Salting the Earth

The Case for Repealing Superfund

Jerry Taylor

Few environmental problems have stirred the kind of popular passions that are behind the concern over abandoned hazardous waste landfills. Similarly, few environmental laws have aroused the disdain and frustration that policy analysts of all stripes feel toward Superfund, the main legislative vehicle that addresses those public fears. Although by no means the most expensive or most encompassing of environmental statutes, Superfund nonetheless costs society about $4 billion annually and, according to a study by the Waste Management Research and Education Institute at the University of Tennessee, will eventually cost the nation about $400 billion.

The law has done terrible economic damage to those unfortunate parties targeted by its crude attempt to "make the polluter pay." In fact, the statute's economic and environmental excesses are so widely acknowledged and well documented that it is curious that reform, rather than repeal, is the political currency of the day. The truth is that Superfund's problems are so systemic that only by repealing the law and starting anew can society's interest in efficient and effective remediation of hazardous waste sites be realized.

Legislating by Anecdote

Although environmentalists now decry the 104th Congress's alleged practice of "legislating by anecdote," it is worth remembering that Superfund is the most historically noteworthy example of that practice. The law was almost entirely prompted by the events at Love Canal in 1978 and the ensuing evacuation. Indeed, Love Canal is today a fundamental part of the modern American psyche and a potent symbol of the supposed irresponsibility of corporate America. Since Superfund was to ensure that there would be "no more Love Canals," it is worthwhile to review briefly the history of those events. Environmentalists are correct in arguing that the crisis at Love Canal was not an isolated occurrence and that much can be learned from the events of 1978.

The villain of the Love Canal saga was Hooker Electrochemical Company, a firm that legally disposed of 21,800 tons of its wastes in the abandoned canal trenches of the area from 1942 to 1953. Hooker chose the site for two very good reasons: the impermeable clay soil of the area protected the groundwater from contamination, and the largely unpopulated region outside of Niagara Falls minimized any potential exposure to the waste. A number of governmental agencies, including the U.S. Army, disposed of toxic wastes at the site during and after the war (a fact that the government attempted to cover up in 1978), as did the municipality itself. But the postwar suburbs of Niagara Falls began to encroach on the site, and America's baby boom forced town officials to scramble to meet the education-

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al needs of a rapidly increasing number of children. Accordingly, the local school board in 1952 thought the site an ideal location for an elementary school, and when Hooker refused to sell the site, the board threatened to use its power of eminent domain unless the company turned over the property.

Hooker went out of its way to make sure the school board knew what it was getting into. The company escorted board members to the site and in their presence made eight test borings into the trenches; two of the borings uncovered chemicals just four feet below the surface. When that did not deter the board from taking the property, the company capped the already clay-lined trenches with an additional four feet of clay, a practice that far exceeded the standard design for such sites at the time, and that, according to EPA officials, could well have won the site a federal operating permit even as late as the mid-1980s. The final paragraph of the deed of sale (the entire site was sold to the board for one dollar) was quite explicit: "Prior to the delivery of this instrument of conveyance, the grantee herein has been advised by the grantor that the premises above described have been filled, in whole or in part, to the present grade level thereof with waste products resulting from the manufacturing of chemicals by the grantor at its plant in the City of Niagara Falls, New York, and the grantee assumes all risk and liability incident to the use thereof. It is therefore understood and agreed that, as a part of the consideration for this conveyance and as a condition thereof, no claim, suit, action or demand of any nature whatsoever shall ever be made by the grantee, its successors or assigns, against the grantor, its successors or assigns, for injury to a person or persons, including death resulting therefrom, or loss of or damage to property caused by, in connection with or by reason of the presence of said industrial wastes. It is further agreed as a condition hereof that each subsequent conveyance of the aforesaid lands shall be made subject to the foregoing provisions and conditions."

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Hooker Electrochemical's careful attempts to contain the waste and warn of the site's dangers were immediately undone by the school board. Thousands of cubic yards of the clay cap were scraped away in the course of constructing the school and later during the landscaping of a housing development that was built on the site. The board's attempted sale of land in 1957 for residential purposes was vigorously opposed by Hooker. The *Niagara Gazette* reported at the time that Hooker's attorney told the Board of Education that it had a "certain moral responsibility in the disposition of the land" and that the waste at the site "made the land unsuitable for construction in which basements, water lines, sewers, and such underground facilities would be necessary." Finally, he warned that "the property should not be divided for the purpose of building homes and [hoped that] no one will be injured." Despite those and subsequent pointed warnings, the board went ahead anyway and eventually sold the land to developers, while city workmen constructed sewers throughout the area that were in due course directly responsible for breaching the site. It was only a matter of time before the wastes leached out of the trenches and into the lives of the hapless residents of Love Canal.

What we have, then, is not a parable of rapacious, shortsighted capitalists putting profit above public health, but the story of a conscientious company whose best efforts were undone by shortsighted public officials who put immediate political return above the general welfare. Although that was not quite the spin the media put on those events 17 years ago, a few newspapers did manage to note last year that a federal court rejected New York State's attempt to levy $250 million in punitive damages on the company.

