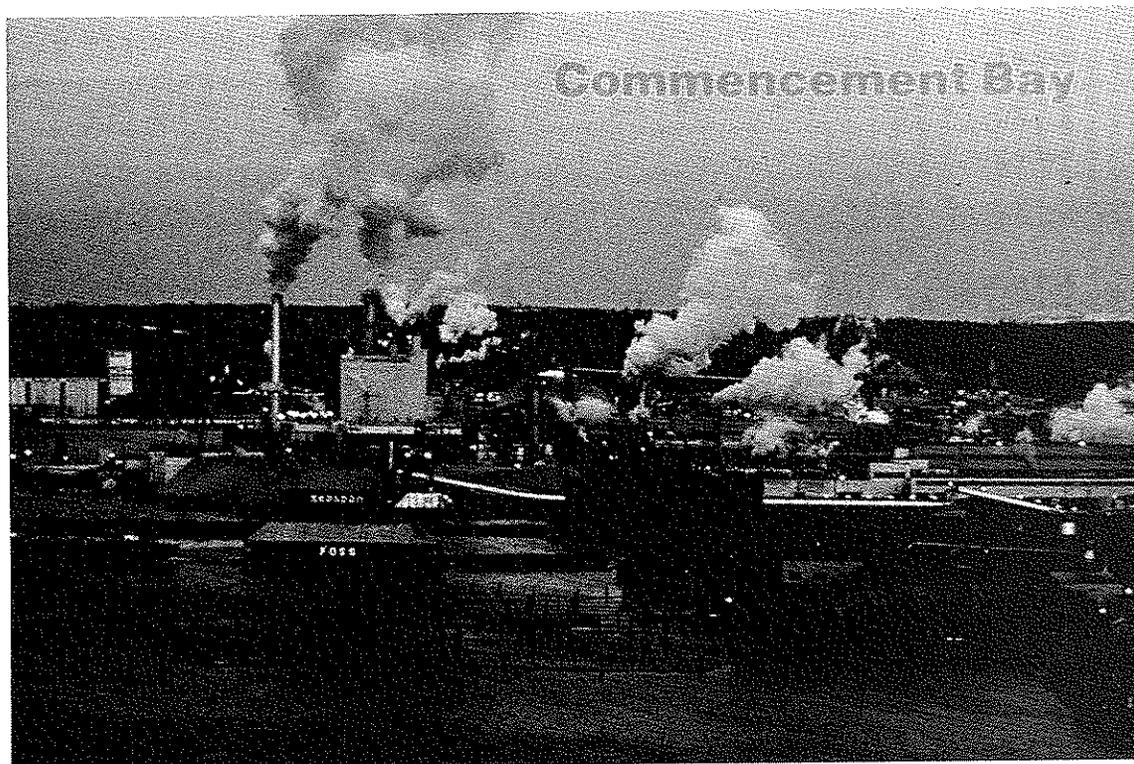


FIG. 7 Early industrialization and subsequent releases of hazardous substances into Commencement Bay have led to concerns about possible contamination of shellfish and other animals consumed by humans.

WATERWAYS/Shoreline Project

Past Actions

A detailed site investigation (Remedial Investigation) was started in 1983 and completed in 1985. The investigation was successful in identifying sediment problem areas, defining problem chemicals, and identifying many of the sources of those chemicals.

- . In April 1985 the Tacoma Pierce County Health Department issued a revised health advisory warning against the consumption of fish and crabs from the Commencement Bay Waterways. The Health Department also recommended that individuals limit their consumption of fish and crabs caught along the Ruston Point Defiance shoreline and Carr Inlet.
- . In summer of 1985, a source control team was formed to identify and mitigate individual sources of contamination in the Commencement Bay area.
- . The study of alternative mitigative measures (Feasibility Study) for the cleanup of the area is due to be completed April 1987.
- . Individual source control efforts are ongoing to identify and mitigate the sources of contamination.

RUSTON/VASHON PROJECT

Past Actions

- . In 1983 the Centers for Disease Control signed a cooperative agreement with Ecology to undertake an investigation to identify significant environmental pathways (air, soil, etc.) by which children are exposed to arsenic (Exposure Pathways Study).
- . In 1983 Ecology signed a cooperative agreement with the Environmental Protection Agency to conduct a Remedial Investigation.
- . During early 1985 the ASARCO Smelter (the major source of arsenic contamination) shut down its operations.

Current Actions

- . The Exposure Pathways Study will be completed in Fall of 1986. The study is examining the following:
 - . Air quality - indoors and outdoors
 - . Soil
 - . Vegetable contamination, and
 - . Urinary arsenic levels in children and adults
- . The Exposure Pathways Study will comprise a major part of the detailed investigation and study of alternative mitigative measures (Remedial Investigation/Feasibility Study) which is due to be completed next year (1987).
- . The Environmental Protection Agency, Ecology, and Air Pollution Control Agency are currently reviewing plans for stabilization of the ASARCO plant site and investigation of on-site contamination.
- . Under a consent agreement with EPA, ASARCO will conduct site stabilization and Remedial Investigation/Feasibility Study activities at the smelting facility. The stabilization activities include demolition of various buildings on the smelter site.

GENERAL ELECTRIC SITE
Spokane, Spokane County

Concern

The General Electric site is a state priority site. The concern is high levels of polychlorinated biphenyls (PCB's) in the soil with the potential for ground water contamination (Spokane-Rathdrum Prairie Aquifer). Soil contamination was first documented in 1976. The primary source of contamination is polychlorinated biphenyls, a known carcinogen. PCB's are used in insulation for electric cables and wires in the production of electric condensers, as additives for extreme pressure lubricants, and as a coating in foundry use.

