

MAKING THE PROGRAM FASTER, FAIRER, AND MORE EFFICIENT

SUPERFUND ACHIEVES 5,000TH MILESTONE IN MISSOURI

St. Louis, Missouri (1998) — EPA completes its 5,000th successful removal action at an abandoned drum reclamation plant, making way for potential economic development in the metropolitan area. A fire on the 11-acre Great Lakes Container site in 1995 alerted officials of the potential dangers associated with the site and prompted several environmental investigations. Investigations revealed buried drums of hazardous substances, asbestos, and high levels of lead and polychlorinated biphenyls (PCBs) were threatening the environment and the health of nearby residents. EPA conducted an eight-month Removal Action to mitigate these threats, including the removal of 55,000 tons of contaminated soil, collection of 680 drums of hazardous substances, and the treatment of 580,000 gallons of water.

IMPROVING CLEANUP PROCEDURES

EPA has maintained an ongoing effort to reform and revitalize the Superfund program.

In 1989, the Agency completed *A Management Review of the Superfund Program*. Also known as the “90-Day Study,” the Management Review proposed 50 specific recommendations to immediately control threats to human health, provide for efficient and effective cleanups, develop innovative technologies, encourage community participation, and get responsible parties to pay for cleanups.

In 1990, EPA revised the NCP and the HRS in accordance with SARA. The NCP was revised to provide for broader response actions, increased State and public participation, and stronger enforcement procedures. The HRS was revised to ensure that, to the maximum extent feasible, it accurately assessed the relative degree of risk to human health and the environment posed by sites.

In 1991, EPA convened a 30-Day Task Force to develop options for accelerating the rate of cleanups and to improve how the risks posed by hazardous waste sites are evaluated. The “30-Day Study” culminated in initiatives to:

- Set up aggressive cleanup targets;
- Streamline the Superfund process;
- Address site specific issues that cause delay;
- Accelerate private party cleanups; and
- Review risk assessment and risk management practices.

A year later, EPA introduced the Superfund Accelerated Cleanup Model (SACM). SACM reduced the time and money spent at Superfund sites, while continuing to protect human health and the environment. After SACM, EPA began measures to reduce risk and start cleanups earlier in the process.



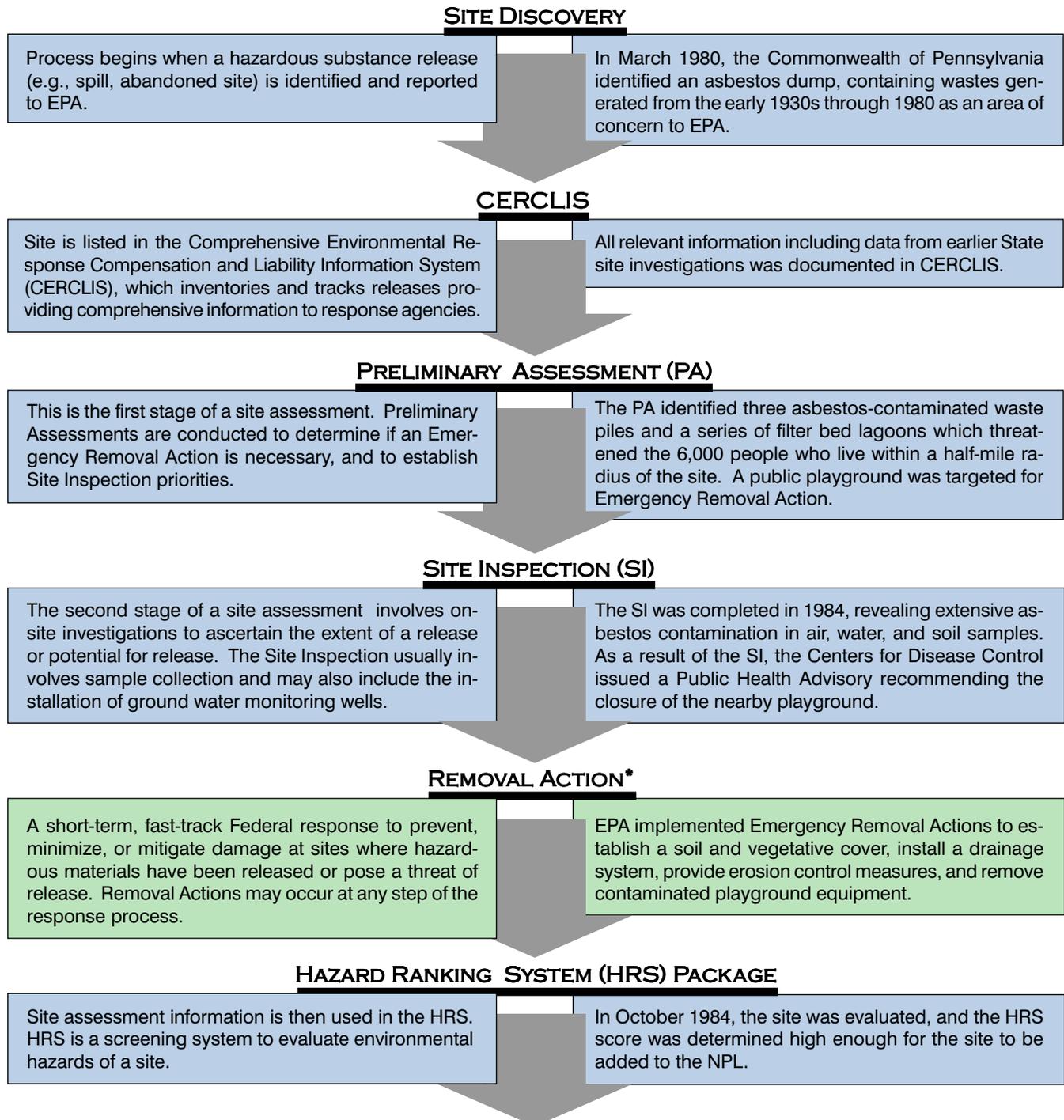
Residential cleanup of hazardous waste

STEPS FOR CLEANING UP A SUPERFUND SITE

The general approach taken by EPA to clean up a Superfund site is detailed below. In the left column is a description of the step-by-step process normally followed by EPA from discovery of a hazardous substance release through deletion from the NPL. The right column is a description of the steps undertaken by EPA, the potentially responsible parties (PRPs), and other stakeholders in the cleanup of the Ambler Asbestos Piles site in Pennsylvania.

General Description of Cleanup

Cleanup of Ambler Asbestos Piles Site



*Removal Action is in a different color because removals can occur whenever they are determined to be necessary, and not during a specific stage in the cleanup process.

General Description of Cleanup (cont.)

Cleanup of Ambler Asbestos Piles Site (cont.)

NPL LISTING

The NPL is a list of abandoned or uncontrolled hazardous substance sites that are the national priorities for long-term cleanup, making them eligible for Federal cleanup funds.

In June 1986 the site was formally added to the NPL.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)

Once a site has been placed on the NPL, a Remedial Investigation (RI) and Feasibility Study (FS) are conducted. The purpose of the RI is to collect data necessary to assess risk and support the selection of response alternatives. The FS is a process for developing, evaluating, and selecting a remedial action.

The RI/FS was issued in September of 1989. The RI revealed a total of 1.5 million cubic yards of asbestos-contaminated wastes abandoned on-site, with notable levels of asbestos detected in Wissahickon Creek, which borders the property. Feasible actions to mitigate the threat of asbestos release were explored.

RECORD OF DECISION (ROD)

Once an RI/FS is completed, a Record of Decision (ROD) is generated, which outlines cleanup actions planned for a site.

In 1988 and 1989, two RODs were filed documenting the remedies selected for the site.

REMEDIAL DESIGN (RD)

The Remedial Design (RD) is the set of technical plans and specifications for implementing the cleanup actions chosen in the ROD.

In 1992, RD negotiations were completed and a plan was selected.

REMEDIAL ACTION (RA)

Remedial Action (RA) is the execution of construction and other work necessary to implement the chosen remedy.

A RA was reached in 1993, with agreed remedies consisting of: regrading pile plateaus; reinforcing the soil cover; installing erosion and sedimentation control devices; treating surface water and runoff; installing or upgrading the fence/locking gates; posting warning signs; and monitoring the air.