Of course, what gripped the public imagination were the preliminary health assessments—based entirely on anecdotal evidence—that pointed toward a public health emergency. Although such reports were, to say the least, widely and uncritically reported by the press, far less attention was given to the subsequent discrediting of those accounts. A 1980 study conducted by the New York State Department of Public Health found that "both the numbers and types of can-

cer [at Love Canal] were in no way unusual from that which would be expected in the general population." That same year a committee headed by the chancellor of the Memorial Sloan-Kettering Cancer Center found that "there has been no documentation of acute health effects linked to exposure to toxic wastes at Love Canal." The following year a study published in *Science* concluded that "data from the New York State Cancer Registry show no evidence for higher cancer rates associated with residence near Love Canal." A sensational preliminary study finding increased birth defects, epilepsy, bronchitis, and cancer in the town was discredited by a panel of state medical researchers who noted that the findings fell "far short of the mark as an exercise in epidemiology. . . . The illnesses cited as caused by chemical pollution were not medically validated. . . . [The report] cannot be taken seriously as a piece of sound research." Reports issued by the Center for Disease Control in 1983 and 1984 found no incidences of increased disease or cancer and "no increase in the frequency in chromosomal abnormalities . . . of residents of Love Canal." A 1991 report by the National Research Council found that even to this day no evidence exists to suggest that Love Canal ever posed any risk to public health.

Thus, almost single-handedly, did government mismanagement at Love Canal and sensationalist journalism deliver us the Superfund law of 1980.

Into the Quagmire

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was the vehicle by which Congress established the Hazardous Substances Trust Fund (Superfund) and the various cleanup and liability protocols in existence today. CERCLA was originally designed as a short-term project; $1.6 billion over five years to tackle 400 sites (by law, at least one per state and, not coincidentally, about one per congressional district). Today Superfund has ballooned into one of the nation's largest public works projects: $30 billion being spent at almost 1,300 sites. The EPA is directed to find parties potentially responsible for the mess and to stick them, rather than the taxpayers, with the bill.

The Superfund site selection process begins when potential sites are brought to the EPA's attention or flagged by the agency's own identification procedures. Those sites are then placed in a computerized inventory system—CERCLIS—that currently lists approximately 35,000 such sites. A preliminary assessment then takes place; about one-third of the sites investigated are found to require no further action. Although the law was originally justified as the only means by which abandoned sites could be cleaned, only a fraction of the sites listed are "orphaned"—most either have current owners or are still in operation. The U.S. Government Accounting Office believes that as many as 425,000 sites may eventually make their way into the CERCLIS.

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Sites deemed potentially hazardous after preliminary assessments are then evaluated using the Hazard Ranking System (HRS) to determine each site's potential threat to public health. The HRS is a crude statistical index that "scores" sites based on potential exposures from groundwater, surface water, air, and soil. Each of those pathways is scored separately on a zero to 100 scale and considered thusly: $HRS = [(GW^2+SW^2+A^2+S^2)/4]^{1/2}$. A score of 28.5 makes a site eligible for the National Priority List (the so-called NPL, which now totals over 1,200 sites), the official ledger of sites to be cleaned up under Superfund.

The 28.5 cutoff score is completely arbitrary, meant only to ensure that 400 sites would be identified for cleanup. As Curtis C. Travis of the Center for Risk Management at Oak Ridge National Laboratory notes, "There is little correlation between a site being on Superfund's National Priority List and the risk it poses to human health. . . . Many sites on the list pose little or no risk to human health. . . . Conversely, many sites with significant health and environmental risks are not on the list." Joel Herschhorn of the Office of Technology Assessment observes that "the ranking system is only very loosely related to the actual severity of the problems at the sites."

The problems with the HRS are legion, although two are most significant: (1) the single

most hazardous substance located at a site is used to "score" the toxicity for all the contaminants at the site; and (2) greater weight is given to the number of people near a site than to the toxicity of the hazardous constituents in question. At a Superfund site in South Carolina, for example, the EPA took two surface soil samples and more than 20 subsurface samples from depths of three to six feet. The most contaminated sample of the nearly 30 performed was used to calculate the soil exposure pathway in the HRS. Dr. Richard Goodwin, a private environmental engineer in New Jersey who has overseen more than 20 cleanups, asked the *New York Times* rhetorically: "Does it make sense to spend million of dollars cleaning up a site that only has a tenth of an ounce of contamination? I say no. All we're doing in most cases is throwing money at a problem without improving public health or the environment."

It is important to remember that, for the most part, private parties—not the federal government—are paying the bills.

Where immediate health risks exist, the EPA is empowered to undertake emergency cleanup actions designed to quickly eliminate risks to the surrounding community. Thomas Grumbly of Clean Sites, an engineering consulting firm, believes that the 2,600 such emergency actions undertaken since 1980 "ha[ve] probably eliminated most of the immediate health risks posed by abandoned hazardous waste sites."

Preliminary assessments and HRS investigations take an average of four years to complete. Not surprisingly, thousands of sites on the CERCLIS are still awaiting such evaluations, and the U.S. General Accounting Office finds that the EPA screens candidate sites according to the level of regional effort necessary for an investigation and the length of time that the site has been in the queue, not according to potential health or environmental risk.

Although CERCLA directs the EPA to make certain that cleanups are cost effective, the EPA is required to favor "permanence" and "treatment" in selecting site remedies. Therefore, the EPA considers more than what would be required to make a site safe for the community at present; it generally considers what needs to be done to make sure the site is safe in the future should that property become the site of a residential development with a high concentration of children, children that might play in and eat the dirt or drink from an aquifer that might become the source of drinking water.

