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Protecting America's Land





This photo shows drums of hazardous wastes stacked at the Chemical Control Corp. site in Elizabeth, N. J., which exploded and burned on April 21, 1981, before the State of New Jersey could complete removal of what it charged were improperly stored wastes. For a view of this scene after the fire and explosion, turn to the inside back cover.

Land and Pollution

In this issue of EPA Journal, we take a look at the comprehensive programs being carried out by Federal, State and local government and industry to help heal land pollution scars and protect the public from discarded hazardous wastes.

EPA Administrator Anne M. Gorsuch has pledged that "The Agency will continue to press responsible parties through legal action if necessary—to clean up sites threatening public health or the environment." She added that "where this cannot be done, or if it cannot be accomplished in a timely manner, EPA and the States will finance remedial action under Superfund and seek recovery from responsi-

ble parties under separate legal action."

Rita M. Lavelle, Assistant Administrator for Solid Waste and Emergency Response, notes in an interview in this issue of EPA Journal that "effective handling and disposition of hazardous wastes is one of the most challenging environmental problems facing our country today."

Lavelle emphasizes that her first responsibility, as defined by law, "is to protect human health and the environment through effective administration of two Federal laws regulating hazardous wastes."

The two laws are the

Resource Conservation and Recovery Act, which tracks and regulates the handling and disposal of hazardous wastes, and the Comprehensive Environmental Response, Compensation, and Liability Act—generally referred to as Superfund—which deals with immediate and long-range environmental problems created by hazardous materials.

In this issue we review the operation and enforcement of programs set up to carry out these laws.

The magazine also examines various approaches to dealing with wastes such as incineration, recycling and land disposal.

One article gives a report on how wastes are handled in some

of the more progressive countries in Europe.

Another problem examined in this issue is how industry and government deal with hazardous waste emergencies.

With the Superfund law, Rita Lavelle predicts that "our past offenses and present problems will be eliminated. With RCRA we can avoid creating new offenses while encouraging and motivating development of affordable technologies for disposal of our waste.

"Proper application and strict enforcement of those laws will enable us to achieve our goal of protecting human health and the environment."

EPA JOURNAL

Anne McGill Gorsuch, Administrator
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EPA is charged by Congress to protect the Nation's land air and water systems. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

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Front Cover: Two tow-headed youngsters view scenic landscape stretching below rocky peak near Skyline Drive in the Blue Ridge Mountains of Virginia.

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Regulating Hazardous Wastes

An Interview
with Rita M. Lavelle,
Assistant Administrator
for Solid Waste
and Emergency Response



Q What are your primary goals as Assistant Administrator for Solid Waste and Emergency Response?

A My first responsibility is to protect human health and the environment through effective administration of two Federal Acts regulating hazardous wastes. One law is the Resource Conservation and Recovery Act (RCRA), which tracks and regulates the handling and disposal of hazardous wastes. Second is the Comprehensive Environmental Response, Compensation, and Liability Act, generally referred to as Superfund. It deals with immediate and long-range environmental problems created by improper handling of hazardous materials.

Effective handling and disposition of hazardous wastes is one of the most challenging environmental problems facing our country today. RCRA and Superfund are effective tools, but Federal dollars, talent or experience cannot do the job alone. One of EPA's goals, therefore, is to build an effective Federal-State-industrial partnership which will develop an environmentally sound system for disposing of hazardous waste. Another is to manage the nation's hazardous waste programs consistent with four of President Reagan's basic objectives which are particularly relevant to this effort. These objectives are regulatory reform, economic recovery, control of government spending and transfer of more authority to State and local governments. Happily, both RCRA and Superfund afford excellent examples of Administration success in implementing all four of these policies.

Q Since you view this program as a partnership, what roles do you see each partner playing in the effort?

A Protection of human health and the environment requires a unique partnership consisting of as many as four sectors, all of whom share one common distinction. But the key to the success of all four sectors is the work of citizens who zealously seek to protect the quality of life we enjoy in this country. These citizens bring to this undertaking varied talents and experiences.

First the Federal partner sets the standards and provides oversight. The States, with Federal assistance and guidance, develop and enforce their own programs in accordance with Federal guidelines. Industry complies with the standards and contributes technical innovations. These actions yield not only better environmental protection but better products and increased competition which in turn leads to still better technology. Local governments work with both industry and their other governmental partners to provide insight through day-to-day waste management activities. We cannot just wish away the waste which is concomitant with the way of life we all enjoy. We must face the reality of almost half a billion metric tons of solid wastes per year. We must all work together to handle and dispose of it properly. All of these partners are meeting this challenge in laudable fashion. The job is manageable, and it can be done.

Q Are the States doing an effective job of tackling their waste problem?

A The States are willing and eager to handle their waste problem. They know as we do that those closest to the problem are best able to handle it. For non-hazardous wastes, the States have an enviable record. They have long-standing programs which not only regulate disposal but provide incentives for proper management techniques such as recycling and resource recovery. For hazardous waste, Federal and state governments are still learning each day how to regulate effectively. EPA Administrator Anne Gorsuch has now signed a complete waste regulatory package at the Federal level. EPA can authorize States to administer the entire regulatory program. So far 32 States have received interim approval from EPA to operate all or part of the program. Four States have authority to issue permits for all storage, treatment and incineration facilities. By 1985, forty States are expected to have final authorization to operate and enforce the entire RCRA program. That authorization will be based upon the fact that their programs are at least as stringent as EPA's if not more stringent.

Q Since the Superfund program gives the Federal government the funds to clean up hazardous waste sites, what role do you see for the private sector?

A Industry has probably the most important role in managing and disposing of hazardous waste. First, industry continues to invest significantly in improvement of treatment and disposal facilities, as well as their technologies. Secondly, the preferred solution to any problem will generally be found closest to the problem. In most cases and without fanfare, industry is utilizing various on-site technologies to dispose of the waste it creates. This growing practice removes a tremendous burden from off-site disposal and treatment facilities. When it comes to existing sites already on the Superfund list for action, the private sector again plays an important role. First, private sector technical initiatives are being used to clean the sites. Second, where appropriate, private sector generators are "stepping up to the table," assuming their responsibilities and bringing about timely resolution of the problems. While the State governments also must make a significant contribution, the generators and disposers of waste still have the primary responsibility for cleaning up. We need all the talents we can muster, and Superfund ensures consistent, reliable performance pointed toward a goal of expedited, environmentally-sound cleanup in a cost-effective manner.

Q Has EPA been slow to move on cleanups, past or present?

A When dealing with a subject that strikes such an emotional chord, the perception by some will always be that we are not moving fast enough. The truth is that we are moving very expeditiously to clean up the 115 sites on the Agency's Interim Priority List and we are already adding sites to that list. So far \$63 million has been provided for cleanups at 57 sites. Nearly \$25 million has been allocated for removal actions at 76 sites. Removal actions have been completed at 25 sites. Action of one type or another is underway on virtually every site on that interim list. Cooperative agreements have been signed with 21 States. More than 1,300 notices have gone to generators or disposers of hazardous waste at 82 sites. So far they have responded with more than \$80 million in private money for cleanups at more than 20 sites. When you consider EPA has had responsibility for the Superfund program only since last August, the record is quite remarkable.

"My first responsibility is to protect human health and the environment. . . ."

Q Why has the number of cases brought against violators of the different hazardous waste law and regulations dropped in 1981?