CONSTRUCTION COMPLETION

Construction completion is where physical construction of all cleanup remedies is complete, all immediate threats have been addressed, and all long-term threats are under control.

Construction of all remedies was completed in August 1993 along with approvals and documentation.

OPERATION AND MAINTENANCE (O & M)

Operation and Maintenance are activities conducted at a site after remedial construction activities have been completed to ensure the cleanup methods are working properly.

Post-closure inspections, monitoring, maintenance of the piles, and preparation of a contingency plan occurred.

DELETION FROM NPL

When EPA, in conjunction with the State, has determined that all appropriate response actions have been implemented and no further remedial measures are necessary, a Notice of Final Action to Delete is published in the Federal Register. If EPA receives no significant adverse or critical comments from the public within the 30-day comment period, the site is deleted from the NPL.

In December 1996, the Ambler Asbestos Pile site was deleted from the NPL.



Cleanup at Bruin Lagoon site in Pennsylvania



Ground water sampling in progress

EPA'S PARTNERSHIP WITH THE DEPARTMENT OF JUSTICE

EPA works closely with DOJ to require PRPs to bear the cost of cleanup. DOJ attorneys work with EPA to negotiate Consent Decrees, under which PRPs agree to a court order requiring them to perform long-term cleanups. DOJ and EPA also cooperate in the enforcement of UAOs. In cases where EPA has used the Trust Fund to finance cleanups, DOJ initiates judicial actions to recover the costs of cleanup from PRPs. Over the past five years, DOJ has helped EPA obtain over \$3.5 billion in cleanup commitments or cost recoveries from PRPs.

In 1993, EPA established the Construction Completions category of sites within the NPL. EPA established this category as a new way to more accurately reflect the work accomplished at Superfund sites. By definition, these are sites where all physical remedy construction has been completed and the site is awaiting official deletion from the NPL. As of October 2000, 757 Superfund sites had all cleanup construction completed.

PLACING “ENFORCEMENT FIRST”

Enforcement procedures were strengthened at the same time that cleanups were being streamlined.

In the early 1980s, the Federal government enforced CERCLA primarily by initiating lawsuits against responsible parties to stop certain actions or have the Trust Fund pay for cleanups and then sue the responsible parties to recover the costs. Either route was slow and cumbersome. With SARA, Congress added a number of provisions to strengthen CERCLA's enforcement procedures, and to encourage voluntary settlements with the PRPs.

After the “90-Day Study” found that cleanups were not moving fast enough, EPA initiated the “Enforcement First” policy. Under “Enforcement First,” EPA looks for the parties who are potentially liable for a release and gets them to address the problem they created. The preferred method is to reach a voluntary settlement with the PRPs, but EPA can also issue a unilateral administrative order (UAO). By requiring the responsible parties to take action to clean up a site, “Enforcement First” limits the amount of time spent litigating cases in court and also saves the resources of the Trust Fund for responding to “orphan” sites where no viable responsible parties can be found.

REVITALIZING THE PROGRAM THROUGH THREE ROUNDS OF REFORMS

In 1993, EPA began a series of reforms to make the Superfund program “faster, fairer, and more efficient.” Building on the 90-Day and 30-Day Studies, SACM, and the “Enforcement First” policy, the first round of Superfund Reforms consisted of 17 initiatives that improved the effectiveness of cleanups and increased enforcement fairness. The First Round also focused on expanding State and public involvement in cleanup decisions.

In Round 2, EPA introduced an additional 12 reforms and tested many of them through pilot projects. Round 3 consisted of 20 initiatives and took a “common sense” approach to reforming the

program. Rounds 2 and 3 were introduced in 1995, and together they strengthened the Superfund program by attempting to: reduce litigation and transaction costs; make cleanup decisions more cost-effective; encourage the redevelopment of cleaned up sites; get States, Tribes and communities more involved; and encourage innovative technologies.

The National Academy of Public Administrators (NAPA) conducted an in-depth examination of the Superfund reforms. In a June 2000 report, NAPA concluded that “the reinvention effort successfully addressed the key challenges facing Superfund” and “implementation of the reforms has been accompanied by substantial improvement in aggregate measures of program output.”

Reform of the program is ongoing. The reforms are being refined and improved – and their impact is becoming broader. EPA is consistently addressing stakeholders’ criticisms and developing new ways to make Superfund work faster, fairer, and more efficiently. The remainder of this chapter presents a few examples of how this revitalized program is succeeding in the field.

INCREASING COMMUNITY PARTICIPATION AND PUBLIC/PRIVATE PARTNERSHIPS

From the beginning of the Superfund program, EPA has recognized the need for input from those affected by a release. It takes a commitment by the affected community, State and local governments, and the stakeholders to fully address problems caused by hazardous waste. Here are just some of the ways that EPA increases community participation and creates partnerships.

Facilitating Community Involvement

EPA believes that communities must have meaningful opportunities for involvement early in the cleanup process and should stay involved throughout site cleanup. Some of the ways that this is done is through Community Advisory Groups (CAGs) and Technical Assistance Grants (TAGs).

A CAG is a committee of citizens affected by a hazardous waste site. CAGs are made up of representatives with diverse community interests and provide a public forum for community members to present and discuss their needs and concerns regarding decision-making at a site.

Many Superfund sites present communities with complex issues often requiring expertise in chemistry, engineering, geology, toxicology, and law. A TAG is a grant of up to \$50,000 for community groups to hire the technical advisers needed to help

TECHNOLOGIES USED TO MAKE SITES SAFE

Today, there are as many ways to clean up a Superfund site as there are types of sites. EPA tailors the techniques and technologies to community needs and to the individual problems posed by different areas of a site. Here are some of the cleanup techniques that EPA has developed to make sure that all areas of a site are safe:

- **REMOVAL:** Physically removing toxic contaminants from the site to a facility that can safely handle the waste.
- **TREATMENT:** Treating the waste at the site to remove the toxic contaminants from the soil, sediment, or ground water.
- **RECYCLING:** Treating or converting toxic waste material to make it safe and reusing it for other purposes.
- **CONTAINMENT:** Placing covers over or barriers around waste to prevent migration and to keep people from coming into contact with the waste.
- **SOLIDIFICATION:** Physically binding or enclosing toxic contaminants within a stabilized mass, like cement.
- **STABILIZATION:** Inducing chemical reactions between a stabilizing agent (such as lime, Portland cement, fly ash, or kiln dust) and the contaminants to reduce their mobility.
- **BIOREMEDIATION:** Breaking down toxic contaminants by using natural microorganisms.
- **CHEMICAL TRANSFORMATION:** Detoxifying contaminants by transforming their chemical structure.
- **NATURAL ATTENUATION:** Using natural biotransformation processes such as dilution, dispersion, volatilization, biodegradation, adsorption, and chemical reactions to reduce contaminant concentrations to acceptable levels.
- **INCINERATION:** Using extremely high temperatures (1,600-2,200°F) to render organic contaminants harmless.