What is often ignored in the Superfund debate is just how few people are presently at risk from any given site. The EPA's Region 1, for example, sampled 13 regional NPL sites and found that the median number of people potentially at risk was only 250. Similarly, professors Kip Viscusi and James Hamilton of Duke University examined 78 NPL sites in 1993 and found that out of 1,430 potential pollution exposures, 70 percent of the cancer risks, 79 percent of noncancer risks, and 72 percent of total risks arose from future, rather than current, land uses. Viscusi and Hamilton found that when both the frequency and the severity of the risks are considered, 91 percent of the risks from sites stemmed from hypotheses about future land use.

Remedies are also required to comply with all legally "applicable or relevant and appropriate requirements." The EPA has interpreted this as requiring, for example, contaminated groundwater aquifers to be able eventually to meet standards set by the Safe Drinking Water Act, whether or not the aquifer is currently being used for drinking water.

It is important to remember that, for the most part, private parties—not the federal government—are paying the bills. By 1993, 80 percent of the costs associated with site remediation were paid by the private sector. The EPA is therefore unconstrained by the budget process and has little incentive not to pursue the fullest extent of cleanup possible.

Federal cleanup costs are paid for out of the Hazardous Substances Trust Fund (what "Superfund" actually refers to), which is funded from several dedicated taxes: a $2.75 billion petroleum tax (weighted heavily against imported oil, a fact that caused the Treasury Department originally to oppose the tax as a hidden oil import fee); a $2.5 billion corporate minimum tax; and a $1.4 billion chemical feedstock tax. Another $1.25 billion is taken from general revenues, and $600 million is expected from cost recoveries from liable parties. According to a recent study from Resources for the Future, 50 percent of Superfund taxes were paid by manu-

facturers; 30 percent came from the general corporate community; 17.5 percent from the finance, insurance, and real estate sectors; and 16.3 percent from transportation companies and public utilities.

Superfund requires states to provide 10 percent matching cleanup funds for privately owned sites and 50 percent matching funds for publicly owned sites. States are also obligated to ensure the existence of appropriate facilities to dispose of any wastes removed from the site. Although the EPA is authorized to conclude cooperative agreements with states or private parties—which allows those parties to assume management responsibility for site remediation—the federal government typically takes the lead in overseeing remediation.

Thus far, the program has proven a disappointment. Only about 200 of the 1,200 sites listed on the NPL have been completely cleaned up—at an average of $30 million and 12 years per site.

"Landfill to the left of us, landfill to the right of us...."

Lawyers in Love

One of the chief reasons for Superfund's exploding costs is the litigious free-for-all engendered by the act. Superfund calls for retroactive liability, meaning that corporate practices that might have been safe, legal, fully permitted, or even required under the law years ago can now be punished retroactively. "Potentially Responsible Parties" (PRPs), according to the law, are those who (1) own or operate a site; (2) owned or operated a site at the time of the disposal of wastes; (3) arranged for disposal, treatment, or transportation of waste; or (4) accepted waste for transport. The courts have interpreted Superfund as calling for joint and several liability, meaning that any party that ever touched that waste—no matter how tertiary the involvement or how minor the amount—can be held liable for the full cost of remediation. Finally, CERCLA shifts the burden of proof from the government to the accused and does not require the government to meet any significant standards for admissible evidence. For example, the vague recollections of a garbage hauler about customers 40 years in the past have repeatedly been accepted as dispositive by the EPA and the courts.

Typically, the EPA tries to hunt down one or two "deep pocket" corporations that can somehow be linked to the site and then hits them with the full cost of cleanup. Those companies then go about finding any party that might conceivably have had anything to do with the site and then sue that party under the joint and several liability standard to pay the bill. Not surprisingly, lawyers, consultants, private investigators, and administrative overhead consume vast quantities

of Superfund dollars. Such "transaction costs" eat up 35 percent of corporate Superfund expenditures, 88 percent of insurance company Superfund expenditures, and 50 percent of public Superfund expenditures. Before 1980 only 2,000 attorneys specialized in environmental litigation nationwide. After 15 years of Superfund that number has increased tenfold. Although not all of those additional 18,000 attorneys were created by Superfund, best guesses from practitioners indicate that about 75 percent were.

Given that anything corrosive, flammable, reactive, toxic, or in great enough quantities (such as 150 gallons of vegetable oil) is considered hazardous waste, hundreds of companies are potentially liable for cleanup costs at any given site. Moreover, banks that loaned those companies money, parties that sold those companies hazardous materials, and municipalities that dumped even routine household garbage or sewage (which the Office of Management and Budget believes are responsible for a quarter of cleanup costs) at the site are routinely held liable for remediation. Even corporations that were required by the government to dispose of their wastes at a certain facility find that "we were only following (government) orders" is no defense against liability.

After investing some $30 billion in one of the most expensive public-works programs in national history, it is somewhat shocking to learn that there is no evidence that *any* good is being accomplished.

