

Superfund: A Half Century of Progress

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Former managers and staff of the U.S. Environmental Protection Agency (EPA) have formed an EPA Alumni Association (EPA AA). The association has developed this and six other web-based subject matter essays in support of its Half Century of Progress project. An integrated summary based on all of these essays, [Protecting the Environment: A Half Century of Progress](#), is available on the Association website. The Association has developed these materials to inform high school and college students and other members of the public about the major environmental problems and issues encountered in the United States in the latter half of the 20th century, as well as the actions taken and progress made in mitigating these problems. We hope that, besides summarizing the history of U.S. environmental programs, these essays might inspire some students and others to consider careers in the environmental field.

A number of retired EPA program managers and subject matter experts worked together to produce each of the essays. This document was reviewed by the EPA AA Board of Directors and members of the association. We welcome comments on this document, which you may email to [the EPA Alumni Association](#).

Superfund: A Half Century of Progress

I – History

In April 1978, residents of Niagara, New York, awoke to newspaper headlines about a former river diversion called Love Canal. Following practices typical of the time, a local chemical company had used it for years as a dump site. An elementary school sat on the closed site. By August, both New York State and the federal government had declared states of emergency.

Until the 1970s, there were few controls on the handling and disposal of hazardous waste. Generators of waste typically disposed of their wastes onsite or arranged for companies to transport them offsite, usually to locations unknown to the generator. Once waste left the plant fence line, companies usually had no idea where it ended up. Unscrupulous transporters or disposers of such waste had little, if any, regulatory control, and many times the waste was disposed of in locations that were not isolated from the environment and caused significant harm to the groundwater, surface water, and soils. This resulted in a legacy of sites throughout the country where public health and the environment were being seriously harmed.

In the late 1970s, the beginnings of recognition of past hazardous waste disposal practices, such as Love Canal and Valley of the Drums, presented a need for environmental cleanup at highly contaminated sites posing significant health risks, when the parties who owned contaminated land were unknown, were not financially viable, or did not believe that they were responsible for the contamination, or where waste generators were not aware of where their waste was disposed of. Since there was no effluent discharge or air emission, and hazardous waste rules were still being developed, there was no apparent national-level control over the contamination or method to require cleanup.

The regulatory environment for industrial or municipal facilities depended on owner/operators to perform necessary environmental control. Since these were operating facilities, there was a cash stream that could be used for environmental cleanup. The Clean Water Act and Clean Air Act were the major environmental control programs for these facilities. The national hazardous waste management program under the Resource Conservation and Recovery Act (RCRA) had just been passed in 1976 and regulations were not yet developed. The purpose of RCRA was to manage the handling of currently generated, transported, or disposed of hazardous waste and was not focused on handling past contamination.

Although the EPA attempted to use the developing RCRA program to deal with some of these hazardous waste sites using emergency authorities under Section 7003, it became apparent to many that a new law was necessary to deal with these types of contaminated sites.



II – Major Early Implementation Actions Taken

In December 1980, during a lame duck session of Congress, the Comprehensive Environmental Response, Compensation and Liability Act—nicknamed “Superfund”—was passed by Congress and signed by the President.

Because many of the contaminated sites being discovered at that time were either “orphan” sites (i.e., without known or financially viable owners), or were caused by parties who did not have records to show where their waste went decades before, it was clearly recognized that two approaches might be necessary:

A different liability scheme, or

A public works program for cleanup that would provide government funding for cleanup.

In the end, both concepts were included in the new law.

Because of the difficulty in assigning responsibility for cleanups, it was recognized that there was a need for strict, joint, and several and retroactive liability to make a wide net to provide financially viable parties who could and should pay for cleanup. Contrary to most environmental laws, which usually deal only with current owners, Superfund casts a wider net for its responsible parties. These parties include past or present generators and transporters of hazardous materials to the site, as well as current—and with some exceptions, past—owners of the site in order to find enough responsible parties to pay for the cleanups.

To fund the program, it was recognized that resources were needed to staff EPA to run the program and for investigations and cleanups where responsible parties could not be

easily found. As a result, the Superfund was established to provide public funding (through a taxing mechanism on certain industries) to build the program, manage it, and clean up “true” orphan sites. Funding started at \$1.6 billion, and then increased to \$8.5 billion.

During the early days of the Superfund program’s implementation, comprehensive regulations were developed and added to the already existing oil spill procedures to form the oil and hazardous substances National Contingency Plan. This provided the framework for program implementation. During this early period of program development, much of the Superfund was utilized for government staffing and contract funds to implement the program.

Early cleanup action focused on site cleanup studies, emergency response to contain and stabilize immediate threats, and mechanisms to identify potentially responsible parties (PRPs) who were responsible for cleanups. During this time, there was significant public support for the program



III – The Program Overcomes Hurdles

Emergency response activities were highly successful in reducing immediate site threats to human health and the environment throughout the years. However, because of the huge sums and long time frames that were required for the less immediate and more complex, longer-term cleanup actions, many stakeholders began to criticize the program. They included PRPs, states, Congress, and the public.

Early political concerns and criticism about program management resulted in top management changes in the early 1980s, as well as efforts to streamline processes and

develop a more robust enforcement program for PRPs to shoulder a larger load of site cleanups. Further, the continuing complexity of investigations and site work slowed progress toward many cleanups. Early results were disappointing to many critics. Groundwater cleanups were especially problematic, as more became known about their limitations and need for even longer cleanup time. Long-term “remedial” cleanup costs rose rapidly from the millions, to the tens of millions, to the hundreds of millions of dollars, fueling criticism from parties responsible for paying for the cleanups.