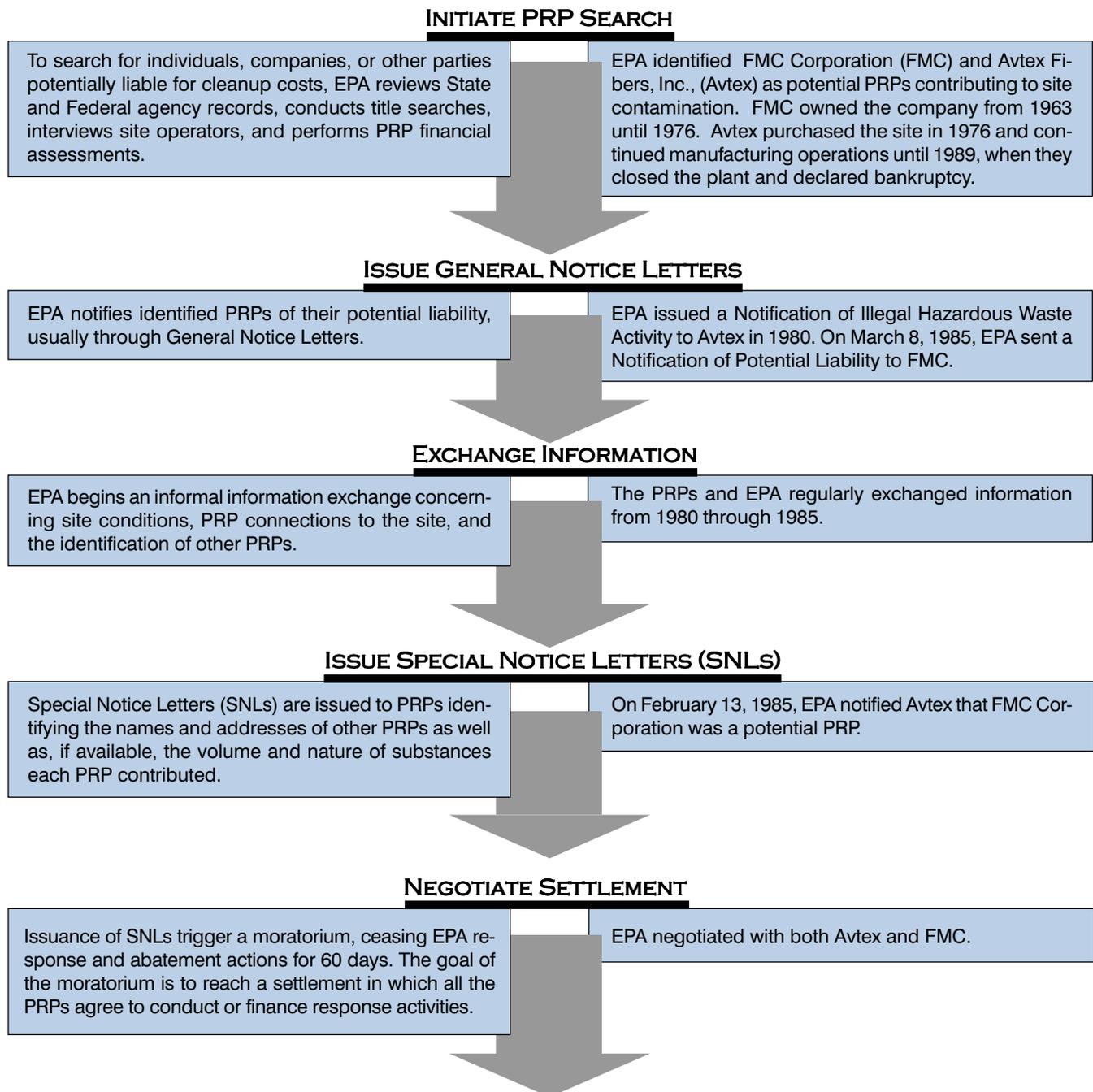
STEPS FOR ENFORCEMENT AT SUPERFUND SITES

The general approach followed by EPA to get the PRPs to clean up a site is detailed below. The left column is a step-by-step explanation of the general steps taken by EPA to enforce cleanup and the right column is the process taken at the Avtex Fibers site in Front Royal, Virginia.

The Avtex Fibers site, on 340 acres on the Shenandoah River, operated since 1940 as a rayon-manufacturing center. After cleanup, a portion of the site will be reused as soccer fields as a result of a partnership between EPA, the U.S. Soccer Foundation, and the Front Royal community.

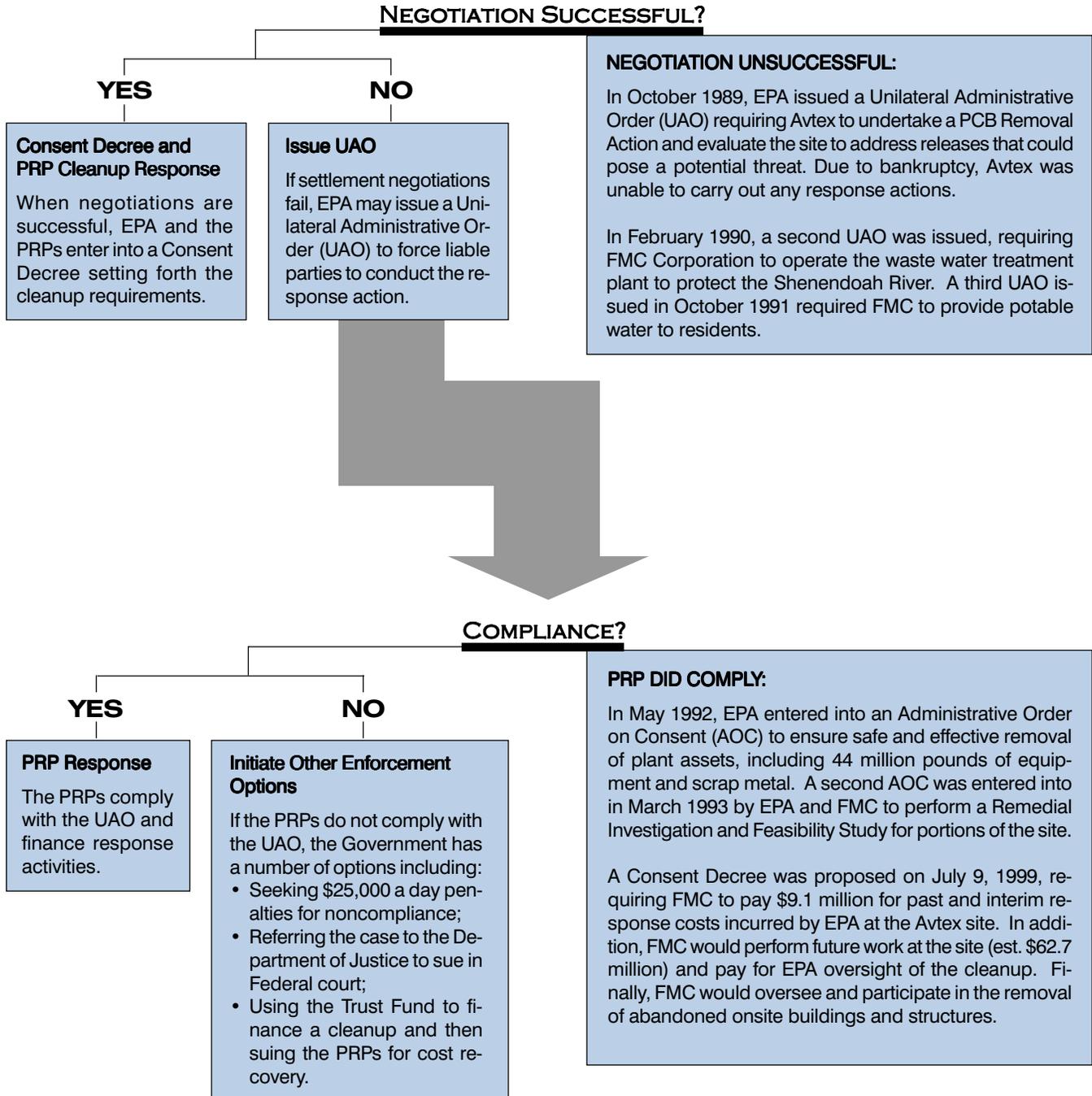
General Description of Enforcement

Enforcement Taken at Avtex Fibers



*General Description
of Enforcement (cont.)*

*Enforcement Taken
at Avtex Fibers (cont.)*



TRANSFORMING AN ABANDONED NAVAL BASE TO HELP NATIVE AMERICANS IN ALASKA

The Adak Naval Air Station near the western end of the Aleutian Islands in Alaska, is a great example of innovative redevelopment of a former Superfund site that also serves Native Americans.

Founded in the early 1940s, the air station on Adak Island served as a key operations and supply outpost for the U.S. military forces fighting the Japanese in World War II. The station continued to serve as a vital naval base during the Cold War. With the end of the Cold War and subsequent downsizing of the military, the site was directed to close as a result of the Base Realignment and Closure Act in 1995 (BRAC).

Over 40 years of operation led to large amounts of hazardous waste being deposited in several areas of the island. In the late 1980s, the Navy identified several areas of hazardous waste contamination and the site was put on the NPL in 1994. The Navy completed more than 20 removal actions, including the removal of hundreds of underground storage tanks.