The absurdity of that practice is apparent. Superfund liability has "reached out and touched" pizza parlors, butcher shops (one of which was nailed because some residual glue might have been on the flaps of cardboard boxes sent to a site), boy scout troops, clothing rental companies (one of which paid someone $14 in 1972 to haul trash to a Superfund site), churches, schools, and dog kennels. Typical is the case of two deep-pocket PRPs in Utica, New York that sued 603 small and mid-sized businesses and collected about $2 million to pay a $9 million Superfund liability tab, even though half the money went to pay attorneys' fees. Although small companies typically pay from $3,000 to $9,000 to settle, those that are capable of paying more are hit with truly significant tabs.

One of the most negative consequences of the Superfund liability regime is its impact on the inner city. Virtually any abandoned manufacturing plant (and urban America is littered with them) or commercial property is a candidate for Superfund listing. Given Superfund's practice of targeting current owners of listed sites—whether they knew about or contributed to the contamination at all—few are interested in taking a chance by purchasing those properties. Instead, businesses find it much less risky to develop property in areas that have yet to be industrialized. In essence, then, the unintended consequences of the Superfund liability regime include the further impoverishment of inner cities and the accelerated industrialization of land that once harbored healthy ecosystems. Although the EPA has acknowledged the problem (to which they refer as "brownfields"), there is little the agency can do under the standards set by the law.

That Superfund parade of legal horribles is enough to turn even environmental activists against the law. National Wildlife Federation president Jay Hair told an environmental trade journal that the Superfund liability system "has failed" and that it ought to be scrapped. Similarly, the National Association for the Advancement of Colored People has called for the elimination of retroactive and joint and several liability.

Despite the blatant injustices of retroactive and joint and several liability, environmentalists argue that Superfund "makes the polluter pay" and that, after all, the alternative is to have the innocent taxpayer foot the bill for the misdeeds of others. Yet that argument is spurious on several grounds.

First, a company's Superfund cleanup bill is ultimately being picked up by the shareholders, customers, and employees of the firm. Perhaps that is as it should be. After all, the PRP is simply the economic agent of those parties, making those parties ultimately responsible for the PRP's action. Yet the cost of past (sometimes as much as 50 years in the past) behavior is being borne by current shareholders, customers, and employees—many if not most of which might not have had anything to do with the "pollution" for which they are currently being forced to pay. Only by

identifying and "billing" shareholders, customers, and employees of the company at the time of the action could Superfund truly be said to make the polluters pay.

Second, the Superfund tax does not distinguish between responsible and irresponsible waste disposers, or those who generate a lot of hazardous waste and those who only generate a little. In fact, the tax often hits those who have nothing to do with waste generation and disposal in the first place.

Third, there is no requirement that the waste contributed by a PRP have anything to do with the environmental damage being remedied. Thus, if a business is found responsible for sending trace amounts of cadmium to a site undergoing remediation because of PCB-contaminated groundwater, that business is required to pay for part of the cleanup.

Nor can it be said that industrial regions as a whole are being forced to face up to the full cost of the industrial activity from which they once profited. A recent study published in the *Review of Regional Studies* found that a state's contribution to the Superfund excise tax is unrelated to the number of NPL sites or the cost of site remediation in the state.

Finally, it has been suggested that the very brutality of Superfund liability has served as a vital deterrent to potential polluters. That ignores the fact, however, that Superfund focuses on past actions. The Resource Conservation and Recovery Act already dictates in minute detail the management of hazardous wastes from cradle to grave and stipulates its own onerous set of cleanup requirements for those that step out of line. Thus, Superfund probably does little to influence present corporate behavior.

Assessing Superfund Risk

The threat that Superfund sites pose to public health is an uncertain matter. The National Research Council of the National Academy of Sciences recently reviewed the published literature pertaining to Superfund site risks and concluded that it could not "confirm or refute" the belief that Superfund sites present a risk to nearby communities. Of course, it is always difficult to prove a negative, but after investing some $30 billion in one of the most expensive public-works programs in national history, it is somewhat shocking to learn that there is no evidence that *any* good is being accomplished. The fact that only 1 percent of Superfund expenditures is directed at risk evaluation implies that the EPA does not consider such data particularly relevant to the program.

The EPA calculates a site's risk by postulating a "maximally exposed individual" (MEI), one who is generally assumed to: live 200 meters from the site and breathe outdoor air there 24 hours a day for 30 years; have the dietary habits of a newborn and the appetite of a teenager; have the misfortune of an optimally bad breeze that wafts toward him the maximum concentration of the site's pollutants; drink nothing but water drawn from the most contaminated part of an aquifer below the site for 30 years; and—if a child—spend 350 days per year playing on the site and consuming 10 times the average amount of soil consumed daily by children, on the most contaminated ground possible (even if it would be necessary to break through a fence and dig through snow cover and concrete to get at the dirt).

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The accuracy of the EPA's exposure models is questionable, to say the least. At both the Triumph, Idaho and Smuggler's Mountain (Aspen, Colorado) Superfund sites, for example, federal health investigators were certain that high levels of lead were in the blood of townspeople, given their proximity to mine tailings at the site. Yet after decades of exposure blood tests found *lower* than average levels of lead in the bodies of residents, probably because the lead was tied up in the mine tailings, so that only grinding or breaking could possibly release the contaminant. The EPA ignored the test data and mandated cleanup anyway and—as a side note—increased the residents' exposure to lead by using heavy equipment to disturb the tailings and thereby increase ambient concentrations of lead. A similar situation exists in Everett, Washington. The arsenic levels in the blood of residents were

far below what the EPA expected given the soil contamination at the site and the 100 years of exposure the town has been subjected to from the former smelting facility.