History

- . General Electric owned and operated a cleaning and repairing shop for electrical transformers at this site between 1961-1980. This operation ceased in 1980.

Past Actions

- . A preliminary assessment was completed in 1984 and a site inspection in 1985.
- . At Ecology's request, General Electric has submitted a work plan and schedule for a detailed investigation of the site.
- . The first phase of sampling occurred in June, as numerous test pits were dug and samples collected to assess overall contamination.
- . A report on the first phase of sampling was submitted July 28, and indicates several areas of extremely high PCB contamination.
- . Ecology also investigated adjacent property, and, because of contamination detected, requested General Electric to expand the scope of their sampling effort. Bechtel conducted preliminary sampling in July and submitted a report on the results in September.

Current Actions

- . Bechtel National, Inc. has been hired by General Electric to perform site investigations.

PONDERS CORNER
Ponders Corner, Pierce County

Concern

Lakewood Water District Wells H-1 and H-2 are on the National Priorities List. The concern at this site is the contamination of these two wells which served Lakewood Water District customers in the Ponders/Nyanza Park area prior to the installation of an emergency water treatment system. The primary contaminant of concern, tetrachloroethylene, is a human carcinogen and is a widely used solvent with particular use in the dry cleaning industry.

History

- . Wells H-1 and H-2 are located in the Ponders well field in the Lakewood area, just north of McChord Air Force Base.
- . In July 1981, EPA sampled the wells and found they were contaminated with 1,2-transdichloroethylene, trichloroethylene, and tetrachloroethylene.
- . In August 1981, the wells were taken out of production.
- . The primary source of the contamination is from Plaza Cleaners.

Past Actions

- . An Interim Remedial Measure of constructing a water treatment system (stripping towers) was conducted in 1984, at a cost of about \$70,000 to Ecology. This measure is in operation and now allows for water production at wells H-1 and H-2.
- . A detailed investigation and study of alternative mitigative measures (Remedial Investigation/Feasibility Study) identifying the permanent remedy for the project has been completed.

Current Actions

- . Design for the permanent cleanup action is in progress and will include:
 1. Some soil removal or treatment in conjunction with removal of the septic tank and drain field at Plaza Cleaners,
 2. Installation of additional ground water monitoring wells, and,
 3. Modifications to the stripping towers currently in use.

MIDWAY LANDFILL
Kent, King County

Concern

Midway Landfill is on the National Priorities List. The most immediate concern is the migration of methane gas from the landfill. The extent of ground water contamination is not known at this time, however an extensive investigation of the ground water will be conducted. Methane gas, which is produced by decomposing garbage, is a colorless, odorless, tasteless and non-toxic gas. However, methane gas can be explosive at relatively low concentrations (between 5% and 18%) in confined spaces. At concentrations over 50 percent in confined spaces, methane is an asphyxiant. The gas has been detected in homes and businesses in the area of the landfill and several residences and businesses have had to be evacuated. Additional methane was found at depths farther from the landfill in June 1986.

History

- . The 60 acre landfill, located within the City of Kent, was operated by the City of Seattle from 1966 to 1983.

Past Actions

- . Beginning in 1984 a series of gas "probes" were installed around the landfill by the City of Seattle and in the fall of 1985 Ecology installed approximately 70 more probes. Ecology installed an additional 20 probes in 1986.
- . An on-site emergency gas extraction system was installed by the City of Seattle during the fall of 1985. The system involves 32 wells which vent the methane to a system of flares that burn the gas.
- . Off-site gas extraction systems were installed by Ecology and Seattle in areas away from the landfill in the winter of 1985/6. Seattle installed additional off-site gas extraction wells during June/July 1986.
- . The final Environmental Impact Statement for the post closure of the Midway Landfill was published May 28, 1986.
- . A consent order between Seattle and Ecology for Seattle to implement a detailed investigation and a study of alternative mitigative measures (Remedial Investigation and Feasibility Study) was approved by Seattle City Council on July 28, 1986.