Since the cleanup, authority over the site has been transferred from the Navy to the U.S. Fish and Wildlife Service. The Fish and Wildlife Service then traded a large part of the property to the Aleut Corporation, a native Alaskan-owned company whose mission is to promote economic redevelopment of the area. Some of the services the company is promoting include a multi-million dollar airport and port facilities that can support a wide variety of vessels including research ships, station work vessels, cruise ships, factory trawlers, and fishing boats. The Aleut Corporation is also promoting Adak as a tourist center inviting guests to experience the wildlife on the island while enjoying the benefits of accommodation and fine dining on the former naval site.

the community better understand complex site-related technical information.

At the Southern Shipbuilding site in Slidell, Louisiana, EPA established both a TAG and a CAG empowering the community to take an active role in response action planning. This allowed EPA to implement a creative, community-based approach which resulted in an efficient cleanup catering to the needs of the residents of Slidell.

EPA also creates new opportunities for community input on the individual level by utilizing tools such as forums and web sites.

Developing Partnerships

To achieve success and promote public participation, EPA works with communities, local businesses, large corporations, and State, local, and Tribal governments in the form of partnerships.

EPA, through its State and Tribal Enhanced Role Initiative, developed a comprehensive plan to implement equitable sharing of Superfund program responsibilities with interested and capable States and Tribes, resulting in quicker cleanup of more sites. In Mississippi, EPA has entered into a pilot program partnering with a band of Choctaw Native Americans. The pilot supports Tribal efforts in building a greater Superfund capacity with respect to emergency preparedness and response. Through the pilot, the Tribe will learn how to effectively respond to oil and hazardous substance spills and perform environmental assessments at potential waste sites on Tribal lands.

At the Re-Solve, Inc. Superfund site in Dartmouth, Massachusetts, EPA has found an innovative way to promote local community involvement by implementing an important post-cleanup fish monitoring program. EPA created the Cornell Pond Annual Fishing Derby to help collect various fish species for PCB analysis as part of the long-term monitoring program. It also reminds local fishermen that a Massachusetts Department of Public Health fish advisory covering local waters is in effect. The annual fishing derby is just one of the creative ways that EPA works with partners and local communities to solve problems caused by hazardous waste.

The Superfund Jobs Training Initiative (Super JTI) is another example of an outreach initiative, creating local economic benefits from site cleanup in disadvantaged areas. SuperJTI, in conjunction with the Brownfields Job Training and Development Demonstration Pilot Program, promotes the employment of trainees at cleanup projects.

At the NL Industries-Teracorp Superfund site in Granite City, Illinois, EPA worked with a diverse team of partners including DePaul University in Chicago, Belleville Area Community College, the Venice Lincoln Technical Center, and the Army Corps of Engineers to provide environmental job training in life skills, technical environmental practices, and a regulatory overview for 27 area residents. Soon after completing the training, 20 students were hired as recovery and field technicians, and for construction.

ENHANCING CLEANUP EFFECTIVENESS AND CONSISTENCY

EPA has initiated several ongoing reforms to ensure that cleanups are cost-effective and reflect the most recent advances in science and technology. Partially because of these reforms, three times as many Superfund sites have been cleaned up in the past seven years than in all the prior years of the program combined.

Some of the more significant advances in cleanup effectiveness and consistency are described below.

Implementing Technological Innovations

SARA established a preference for treatment of hazardous wastes and created a demand for alternatives to land disposal. New innovative treatment technologies grew from this demand to provide more permanent, less costly solutions, for dealing with contaminated materials.

The Superfund Innovative Technology Evaluation (SITE) Program was established to meet this increased demand for alternative technologies. The SITE Program has provided demonstrations of new technologies at particular sites, resulting in average cost savings of over 70 percent per site. The total cost savings for innovative treatment as opposed to conventional treatment is estimated at \$2.1 billion.

Superfund's Technology Innovation Office works to break down barriers to using new technologies by providing a wealth of technical information, including:

- A free monthly e-mail service newsletter which reaches over 9,500 cleanup professionals;
- Traditional classroom and Internet-based seminars, which reached over 3,000 site managers in 1999; and
- An online database, which provides information on more than 500 assessment and cleanup technologies.



De-watering at Velsicol Chemical Corp. site in Michigan

AN EXAMPLE OF INNOVATIVE TECHNOLOGY AND COST SAVINGS IN INDIANA

At the Seymour Recycling site in Indiana, bioremediation, an innovative technology, resulted in significant cost savings. During actions to remove the immediate threat posed by the site, EPA discovered that bacteria were naturally aiding in the remediation of soils on-site. The remedial design accommodated this discovery by relocating a planned ground water treatment works one-third of a mile downslope to utilize the bioremediation activities occurring naturally in the soil. By taking advantage of this natural process, EPA could construct a smaller ground water treatment facility, which resulted in substantial savings.



Construction of protective cap at Tulalip Landfill site in Washington

SOME INNOVATIVE TREATMENT TECHNOLOGIES NOW USED AT SUPERFUND SITES

SOIL VAPOR EXTRACTION removes contaminant vapors from soil (without having to dig it up) through the use of vacuum extraction wells placed in the ground. Contaminants are collected for further treatment.

AIR SPARGING injects air into the ground below the contaminated area, forming bubbles that rise and carry trapped and dissolved contaminants to the surface where they are captured by a soil vapor extraction system.

BIOREMEDIATION uses microorganisms, such as bacteria in engineered processes, to break down organic contaminants into harmless substances.

THERMAL DESORPTION heats soil at relatively low temperatures to vaporize contaminants with low boiling points. Vaporized contaminants then are captured and removed for further treatment or destruction.

SOIL WASHING uses water or a washing solution and mechanical processes to scrub excavated soils and remove hazardous contaminants.

CHEMICAL DEHALOGENATION converts contaminants that contain halogens (*e.g.*, chlorine and fluorine) to less toxic substances through controlled chemical reactions that remove or replace halogen atoms.

SOLVENT EXTRACTION separates hazardous organic contaminants from oily-type wastes, soils, sludges, and sediments, reducing the volume of hazardous waste that must be treated.

IN SITU SOIL FLUSHING floods contaminated soils beneath the ground surface with a solution that flushes the contaminants to an area where they can be extracted.

EPA has worked to form several partnerships to improve the coordination of research and development efforts between academia, private industry, and the Federal government. They include: an industry/government partnership to find innovative solutions to high priority problems; a petroleum refinery partnership for improved solutions for ground water contamination; a partnership with State dry cleaners cleanup programs; and an interagency partnership to collaborate across the Federal government on technology demonstrations and evaluations.

EPA also promotes the research and development of innovative technologies by sharing the risk with PRPs who select remedies employing low-cost, high performance technologies. EPA will “underwrite” these innovative approaches by agreeing to reimburse up to 50 percent of the cost if the innovative remedy fails and a subsequent remedy is required.

These risk-sharing agreements work. At the Douglassville Disposal Site in Pennsylvania, EPA amended an incineration remedy to a chemical dehalogenation remedy using lime-based stabilization. The use of this innovative technology resulted in savings of \$36 million.

Reducing Time and Cost Through Presumptive Remedies

Seeking to improve consistency and to streamline cleanups, EPA implemented the use of presumptive remedies. Presumptive remedies provide guidance on how to address certain recurring situations at sites, thereby standardizing the response.

Presumptive remedies have been developed for the following four types of sites:

- Municipal landfills;
- Volatile organic chemicals (VOCs) in soils;
- Wood treater sites; and
- Contaminated ground water.

At the South Indian Bend Wash site in Arizona, presumptive remedies increased consistency in decision making by taking advantage of lessons learned at similar sites and allowing a speedup of the site evaluation process. A study conducted by EPA’s Office of the Inspector General noted efficiency, economy, consistency, and quality as some of the benefits of presumptive remedy use at the South Indian Bend Wash site.

Reviewing and Updating Cleanup Decisions

EPA has instituted a number of procedures to make sure that the best, and most up-to-date, information is used in deciding a cleanup remedy.

For example, proposed remedies are analyzed by a peer review group to make certain that they are cost-effective, consistent with Superfund law and regulations, and protective of human health and the environment. Such reviews from 1995 through 1999 resulted in total savings of over \$70 million, and a savings of \$27 million in 1999 alone.

These reviews continue even after a cleanup has started. Remedy decisions are updated to bring them in line with current science and technology, or reflect new information about a site. Such updates have occurred at 300 sites, producing cost savings of \$1.5 billion.