A Effective enforcement cannot be measured by the number of civil suits brought against violators. The previous Administration depended upon civil suits as its only enforcement tool. We are relying on a number of other, more effective, less burdensome and less expensive devices. We have set a results-oriented course designed to solve the problem, not discuss it in perpetuity in court after waiting two or three years to get on a calendar. For instance, we have issued twice as many consent decrees this year as last year. We have also issued more than 250 Administrative Orders that accomplish better results than civil suits. As I just noted, we have already collected \$80 million for Superfund cleanup efforts through consent decrees and court orders. Litigation in the same cases would still be underway with no income realized. Our enforcement policy now has a consistency which adds the virtue of predictability, an extremely important factor to the regulated community. That factor alone will curb violations far more effectively than headline-grabbing, time-and talent-consuming lawsuits. It is high time we stop equating enforcement with the number of lawsuits underway, and measure it instead by the results we are achieving. In this area, we are compiling a record which is a source of considerable pride.

Q What progress has been made in developing a regulatory program in hazardous waste?

A When this Administration took office, a number of regulations were about to go into effect. Many were neither reasonable nor workable. Consequently, we held them up until we could take our own look at the situation. We have now published all the major components of a realistic and workable regulatory program. These standards now cover every aspect of the hazardous waste cycle, from generation to transportation, storage and disposal. Only recently we issued regulations covering land disposal and incineration. These regulations complete a realistic, achievable program which will protect human health and the environment without unnecessarily hamstringing industry. Completion of the package has also cleared the way for the States to begin permitting hazardous waste management facilities of all types. Meantime, we are proceeding with a regulatory impact analysis and a series of public hearings and task forces which will fine-tune these regulations as they begin to make their effects felt.



Q How do you plan to deal with citizens' complaints about dumps and hazardous waste spills?

A The National Contingency Plan, the official blueprint for Superfund, calls for clear accountable channels of communication with the citizens to clear up apprehensions created by misconceptions and misrepresentations. EPA is a highly visible Agency. Our actions are constantly and carefully scrutinized and questioned by the media. Our technology is subject to intensive questioning by both the media and the public itself. This process is a good and healthy one. I have no doubt whatsoever that it contributes significantly to better protection for the environment, which is what we all seek. Practically speaking, most citizen concerns will be handled best by local, State or Regional officials. They will ordinarily be familiar with the specifics of the cases in question. One of EPA's primary concerns is to maintain a close working relationship and dialogue with the States and through them industry and local governments, so that all elements of the industry-governmental partnership will be well-informed on programs, goals and environmental progress. In that way, no matter who responds to citizen complaints, the answer will accurately reflect the rationale and progress of the partnership's program.

Q To get away from hazardous waste for a moment, what is EPA doing in the area of solid or non-hazardous waste?

A EPA leadership is responsible for bringing solid waste planning and management to its present level of sophistication. Our interest in providing for sound non-hazardous waste disposal is just as strong as our interest in hazardous waste. With our guidance, 52 States and territories have developed solid waste plans. By the end of this fiscal year, EPA will have approved more than half of them. We no longer have to mandate programs. Our role now is to support the States' efforts. EPA's open dump inventory and our recent study on the dioxin issue and resource recovery are examples of this supportive role. The open dump inventory has been extremely helpful to State planning processes by earmarking those facilities which are in need of greatest improvement. Approximately 2,000 dumps have been inventoried and although the program is no longer funded, more than 30 States continue to evaluate facilities with carryover monies. The TCDD, or dioxin, study responded to growing public concern over emission of the pollutant from refuse-to-energy facilities. The study confirmed that levels of TCDD currently being released do not constitute a hazard to human health or the environment. As added insurance, we are continuing to monitor facilities.

Q Can recycling play a major role in dealing with future solid waste disposal?

A Recycling has always been an important part of solid waste management. Most of the innovations in the recycling field have come from municipalities and industry, spurred by some very interesting entrepreneurial endeavors. A great number of cities and towns have been able to reduce their solid waste disposal costs through recycling programs. They have eloquently demonstrated the feasibility of recycling. The Reynolds Aluminum Company's program paid \$90 million last year alone to can collectors. The most common form of recycling involves newspaper and glass. Collection centers are springing up throughout the country for recycling these and similar household wastes. Industrial waste also is recycled. The Dow Chemical Company, for instance, employs a thermal process to recover chlorine from wastes. The hazardous waste exchanges are an excellent example of the old adage: "One man's trash is another man's treasure." As the price of materials rises, it is only natural that recycling will increase.

Q If you could choose one achievement for your administration, what would it be?

A It would be to leave my post knowing there is in place and operating, a complete and effective system ensuring that the nation would never again suffer the environmental horrors caused by past practices of improper waste disposal. With Superfund, our past offenses and present problems will be eliminated. With RCRA we can avoid creating new offenses while encouraging and motivating development of affordable technologies for proper disposal of our waste. Proper application and strict enforcement of those laws will enable us to achieve our goal of protecting human health and the environment. □

A Superfund Progress Report

In December 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act. In the year and a half since then, many start-up problems have been overcome, and Superfund—as the law came to be known almost immediately—is getting into high gear.

Before Superfund arrived on the scene, the Federal government had no authority to clean up old, abandoned hazardous waste sites. The Resource Conservation and Recovery Act (RCRA) authorized Federal regulation of operating sites, and the Clean Water Act authorized federal action against oil and hazardous discharges into navigable waters. But there was no authority for Federal response to abandoned and uncontrolled hazardous waste sites and spills in air or on land.

Superfund filled that gap. The law provides for a \$1.6 billion fund to cover cleanup costs. Most of this—86 percent—comes from taxes on the manufacture or import of certain chemicals, petroleum, and petroleum products. The rest comes from general revenues.

The government generally can take legal action to recover cleanup costs from those responsible for the waste. Responsible parties who do not take ordered cleanup action are, under certain conditions, liable for punitive damages equal to three times the governments' response costs.

How Superfund Works

In his Executive Order of August 14, 1981, President Reagan delegated to the Environmental Protection Agency the responsibility to revise the National Contingency Plan "to contain the implementing procedures for the coordination of response actions to releases of hazardous substances into the environment." EPA proposed a revised Plan last March, and issued the final Plan in July.

The Plan establishes methods for determining where, when, and how Superfund monies will be spent. It describes two categories of cleanup: *removal* in response to acute emergencies or to abate a serious threat, and *remedial* action to provide a long term cleanup or solution to the problem. It sets up a process for determining the extent

of remedial cleanup. Sites are evaluated or "scoped" to see what remedial action is needed. Then cleanup alternatives based on environmental, economic, and engineering criteria are developed. The final remedy selected will be the most cost-effective that protects public health, welfare, and the environment.

In conjunction with the Plan, EPA is compiling a national ranking of state-nominated hazardous waste sites. Last fall the agency selected 115 sites to be the first to receive attention under Superfund. This fall EPA will complete naming the nation's 400 priority sites.

EPA experience has shown that cleanup conditions and needs vary greatly from site to site, depending on the chemicals involved, area geology, soil conditions, climate and population. That is why the National Contingency Plan allows for flexibility in dealing with waste sites. It also requires extensive State and local involvement in Superfund activities, with States involved from the beginning of the process to the end, from ranking problem sites to cleaning them up.

A Progress Report

Superfund has a Congressionally-mandated life span of five years, and it's already one and one-half years old. What has it accomplished?

Superfund Accomplishments: Some Vital Statistics

- \$26 million allocated for 81 removal actions.
- 40 removal actions completed.
- \$75 million allocated for remedial actions (including investigation, feasibility studies, design, and construction) at 63 sites.
- 26 cooperative agreements signed by EPA and the States; 6 state contracts awarded.
- 1,450 notice letters sent to responsible parties associated with 86 of the 115 top-priority hazardous waste sites.
- Administrative Orders issued to abate dangers to public health or welfare (more under development in the regional offices).

As of June, the Federal government had collected \$300 million in taxes under Superfund, and, as of July 2, allocated nearly \$147 million for both remedial and removal actions (see box). Forty removal actions have been completed.