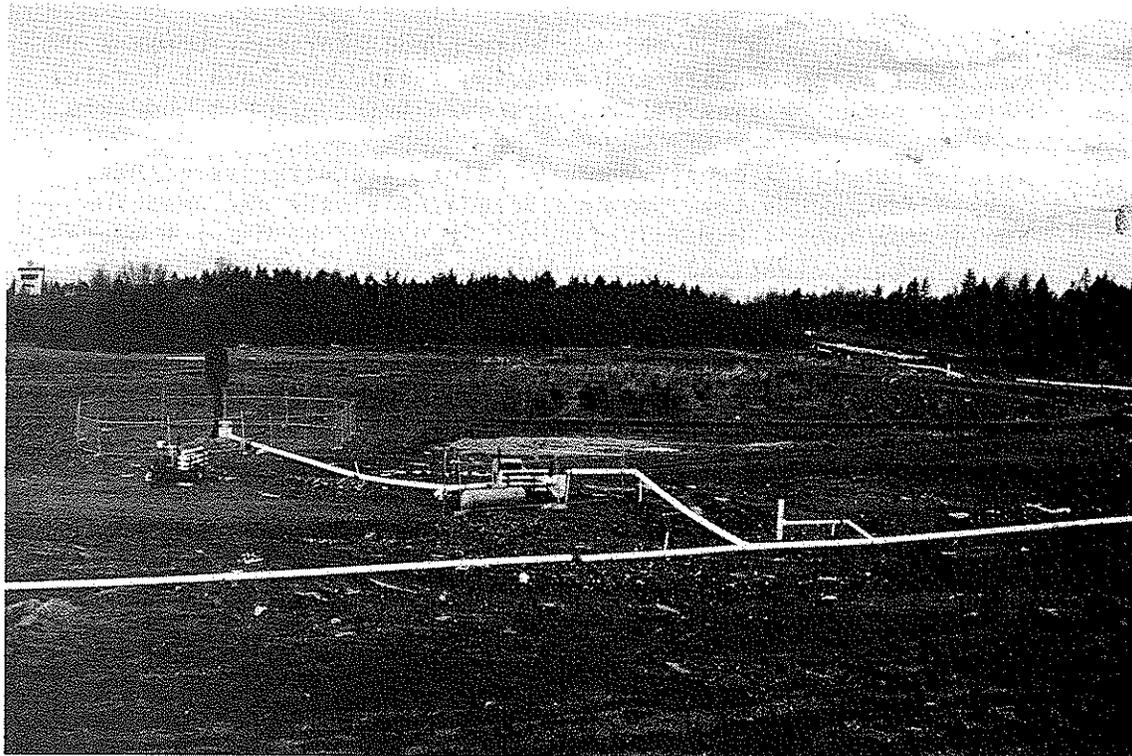


FIG. 8 The Midway Landfill on-site gas extraction system installed by the City of Seattle.

Current Actions

- . The City of Seattle will be conducting a comprehensive remedial investigation.

NORTH MARKET STREET
Spokane, Spokane County

Concern

North Market Street is a state priority site. The concerns are a) contaminated industrial and domestic water supply wells, and b) the potential contamination of Spokane's sole source drinking water supply, the Spokane-Rathdrum Prairie Aquifer.

The contaminants are benzene, toluene and xylene (along with other petroleum by-products).

- . Benzene, used as a constituent in motor fuels, as a solvent for fats, inks, oils, paints, plastics, and rubber, in the extraction of oils from seeds and nuts, and in photogravure printing, is a known carcinogen.

- Toluene, used as a solvent for paints and coatings, or as a component of automobile and aviation fuels, can have a harmful effect on the central nervous system, liver, kidneys and skin.
- Xylene, used as a constituent of paint, lacquers, varnishes, inks, dyes, adhesives, cements, cleaning fluids and aviation fuels, can have a harmful effect on the central nervous system, eyes, gastrointestinal tract, blood, liver, kidneys, and skin.

History

- This area has been used for various petroleum related activities (refining, recycling, storage, disposal, transportation, and retail sales) since the early 1920's.
- There are currently 14 potentially responsible parties identified.
- Soil contamination was first identified in 1978 at the Draper Tractor Company site. Ground water contamination was first officially noted in mid-1984.



FIG. 9 Petroleum related industries present since the 1920's have contaminated some Spokane area water supplies.

Past Actions

- . Preliminary assessments and site inspections were completed at several sites in 1984-85 to identify the nature of the problem.
- . A remedial investigation was started in May 1985 with Phase I completed in September 1985.
- . Phase II of the remedial investigation was started March 1986.
- . During the first stages of the Phase II remedial investigation:
 1. Ground penetrating radar defining subsurface geological conditions was used to identify and map buried waste/lagoons and fill areas.
 2. A preliminary public health risk assessment was conducted.
 3. Test pits and soil sampling took place in June 1986.
 4. A soil gas survey test was conducted to see if this method can be used to determine contaminant plume. Unfortunately, it was not successful.
- . Monitoring domestic and industrial wells in the vicinity began in May.

Current Actions

- . Phase III, which should complete the remedial investigation, will begin in November. Major elements include:
 1. Installation of 10 monitoring wells.
 2. Five boreholes, several of which will be drilled through waste disposal areas, to determine whether contaminants are migrating.
 3. Additional test pits and sampling throughout the site.
 4. Continued sampling of existing wells.
 5. Investigation of the Midget Oil property.