Once an MEI is identified, the EPA proceeds to conduct a traditional risk assessment. As with all EPA risk assessments, the following worst-case assumptions are made: any chemical that causes cancer in an animal species will also cause cancer in a human; there is no safe threshold dose; the dose-response curve is linear at low doses; the result of the most sensitive animal species and gender is applicable for humans; and humans are more sensitive relative to body weight than the most sensitive species and gender. As Dr. Ronald Hart, director of the National Center for Toxicological Research notes, "Our animal bioassay risk models are based on at least 50 assumptions, none of which have been scientifically demonstrated."

To deny that cost is relevant to regulatory policy is implicitly to deny the reality of economic scarcity and the corresponding reality of opportunity costs.

The Washington, D.C.-based Hazardous Waste Cleanup Project analogizes the EPA's risk assessment process to the decision one might face about a 9:30 A.M. trip to the airport. Using worst-case assumptions about when to leave Washington in a cab for Dulles airport (about 45 minutes away from the Capitol under normal conditions), one might plan for: two hours worth of construction delays; an hour should the driver get lost; an hour in case of a flat tire; an hour in case of rush hour delays; 45 minutes should there be a line at the ticket counter; and 45 minutes for the security check and shuttle to the gate. Thus, if we planned our trip as the EPA plans cleanup requirements, we would leave for Dulles at 2:15 A.M.! Although any one of those worst-case assumptions is (barely) possible, there is virtually no chance that they will all occur at the same time.

Simply by examining four assumptions—chemical concentrations in soil, rate of soil ingestion, frequency of exposure, and duration of exposure—the Hazardous Waste Treatment Council calculated that the difference between reasonable mean estimates and EPA worst-case postulations is a factor of 1,167.

Even if those hyper-conservative calculations are correct, few environmental gains are realized from most Superfund remediations. The *UB in New England* report examined 1,570 potentially harmful hazardous waste sites (only 59 of which were on the NPL) and estimated that just four cancer risks existed in all of New England from those sites. William Cooper, an ecologist at Michigan State University, concedes that "if you had to do it [Superfund cleanups] on risk alone, you wouldn't spend any money on these things." Given the background risk of cancer, even the EPA's worst-case assumptions about Superfund risks mean that the "maximally exposed individual" would have his lifetime risk of cancer decrease by a range of 0.03 percent to 0.0003 percent.

On the other hand, false toxicological negatives are not impossible. The synergy between various chemicals is not considered because our knowledge in this area is limited. We do know, however, that certain chemicals that might be relatively benign on their own are more virulent in combination with others in certain circumstances. Second, only a small percentage of industrial chemicals in use today has gone through a thorough toxicological examination, and those not tested are not regulated particularly stringently. Third, the neurological toxicity of most chemicals is a great unknown. Finally, the very dubiousness of the entire toxicological procedure casts doubt on any finding. We know of several substances that passed toxicological examinations with flying colors but have since been correlated by epidemiological studies with health problems; direct ingestion of cigarette smoke is perhaps the most prominent example. Nor are epidemiological studies flawless. It might be that surveyed populations would be more healthy than the standard were it not for certain environmental exposures.

The case for danger from Superfund sites is based almost entirely on "popular epidemiology": the practice of noting abnormally high concentrations of cancer and noncancer health abnormalities near a site. There are three problems with that approach. First, no epidemiological study exists showing a national correlation between cancer or noncancer abnormalities and proximity to Superfund sites (indeed, a veritable mountain of studies exists demonstrating that there is no such

correlation). Second, it discounts the randomness of cancer distribution. Variation is to be expected. It would indeed be odd if every community had the exact number of disease occurrences postulated by averages. Third, popular epidemiology commits the logical fallacy of assuming that correlation equals causation. Even if a nationwide correlation between Superfund proximity and disease were one day discovered, it would not necessarily mean that hazardous waste is the culprit. It could be that Superfund sites tend to be found in locations where median ages are higher than average, or any number of other factors.

Still, we can draw some conclusions from the data. If Superfund sites truly presented a significant public health threat, one would expect to see some correlation between health problems and proximity to the sites; but no such correlation exists. Through the process of elimination, we can judge how many cancer risks could be explained by Superfund by eliminating the number of cancers that we know are caused by something else. Drawing upon the definitive study on the causes of mortality from Oxford professors Richard Doll and Richard Peto, Michael Gough of the Office of Technology Assessment calculates that only 1,200 to 6,600 cancer fatalities annually could possibly be attributed to environmental pollution. Diet, lifestyle, smoking, and simple aging are the cause of the overwhelming number of cancer fatalities.

Of that universe of potential environmental harm, ecologists, scientists, and public health experts consistently rank hazardous waste as only a medium-to-low risk compared to other environmental concerns. Most prominent in the literature are the EPA's 1987 *Unfinished Business* and the agency's Science Advisory Board's *Reducing Risk* in 1990. When one combines the limited degree of potential risk with the fact that Superfund risk assessments are almost entirely postulated on exposures that have yet to occur (and will not, absent land use changes), it is difficult to conclude that Superfund cleanups are presently helping anybody.