According to William Hedeman, Director of EPA's Office of Emergency and Remedial Response, remedial investigations or feasibility studies are either underway or soon to begin at 55 of the first 115 priority sites. Designs for cleanup are underway or about to start at 20 of the sites; and actual cleanup work, at 19 others.

Some investigative or remedial work is expected soon at another 20 or so sites.

Hedeman explains that action has not yet begun at some sites for a variety of reasons. Many are still involved in enforcement actions to bring about voluntary cleanup by responsible private parties. Some States have decided to clean up certain sites under State enforcement laws rather than Superfund. Other States haven't come up with the 10 percent matching funds for EPA cleanup. Still others have not yet budgeted funds for cleanup.

EPA is encouraging voluntary cleanup by private parties whenever possible. The agency has identified responsible parties at about 70 percent of the priority sites, and has sent more than 1,400 notice letters, the first step in negotiating privately financed cleanup.

Overall, Superfund has moved quickly, and only 16 of the first 115 priority sites are left for EPA to consider and process. Since the full national priority list of 400 sites is not due until fall, EPA has asked its regional offices and the States to nominate additional sites for action between now and fall. Superfund work can begin at those sites immediately.

Eighteen months after its establishment, Superfund is entering a new stage of development. While its record of past accomplishments is significant, its record of future accomplishments will be even more so. Rita Lavelle, EPA Assistant Administrator for Solid Waste and Emergency Response, says the law will be judged not by how much money is spent, but by how many hazardous waste sites get cleaned up. □



A Superfund Calendar

- December 1980** Congress passes the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also known as Superfund.
- August 1981** President Reagan issues Executive Order 12316, delegating to the Environmental Protection Agency the responsibility for amending the National Contingency Plan and for allocating money from the Hazardous Substance Response Trust fund to carry out the purposes of the Act.
- August 1981** EPA awards first cooperative agreement under Superfund for \$2 million in remedial investigations and cleanup at Sylvester site in Nashua, New Hampshire.
- October 1981** EPA announces 115 top-priority hazardous waste sites targeted for action under Superfund.
- February 1982** EPA establishes a special task force to accelerate cleanup by private parties at hazardous waste sites under Superfund. EPA also announces an agreement in which the U.S. Army Corps of Engineers will manage construction and design contracts and provide technical assistance to EPA in Superfund cleanups.
- March 1982** EPA proposes a revised National Contingency Plan setting criteria for determining where, when, and how Superfund monies will be spent. Also, issues policies for state participation and lead through cooperative agreements.
- April 1982** EPA awards first State contract under Superfund: \$718,000 for remedial and site investigations at the Commencement Bay site in the State of Washington.
- July 1982** Final National Contingency Plan published.
- Fall 1982** Due date for proposal of national priority list of 400 hazardous waste site "response targets."
- September 1985** Sunset date for end of Superfund tax.

On a Two-Way Street:

The Superfund Community Relations Program

EPA's Superfund community relations program information travels a two-way street. It flows from EPA to the public, telling citizens about hazardous waste site cleanups planned for their communities; and from the public to EPA, keeping the agency abreast of community concerns. Only with this kind of dialogue can EPA and the public understand each other's concerns and make informed decisions about how cleanups should proceed.

The Superfund law gave the Federal government authority to respond to abandoned and uncontrolled hazardous waste sites and spills on air, land, or water. EPA realizes that every such site and spill has the potential for intense public concern over government actions. However, an effective community relations program can help ease citizen concerns by providing the facts.

Before setting up its Superfund community relations program, EPA tried to find out what to expect by conducting a study of government-community interaction at 21 hazardous waste sites across the country. The study showed that the credibility of the government agencies involved was more important in determining public concern about a site than the level of environmental threat, or the education, socio-economic status, or prior political or environmental activism of the citizens. Given the importance of credibility, the message to EPA was obvious: tell the whole truth, tell it up front, and keep on telling it. This has become the cornerstone of the agency's community relations program.

According to William Hedeman, Director of EPA's Office of Emergency and Remedial Response, the community relations program has six objectives:

- To establish at each site some means of learning the community's concerns.
- To inform citizens about budget constraints that limit Superfund actions so they don't develop unrealistic expectations.
- To deal constructively with public response to Superfund actions.
- To decrease the likelihood of costly delays, cost overruns, and politicization of purely technical issues.

- To establish a preventive program to lessen or avoid public confusion about Superfund remedies.

- To stress the interaction of Federal, State, and local governments in solving a local problem.

There is no set formula for achieving these objectives. The community relations program is flexible to adapt to the variables at each Superfund site. The only requirement of the program is for preparation of a community relations plan for remedial actions and for planned removals lasting longer than two weeks. The purpose of the plan is to integrate community relations activities into technical responses. Each plan is based on the individual characteristics and level of citizen concern at a particular site.

A community relations plan starts with discussions with local officials, community leaders, and citizens to identify local concerns. It describes the background of the site, the objectives of the community relations program at the site, techniques that will be used to achieve the objectives, a workplan, and a budget.

Such a plan is required for each planned removal expected to last over two weeks; the level of detail in the plan depends on the scope of the action. When the removal is finished, a "responsiveness summary" is required to document how EPA handled citizen concerns. The summary lists the community



The specific techniques in each plan are determined by

relations activities that took place and the issues that came up, and evaluates the community relations program at the site.

For remedial actions, two plans are required. The first comes once the need for remedial action has been determined; the second, when investigation and feasibility studies have been completed and remedial design is beginning. A responsiveness summary is also helpful in remedial actions to evaluate EPA-community interaction.

The specific techniques in each plan are determined by the site manager with extensive community input. Though the techniques will vary from site to site, and from stage to stage at each site, one general rule applies to most situations: informal is better.

Therefore, most plans will tend to favor such techniques as small "living room" citizen meetings, information interviews, telephone contacts, courtesy visits to local officials, site tours, press releases, fact sheets, exhibits, and mailings, rather than the larger, more formal public hearing. The reason is not to avoid public contact, but to maximize it.

At remedial actions and especially at planned removals, the remedy may be limited. A community relations plan should make this clear to the public. Since a community's perception of the public health threat posed by a hazardous waste site can determine the level of citizen concern, a community relations program should identify those concerns, and then give the citizens enough knowledge to base their perceptions on fact.

Superfund cleanups are just getting underway across the country, so EPA regional offices have not yet accumulated much experience in implementing community relations plans. Still, enough is known so that Marcia Carlson, community relations coordinator in EPA's midwest region, compares the process of developing a plan to "going over an area with a mine sweeper." Her comparison points up the importance of identifying potential problems before they erupt.

EPA's Superfund community relations program recognizes that abandoned hazardous waste sites and hazardous materials spills are not just environmental problems, but are political, economic, and social problems as well. The program's effort to deal with these problems using informal channels of communication has been criticized as an attempt to bypass community input. EPA feels that, to the contrary, it is an attempt to enhance community input by favoring dialogue over confrontation.

Superfund chief Hedeman makes a big distinction between public relations and community relations. The former is information on a one-way track to citizens. The latter is on a two-way track, to and from citizens. This, says Hedeman, helps insure responsiveness. "The Superfund community relations program is not image-building. It's an honest effort to conduct our business openly and efficiently. EPA must be credible to be effective, and credibility can come only from sincere efforts to address community concerns." □



the site manager with extensive community input.

Superfund Helps New Hampshire

By U.S. Rep. Judd Gregg

In an era when public perceptions of issues are formed by simplified mass media presentations, our view of our government frequently tends to be badly distorted; and probably no agency has fallen victim to the media more than the EPA.

To hear some tell it, all that is clean and beautiful around us is about to be ravaged by lustful and greedy industrialists. EPA is pictured as either unwilling or unable to intervene. Such allegations are very disturbing to those of us from states such as New Hampshire which take great pleasure and pride in our environment and, at the same time realize just how sensitive and vulnerable it is.