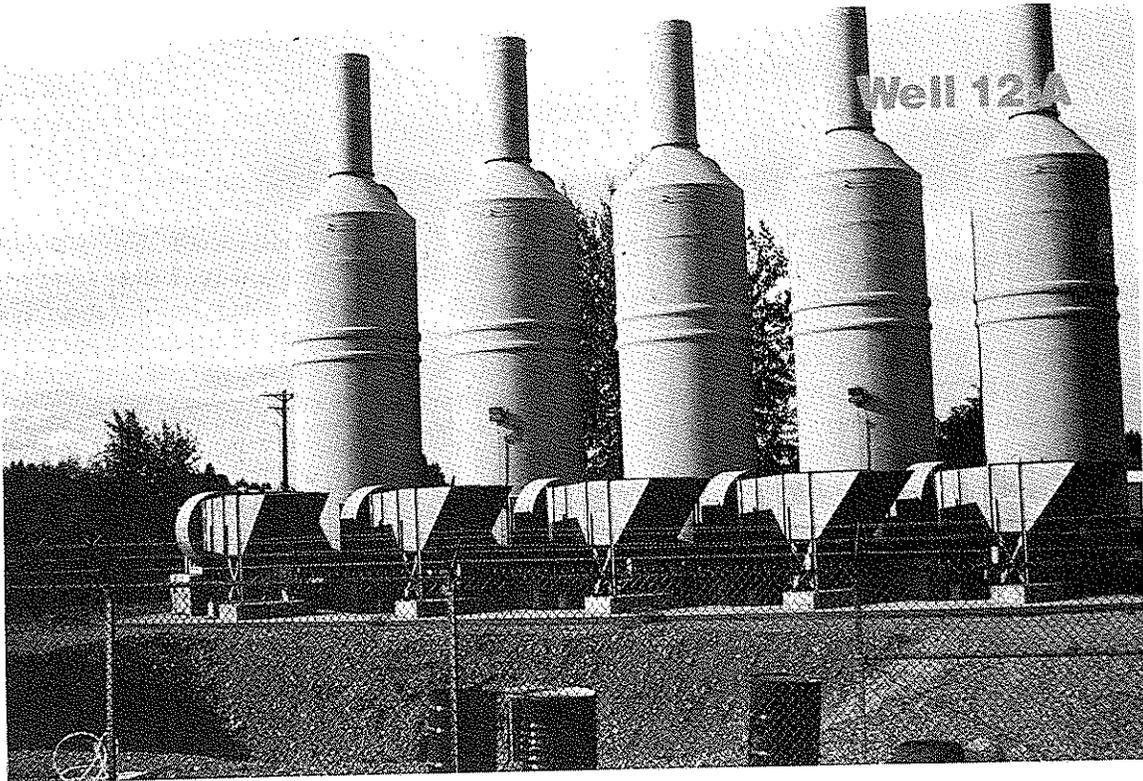


FIG. 10 Stripping towers at Well 12A prevent migration of contamination to other nearby wells:

- . The cleanup will consist of:
 1. Soil removal of the material most highly contaminated along with an in situ treatment of soil using a vapor extraction system.
 2. Ground water treatment at the source of contamination with a carbon adsorption system.
 3. Continued operation of the stripping towers at Well 12A.
- . The City of Tacoma continues to monitor ground water around Well 12A.

WESTERN PROCESSING
Kent, King County

Concern

Western Processing is on the National Priorities List. The concerns include: 1) contaminated soils with over 80 identified priority pollutants; 2) contamination of nearby Mill Creek, and 3) ground water contamination. Many of the 80 plus contaminants identified are carcinogenic, toxic, or mutagenic.



FIG. 11 Parties responsible for pollution at the Western Processing site have begun cleanup activities which include extensive soil and water sampling.

History

- . Western Processing was a chemical waste recycling business in operation from about 1960 until 1983.
- . The company was ordered in April 1983 to stop operations after non-compliance with an enforcement order to provide a plan for containing or treating pollution at the site.
- . Over 300 firms have been identified as potentially responsible parties for the cleanup of the site.

Past Actions

- . The Environmental Protection Agency and the U.S. Coast Guard conducted an emergency cleanup in mid 1983. This involved testing tank integrity, checking surface impoundments for leaks, identifying wastes and containing leaking drums.
- . Ecology initiated state action in 1983 to control leaching and run-off from a gypsum storage pile and pond.

Disposal of Hazardous Waste

As a hazardous waste site is cleaned, the wastes must be disposed of in a legal and environmentally safe manner. Usually, the wastes are sealed into 55 gallon barrels, assigned hazardous waste labels and generator numbers, and shipped to permitted toxic substances disposal facilities. Contaminated soils are also trucked to the facilities. The two main facilities for the Pacific Northwest are Envirosafe Services of Idaho, Inc., and a site operated by Chem-Security Systems, Inc. (CSSI) in Arlington, Oregon. Many of the wastes are reprocessed or treated before they are shipped to the final repository.

Disposal of hazardous waste from cleanup sites is expensive. Cost depends on a number of factors which include the type, form, and volume of the waste. Before a waste is accepted by a disposal facility, a waste profile sheet containing analytical data on the waste must be submitted to the facility. Hazardous waste disposal facilities face many variables such as tighter regulations, violation penalties, and soaring liability insurance costs, which cause them to increase handling and disposal fees.

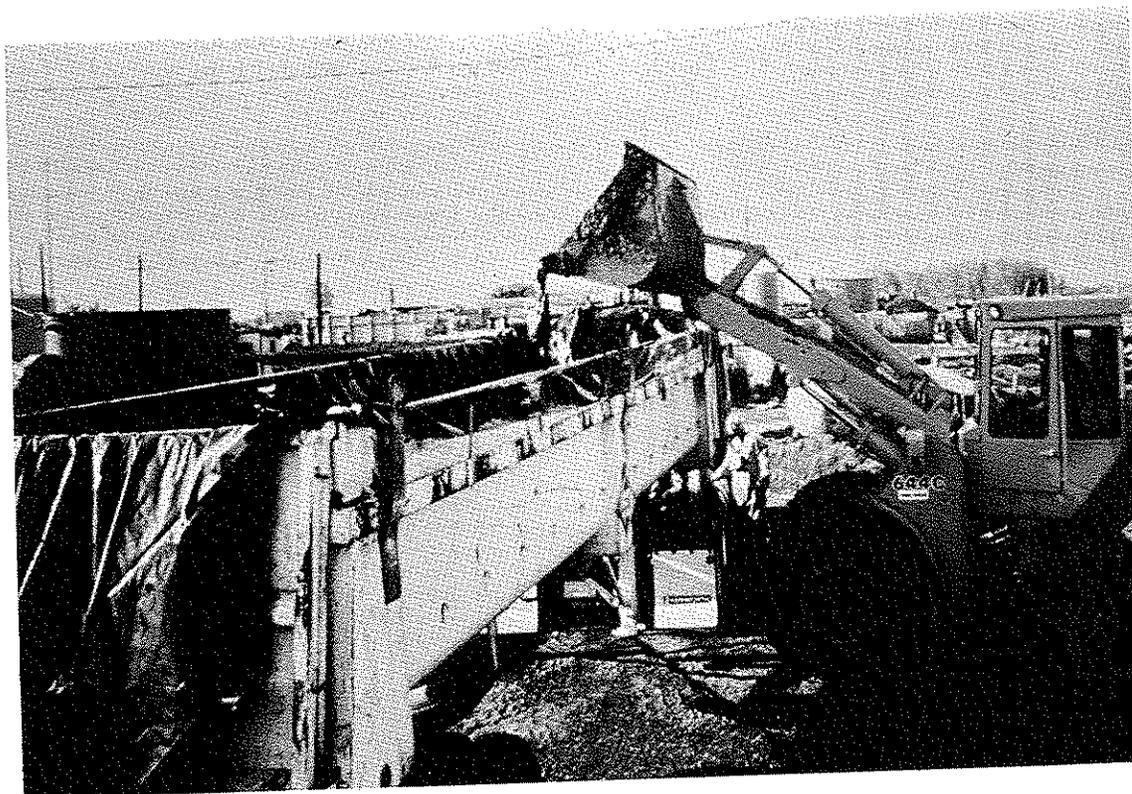


FIG. 12 Contaminated soils are removed from a hazardous waste site and trucked to a toxic substance disposal facility.