The Precautionary Principle Reconsidered

Environmentalists often argue that, in the face of uncertainty, it is only prudent to adopt a principle of precaution, to avoid taking any chances, and act instead on the basis of the worst-case scenario. An ancillary argument is that even if only a handful of cancer risks are eliminated by Superfund, not to act would be unconscionable and would amount to putting a price on human life. While the "precautionary principle" and "zero risk" standards seem reasonable, they are far less attractive once examined rigorously.

First, there is the matter of the correlation between wealth and health. The argument, popularized by the late political scientist Aaron Wildavsky, is that richer societies have lower mortality rates than poorer ones and that to deprive a society of wealth is to deprive it of safety. Wildavsky's argument is intuitively correct; wealthier individuals can afford better health care, more nutritious diets, and tend to experience less stress, among other things. Using extremely detailed but rather preliminary regression analyses, systems analyst Ralph Keeney of the University of Southern California calculates that every $7.25 million of regulatory costs results in an additional mortality. Thus, regulations that cost more than $7.25 million per life saved actually harm public health.

The evidence is mounting that the dominant method employed by the EPA to remediate groundwater contamination—pumping the water out of the ground, treating it, and then returning it to the aquifer—is futile.

Second, to deny that cost is relevant to regulatory policy is implicitly to deny the reality of economic scarcity and the corresponding reality of opportunity costs. Money spent on Superfund risks is money not spent on something else, including the ability to protect public health in other ways, reduce poverty, improve public safety, or even the intangible (but very real) benefits one gets from disposing one's income as one likes. According to the EPA's (extremely dubious) estimates, for example, $1 million spent on Superfund saves approximately 2.5 years of life. But $1 million spent on breast cancer screening saves 300 to 700 years of life. Similarly, $1 million spent on cervical cancer screening saves 700 to 1,500 years of life.

That environmentalists are occasionally oblivious to the notion of comparable risk is clear from a story in the December 13, 1992 *Denver Post*. Lois Gibbs, former celebrity citizen-activist

of Love Canal and now head of the Hazardous Waste Clearing House, was reported to have led a march against then-Governor Mario Cuomo in 1990 "eight months pregnant with her fourth child," shouting "Love Canal killed and will kill again!" while "dragging on a Benson & Hedges."

Third, there is the matter of the public health cost of remediation. Superfund cleanups frequently expose workers to harmful chemicals, create hazards in the transport of waste, and shift environmental contamination to other media. As the National Research Council reported recently, remediation "might create more of a hazard than would be caused by leaving such materials undisturbed." Similarly, the U.S. General Accounting Office found that facilities receiving and treating wastes are themselves responsible for serious violations of EPA regulations.

The problems with Superfund are so profound and fundamental that amending the law appropriately would be more challenging than simply repealing it and starting over.

Commonly used "pump and treat" remediation practices for groundwater, for example, often cause serious land and other ecological damage. Dewatering an aquifer seriously depleted the groundwater at a Superfund site in San Jose, California. "Soil washing" techniques create a significant problem of wastewater disposal. And drilling too deep to recover settled contaminants in aquifers can cause pollution to move deeper (and thus generally more harmfully) into the groundwater—as happened at the Department of Energy's Savannah River site in South Carolina—or vertically, thus extending the contamination.

In sum, the precautionary principle can become a suicide pact, and the pursuit of zero risk is not risk free.

Remediation on Trial

Startlingly, there is a growing debate about whether Superfund cleanups are even making the sites in question any safer. Most of the remediation problems are associated with groundwater, the main pathway for Superfund risk exposures, and thus the central target of most cleanups.

A recent study by the accounting firm Arthur D. Little found that chromium and mercury, two frequently targeted chemicals in Superfund remediations, are virtually impossible to remove from normal soil and groundwater aquifers with current treatment technologies. Little found no evidence that the theoretical standards set by the EPA had ever been achieved in cleanups, although laboratory and pilot scale tests indicated that it was possible under certain conditions.

Most EPA cleanup plans state that pumping and treating groundwater will continue until drinking water standards are met—without presenting any analysis that the goal can actually be achieved. But the evidence is mounting that the dominant method employed by the EPA to remediate groundwater contamination—pumping the water out of the ground, treating it, and then returning it to the aquifer—is futile.

The reason for the difficulty is the fact that contaminants typically bind to the soil, particularly when they have been present for some time, and generally resist being drawn up by the pumping process. Pumping causes groundwater to flow through soils with the highest permeability. Thus, soils with the lowest permeability, where contaminants typically concentrate, are not picked up by extraction. Cleaning an aquifer is therefore limited to the rate of contaminant diffusion from the soil. Scientists believe that the process could take centuries. Groundwater that is pumped and treated successfully could be returned to the aquifer only to be recontaminated—perhaps even to its original levels.

Despite months of intense investigation, researchers at the Oak Ridge National Laboratory could not find a single aquifer that had ever been successfully restored using that process. The scientists warned that "no matter how much money the federal government is willing to spend, at present contaminated aquifers cannot be restored to a condition compatible with [drinking water] standards." In its report *Alternatives for Ground Water Cleanup*, the National Research Council confirmed that "almost universal concern" exists "that the nation might be wasting large amounts of money on ineffective remediation." An EPA-convened panel of experts concluded in 1991 that Superfund sites are highly likely to be contaminated with certain chemicals that make complete groundwater cleanup

impossible using current technologies. Settled contaminants may "persist for decades or centuries before completely dissolving into groundwater."