For that reason it was tremendously reassuring to find out first hand that the EPA still lives. Not only does the Agency still have the will and resources to do the job, but the recent moves to streamline its functioning seem to be working. In my experience in Washington I have not run into any other agency that can match the responsiveness which I received from EPA.

In December 1980, Congress passed the Superfund law authorizing the Federal Government to clean up old, abandoned hazardous waste sites.

That was only 18 months ago. But despite the fairly brief stretch of time from passage of the law to the present, many critics have charged that the Environmental Protection Agency has not moved fast enough to implement the law. Even though some action is already under way at 99 of the first 115 "interim" priority sites the agency selected last fall, the critics complain of foot-dragging.

I can't speak for other States, but I can speak for New Hampshire. And in New Hampshire, what we have seen on the part of EPA is not foot-dragging but a prompt response to local needs. EPA has provided Superfund assistance for response actions at three of the most hazardous sites in New Hampshire. At sites in Epping and Kingston, EPA has committed more than \$3.3 million for ongoing cleanup actions. At the Sylvester dumpsite on Gilson Road in Nashua, EPA officials have also acted quickly to help the State diminish the immediate threat to public health, and to come up with a longer-range solution.



Judd Gregg

The Gilson Road site is an abandoned gravel quarry that had been illegally used during the 1970's for dumping all kinds of liquid and solid hazardous waste. More than a thousand drums of chemicals were scattered over the surface of the site. Even worse, though, liquid hazardous wastes had been deliberately poured through makeshift pipes directly into the earth under the old quarry pit.

This would be bad enough if the site were isolated, but it isn't. It is adjacent to a large trailer park housing several hundred families. It is also 600 feet from a creek that flows into the Nashua River, from which several towns downstream draw their drinking water. There was the potential for chemical explosions, and there was the potential for pollution of the drinking water. Gilson Road was a disaster waiting to happen.

In 1979 and 1980, the State of New Hampshire and the U.S. EPA took preliminary steps towards cleaning up Gilson Road. Then in April 1981, four months after passage of Superfund, EPA and the State released a report on the investigation of the site. It found the situation was worse than anticipated. The report identified a significant plume of contamination in the groundwater beneath the site. The contaminated groundwater was flowing toward the creek not at the usual rate of inches per month, but at the alarmingly rapid rate of one and one-half feet per month! Obviously, something had to be done, and fast.

On May 25, Governor Gallen sent a letter to EPA, requesting Superfund assistance and agreeing to meet State responsibilities as specified in the law. On June 8, a public meeting was held in Nashua. Representatives of the New Hampshire Water Supply and Pollution Control Commission and regional and headquarters EPA offices attended. The next day, State and Federal officials met again in all-day discussions on the technical aspects of cleaning up Gilson Road. On June 30 the State submitted a formal application for Superfund funding. And on August 24, New Hampshire was awarded over \$2.4 million in the first cooperative agreement with a State under Superfund. Under the agreement, the State would carry out a study of various ground water treatment options and would be responsible for the design and construction of a slurry wall and cap to contain the wastes on the Gilson Road site. In addition, EPA agreed to install and operate an interim ground-water pumping and recirculation system which would keep the contamination from reaching the stream below ground, while the slurry wall and cap were under construction.

Subsequent work showed that the below ground contamination—originally thought to affect some 12 acres—had spread significantly, and now covered some 20 acres. This meant the slurry wall and cap would have to be expanded. In addition, geological data collected at the site showed that treatment of the ground water within the containment system would be necessary.



On June 22, 1982, the State-EPA cooperative agreement was amended to provide New Hampshire with another \$2 million for expansion of the containment system and to design a system to treat the contaminated ground water.

Now if you noticed the dates I have just cited, you realize that from the time the investigation report came out in April 1981 to the time the cooperative agreement was awarded in August 1981, four months had elapsed. Four months for the State and the Federal agencies involved to work with a brand new piece of legislation, untested and untried. Four months to work out a com-

plicated, first-of-its-kind project. Four months for New Hampshire and EPA to get the job done. And they did it. Is that foot-dragging?

New Hampshire was successful in taking prompt action under Superfund because State officials stayed in constant contact with EPA officials, working out details, discussing changes, hammering out mutually acceptable compromises. Perhaps if EPA critics spent their time as productively as we did, we would see even greater progress under Superfund. □

The First Inning of Superfund

The forces that led to the Superfund law and the revised National Contingency Plan were first unleashed in March 1967 when the mammoth oil tanker *Torrey Canyon* broke in two off the English coast.

At least 15 of EPA's current Superfund employees took part in the original work designed to develop plans for dealing with such a disaster if it ever occurred in waters off the United States.

Thirty-three million gallons of crude oil gurgled out from the *Torrey Canyon's* hold and slithered across the sea—enough to foul parts of the coastlines of two nations. Military units in England and France mobilized troops in the attempt to deal with this unprecedented emergency. The major oil spill damaged beaches, wildlife, fishing and tourist economies, and the marine foodchain.

Across the Atlantic, the U.S. Government was deeply concerned about the implications of this massive spill. In an era of steadily increasing energy use, the high seas were criss crossed with ever-larger supertankers carrying oil from the Middle East to the industrial nations. These leviathans, seldom flying under flags with the safest maritime codes, were often commanded and crewed by sailors from diverse nations with no common language for giving and receiving orders. To our government it appeared not unlikely that this first major marine disaster involving so much oil might be the harbinger of a similar event on the U.S. shoreline or even on the already ecologically overburdened Great Lakes.

The U.S. therefore sent over a six-man team to see what could be learned. The observers represented Federal Agencies, and a State government as well. The team flew to Europe in April 1967, about a month after the disaster.

Kenneth Biglane, then with the Department of the Interior and now Director of EPA's Hazardous Response Support Division, was a member of the team.

The first stop was Cornwall on the Southern English coast, still oil-drenched, where British troops were attempting to break up the oil molecules with 3 million gallons of dispersants. This put the aquatic life cycle hopelessly out of kilter. Fish and seaweed washed up on the beaches. Thousands of birds died, although there were bird hospitals where workers attempted to clean and revive rarer species, such as the guillemot and puffins. Seashore tourists, who were appalled by the oil and nauseating fumes, not only got in the way of emergency cleanup operations, but tracked up local lodgings with oily footprints.

But to the U.S. team of observers, the worst aspect and perhaps most notable feature of the disaster was the mismanaged nature of the attempts to cope with it. Instructions for the workers conflicted. There were no clear lines of authority, as well as no technology available at the disaster scene to deal with the incredibly complex technical problems facing the troops.

Across the English Channel a few weeks later, the U.S. team found the French Army using straw to sop up the oil on the sea. Detergents had been ruled out, to avoid disrupting water and seaweed maritime ecology and the French fishing industry. The oil-soaked straw was loaded into lorries and trucks, then into railroad tank cars, and shipped to Brest, where the plan was to recover the oil by letting it out through stopcocks at the bottoms of the tanks. Unfortunately, sand and debris prevented the oil from flowing. In short, the U.S. observers found that, in France as in England, efficient deployment of resources was severely hampered by lack of planning and an overall strategy.

The six observers, convinced that lack of planning and spill-technology should not be allowed to happen in the United States, reported their findings to their respective cabinet officers. The need for a national plan and better technology also was reported to the White House.

At the request of the President, the team then completed a report on the status of United States spill technology, design of vessels, available equipment and skilled manpower.



The report resulted in a presidential request to the Secretaries of Interior, Transportation, Defense, Health, Education and Welfare, and the offices of Science & Technology and Emergency Planning to assume responsibility for developing a national contingency plan.