An additional factor contributing to the increasing costs of disposal is the difficulty in finding facilities eligible to accept hazardous wastes. EPA's "offsite disposal policy" requires that all facilities accepting hazardous wastes must be inspected every six months and have no major violations of Resource Conservation and Recovery Act (RCRA) regulations. The regulations require the disposal facility to have a unit which is double lined; with a leachate detection, collection and removal system in place and approved. This policy is intended to minimize the use of improper land disposal methods, while promoting alternatives to disposal such as recycling, reuse and treatment of wastes.

Ecology recommends in the recently released Priority Waste Management Study that higher priority waste management options (reduction, recycling and treatment) be encouraged through information dissemination programs and economic incentives. Among the incentives being considered is one which would involve an additional fee for wastes that are landfilled.

Looking Ahead

Throughout Washington, there are approximately 800 facilities that generate, transport, treat, store or dispose of hazardous wastes. Last year, nearly 400,000 tons of hazardous wastes were generated. Hundreds of potentially contaminated sites are the result of incorrect handling and management of such wastes.

The process of investigation and cleanup at a contaminated site is expensive. In the last three years, approximately \$32.5 million has been spent for investigation and cleanup at sites in Washington State. There is still much more to be done. Costs for remediation of long-term contamination problems could total several hundred million dollars. Legislation is needed to assure the viability and funding of the program in order to continue cleanup efforts at the hundreds of hazardous waste sites in Washington.

Currently, Ecology has approximately 200 sites on a priority list for cleanup. Because of limited resources, attention is being directed to about 100 key sites across the state. During Fiscal Year 1987, Ecology plans to:

- . Complete Remedial Investigations at 11 sites.
- . Complete Feasibility Studies at five sites.
- . Complete Remedial Design at one site.
- . Complete Remedial Action at two sites.
- . Undertake regional enforcement efforts at 32 sites.
- . Pursue source control efforts at 47 sites.
- . Conduct three water quality investigations.
- . Undertake 40 preliminary assessments.
- . Conduct 19 site inspections.
- . Complete a site discovery pilot project.
- . Prepare up to 12 hazard ranking documents.
- . Continue to pursue cost recovery actions.

Appendices

Appendix A

Site Inspections - Fiscal Year 1986

<u>Site:</u>	<u>Location:</u>
Alder Mill	Twisp
Buffalo Don Murphy	Tacoma
Callahan Mine	Colville
Coski Industrial	Tacoma
FMC	Vancouver
General Electric	Spokane
March Point Landfill	Anacortes
Northwest Transformer	Everson
University of Washington Pack Forest	LaGrande
Universal Manufacturing	Woodinville

Complete reports are available for review at Ecology's Headquarters office in Lacey, Washington, (206) 459-6322.

Appendix B

Emergency Cleanup Actions - Fiscal Year 1986

<u>Site</u>	<u>Location</u>	<u>Cleanup and Disposal Costs</u>	<u>Costs Recovered</u>
Eloise Anderson Drums	Washougal	5,315.99	0
Unknown Chemical	I-205	455.95	N.A.
Puget Power Property	Everett	3,088.74	N.A.
Molasses Spill	Hwy. 18	763.50	0
Oil Spill	I-5, Alger	1,057.80	N.A.
Drum	Issaquah	145.84	0
Blackstone Drums	Renton, Puyallup, Brown's Point	15,000.00*(est)	7,100.00 Anticipated
"Penta" Spill	Bucoda	5,472.25	N.A.
Culvert	Boeing Field	2,286.58*	
Lindal Site, Drums	Kent	320.80	N.A.
Drum	May Valley/Coalfield	3,060.56*	N.A.
Sodium Hydroxide Spill	Bellingham	156.42	N.A.
Drums	Monroe	1,174.91*	
Acid	Kent	2,130.79*	N.A.
Drums	Renton	2,688.38	N.A.
Turner Dump	Okanogan River	19,559.73*	Anticipated
Drums	Mason County Fairgrounds	592.78*	N.A.
Solvents	Lynnwood	2,536.10*	N.A.
Drums	Roy	879.35*	Anticipated
Oil Drum Spill	South Seattle	653.92	N.A.
Hazardous Waste	West Seattle	1,141.53*	Pending
I-5	Marysville	959.96*	N.A.
Drums	Kent	1,846.51*	Pending
Drums	Federal Way, Kent, Seattle	5,706.18*	N.A.
I-90	Bandara Exit	1,050.60	0
Drum	Bellevue	895.59	N.A.
	TOTAL	\$78,940.76	

* Additional bills forthcoming (testing, disposal, etc.)

N.A. = Cost recovery not appropriate--no identifiable responsible party, (i.e. midnight dumps).