EPA responded with a set of administrative reforms meant to speed up program implementation and make a “fairer” process for PRPs. This led to some improvements in process and results.

When Congress determined not to renew Superfund taxes on industry in the 1990s, funding for the program was required to come from general appropriations. As a result, significant limits were put on EPA’s ability to perform cleanup work itself, and an increasing percentage of cleanups was being performed by PRPs. EPA focused activity during this period and onward on ensuring that PRPs perform most of the cleanups, thus saving dwindling public funding for government oversight of private actions.

In the first decades of the 21st century, the Superfund program has continued to remediate hazardous waste sites, albeit with more stable implementation as responsible parties, state and local governments, Congress, and local citizens have recognized the difficulties of hazardous site cleanup. Most cleanup is done by responsible parties under the oversight of EPA and states that have set up parallel programs for less contaminated sites. Also, the federal government has reserved funding for cleaning up formerly or currently owned federal facility sites. Many of the smaller, less complex sites have been remediated, and a higher proportion of sites are large-area, difficult-to-remediate sites, such as mine tailing and sediment cleanups.

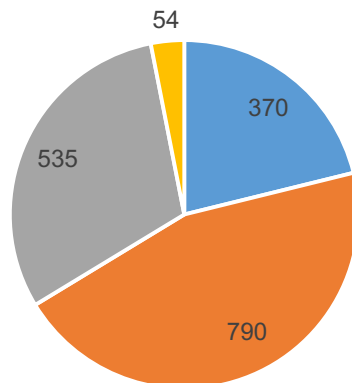
IV – Progress Made

Since 1980, more than 1,700 sites have been put on the cleanup list. Of these, the table below reflects the progress as of 2013. The authors developed these estimates based on multiple sources, including communications with experts.

Number of sites cleaned up and removed from the cleanup list.	370
Number of sites where construction of cleanup facilities is completed, but where facilities need to be operated into the future.	790
Number of sites where cleanup is underway.	535
Number of sites not yet at cleanup stage.	54

This distribution of sites is illustrated graphically below:

Superfund Cleanup Status



- Number of sites cleaned up and removed from list
- Number of sites where construction of cleanup facilities is completed, but need facilities to be operated into the future.
- Number of sites where cleanup is underway
- Number of sites not yet at cleanup stage

One can look at these figures from two directions. One reaction could be that only 370 sites have been removed from the list, and there is still much work that needs to be done to clean up all the sites on the list. This view does not consider the complexities of studying and remediating contamination that is underground, and thus hard to locate and remove, even with today's technologies. Another view could be that all but 54 sites either have been fully cleaned up or are in the process of being cleaned up. The public's reaction to Superfund tends to gravitate toward these two views. In fact, there has been a tremendous reduction in risk to the public from these cleanups, and most critics recognize that this work is important and needs to continue.

An additional unquantifiable benefit of the Superfund program has been how the Superfund liability scheme has revolutionized the way commercial and industrial real estate is transferred. No longer can sellers of such property use "let the buyer beware" as a means to relieve themselves of liability for contamination from past activities. No conditions in a private contract of sale regarding past contamination can shield a party from Superfund liability. In addition, buyers of such property have been much more conscious of potential liability. An entire industry has developed that deals with Superfund liability in property transactions, thus ensuring that knowledge of contamination is clear to all parties during property transfers.

Another benefit of the Superfund program was the recognition that industrial development of remediated Superfund sites created opportunities for industrial growth

in formally blighted areas. The “Brownfields” program was started in the 1990s and developed processes, procedures, and funding for local governments to convert formerly contaminated sites to productive industrial redevelopment. Prompted by a series of court cases in the early 1990s that essentially caused lenders to redline contaminated property for fear of potential liability, the first several rounds of Brownfields pilot projects provided local governments with financial assistance and tools to assess such properties in terms of the financial ramifications of any contamination, and also provided prospective lenders and purchasers with liability relief.

These early rounds of pilot projects in the mid-1990s became so politically and financially acclaimed that they led to widespread calls by labor unions, local governments, and financial entities for congressional legislation to codify the programs’ success. In January 2002, President George W. Bush signed into law the Small Business Liability Relief and Brownfields Revitalization Act (the “Brownfields Law”).

As of September 2015, EPA estimates that grants through the Brownfields program have cumulatively leveraged \$24.2 billion and 116,963 jobs and led to 56,442 acres of land made ready for reuse. The program has also led to ancillary economic revitalization. For instance, EPA studies have found that residential property values around assessed or cleaned-up brownfields sites increased by 5.1 to 12.8 percent.

V – Future Challenges

There are significant future challenges for Superfund. As the simple and relatively easy sites are cleaned up, a residual number of difficult and massive sites need to be addressed. Examples are large-area mining and sediment sites, with estimated costs of hundreds of millions to billions of dollars for cleanup at each site. Currently, these few large sites dominate EPA funding requirements, leading to the public who live near other unfunded sites to wonder: “Where is Superfund?”

Another challenge in the Superfund program concerns past or current federal facilities, which are being remediated much more slowly. Among the reasons are the differences in EPA’s ability to require performance as compared with private sites, the sheer number of federal facility sites, and the difficulty of dealing with Department of Energy radioactive wastes. As a result, a significant number of federal facilities still need to be remediated.

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