The plan was developed and signed into law November 13, 1968. The same agencies were designated to provide overall policy



The wreck of the Torrey Canyon which was responsible for gigantic oil spill in the Atlantic off the Coasts of England and Fr

direction in carrying out the plan's provisions. The Interior Department, as lead agency, established a division in the Federal Water Pollution Control Administration in January 1970 to handle the responsibility.

Many of the original team comprising this division, which preceded first the EPA spill control program and then Superfund, are still working together on the Superfund team. They include:

Headquarters: Kenneth E. Biglane, Russell H. Wyer, Richard Hess, H. D. Van Cleave, Jean Wright, and Ruth Rexroth.

Regions: John Conlon, Region 1; Paul Elliott, Region 2; John A. Little, George Moein, Al Smith, all of Region 4; Russell Diefenbach, Region 5; Charles Gazda, Region 6; Richard Jones, Region 8; James Willmann, Region 10. □

States Active in Hazardous Waste Control

When given the chance, most States are showing that they welcome the opportunity to run programs to control hazardous wastes.

States are allowed by law to operate their own hazardous waste program in place of the Federal program, as long as the two are "substantially equivalent." As of June 1982, nearly two-thirds of the states had proved their programs were substantially equivalent and were running portions of their own programs.

A Short History of A Long Process

In 1976, the Resource Conservation and Recovery Act (RCRA) authorized EPA to establish a hazardous waste control program for the country.

Writing the regulations to implement that part of the law was a complicated and time-consuming process. So complicated, in fact, that EPA decided to do it in stages. And so time-consuming that it took four years just to complete the regulations for the first stage.

In 1980, these regulations took effect. Regulations for Phase 1 cover identification and listing of hazardous wastes, and requirement for generators, transporters, and owners and operators of treatment, storage, and disposal facilities.

Regulations for Phase 2 cover granting of permits for such facilities.

Additional regulations covering permits for containers, tanks, waste piles, surface impoundments, and incinerators took effect in 1981. Rules for permits for disposal facilities have not yet taken effect.

One part of RCRA-Section 3006 authorized "substantially equivalent state hazardous waste programs to operate in place of the Federal program on a temporary, interim basis. After a complete Federal program has been promulgated, State programs can receive final authorization if they are "equivalent" to the Federal program and "consistent" with other State programs.

States wishing to operate their own programs submit qualifying documents to EPA to demonstrate "substantial equivalency." This material includes a description of the state program and certification by the State Attorney General that State law and regulations provide adequate authority to carry out the program. Also needed are a Memorandum of Agreement between EPA and the State; an Authorization Plan specifying what steps will be taken to qualify for final authorization, and when; and a letter from the Governor requesting authorization.

EPA advises the states in developing these submissions; then reviews the documents to determine if the State is qualified for authorization. After a public hearing, authorization notices are published in the *Federal Register*.

Where We Stand

Because the regulations came out in stages, States that wanted to run their own hazardous waste programs had two options. They could wait until all the Federal regulations were complete to apply directly for final authorization. Or they could go for step-by-step interim authorization, establishing their programs piecemeal as each set of Federal regulations was issued. Most of them chose to do the latter.

Arkansas was the first State to receive Phase 1 authorization. Its authorized program began November 19, 1980, the same day the Phase 1 regulations took effect. Since then another 31 States have received similar authorization. Four States—Arkansas, Georgia, North Carolina, and Texas—have also received permitting authorization under Phase 2.

By September 1983, it is expected that 45 States will have received authorization for Phase 1, and 30 States for Phase 2.

In those States that have not yet received authorization, EPA runs the program with the State's cooperation and assistance.

Ironically, it has been easier for those States without a hazardous waste control program to set one up from scratch than it has been for States with an established program to make the necessary changes.



States with no existing program could adopt the EPA regulations almost intact. But States like New York, New Jersey, and Ohio which had well-established programs needed complicated operational and legislative changes to become "substantially equivalent" to the Federal program.

Some States, like West Virginia, were not able to pass legislation before the application deadline for interim authorization. That meant they would have had to skip the interim phase entirely, wait for the Federal program to be completed, and then apply for final authorization. To avoid these delays, EPA is working on extending the deadline.

New Federalism

When North Carolina received authorization to administer Phase 2, EPA Administrator Anne Gorsuch called the occasion a demonstration of "the Reagan Administration's desire to turn over programs to the level of government closest to the problem and best suited to deal with it."

Under Gorsuch, EPA views the States as equal partners, who share the Agency's commitment to environmental quality. The agency is seeking to reinforce the primary functions of State and local governments in promoting and maintaining environmental quality.

EPA believes that the states should be principally responsible for the day-to-day management of environmental programs. Evidence of the States' growing commitment to environmental quality is the fact there are ten times as many state environmental staffers on the job today as there were in 1970.

In keeping with the concept of new federalism, EPA encourages the States to run their own hazardous waste control programs, and will do whatever it can to help them qualify. The Agency advises States in developing application materials and is seeking to make deadlines more realistic.

A critical factor, of course, is money. Federal grants to States now amount to less than half of total State expenditures for environmental programs. In fiscal year 1982, for example, EPA will provide about \$237 million to states. Estimated State funds for the same period exceed \$300 million.

Nevertheless, if substantial budget cuts are made, States may not be able to afford their own programs. So EPA already has a study of alternative funding underway. User fees and other innovative funding mechanisms are being examined for recommendation to financially hard-pressed States.

Running a hazardous waste control program is more difficult for some States than others. Still, as most are demonstrating, they can do it themselves. □

A Burning Answer to a Difficult Question

Although an innovative research community continues to develop increasingly exotic hazardous waste disposal techniques, the favorite disposal alternative for the near future appears to be mankind's oldest alternative—burning.

The rapidly growing popularity of incineration is readily seen in more than 300 industrial systems currently operating throughout the nation. They handle about seven million tons of hazardous waste per year, approximately 17 percent of the total generated. Many more are coming on line or are in the permitting process.

The sky is the limit for this process which has the capability of destroying 9,999 parts of waste out of every 10,000 treated.

EPA's policy is one of encouraging use of more incinerators. Administrator Anne M. Gorsuch calls incineration "clearly one of the most effective ways of disposing of hazardous waste."

The Agency recently took a major step in encouraging incineration when it published modified permitting regulations providing maximum operational flexibility and economy while preserving requirements capable of protecting the public health and environment.

Release of the amended regulations not only will accelerate the permitting process, it also sets the stage for authorization of States to do their own permitting. Four—Arkansas, North Carolina, Georgia and Texas—now have such authority, but EPA officials predict virtually all States will have it by 1983.

Adaptability: A Major Asset

One of the strengths of incineration is its adaptability. The system can be designed to dispose of any type of organic waste: rubbish, solids, burnable liquids, difficult-to-burn liquids and sludges. Incineration can also be designed to recover energy or raw materials during the burning process.

Incineration is actually a simple chemical oxidation reaction occurring at extremely high temperatures. Organic material, composed largely of carbon and hydrogen, reacts under those temperatures with oxygen to produce carbon dioxide and water vapor. The complexity of the substances to be incinerated determines the degree of sophistication and expense required in the system.

Rotary kilns are one of the most versatile types of incinerators. They can destroy solids, liquids, sludges, or even entire containers of toxic materials. The name is derived from the rotation of the primary combustion chamber on a central axis, permitting more efficient burning of solids.

The most effective form of incineration will be found in systems directly associated with production processes. Such *disposal* eliminates hazards associated with transportation and storage of waste materials. It also permits final control by the generator and often allows incorporation of energy and raw material recovery techniques in the process.

The recovery of energy, for instance, is a popular process associated with combustion. The heat released when waste is burned can be captured in heat exchangers (boilers) operating like huge radiators. These devices capture the heat to convert water to steam and make a significant contribution to energy resources.