Appendix C

National Priorities List Sites in Washington State

<u>Site Name</u>	<u>City</u>	<u>County</u>
Northwest Transformer Salvage	Everson	Whatcom County
Midway Landfill	Kent	King County
Western Processing	Kent	King County
Queen City Farms	Maple Valley	King County
Harbor Island	Seattle	King County
Commencement Bay-South Tacoma Channel	Tacoma	Pierce County
Commencement Bay-Nearshore/Tideflats	Tacoma	Pierce County
Ponders Corner	Lakewood	Pierce County
American Lake Gardens	Tacoma	Pierce County
Toftdahl Drums	Brush Prairie	Clark County
Frontier Hard Chrome	Vancouver	Clark County
Pesticide Experimental Laboratory (USDA)	Yakima	Yakima County
FMC Corporation	Yakima	Yakima County
Silver Mountain Mine	Loomis	Okanogan County
Mica Landfill	Mica	Spokane County
Northside Landfill	Spokane	Spokane County
Greenacres Landfill	Greenacres	Spokane County
Kaiser Aluminum	Mead	Spokane County
Colbert Landfill	Colbert	Spokane County

Sites Proposed for the National Priorities List

<u>Site Name</u>	<u>City</u>	<u>County</u>
Hidden Valley Landfill (Thun Field)	Puyallup	Pierce County
Old Inland Pit	Spokane	Spokane County
Wyckoff Company/Eagle Harbor	Bainbridge Island	Kitsap County
Naval Undersea Warfare Station	Keyport	Kitsap County
Landfill No. 5	Fort Lewis	Pierce County
Wash rack/treatment area	McChord AFB	Pierce County
Ault Field	Whidbey Island NAS	Island County
Seaplane base	Whidbey Island NAS	Island County
Ordnance Disposal	Bangor	Kitsap County

APPENDIX D
HAZARDOUS WASTE CLEANUP PROGRAM
SITE ACTIVITIES - FISCAL YEAR 1986
Federal Superfund Sites

Site	A C T I V I T I E S			Lead Agency	Site Specific Expenditures*	Comments
	Started	Underway (Continued from FY 85)	Completed			
Colbert Landfill		FS	RI	Ecology	\$663,422	Affected residents connected to clean water supply.
Commencement Bay, South Tacoma Channel:						
• Tacoma Landfill	RI			Ecology	626,293	Consent agreement with city of Tacoma to do RI/FS
• South Tacoma Swamp				Ecology	11,051	Develop RI
• Tacoma Tarpits	FS	RI		EPA		PRP do RI/FS
• Well 12-A	RA			EPA	53,671	ROD developed, Op. & Maint.
Commencement Bay, Nearshore/Tideflats:						
• Ruston Vashon	RI			Ecology	593,880	Exposure Pathways Study
• Waterways/Shorelines		FS	RI	Ecology	593,903	Sediment sampling, source evaluation
FMC Corporation				Ecology	1,149	Cleanup order, ground water monitoring.
Frontier Hardchrome		RI		Ecology	351,011	Sampling of soil and water continues.
Greenacres Landfill	RI			Ecology	70,612	Monitoring wells installed, sampling, seismic survey
Harbor Island	RI			Ecology	60,863	Contacts with PRPs to conduct RI/FS.
Ponders Corner		Final RA		EPA	53,912	Op. & Maint.
Mica Landfill				Ecology	1,168	Ground water sampling
Midway Landfill	RI	IRM		Ecology	1,117,190	City of Seattle implementing RI/FS under negotiated agreement, gas extraction wells operating.

Federal Superfund Sites (continued)

Site	A C T I V I T I E S		Completed	Lead Agency	Site Specific Expenditures*	Comments
	Started	Underway (Continued from FY 85)				
Northside Landfill		RI/FS		Ecology	\$12,881	City of Spokane implementing RI/FS under negotiated agreement, affected residents connected to clean water supply.
Northwest Transformer Salvage				EPA	1,164	Workplan development for RI.
Queen City Farms	RI	IRM		EPA	16,466	Removal of sludge and covering - focused RI/FS.
Quendall Terminals				EPA		Taken off proposed NPL List in April 1986.
Silver Mountain Mine			IRM	Ecology	1,484	Operation and maintenance.
Toftdahl Drums			RI	Ecology	236,208	ROD developed. In review and comment period.
Pallister Paint				EPA	7,149	Stabilization activities.
Western Processing			RD	EPA	718,320	Consent decree signed with RPs for soil, surface and ground water cleanup.
Wyckoff Co./Eagle Harbor	RI			Ecology	157,168	RI being developed.

HAZARDOUS WASTE CLEANUP PROGRAM
SITE ACTIVITIES - FISCAL YEAR 1986
INDEPENDENT STATE SITES

Site	A C T I V I T I E S			Lead Agency	Site Specific Expenditures*	Comments
	Started	Underway (Continued from FY 85)	Completed			
Argonne Road		RI	IRM	Ecology	\$ 2,933	USGS doing RI, water main constructed for residents, monitor wells.
Buffalo Don Murphy				Ecology	1,300	Sampling off-site soil.
C.B. Bumper		IRM		Ecology	3,023	Removal action.
Crop King		RI		EPA	9,676	Burlington Northern doing RI, USGS inventory wells
EDB sites: • Skagit Co.		IRM	Phase I-RI	Ecology	327,162	Bottled water available, funding alternate water supply
• Thurston Co.		IRM	Phase I-RI	Ecology		Bottled water available, funding installation of water main.
• Whatcom Co.		IRM, RI	Phase I-RI	Ecology		Bottled water available, expanding investigation.
Ellisforde Landfill		RI		Ecology	48,265	Monitoring wells installed, sampling ground water
Everett Tire Fire				Ecology	9,547	Enforcement, technical assistance.
Gas Works Park				Ecology	620	USGS research hydrogeologic information
Lincoln Avenue Ditch				Ecology	11,528	Notice letters sent to businesses, ongoing removal efforts
Lynden Airport				Ecology		Cost recovery actions underway
Mt. Vernon Gas Spill		IRM		Ecology	1,889	Site stabilized, ongoing vapor extraction system working
North Market Street		RI		Ecology	254,553	Major PRPs identified, sample wells and soils
Northwest Transformer (Downtown) Ostrom Mushroom				Ecology Ecology	621	