STREAMLINING THE ENFORCEMENT PROCESS AND OPTIMIZING FAIRNESS

EPA is dedicated to “Enforcement First.” Encouraging PRPs to enter into cooperative cleanup settlements has reduced the need for litigation and has minimized transaction costs for both EPA and the PRPs.

EPA has taken significant steps to reduce litigation, promote earlier settlements, and optimize fairness concerns. By streamlining the enforcement process, EPA is able to reach settlement more quickly on terms that are considered more fair to the responsible parties. This streamlined process allows both EPA and the PRPs to move quickly to clean up sites, and to increase the pace at which contaminated properties are returned to productive use.

Since 1992, responsible parties have performed over 70 percent of the new cleanup work at Superfund sites. And over the life of the Superfund program, EPA has reached settlements with private parties valued at over \$18 billion.

EPA is making full use of its enforcement discretion to encourage settlements that are fair to all parties. Some of the tools that EPA uses to achieve more efficient and equitable settlements are described below.

Resolving Disputes Outside of Court

Some of the most complex and contested cases can be settled using an outside mediator – allowing all the parties to spend their

PREVENTING POLLUTION WITH “GREEN CHEMISTRY”

If there are no hazardous substances, there are no potentially hazardous releases. Stopping hazardous substances from being created in the first place is the goal of “green chemistry.”

Green chemistry, or environmentally benign chemistry, is focused on processes and products that reduce or eliminate the use and generation of hazardous substances. Major interest in green chemistry began with the passage of the Pollution Prevention Act of 1990, and gained momentum in 1991 as it became the formal focus of an EPA program.

When the Pollution Prevention Act was passed by Congress in 1990, it was the first act to focus on pollution prevention rather than treatment and abatement. This represented a fundamental change from the government regulatory approach, dictating methods of dealing with pollutants that had been typical of the previous decade. The Act established pollution prevention as national policy, encouraging industries and academics to devise novel technologies and processes that avoided the formation and/or use of hazardous substances.

In 1991, EPA created the Green Chemistry Program. The Green Chemistry Program is a non-regulatory program fostering research, development, and implementation of innovative chemical technologies that prevent pollution in a scientifically sound and cost-effective manner. The program works with many partners in industry, academia, other government agencies, scientific societies, trade organizations, national laboratories, and research centers to promote pollution prevention through green chemistry.

Pollution prevention through green chemistry is gaining widespread attention thanks to public/private partnerships. New green chemistry programs now provide incentives for the private sector to develop innovative solutions to production. The chemical industry is changing its face through advances in green technology, while at the same time utilizing the benefits of significant reductions in regulation compliance costs, liability and cleanup costs, and disposal and on-site storage costs.

**\$1 BILLION SETTLEMENT
REACHED AT IRON MOUNTAIN
MINE SITE**

Redding, California (October 19, 2000) — The United States and the State of California announced a settlement with Aventis Crop Sciences USA, Inc. to fund future cleanup costs that could approach \$1 billion at the Iron Mountain Mine site. The settlement is one of the largest to be reached with a single private party in the history of the Superfund program. The agreement will ensure long-term control of more than 95 percent of the releases from the site.

The 4,400-acre site, which operated from the 1860s through 1963, is historically the largest point source of toxic metals in the country, and the source of the most acidic mine drainage in the world. Prior to remediation, the mine discharged an average of a ton of toxic metals a day into the Upper Sacramento River, a critical salmon spawning habitat and central feature in the State's water system. Approximately 70,000 people used surface water within 3 miles of the site as their source of drinking water.

In 1983, EPA listed the site on the NPL at the State's request. Since then, numerous Federal and State agencies have worked together on this site which has been addressed in six stages starting with a series of emergency actions. In 1994, a high density sludge treatment plant was installed that removes 99.99 percent of metals from the site's toxic runoff.

The settlement pays for natural resource restoration projects, provides for operation and maintenance for 30 years, and guarantees additional funding for site costs incurred after the year 2030.

time and resources cleaning up sites rather than litigating cases in court.

For example, at the Landfill & Resource Recovery site in Rhode Island, the parties included 18 PRPs, along with the United States and the State of Rhode Island. Both the Federal and State claims were resolved with the help of a Federal district court judge with a settlement that reimbursed the government for 97 percent of its expected costs. The mediated settlement also provided funds to purchase wetlands to expand the Blackstone River Valley National Heritage Center.

At the Auburn Road Landfill site in New Hampshire, a voluntary mediation led to a consent decree that resolved the government's claims against 31 PRPs. The settlers agreed to perform the remedy and to reimburse the United States for its past cleanup costs and future oversight costs. In addition, the settlers are reimbursing the State of New Hampshire and the Town of Londonderry for past cleanup costs and future oversight costs.

Protecting the "Little Guy"

Some Superfund sites have hundreds of PRPs, including small companies (or even individuals) who contributed only a minor portion of the waste. These small contributors may be dragged into burdensome litigation by the PRPs which were primarily responsible for the contamination. EPA attempts to identify and resolve the liability of these small party contributors early in the process, leading to *de micromis* and *de minimis* settlements.

A *de micromis* party is someone whose contribution of waste is minimal. In fact, the costs of hiring a lawyer, and negotiating a settlement, would dwarf any amount the party could reasonably be expected to contribute to cleanup costs. Many times, the PRPs who contributed a major portion of the waste to a site sue the *de micromis* parties for contribution. EPA enters into a *de micromis* settlement with these parties to protect them from such suits.

For example, 47 homeowners who lived around the Raymark Industries site in Connecticut could be seen as *de micromis* parties since they only contributed household wastes to the site. EPA and the State of Connecticut protected these homeowners from being sued by entering into a settlement where each homeowner paid \$1 to be protected from "third party" law suits brought by the major contributors.

A *de minimis* party has contributed more waste than a *de micromis* party, but the amount is still insignificant when compared with what has been contributed by some of the major PRPs – for example, less than one percent of the waste at a site. With *de*

de minimis parties, EPA has placed a priority on achieving a quick, efficient resolution of their liability to protect them from burdensome litigation.

At the Tulalip Landfill in Washington, EPA settled with 207 *de minimis* parties very early in the process, resulting in the recovery of approximately \$10 million and the identification of PRPs who made major contributions of waste to the site. At the Cherokee Oil Resources site in North Carolina, EPA entered into an early *de minimis* settlement with over 200 small contributors. Both the *de minimis* and the major contributors agreed not to sue over 1,000 *de micromis* parties.

EPA gets the “little guys out” of the Superfund enforcement. Over the years, 460 *de minimis* settlements have been reached with nearly 23,000 small waste contributors.

Paying for the “Orphan Share”

Many times, wastes have been contributed to sites by companies that are now insolvent. The share of cleanup liability attributable to such parties is sometimes referred to as the “orphan share.”

EPA’s orphan share policy provides money from the Trust Fund to reduce the liability of PRPs that agree to perform cleanups. Allowing the Trust Fund (rather than PRPs) to pay for orphan shares enhances fairness and creates a major incentive for the PRPs to perform cleanups and to settle claims without litigation – thereby decreasing the overall costs of the cleanup.

Recent EPA offers for orphan share compensation have expedited cleanups at the Operating Industries, Inc. Landfill in California and the Interstate Lead Company Superfund Site in Alabama. Through October 2000, EPA has offered approximately \$190 million in orphan share compensation at 119 sites.

Removing Legal Barriers to Economic Development

One of the biggest success stories of the Superfund program has been the return of hundreds of formerly contaminated properties to productive use. Areas that were once written off as toxic eyesores have been transformed into office buildings, recreational centers, wildlife habitats, and industrial plants.

These transformations will not take place unless certain legal issues are addressed first. Many real estate firms are afraid to develop a Superfund site because of the possibility that the firm could be found liable for the enormous costs of the cleanup – even for conditions that existed before anyone at the firm became involved with the site.

SUCCESSFUL ENFORCEMENT AT THE BROS SITE IN NEW JERSEY

EPA’s response to the Bridgeport Rental and Oil Services (BROS) site in Bridgeport, New Jersey is recognized as one of the greatest achievements of the Superfund program. The cleanup of this former waste oil storage and recovery facility proved to be one of the most technically challenging in the program’s history and was galvanized by an enforcement settlement valued at \$222 million. This represents one of the largest, most complex settlements in Superfund history.