Dow Chemical U.S.A., for instance, operates more than 25 heat recovery incinerators throughout the nation. Their annual heat recovery is estimated at about 2.8 trillion BTUs, the equivalent of 9.2 million gallons of gasoline.

Hierarchy of Waste Incinerability

Under EPA's modified permitting regulations, industrial incinerators must meet three major performance standards:

1. Destruction and removal efficiency of 99.99 percent. For every 10,000 pounds of waste going into the incinerator, only one pound can come out.

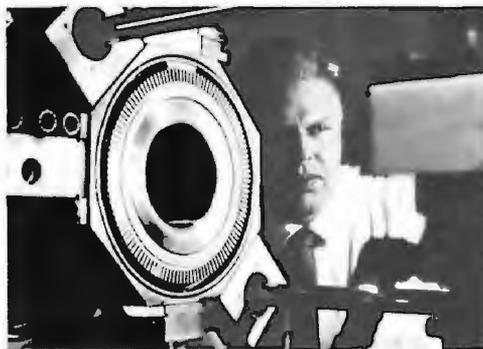
2. Hydrogen Chloride removal of 99 percent, before it is released into the atmosphere, whenever the release exceeds four pounds per hour.

3. Careful control of particulate emissions. Particulates must not exceed 180 milligrams per dry standard cubic meter of stack gas.

It was charged in some industry comments that meeting such standards would be prohibitively expensive, even impossible. Rita M. Lavelle, Assistant EPA administrator for Solid Waste and Emergency Response, said however that "a careful review of the evidence affirms the Agency's belief that industry can meet those standards."

Cost is a critical factor, since a trial burn—the central element in the permitting process—may cost the operator from \$50,000 - 100,000.

To minimize and alleviate the impact of such expenses, Lavelle said, the Agency's



The Westinghouse Marc 31 Arc Heater is an ultra high temperature heat exchanger.

modified regulations established a system whereby industry need not perform a trial burn on all substances it intends to process. It may perform the test only on components that are hardest to burn, under the assumption that all those which are easier to burn also can be destroyed satisfactorily in the process, she said.

EPA's permitting guidance manual includes a "hierarchy of waste incinerability" which ranks approximately 300 chemical constituents found in hazardous wastes in the order of their degree of combustibility. If the trial burn demonstrates compliance with the performance standards for a given constituent, then compliance is assumed under the same operating conditions for any constituents ranking below it on the hierarchy.

The Permitting Process

The amended regulations, which place both new and existing incinerators under the stringent controls described above, greatly simplify previous permitting procedures.

Here is how the permitting process will work:

1. From a range of wastes an applicant proposes to burn, the permitting official selects a limited number of components—usually 1-6—which are most difficult to destroy. These substances are called "Principal Organic Hazardous Constituents (POHCs)."

2. A trial burn is conducted to prove that the performance standards are met, and to establish the operating conditions required to meet them.

3. If the performance is successfully demonstrated, the operating conditions selected for the test burn become the permit conditions.

4. The permit allows burning of any waste with constituents which are less difficult to burn than the selected principal hazardous constituents, based on the hierarchy of waste incinerability.

The permitting process for new incinerators provides regulation for four basic operational phases: a "shakedown" phase to ensure that the incinerator is functioning properly; a trial burn to prove compliance with the performance standards; temporary limited operation while the trial burn results are being evaluated; and final long-term operation based on the trial burn results.

The Next Step—Authorizing States

The amended regulations set the stage for State implementation of Resource Conservation and Recovery Act (RCRA) provisions applicable to incinerators. Ultimately most incinerators will be permitted by States under the Federal regulations or their equivalent.

Most States are expected to receive approval to issue incinerator permits by the end of next year. Whether issued at the Federal or State level, permits will provide strict controls to ensure safe operation without harm to human health or the environment and without placing unreasonable burdens upon the regulated community. □

European Waste Management

Garbage is not a tourist attraction. The average sightseer in Copenhagen, Denmark, for example, doesn't much care about the city's carefully planned and operated system of hazardous waste management. Nor is the average tourist in Paris the least bit interested in that city's refuse power plant. Yet these two systems of hazardous and solid waste management, and others like them throughout Europe, are worth some attention, for they are more advanced in many ways than American systems.

Beautiful Copenhagen stays that way partly because it has an organized method to control its own toxic wastes. According to John Lehman, Director of the Environmental Protection Agency's Hazardous and Industrial Waste Division, the Danish system of hazardous waste management is exemplary in several ways. Unlike most U.S. systems, it integrates treatment, disposal, and transportation into a single system, and features public-private cooperation.

In Denmark, there is at least one collection station in each municipality to collect waste oil and chemical waste from private households. Twenty-three central collection stations located throughout the country receive waste from these local stations as well as from industry and agriculture. The waste then travels by road or rail to the treatment plant, known as *Kommunekemi*. There the hazardous waste is incinerated, chemically treated, or, if it cannot be treated, disposed of in abandoned salt mines 700 meters underground. Every hazardous waste producer in Denmark *must* send its waste to *Kommunekemi* unless it can convince the local municipality that it can handle the waste safely itself.

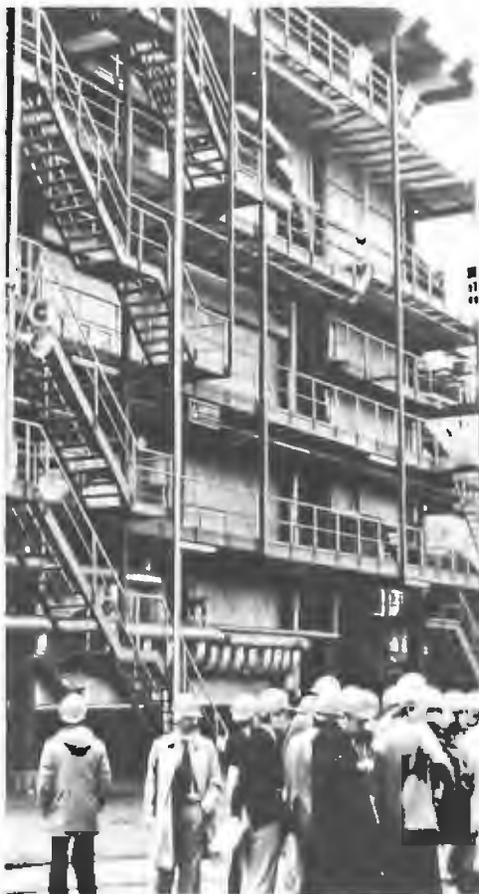
With a capacity to handle 80,000 tons of hazardous waste a year, *Kommunekemi* is the largest plant of its type in Europe. Similar but smaller plants are located in Ebenhausen and Biebesheim, West Germany (70,000 and 60,000 tons respectively) and in St. Vulbas, France (30,000 tons). All three plants accept waste from beyond their immediate plant area, even from other countries. And there are other similar facilities elsewhere in Europe. Lehman explains that these facilities use state of the art technology. "They have stood up to some heavy public pressure," he says, "and were found to be pretty good." Like *Kommunekemi*, the German plants are owned and operated by a government-industry consortium. The French plant, though privately owned, is government regulated and subsidized.

Built last year, the Biebesheim plant is one of the newest in Europe, and will eventually

include wastewater treatment plants, a landfill, and physical/chemical treatment plants, all under the same management. Biebesheim will recover some of the energy it consumes. Heat from burning waste is already being converted to steam, which in turn is being used to produce electricity and to power a system for reclaiming crank case oil. Future plans call for greenhouses to be built next to the plant, heated by turbine condense from the plant and used for growing winter vegetables.