Environmental Justice?

One of the driving forces that has recently emerged in the Superfund cleanup program is the belief that a majority of sites are located in poor and minority communities. Activists charge that Superfund sites are an element of "environmental racism"—the practice of siting waste facilities in minority communities—and that leaving them unremediated is disproportionately injurious to the poor. That belief, however, is based on myth. Political scientist John Hird of the University of Massachusetts at Amherst examined the distribution of NPL sites by county and found that

- The more economically advantaged the county, the more likely it is to have a Superfund site, and the higher the poverty level, the less likely a site will be found;
- The number of NPL sites in counties most heavily represented by the poor, the unemployed, and nonwhites is below the national average;
- The median housing value for counties with Superfund sites is $44,225, compared to the national county average of $35,296;
- Counties with the largest numbers of NPL sites—13 of which contain 10 or more sites—had poverty and unemployment rates far below the national average; and
- Of the 35 sites that scored 60 or above on the HRS, the surrounding population had lower poverty rates, higher median housing values, and a lower percentage of nonwhites than the national average.

Concludes Hird, "What has never been conveyed is that virtually all Americans are paying for Superfund cleanups, and probably regressively through higher product prices on (mostly) chemical and petroleum products." Thus, although "Superfund is defended by grassroots proponents as a populist reaction to the excesses of big business, the net effect of cleaning up abandoned waste sites is most likely to redistribute resources regressively from consumers and taxpayers chiefly to wealthier communities."

Reform or Repeal?

The problems with Superfund are so profound and fundamental that amending the law appropriately would be more challenging than simply repealing it and starting over. Congress would therefore be best advised to repeal CERCLA completely, along with the 1986 Superfund Amendments and Reauthorization Act. In its place, Congress should create a National Hazardous Waste Trust Fund to be managed by the EPA. The fund—the repository for unspent federal Superfund dollars—would be used to distribute money to each state based on the number of sites currently on the NPL (distributing money to each locality would be preferable but probably politically unachievable). The only restriction would be that states would have to forgo joint-and-several liability standards and abandon retroactive liability for any site listed earlier than 1980 in order to qualify for federal money. Otherwise, they would be free to conduct their cleanup efforts as they see fit. When current funds are exhausted, the disbursement operation should be disbanded.

The inescapable fact remains that unless cleanup priorities are set, Superfund cleanup costs could dwarf those of the savings and loan bailout by several orders of magnitude.

Federally owned facilities should remain a federal responsibility. Cleanup protocols—currently linked to Superfund remediation standards—should be renegotiated to consider only present land-use patterns. Risk assessments should then be performed under a "Monte Carlo" procedure, in which all possible variables for each matter of uncertainty are weighted and then calculated. The aggregate of those calculations should then be considered and an appropriate upper-bound cleanup option chosen. Worst-case scenarios would be considered, but only in relation to their likely occurrence.

Repealing the current liability standards is a simple act of fairness. It is doubtful whether Superfund's joint-and-several or retroactive liability standards could even survive a court challenge, given the current composition of the Supreme Court. Repeal would also cut costs dramatically. An insurance industry report concluded last March that simply repealing retroactive

liability would cut Superfund program costs by one-third.

The above proposal is predicated upon the concept of subsidiarity—the idea that local problems ought to be handled by local officials. A Superfund site is a quintessentially local concern. Each particular site is unique, with different contaminants, soil hydrology, geological characteristics, size considerations, and land-use patterns. Moreover, potential hazards from sites primarily affect those in the immediate surrounding community. For example, the Smuggler's Mountain site in Aspen, Colorado does not affect anyone in Denver, Chicago, New York, or even Washington, D.C. Suggesting that because Superfund sites are found nationally, a national response is called for is spurious. Education, road repair, garbage collection, park maintenance, emergency services, and law enforcement needs are all national phenomena that we still consider particularly local concerns. Suggesting the former standard would mean transferring most responsibilities of city councilmen to Washington.

It is time for the federal government to cut its losses and withdraw from this bureaucratic quagmire before any more economic or environmental damage is done.

Ultimately, decisions about local resources ought to be made by local citizens. Environmentalists fear, of course, that when asked to spend their own tax dollars directly, people will become less enthusiastic about Superfund cleanups. Perhaps so, but under the current regime, people also pay for Superfund cleanups, but do so indirectly through a regressive levy that manifests itself in higher consumer prices. Just as some communities favor more schools or parks than others, some communities will undoubtedly prefer different mixes of economic growth and environmental cleanliness than others. To presume that the communal preferences of Washington should dictate such matters is to ignore (1) how financially and culturally atypical the average Washingtonian truly is, and (2) the rights of communities to choose their own paths. Given that citizens can "vote with their feet" to express such preferences, it is more likely that communal choices will match private preferences than monopoly dictates from Washington that leave individuals little choice in their affairs.

Allowing multiple cleanup regimes would encourage innovation through hundreds of environmental policy experiments. New technologies largely untapped today include chemical neutralization, physical stripping, aerobic decontamination, and thermal treatment. Many have blamed the EPA for not introducing those technologies faster and for having too conservative a mindset.