Independent State Sites (continued)

Site	A C T I V I T I E S		Lead Agency	Site Specific Expenditures*	Comments
	Started	Underway (Continued from FY 85)			
Olympic Testing		RI	Ecology	\$ 120	
Parkland Gas Spill			Ecology	1,015	Cost recovery
Peninsula High School			Ecology	2,362	25 barrels removed, inspect for additional drums
Restover Truck Stop		RI	Ecology	194,073	RI underway, monitor wells
Rosch			Ecology	177	Cost recovery actions initiated, attempting to gain renewed access for inspection
Sedro Woolley		RA	Ecology	18,884	Vapor extraction units
Simpson Timber Company			EPA		Assist with EPA emergency removal
Strandley PCB		RA	EPA	6,276	Oversee RP cleanup of PCBs
Tacoma Spur			Ecology	19,546	Copper laden waste shipped for recovery, oily silt and sand stored on-site
Tillicum		RA	EPA	1,865	General study of regional ground water contamination
Tulalip Landfill		RA	Ecology		Technical assistance, oversight
G.F.-PCB	RI		Ecology	642	PRP doing RI, state oversight

* Dollar amounts represent funds expended by Ecology from federal and state sources, and include \$3,307,628 encumbered, or committed, during Fiscal Year 1986 for use on specific cleanup projects during Fiscal Year 1987. Dollar amounts do not represent the substantial amount of funds expended by responsible parties, EPA or other agencies.

- Key:
- RI - Remedial Investigation
 - FS - Feasibility Study
 - RD - Remedial Design
 - IRM - Interim Remedial Measure
 - RA - Remedial Action
 - ROD - Record of Decision
 - RP - Responsible Party
 - PRP - Potentially Responsible Party

APPENDIX E
KEY STATUTES
AFFECTING THE MANAGEMENT AND CLEANUP
OF HAZARDOUS SUBSTANCES

I. PREVENTING SITE CLEANUP PROBLEMS -
REGULATORY PROGRAMS GOVERNING THE CREATION, HANDLING, AND DISPOSAL OF HAZARDOUS SUBSTANCES:

Federal Laws

Resource Conservation and Recovery Act of 1976 (RCRA)

- Authorizes regulation of hazardous wastes from the point of generation to final disposal.
- Allows EPA to delegate authority to states to implement and enforce the regulatory program.
- Focuses on ongoing activities - not past practices of improper disposal.
- Has a narrow definition of hazardous wastes.
- Authorizes inspections of facilities for violations of standards.
- Authorizes EPA to issue compliance orders.
- Establishes civil and criminal penalties for violations.

* Similar authorities also available under the State Water Pollution Control Act (Chapter 90.48 RCW) and the Washington Clean Air Act (Chapter 70.94 RCW).

State Laws

State Hazardous Waste Disposal Act (Chapter 70.105 RCW)

- Authorizes regulation of hazardous wastes from the point of generation to final disposal.
- Authorizes the state to administer the federal act.
- Focuses on ongoing activities - not past practices of improper disposal.
- Broader definition of hazardous wastes.
- Authorizes inspection of facilities for violations of standards.*
- Authorizes the state to issue compliance orders.*
- Establishes civil and criminal penalties for violations.*

Toxic Substances Control Act of 1977 (TSCA)

No equivalent state law

- Allows EPA to regulate the testing, manufacture, processing and distribution of toxic chemicals.
- For the protection of public health and the environment, EPA may restrict or ban a chemical's manufacture, use, or disposal.
- Specifically regulates the use and disposal of PCBs.

II. CLEANUP OF HAZARDOUS WASTE SITES:

Federal Law

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund)

- Authorizes EPA to clean up hazardous substances in water, air, and land.
- Establishes a "Superfund" based on chemical and petroleum industry taxes.
- Authorizes issuance of administrative orders requiring cleanup.
- Authorizes inspections of facilities and records, and collection of samples.
- Establishes civil and criminal penalties, and punitive damages for violations (including treble damages).
- Requires creation of a National Priorities List of sites requiring corrective action.
- Establishes broad powers for recovery of response costs and natural resource damages.

Limited authority exists under Chapter 70.105 RCW, Chapter 90.48 RCW, Chapter 70.94 RCW, and Chapter 70.94 RCW.

State Laws

State Hazardous Waste Fees Statute (Chapter 70.105A RCW)

- Authorizes the state to clean up hazardous substances in water, air, and land.
- Establishes fees on hazardous waste facilities and other businesses for administration of the regulatory program and site cleanup.
- Does not authorize issuance of orders.*
- Does not specifically authorize inspections of facilities, records, or collection of samples.*
- Does not authorize civil, criminal, or punitive damages, except for unpaid fees.*
- Does not require site listing.
- Limited powers for cost recovery.

Federal Law

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA/Superfund)

- . Authorizes states to perform cleanup actions under contract to EPA.
- . Requires consultation and financial contributions from states before sites are cleaned up.
- . Requires states to pay long-term operation and maintenance costs following cleanup of sites.
- . Limits response authorities at sites involving releases of petroleum, petroleum fractions, and registered pesticides.

State Laws

State Hazardous Waste Fees Statute (Chapter 70.105A RCW)

- . Authorizes the state to lead cleanup actions, and take independent state actions.
- . Authorizes the state to participate in Superfund and match funds for cleanup of sites.
- . Authorizes to state to pay operation and maintenance costs (within appropriations).
- . Allows response to all hazardous substances and wastes which threaten public health or the environment.