According to Lehman, these European systems present an organized, logical approach to the management of hazardous waste. "Although the U.S. is not behind them technologically," he says, "we don't have the centralization of facilities they have. And we don't yet see government involvement in these projects." But the biggest gap in the American system, says Lehman, is the tie-in to transportation. "Our transportation systems are usually independent of the overall waste management picture," he explained.

But things may be changing, Lehman concludes. *Kommunekemi* is trying to market its system in this country; a firm in Baton Rouge, Louisiana is trying to build a centralized facility like *Kommunekemi*; and states and regional authorities "may be getting more interested."



A hazardous waste incinerator at the Ebenhausen Facility, Bavaria, West Germany

In solid as well as hazardous waste management, we have a lot to learn from the Europeans. From 1896, when the world's first waste-to-energy plant was built in Hamburg, Germany, to the present, when there are some 200 such plants throughout Europe (but only eight in the U.S.), extracting resources from refuse has become a European specialty. In the Netherlands, in fact, it is more than a specialty, it is the law. New incinerators cannot be built there unless they contain equipment for heat recovery.

The largest of the 200 European plants is in Paris; it processes 2,600 tons of garbage a day. Smaller plants process less than 100 tons a day. According to David Sussman of EPA's State Programs and Resources Recovery Division, the plants are in all types of locations. "Often they're right in the middle of a city," Sussman explains. "After all, that's where the garbage is, and that's where the energy users are. But sometimes they're in the regional countryside, away from any towns at all. One small plant in Switzerland, for example, serves 47 communities in two countries."

In a typical European city, says Sussman, paper products are separated from other garbage at their source by homeowners. The remainder of the municipal trash goes to a central facility where it is burned to produce energy. Most of the plants in central Europe generate high pressure steam for electrical production. Plants in the Scandinavian countries tend to use the energy more for district heating.

Sussman estimates that a good energy recovery plant could meet about 10 percent of a city's energy needs. Still, he emphasizes that garbage disposal, not energy production, is the prime purpose of the plants. The public perception of harmful effects from landfills is greater in Europe than in this country. While Americans have tried to correct the problem of leachate by building a better landfill, Europeans have tried to avoid the problem altogether by burning and recycling the refuse. Although operating costs per ton are two to four times greater for a waste-to-energy plant than for a landfill, the European attitude is that proper disposal through incineration is worth the extra cost.

"Europe," says Sussman, "is 20 years ahead of the U.S. in recognizing the problems with continued land disposal of solid waste and also in recognizing the potential of recovering energy from solid waste." But continuing energy shortages and landfill problems may yet combine to make European-style waste-to-energy plants more popular here.

Europe is known for its historical sites: Roman ruins, medieval churches, Renaissance palaces, Napoleonic monuments. True, the continent is the repository of many historical artifacts of Western civilization. But it is also an advanced laboratory for handling the present and future artifacts of that civilization—solid and hazardous wastes. □

Recycling and Waste Exchanges



The reuse, recovery and recycling of industry's discarded materials is emerging as a solution to the nation's waste disposal problem.

Increasingly, economic incentives are playing a role in changing attitudes toward discarded materials containing recoverable items. As the price of raw materials steadily increases, so does the incentive to recover such materials from other sources. More and more businesses are finding that what is good on a small scale—in terms of reuse, recovery and recycling—is also good for large-scale operations.

The United States currently lags behind the rest of the industrialized world in recovery and recycling of materials. In Europe, for example, a long tradition of resource conservation has allowed several countries to establish themselves as recognized traders in resource recovery and recycling. The recycling of paper products serves as one illustration of the point. The Europeans recycle fully twice as much paper as Americans do. This is true for a number of other waste products as well.

This remarkable disparity may be the result of this country's bountiful supply of relatively inexpensive raw materials. As that picture is changing, however, so is the country's interest in the reusing, recovering and recycling of materials.

Recycling materials is not a new idea; in fact, it has been around for quite some time. It is familiar to most Americans in the form of newspaper and glass recycling. Collection centers have sprung up all over the country for the recycling of common household items

A lesser known, but widely used, form of recycling involves industrial waste. Various industries have made a common practice of recycling waste products, such as steel scrap and glass cullet. An area of increasing interest in industrial waste recycling is the recycling of hazardous waste.

Hazardous Waste: A Complex Problem

Hazardous waste recycling is a particularly complex area. It is difficult to make generalizations about hazardous waste recycling because it is highly process- and material-specific. Whereas municipal solid waste recycling is fairly similar throughout the country, hazardous waste recycling techniques vary from industry to industry, from process to process, from waste to waste.

The amount of hazardous waste currently being recycled is not known. No one collects comprehensive data on hazardous waste recycling. In addition, many recycling processes are proprietary; information about how much is recovered is not released or sought because it discloses valuable information about the process, and gives business competitors an unfair advantage.

However, certain success stories are known. Dow Chemical Company, for example, operates a plant in Freeport, Texas, which recovers chlorine by a thermal process from chlorinated wastes. Stauffer Chemical has developed a process for recovering and reconstituting sulfuric acid from the spent alkylation acids produced by oil refineries.

Once the sulfuric acid is reconstituted it is then recycled to oil refineries for reuse. Another effective technique for the reuse of industrial waste has been demonstrated by Monsanto. This technique employs a waste stream from adipic acid manufacturing in the desulfurization of stacks used in coal combustion. All of these techniques have proven to be highly effective, and industry is well aware of this.

A prime example of the multiple environmental benefits which can result from industry creativity in reprocessing hazardous waste streams is provided by Dupont. At its Edge Moor, Delaware, titanium dioxide plant, Dupont produces large amounts of iron chloride as a by-product. Until 1974 Dupont disposed of this iron chloride at sea. In 1974 Dupont invested several million dollars in a process unit which converts the iron chloride into commercial grade ferric chloride. The ferric chloride is sold to waste water treatment plants and water purification plants as a coagulant for suspended solids and as an agent for removing phosphorus and dewatering sewage sludge. Not only has Dupont found an innovative way to recycle its iron chloride waste stream, it has eliminated the need for ocean disposal and has converted the waste into an essential element for water treatment processes.

The Office of Solid Waste estimates that, excluding waste burned for fuel, only about five percent of the hazardous waste generated in this country is currently being recycled. When the waste that is burned as fuel is included, some 35 percent of the hazardous waste generated is actually recycled. This may appear impressive, but

some estimates of the potential amount of hazardous waste that can be recycled run as high as 80 percent. Thus, there is significant potential for improvement in this area.

Basically, hazardous waste is recycled for two reasons: (1) the value of the materials in the waste, and (2) savings from not having to manage the wastes. The value of the materials for inhouse use or for resale has long been the main reason for recycling, but with the increasing costs imposed on managing hazardous waste by RCRA regulations, savings will soon become a greater consideration.

Silver is an excellent example of hazardous waste recycling done for reasons of value. Silver is a highly valuable commodity; it is also quite toxic. Photographic film is a basestock covered with a silver emulsion. Silver can be recovered from waste waters in the emulsion manufacturing process and from scrap cuttings when the film is trimmed to roll size. Fully one quarter of the silver used in manufacturing can be recovered. The process is fairly involved—it includes settling, treating, dewatering, roasting, smelting and refining—but for one quarter of the silver, it is worth it. Kodak, in Rochester, New York, has the world's largest silver refinery; it operates completely on recycled waste silver.

Savings as a reason for recycling are becoming more and more important as companies look for methods to deal with the costs of complying with RCRA and state hazardous waste management regulations. A pioneer in this effort is the 3M Company which says it has saved \$76 million since its waste reduction program began in 1975. The

3M program generates dollar savings by reducing or eliminating pollution at the source rather than paying to clean it up. 3M's motto, "Pollution Prevention Pays," recognizes that pollution represents an inefficient and uneconomical use of resources.