The BROS site is a 30-acre property which is located approximately one mile east of the Town of Bridgeport and two miles south of the Delaware River. The site houses wastes including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and heavy metals (lead, cadmium, chromium, barium) accumulated during operation from 1950 through the late 1970s. Residents dependent on ground water were at risk of exposure. Pollution migrating from the site also threatened an ecologically sensitive wetland area. In 1979, the volatility of the site became realized as chemical fire swept across the area, rocketing cylinders through the air and engulfing the site in a black toxic cloud.

Enforcement began with an extensive discovery effort, resulting in a voluminous amount of deposition testimony which brought over 90 private parties to the negotiating table. EPA, in the spirit of the Superfund Reform initiatives, agreed to accept less than full recovery of its past costs and entered into a risk-sharing arrangement. Parties used non-binding mediation, an alternative dispute resolution mechanism, to assist them in the negotiations which resulted in this historic settlement. The settlement covered approximately 70 percent of the cleanup costs and required the private companies to complete the remaining cleanup of the Site’s ground water and wetlands.



New homes built at Ft. Wayne, Indiana Brownfields site

One way the Federal government addresses these concerns is by entering into Prospective Purchaser Agreements (PPAs) with potential buyers of contaminated property. A PPA is an agreement where EPA conditionally releases a buyer from Superfund liability for contamination that existed before the buyer began work on the site. The PPA will not provide protection if the buyer creates any new contamination or makes existing site conditions worse.

In return for this conditional release from Superfund liability, the buyer agrees to help EPA with its mission of protecting human health and the environment. The PPA requires the buyer to: avoid any activities that would disturb the cleanup; provide EPA with access to the site so EPA can monitor the success of the cleanup; and, in many cases, help perform, or pay for, the cleanup itself.

In California, the Federal government entered into a PPA with a local real estate developer that allowed the Fairchild Semiconductor site to be transformed into the World Headquarters of Netscape Communications. Another successful PPA will allow soccer fields to be built over the cleaned up Avtex Fibers site in Virginia.

ENCOURAGING ECONOMIC REDEVELOPMENT

Many people have the feeling that if an area becomes contaminated with toxic waste, it will be a wasteland forever. It may be cleaned up, it may be safe, but the best that can happen after the label of environmental contamination is placed on the property is for it to be fenced off, becoming a permanent economic blemish on a community.

But that perception is incorrect. Hundreds of contaminated properties have been cleaned up and turned into office parks, industrial centers, shopping centers, residential areas, tourist centers, and wetlands. Sites that were once abandoned or underused have now become valuable community resources. Areas that once helped to drag the local economy down are now generating new tax revenue, creating jobs and serving as catalysts for broader revitalization.

Successful reuse of once-contaminated properties is happening all over the country. Communities and EPA; developers and State officials; local political leaders and large corporations – all are joining together as partners to make reuse happen.

Returning “Brownfields” to Productive Community Use

“Brownfields” are formally defined as abandoned, idled or underused industrial and commercial properties where expansion or redevelopment is complicated by real or perceived environmental contamination.

Examples include abandoned gas stations, dry cleaners, and photo labs. Brownfields can also encompass much larger facilities like underused shipping terminals or an industrial plant that has closed its doors.

Often in the past, these urban or rural properties were idle after their industrial or commercial uses. They existed as eyesores to the community and drains on the local economy. Developers did not want to go near them, so they built the new gas station (or parking lot or office building) on some undeveloped lot – possibly in suburban or rural areas. Such actions contributed to sprawl and to the slow disappearance of “greenfield” areas.

EPA announced the Brownfields Initiative in 1993 to clean up abandoned, contaminated sites and restore them to productive community use. The benefits of successful brownfields development go far beyond the immediate improvement of public health and environment. Many of the neighborhoods surrounding brownfields were traditionally stable, working class areas that have deteriorated since the departure of the industries that sustained them. Some of the Nation’s highest concentrations of poverty, crime, and other social problems are located in areas close to brownfields. Redevelopment can help remove blight from these neighborhoods and generate jobs and income. Brownfields projects can also serve as catalysts for the revival of older communities and neighborhoods.

The Brownfields Initiative has achieved these successes through four general programs:

- Providing grants for brownfields assessment and cleanup pilots;
- Clarifying liability and cleanup issues;
- Building partnerships and outreach among Federal agencies, States, municipalities, and communities; and
- Fostering local job development and training initiatives.

Since 1993, the Brownfields Initiative has awarded over 500 grants to communities nationwide, totaling over \$164 million. These grants have resulted in the creation of over 7,000 new jobs and have leveraged over \$2.3 billion in private investment. According to a study done by the Conference of Urban Economic Development,

BRINGING DEVELOPMENT TO A BROWNFIELD IN CONNECTICUT

Bridgeport, Connecticut has been plagued with economic hardship due, in large part, to the departure of several industrial operations in the 1980s. Several of these former industrial properties which remain abandoned – often viewed as eyesores detracting from property values – have been the focus of city officials in recent years.

The former Jenkins Valve Company site, located at the city’s main gateway, has been fueling a growing urban renewal effort in Bridgeport. Through innovative fund-raising and a \$200,000 EPA Brownfields Assessment Pilot Initiative grant, the City of Bridgeport identified the property as a priority Brownfields site and performed an evaluation of the property exploring site redevelopment. Based on this evaluation, the Zurich Re Corporation invested \$11 million to clean up and redevelop the site. Both the State and the City contributed a total of \$3 million for site redevelopment.

The result is the state-of-the-art Harbor Yard sports complex featuring a new 5,500-seat minor league ballpark, the home of the Bridgeport Bluefish. There are also plans for a sports arena and a new museum. The complex is a testimony to the commitment of EPA, the State, the City, the business community, and the residents of Bridgeport to revitalize a once-forsaken area with new development.



Brownfields reuse in Bridgeport, Connecticut

**SOME OF THE MAJOR
BROWNFIELDS PROGRAMS**

ASSESSMENT DEMONSTRATION PILOTS - These grants do not pay for cleanup, but provide seed money for environmental site assessment and planning that allows communities to attract investments for revitalization and sustainable growth. EPA has awarded 362 pilots, each funded up to \$200,000 over two years.

NATIONAL PARTNERSHIP AND SHOWCASE COMMUNITIES - Designated showcase communities work with local and State officials to develop local solutions to clean up and redevelop brownfields. These communities serve as national models for other communities with similar issues. The first round of 16 communities was announced in 1998 and has leveraged more than \$900 million for cleanup and economic development. EPA announced 12 additional showcase communities in October 2000.

BROWNFIELDS CLEANUP REVOLVING LOAN FUND (BCRLF) - BCRLF bridges the gap between environmental assessment and development of brownfields properties by providing capital to fund cleanup efforts. EPA has awarded 104 pilots totaling \$64.8 million.

JOB TRAINING AND DEVELOPMENT DEMONSTRATION PILOT PROGRAM - Public and private institutions can receive grants of up to \$200,000 over two years to create job opportunities for residents living near brownfields sites and to ensure well-trained workers for cleanup and redevelopment activities. EPA has provided \$6.9 million in grants to 37 communities.

almost \$2.50 of private investment has been leveraged for every \$1 invested by Federal, State, and local governments.

There have been many notable Brownfields successes. One prominent success occurred in Dallas, Texas. The city initially received a \$200,000 Brownfields grant from the Federal government and has leveraged over \$840 million in public and private development funds. This money has been used to clean up and redevelop 15 sites and reclaim more than 1,000 acres of brownfields. Residents now benefit from new low-income housing developments, a city recreation facility, shopping centers, an environmental training and technology center, and hundreds of new jobs.

On October 12, 2000, the Brownfields Initiative was recognized by the Harvard University John F. Kennedy School of Government and Council for Excellence in Government with their Innovations in Government Award. This is the highest award given to government programs that have served the public and have developed innovative approaches to addressing important public challenges.

Reusing Superfund Sites

The Superfund Redevelopment Initiative (SRI) was announced in 1999, but the effort to return Superfund sites to productive use has been in place for a number of years. Building on the Superfund Reforms and the Brownfields Initiative, EPA has put in place a coordinated national program to make certain that communities have the tools and information needed to realize the potential of reusing Superfund sites.