Glossary

Aquifer

An underground porous layer of rock, gravel or sand that holds or carries water. The depth of this layer can vary from a few feet to several hundred below the ground. Aquifers, which are extremely vulnerable to contamination from chemicals, provide a source of drinking water for approximately 2.5 million Washington residents.

Biennium

A two-year period used by government agencies as a basis for budgeting and spending plans. Each year of the biennium is called a fiscal year.

Carcinogenic

Capable of causing cancer.

CERCLIS List

Comprehensive Environmental Response, Compensation, Liability Information System. List, maintained by the Environmental Protection Agency, of actual and potential uncontrolled hazardous substance sites identified in Washington.

Contaminant

A substance that is not naturally present in the environment or is present in unnatural concentrations or amounts and which can, in sufficient concentrations, adversely alter an environment.

Ecosystem

A community of living things interacting with one another and with their physical environment, such as a rain forest, pond or estuary. An ecosystem can be thought of as a single complex system. Damage to any part may affect the whole.

Fiscal Year

One of two years in a biennium used as budget planning tool. The state of Washington's fiscal year is from July 1 to June 30 of the following year.

Ground water

Underground water supplies, also called aquifers. Aquifers are created by rain which soaks into the ground and flows down until it collects at a point where the ground is impermeable. Ground water then usually flows laterally toward a river or lake or the ocean. Wells tap the ground water for our use.

Hazardous Waste

Any solid, liquid, or gaseous substance which, because of its source or measurable characteristics, is classified under state or federal law as hazardous and subject to special handling, shipping, storage and disposal requirements. Washington state law identifies two categories, Dangerous and Extremely Hazardous. The latter category is more hazardous and requires greater precautions.

Hazardous Waste Cleanup Program

A state funded cleanup program by which the Department of Ecology, acting alone or with the Environmental Protection Agency, cleans up abandoned hazardous waste sites or sites where the responsible parties are unable or unwilling to conduct the cleanup themselves.

Hazardous Waste Site

A site where hazardous wastes are found that endanger or have the potential to endanger humans or the environment.

Hazard Ranking System

A system of points assigned to hazardous waste sites, based on the types of waste found at the site and their proximity to population areas.

Health Risk

The risk or likelihood that a chemical will adversely affect a person's health. Estimating health risks is a complex and inexact science.

Hydrogeology

The study of underground water sources and movement and factors affecting them.

Leachate

Water or other liquid that has dissolved (leached) soluble materials, such as organic and mineral salts, from a solid material, such as a layer of soil or debris. Rainwater that percolates through a landfill and picks up contaminants is called the leachate from the landfill.

Matching Funds

Money that must be put up by one party, such as the state, in an agreement in order to obligate the other party, such as the federal government, to provide an agreed upon share of funds for a project.

Metals

Metals are elements that conduct electricity easily. Certain metals, such as mercury, lead, nickel, zinc, and cadmium are of environmental concern because man's activities release them into the environment in unnatural amounts. They are generally toxic to life at certain concentrations. Since metals are elements, they do not break down in the environment over time.

National Priorities List

The federal list of hazardous waste sites eligible for Superfund money.

Pathways

The means by which a poison or pollutant enters a human, animal or the environment. Common pathways for pollutants into humans include direct contact (spills), ingestion (direct or through contaminated food or water), and inhalation (breathing toxic fumes).

PCBs

Polychlorinated biphenyls, a group of manmade chemicals, include about 70 different but closely related compounds made up of carbon, hydrogen and chlorine. If released to the environment, they persist for long periods of time and can increase in concentration in food chains because they are not water soluble. PCBs are suspected to cause cancer in humans, and are an example of an organic toxicant.

Pesticide

A general term used to describe any substance--usually chemical--used to destroy or control organisms (pests); includes herbicides, insecticides, algicides, fungicides, and others. Many of these substances are manufactured and are not found naturally in the environment.

Plume

The extent or boundary of the spread of underground soil or water contamination.

Pollutant

A contaminant that adversely alters the physical, chemical, or biological properties of the environment. The term includes toxic metals, carcinogens and all other harmful substances.

Priority Pollutants

Substances listed by EPA under the Clean Water Act as toxic and having priority for regulatory controls. The list includes toxic metals, inorganic contaminants such as cyanide and arsenic, and a broad range of both natural and artificial compounds.

RCRA

The Resource Conservation and Recovery Act, the federal law that classifies and regulates solid and hazardous substances.

RCW

The Revised Code of Washington, the compilation of the laws of the state of Washington published by the Statute Law Committee.

Remedial Action

Work done at a hazardous waste site to clean up or control the contamination found at the site.

Responsible Parties

Those who are responsible for causing hazardous substances to contaminate the environment. Responsible parties include the persons or companies that generate, transport, or improperly manage the hazardous substances.

Soil Permeability

The ease with which gases, liquids or plant roots penetrate or pass through a layer of soil.

State Priority List

Sites on which the Department of Ecology is or would like to be working. This list includes National Priority List sites, State Priority Sites, and EPA emergency cleanup sites.

Superfund

The federally funded program to clean up hazardous waste sites nationwide, established under the Comprehensive Environmental Response, Compensation and Liability Act of 1980.

Toxic

Poisonous, carcinogenic or otherwise directly harmful to life.

Toxicology

The study of toxicants and pathways.

Toxic Substances and Toxicants

Chemical substances, such as pesticides, plastics, detergents, chlorine, and industrial wastes that are poisonous carcinogenic or otherwise directly harmful to life.

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Yakima, WA 98903-1164
575-2800

Northwest Regional Office

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Redmond, WA 98502-5301
885-1900

Eastern Regional Office

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