Moreover, local citizens might think that it makes sense to simply fence off a site and rezone the facility to preclude residential land use, rather than to spend millions cleaning it up for the future. The Waste Management Research and Education Institute at the University of Tennessee estimates that $268 billion could be saved while still providing equivalent levels of protection of human health and the environment, simply by considering present rather than future land uses. Similarly, relocation compensation of $250,000 to $500,000 for at-risk households would almost certainly (1) be more cost effective than standard remediation practices; (2) prove more popular with the affected population; and (3) have the benefit of completely removing any health risk. For sites in populated areas, Hugh Kaufman of the EPA confirms that "the best thing we can do is evacuate people if they want, then put up a fence and a flag that says stay away." Similarly, President Clinton's Office of Management and Budget has urged the administration to acknowledge that some sites are not worth restoring to productive use. As economist Richard Stroup of the Political Economy Research Center notes, "Since new cleanup technologies are constantly becoming available, a permanent cleanup that may be chosen later is likely to be safer, more complete, and less costly. Another reason to consider non-permanent cleanup is the fact that the passage of time may reveal a different and more valuable future use of the land. Then a more suitable cleanup goal (which may be either more stringent or less stringent than current EPA policies require) can be selected."

The inescapable fact remains that unless cleanup priorities are set, Superfund cleanup costs could dwarf those of the savings and loan bailout by several orders of magnitude. "It is

doubtful that the U.S. will be able to fund the huge task of remediating all the sites to the cleanest level possible," observed the National Research Council in October 1994. Decisions about remediation and cost must be made, and the only fair way to go about it is to allow those most directly affected to make the decisions themselves.

A national association of state environmental control or public health officials would likely replace the EPA as the center for statistical information, technological advice, and environmental research. States would have every incentive to pool their resources so as not to duplicate those kinds of efforts.

Some environmentalists will argue, however, that states are not capable of assuming the remediation responsibilities of Superfund. Superfund supporters argued in 1980 that no state alone could manage cleanups. But if no state alone can manage cleanups, how can 50 states do so cumulatively? The federal government is no greater than the sum of its parts. Moreover, time has shown conclusively that even if states were incapable of the job in 1980, the federal government was no better situated. An interesting case in point surfaced in a 1980 floor debate between Rep. James Florio of New Jersey and Rep. David Stockman of Michigan. Representative Stockman suggested that Michigan did not need federal help cleaning up toxic waste sites and marshalled as an example a Michigan state suit against Hooker Electrochemical that resulted in a $15 million out-of-court consent decree to clean up the site. "It took a two year response for the appropriate local agency to respond," retorted Florio. "That is what this legislation [Superfund] is all about." Suffice it to say that two years compares rather favorably to today's standard of a decade or more for remediation to come to closure.

Others might object that the plan would amount to just one more "unfunded mandate" on the states. But there would be no mandate—states would be free to do as they wish. Of course, states would prefer that the federal government pay for cleanups, but as Sen. Jesse Helms (R-N.C.) said rightly at the time: "I have always supported state participation in any Superfund bill dealing with hazardous waste sites. This is both a federal and a state problem. States have benefited from an industrial location within their borders in salaries to employees, and in state taxes paid by the corporations. Therefore, the burden is not that of the federal government to solve problems that could and should have been solved by local and state governments."

Nor is it altogether clear that such a plan would prove universally unpopular with state officials. States currently are more often than not asking the EPA not to list sites on the NPL, so that state programs can handle the job. The reason is that 40 states currently maintain their own Superfund programs of various kinds, and the track record of those programs is generally far superior to the federal government's. James Strock, California's secretary for environmental protection and former chief law enforcement officer at the EPA, called for the federal government to turn Superfund over to the states in the Winter 1994 issue of *Policy Review*. J. Winston Porter, director of the federal Superfund program from 1985 to 1989, likewise believes that states should assume full responsibility for nonfederal hazardous waste cleanup: "As I know from my four years of heading the Superfund effort, states simply do the job much more efficiently." Porter notes that in Minnesota, for example, cleanups routinely take less than three years and cost less than $5 million per site. New York state has restored 140 sites and Wisconsin has finished more than 227—almost as many as the entire federal Superfund effort.

A Congress truly committed to rolling back government should start with Superfund, a law widely acknowledged by environmentalists, businesses, and academics as the most flawed environmental law on the books today.

Conclusion

If we had known in 1980 what we know today, Superfund would never have been launched by the federal government. It is time for the federal government to cut its losses and withdraw from this bureaucratic quagmire before any more economic or environmental damage is done. A Congress truly committed to rolling back government should start with Superfund, a law widely

acknowledged by environmentalists, businesses, and academics as the most flawed environmental law on the books today.

The only question that remains is, will Congress have the courage to do it? I believe that the case is so compelling that the American people are mature enough to accept repeal. One could convincingly argue that cleanups will occur more rapidly at less cost and more fairly than they do today, with local citizens, not unelected bureaucrats in Washington, making the appropriate decisions. A recent survey conducted jointly by Republican pollster Robert Teeter and Democratic pollster Peter Hart found that 66 percent of Americans surveyed favored transferring regulatory authority over air and water from the federal to state and local governments. More to the point, popular outrage over hazardous waste is directed not so much at corporate America today as it is at the EPA for ordering costly, dangerous, and ill-considered cleanups in communities that know intuitively that no serious problem exists.

Selected Readings

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