One recent success story is the Fairchild Semiconductor site in California, which now hosts the World Headquarters of Netscape Communications. The 1,600 high-tech executives and employees who work at this once-vacant property earn more than \$153 million annually – infusing over \$122 million of personal spending into the economy and providing more than \$11 million in local and State taxes. This now-valuable Silicon Valley property is also the current or future home of major firms like American Online, Veritas Software, Hewlett-Packard, and KPMG Peat Marwick.

The commercial redevelopment of the former Fairchild Semiconductor site is just one part of a larger plan to link the nearby residential community with the high-tech job center that now occupies the former Superfund site. Plans are underway to build light rail stations, restaurants, parks, biking trails, and open spaces.



Netscape Headquarters on former Fairchild Semiconductor site in California

A very different example is provided by the Chisman Creek site in Virginia, which has been transformed into a sports park containing two lighted softball fields, four soccer fields, two ponds, and the County's Memorial Tree Grove. The sports park supports a 42-team softball league in the summer, and a community youth soccer program in the fall.

There have been more than 190 such success stories at Superfund sites in all areas of the country, over 150 of them involving totally new uses for a site.

The keys to successful cleanup and reuse are the community and the partnerships it can create. Each community decides how far and how wide the benefits of reusing a Superfund site will extend. But it is the partnerships that provide the fuel for success. Successful cleanup and reuse has required strong relationships between communities, EPA, local businesses, large corporations, State governments, and local officials.



Playing softball at former Chisman Creek site in Virginia

HOW SUPERFUND "WORKS" AT ANACONDA



Old Works Golf Course at former Anaconda Smelter site in Montana

In 1997, golfing legend Jack Nicklaus opened the Old Works Golf Course, which he designed. Praised by *Golf Journal* as "world class . . . with 18 fascinating holes," the Old Works course was built over the cleaned up Anaconda Company Smelter site in Montana.

Building a world class golf course over a shut-down copper mine was the result of a successful partnership between Nicklaus, EPA, the State of Montana, the Anaconda community, the local government, and the Atlantic Richfield Company (ARCO), the potentially responsible party.

EPA entered into a consent decree with ARCO to implement the cleanup remedy. Concerned citizens of Anaconda used a TAG to review EPA studies and relay their findings to the rest of the community. EPA, the State, the community, and ARCO worked together to develop a cost-effective re-vegetation plan to prevent contamination from spreading. EPA also helped orchestrate an agreement that transferred ownership of the golf course from ARCO to the County government, including a condition that required revenues be used for the continued economic growth of the Anaconda area.

At Anaconda, the Superfund reforms came together, not only to clean up the site, but to transform it for the community's economic betterment. When the smelter shut down, the community was worried that Anaconda would turn into a ghost town. Now tourists come from miles around to play golf – and many come back when they discover that the area also offers excellent skiing, fishing, hiking, and hunting.

FULFILLING THE PROMISE OF EARTH DAY

SUPERFUND'S SUCCESSES ON ITS 20TH ANNIVERSARY

- Over 6,400 removal actions have been taken to reduce immediate threats.
- 757 Superfund sites have had all cleanup construction completed.
- Of the 1,450 final NPL sites: 219 are deleted; and over 1,200 have all final cleanup plans approved.
- Of the 59 sites proposed for listing on the NPL, 28 have had, or are undergoing, some cleanup.
- Over 650 Five-Year Reviews have been completed to ensure long-term effectiveness of cleanup remedies.
- Since 1992, responsible parties performed over 70 percent of all new cleanups at NPL sites.
- Over the life of the Superfund program, the estimated value of private party settlements is \$18 billion.
- Over 460 *de minimis* settlements have been reached – allowing 22,800 small waste contributors relief from the burdens of Superfund litigation.

In 1990, the first family moved into a home at Love Canal since the area was evacuated in 1978.

This trend continued through the next decade. By 1998, 232 homes had been renovated and sold, and there was a waiting list for additional families to move into the area.

The site that prompted Congress to enact the Superfund legislation is now seen as a desirable place to live once again. Love Canal has been cleaned up. It awaits deletion from the NPL, which is expected in 2001.

MEETING THE CHALLENGE

By the time the Nation came together to celebrate the first Earth Day in 1970, it had developed an understanding that, to ensure a good quality of life for ourselves and our children, we must act as responsible stewards of the air, water, and land. However, at the time of first Earth Day, the dangers associated with past industrial activities were not fully understood.

The events at Love Canal awoke the nation to the consequences of past practices of the industrial age. Hazardous wastes that many thought had been appropriately taken care of were re-emerging into our environment. The discovery of the dangers resulting from sites like Love Canal presented the Nation with new challenges.

An entire new program needed to be created to fulfill the Earth Day goal of achieving a clean and safe environment. However,



Earth Day parade

RENEWAL OF WATERFRONT PROPERTY IN NEW YORK

In the City of Glen Cove, New York, 146 acres of under-used, contaminated land lay idle along the city's waterfront district. This waterfront area in Glen Cove has been the hub of industrial activity since the mid-1800s. Many heavy industrial and manufacturing uses have since ceased, vacating many properties. Because of liability concerns associated with the Superfund law, redevelopment of this prime real estate had not occurred. However in 1993, with the launching of the Brownfields Initiative, new innovative approaches provided new hope for the future of this property, and hundreds like it around the country.

With the aid of Federal money facilitating reuse, the City of Glen Cove is cleaning up and redeveloping this brownfields site. Important partnerships among Federal, State, and local agencies (in collaboration with environmental, business, and community groups) have directed redevelopment. It is estimated that, once redevelopment is complete, Glen Cove's waterfront brownfields will result in 1,700 new, full-time jobs at all skill levels, offering new employment opportunities to low- and moderate-income residents. New businesses on the redeveloped sites are expected to gross \$200 million in annual sales, with annual tax yields of nearly \$10 million.



New commercial opportunities in Massachusetts

by the close of Superfund's first decade, it became clear that the goal could not be achieved simply by laws and regulations – or by the Federal government alone. Instead, partnerships needed to be formed. EPA reached out to States, Tribes, communities, and industry to forge stronger relationships.

EPA facilitated these partnerships through reform of existing programs and creation of new innovative ones. The goals of protecting human health and the environment remained the same, but the means were reinvented. Today, Superfund is more flexible, more effective, more sensible, and more affordable – seeking to achieve the best environmental results for the least cost.

But the proof of Superfund's success is found in our backyards.

Creating Economic Opportunities in Massachusetts

The Industri-Plex site in Woburn, Massachusetts is one illustration of what can happen when partnerships are formed among the community, State, EPA, and the private sector. Industri-Plex is a 245-acre industrial park located 12 miles north of Boston along the heavily-traveled Interstate-93 corridor. Since 1853, it had been the home of various chemical manufacturing operations, including the manufacture of glue from raw animal hides and chrome-tanned hide wastes. These operations caused the soils and the ground water to become contaminated with elevated levels of metals, such as arsenic, lead, and chromium.

Industrial activities ceased at the site in 1969, and the property was sold for development. In the late 1970s, the developer unearthed animal hides, which emitted odors that smelled like rotten eggs. Because of community protest, development activities ceased at the site in 1980 and the Federal government became involved. The site was placed on the first NPL in 1983.

Because of innovative thinking and flexibility, a site that was once the subject of community unrest has been transformed into a center of community pride. When the Federal government settled with the PRPs in 1989, two Trusts were formed among EPA, the Massachusetts Department of Environmental Protection, the City of Woburn, and 24 current and former landowners. The Trusts facilitated the cleanup of the site and its eventual redevelopment.

The many partners were committed to making the Industri-Plex site both safe and economically viable. Lines of communication were kept open, and ways to resolve normally difficult problems were found. Today, this former toxic wasteland has been cleaned up and redeveloped for the following uses:

- **Regional Transportation Center** - State agencies have developed a 36-acre transportation facility that can accommodate 2,400 parking spaces for commuter train service into Boston, a Park and Ride bus service, and shuttle service to Logan Airport.
- **Commercial and retail district** - A Target department store has been constructed, along with 750,000 square feet of office and hotel space.
- **New highway links** - A new highway interchange between I-93 and I-95 eases severe regional traffic congestion and provides access to new businesses. Additionally, the main thoroughfare through the site has been improved and extended.

Cleaning up Industri-Plex has been good for the environment, but it is also a boon to the local economy. The new developments at Industri-Plex now provide as many as 4,300 permanent jobs, approximately \$147 million in annual income associated with those jobs, and a \$4.6 million potential increase in residential property values within two miles of the site.

Creating a New Wildlife Habitat in Ohio

Superfund – combined with innovation, communication, and partnerships – can also lead to new environmental habitats.

The 12-acre Bowers Landfill in Circleville, Ohio was first operated as a pit for gravel excavation, but it was converted to a municipal solid waste landfill. Later the landfill began accepting industrial wastes, including approximately 7,500 tons of chemical waste.

Disposal practices at the Bowers Landfill frequently consisted of depositing waste directly onto the ground and covering it with soil. Waste also was burned on-site. In 1980, investigations determined that contaminants in the landfill were polluting nearby monitoring wells with volatile organic compounds. In 1983, the site was added to the first NPL.

Partnerships formed quickly once the site was identified as a national priority. The partners included EPA, the Ohio Environmental Protection Agency, the Ohio Division of Wildlife, the U.S. Fish and Wildlife Service, and the local community. Each partner played a crucial role in the planning and design of the cleanup. In 1985, the Bowers Landfill Information Committee was formed, providing the surrounding community with an opportunity to become involved with the daily activities of the site. These partnerships facilitated communication, which in turn fostered numerous positive economic and social impacts for the local community.



Cleanup creates wetlands at Bowers Landfill

**NEW THREATS POSED BY
TOXIC WASTE SITES CONTINUE
TO BE DISCOVERED**

In 1996, the State of New Jersey responded to a discharge of an unknown liquid in a housing development. Subsequent investigations revealed elevated levels of creosote seeping into the basements of homes. New Jersey and EPA began an investigation of the site, which found that the contamination was extensive. In 1998, responsibility of the site was transferred from the State to EPA.

EPA conducted extensive soil sampling and found that the levels of carcinogenic materials were at unacceptable levels for at least 19 homes. EPA initiated a Removal Action to reduce the threat of contamination for these 19 families. In 1999, the Federal Creosote Site was added to the NPL.

EPA's cleanup requires the permanent relocation of residents from an estimated two dozen properties. The selected remedy also includes the excavation of contaminated soils for thermal treatment and disposal.

Twenty years after the passage of CERCLA, the Federal Creosote Site demonstrates that the threats first given wide publicity by Love Canal continue to the present day. The big difference is that now there is a strong Superfund program to help address these threats before they become major dangers.

Cleanup of the Bowers Landfill required many creative innovations. For example, EPA and the State of Ohio decided that they needed to do something to protect the newly-capped landfill from floodwaters that frequently inundate the land along the Scioto River. The site's location near the river made it ideal for creating wetlands.

This innovative and cost-effective use of the land not only controls flooding, but benefits the surrounding ecosystem. The wetlands are now flourishing, providing a safe habitat for numerous species of plants, birds, and other wildlife.

FACING NEW CHALLENGES

Wildlife habitats. Transportation centers and shopping malls. These are the just some of the successes of Superfund.

As Superfund enters its third decade, EPA faces four central challenges:

- The Agency will continue the cleanup of NPL sites, as well as address immediate contamination problems through Removal Actions across the country;
- EPA will continue to ensure that cleanup remedies remain protective of human health and the environment for years to come;
- As new sites are identified, EPA will share responsibility with States, Tribes, and other stakeholders to work with communities and PRPs to get these sites cleaned up efficiently; and
- The Agency will continue to serve as a catalyst to promote redevelopment at both brownfields and former Superfund sites.

Because of Superfund, sites that were once dangerous have been made safe. Land that was once desolate has been restored to productive use for communities across America. And new toxic waste sites are prevented from occurring in the first place by the presence of Superfund.

This is Superfund on its 20th anniversary. Now entering its third decade, Superfund will continue its evolution to meet the new challenges of a clean and safe environment – the promise of Earth Day.

Thanking OUR FEDERAL PARTNERS

EPA has primary responsibility for implementing Superfund, but because of the complexity of hazardous waste issues, the Agency has relied on the respective strengths of the following Federal partners to carry out its mission of protecting human health and the environment:

Agency for Toxic Substances and Disease Registry (ATSDR) contributes to the understanding of the negative health effects associated with exposure to hazardous substances, identifies parties at risk of exposure, and intervenes to protect communities from exposure. Since ATSDR was established, it has conducted assessments or consultations at more than 3,000 hazardous waste sites. <http://www.atsdr.cdc.gov>

Army Corps of Engineers (USACE) provides specialized equipment and personnel to assist with the design and construction of large scale remedial actions at Superfund sites. In addition, USACE's Center of Expertise and its Rapid Response Program provide nationwide support to Superfund. USACE has received nearly 5,000 assignments over the last 18 years. <http://hq.environmental.usace.army.mil>

Department of Agriculture (USDA) is responsible for preventing releases at USDA facilities as well as the efficient management and cleanup of hazardous materials when releases occur. USDA has inventoried and characterized over 2,000 sites and completed over 300 removal actions and other responses. <http://www.usda.gov>

Department of Defense (DoD) responds to releases and threatened releases at military facilities. The Defense Environmental Restoration Program (DERP) has responded at 95 percent of the nearly 28,000 potentially contaminated DoD sites – and cleaned up 62 percent of these sites. <http://www.denix.osd.mil>

Department of Energy (DOE) ensures cleanup of radioactive, chemical, and hazardous wastes that were left after 50 years of nuclear weapons production, and associated research and development activities. By the end of 1999, a total of 6,810 releases had been identified – of which 4,053 were in the assessment phase, 876 were in the cleanup phase, and 1,881 had been completed. Three DOE sites have been cleaned up and deleted from the NPL. <http://www.em.doe.gov>

Department of the Interior (DOI) operates programs in support of EPA and the U.S. Coast Guard for preparedness and response actions, and performs natural resource damage assessment and restoration functions during an oil discharge or a release of hazardous materials. DOI is designated as a Natural Resource Trustee and is also responsible for developing the regulations to determine the extent of harm to a natural resource. <http://www.doi.gov/indexj.html>

Department of Justice (DOJ) represents EPA and other Federal agencies in judicial actions in Federal Court to enforce the provisions of CERCLA that require PRPs to perform or pay for site cleanup. DOJ has worked with EPA to transform the Superfund program by prompting responsible parties to enter into settlements or voluntarily comply with administrative orders, rather than litigating with the government. DOJ also represents the Federal trustees when there is a need to recover damages resulting from injuries to natural resources. <http://www.usdoj.gov/enrd>

Federal Emergency Management Agency (FEMA) provides support to State, Tribal, and local governments and to the private sector for responding to releases of hazardous substances. Some of FEMA's activities include: distributing information; planning for emergencies; training for emergencies; membership and participation in the 13 Regional Response Teams; and the administration of \$5 million each year to State governments and Tribes for hazardous materials (HAZMAT) training. <http://www.fema.gov/pte/carep.htm>

National Institute for Environmental Health Sciences (NIEHS) sponsors two major Superfund programs: the Hazardous Substances Basic Research and Training Program and the Worker Education and Training Program. These two programs have successfully trained over 800,000 workers across the country by providing nearly 42,000 classroom and hands-on training courses that account for over 12 million contact hours of training. <http://www.niehs.nih.gov>

National Oceanic and Atmospheric Administration (NOAA) acts on behalf of the Secretary of Commerce as a natural resource trustee. NOAA trust resources include coastal and marine fisheries, marine mammals, resources of National Marine Sanctuaries and Estuarine Research Reserves, tidal wetlands, and other coastal habitats. Through the Coastal Protection and Restoration Program, NOAA has worked with EPA, PRPs, and other Federal, State, and Tribal trustees to initiate cleanup and restoration activities at over 500 sites, ensuring more environmentally protective remedies and cleaner, healthier coastal habitats. <http://www.noaa.gov>

United States Coast Guard (USCG) continuously maintains facilities for the surveillance of oil discharges and hazardous substance releases that occur in the coastal zone. USCG administers the National Response Center (NRC) which provides a centralized means for coordinating national response logistics for responding to releases. NRC also maintains a database of critical hazardous substance information that can quickly be provided to responders in order to help identify a substance and thereby correctly choose an appropriate response action. <http://www.uscg.mil>

FOR FURTHER INFORMATION . . .

on the Superfund program, please consult

www.epa.gov/superfund

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