Recognizing the potential significance of recycling as a tool for managing hazardous waste, the RCRA regulatory program has adopted an approach which promotes recycling of hazardous waste. "UR³," which stands for use-reuse-recycle-reclaim, is the acronym which describes this approach. The goal is to encourage hazardous waste recycling while still maintaining control over some of the recycling methods. Under UR³ the RCRA regulations will impose stricter requirements on some recycling techniques compared to others based on the wastes involved; the lighter regulatory burden thus imposed on some techniques should encourage recycling through those processes.

Waste Exchange

Recycling within a company or industry may present a real solution with regard to certain wastes, but what of the many other waste products which the company or industry cannot reuse, recycle, or recover? Are there potential uses for these other industrial by-products? Industry is discovering more and more that one company's waste may be another company's resource. Increasing interest in this form of recycling has led to the development of waste exchanges.

Waste exchanges are basically of two different types—waste information and waste

materials exchanges. The two differ in what they transfer and the role they play in the basic transfer system. The former, of course, deal only with the information about wastes, serving primarily as clearinghouses for generators and users. The latter actually receive and handle the waste materials themselves, and thus function as an integral part of the transfer system.

EPA has long been receptive to the idea of waste exchanges. As early as 1976 the Agency proposed to U.S. industries a sequence of steps involving waste reprocessing and exchange for their waste management strategies.

These steps are designed to:

- Minimize the quantity of waste generated by modifying the industrial process involved.
- Concentrate the waste at the source to reduce handling and transport costs.
- Transfer the waste "as is" without processing, if possible, to another facility that can use it as a feedstock.
- Reprocess the waste for material recovery when a transfer "as is" is not possible.
- When material recovery is not possible: —incinerate the waste for energy recovery and for destruction of hazardous components, or —if the waste cannot be incinerated, detoxify and neutralize it through treatment.
- Use carefully controlled land disposal only for that which remains.

One example of a successful waste exchange is the Midwest Industrial Waste Exchange. Begun in 1975 as the St. Louis Industrial Waste Exchange, this organization was the first of its kind in the U.S. An information source, this exchange had 45 listers in each quarterly publication of wastes in 1979. Today that number has grown to approximately 125 listers per issue. The circulation of the quarterly has jumped from 956 in 1979 to nearly 5,000 today.

EPA has assisted this exchange, where possible, in upgrading and expanding its services to the Midwest region. Other existing waste exchange operations have joined the Midwest exchange in its growing regional effort. The Minnesota and Iowa exchanges are now participating in the expanding regional program. Nebraska is also an active sponsor, and the Waste Materials Clearinghouse in Indianapolis is expected to join forces with the Midwest exchange next year.

The Midwest exchange is one of the real success stories in the area of waste recycling. Its environmental contributions were recognized earlier this year when a panel of judges for the President's Council on Environmental Quality, including EPA Administrator Anne M. Gorsuch, conferred on this exchange the 1982 Award for Excellence in Toxic Pollution Control. □

A page from the Midwest Industrial Waste Exchange catalog and news brochure.



ITEMS Available

1. ACIDS, INORGANIC

Code Identification: A-19-9

Item: Sulphuric Acid spent pickle liquor. Fe 10%, Acid 3%.
Availability: 12,000 gallons/week. Bulk.
Location: Central Kentucky

Code Identification: A-19-13

Item: Spent Hydrochloric Acid, 45%-55% by volume.
Availability: 780 gallons twice a year, fiscal weeks 3 & 28. Bulk.
Location: Southwestern Virginia

Code Identification: A-19-14

Item: Spent Nitric Acid Etch Solution, 1% by volume.
Availability: 260 gallons every 60 days + 180 gallons fiscal week 28.
Location: Southwestern Virginia

A Moveable Burner

EPA has developed a mobile incinerator capable of burning large quantities of hazardous wastes at a particular site.

This three-trailer monster has the potential to eliminate some of the problems associated with hazardous waste disposal. It can cut transportation and storage costs, and do away with accidental spills in transit.

Still more encouraging, the incinerator is just one of dozens of technological innovations that EPA's Office of Research and Development (ORD) is bringing to the front lines of the war against hazardous wastes.

The incinerator was conceived in 1976, when ORD first issued a request for proposals to develop the unit. Mobility was critical for several reasons. Accidents that occur while moving hazardous wastes to disposal sites can trigger health-threatening spills. But an incinerator that goes to the site of origin can eliminate the need for transporting small quantities of waste altogether. Also, because a mobile incinerator leaves the site when the job is done, it poses less danger to nearby residents than a stationary incinerator or landfill. The mobile incinerator should be particularly applicable to refractory synthetic organics such as PCBs, Kepone, and dioxin—substances which are surrounded by public sensitivity.

In August 1980, the prototype incinerator arrived at EPA's Oil and Hazardous Materials Spills Branch in Edison, New Jersey for field tests and final shakedown. Since then, two test burns with fuel oil have been successfully completed. A trial burn and field demonstration with PCBs are scheduled later this year at the Edison facility and Kin-Buc landfill. According to Frank Freestone, Chief of the Hazardous Spills Staff at EPA's Edison lab, no major technical problems are expected.

Trailer One of the incinerator system is equipped with a rotary kiln where organic wastes are fully vaporized. The kiln's 1800°F temperature partially destroys contaminants. The gases then pass to Trailer Two, where decomposition of contaminants is completed at 2200°F. In Trailer Three, a scrubber, particulates are removed and acid gases neutralized. The cleansed gases are then discharged from a stack. A separate trailer monitors stack gases.

The mobile incinerator was the first of its kind. A Massachusetts firm has since developed an incinerator along similar concept lines. EPA is counting on the ingenuity of American industry to produce future generations of this technology. To encourage this, when testing is completed the agency will provide interested companies with all incinerator plans, specifications and permitting application materials.

The incinerator can treat up to 100 tons of dry hazardous waste, or six tons of liquid hazardous waste per day. Assuming an operating cost of \$10,000 per day, incinerating costs, after set-up, should run about \$100 per metric ton of contaminated solids and about \$1700 per metric ton of chlorinated fluid (\$350 per 55 gallon drum). While that is by no means cheap, mobile incinerators are still expected to save money. Savings will come from eliminating costs of waste transportation and storage. Operating costs will drop as experience is gained. And companies should be able to reproduce the incinerator for less than half of the \$2.2 million it cost EPA to develop the prototype.

Of Soils and Spills

The mobile incinerator is one of many pieces of innovative equipment that EPA's Office of Research and Development is working on to meet program needs. Some equipment is still in the research stage; some is already available for field use. Private industry, operating under Federal contract, can use the equipment to clean up hazardous waste sites. EPA believes the private sector will marshal the technologies and skills to do this job.

The scope of EPA research projects is extensive, ranging from remote sensing to acoustic monitoring, and from checking soils to cleaning spills. These projects include:

- A portable, inexpensive, and low-maintenance acoustic emission monitoring device provides early warning of potential failure of earthen dams containing hazardous materials. It has been used for industrial waste impoundments and dams up to 150 feet high, and on many occasions has provided adequate warning of dam collapse.
- A carbon adsorption pilot plant can be used to conduct on-site evaluations of the treatability of chemical waste solutions and mixed chemical spills. Pilot scale systems have been used at two uncontrolled hazardous waste sites in New York.
- A portable foam dike system sprays polyurethane foam that forms a barrier, either enveloping or diverting the flow of many spilled hazardous chemicals. Firefighters and other first-on-scene personnel often use this to control the flow of a spill.
- A mobile stream diversion system can dam a stream above the site of a hazardous materials spill. This bypasses the normal stream flow and facilitates cleanup by permitting the spill area to dry. The system was

A full length view of EPA's mobile incinerator when it was displayed behind the Agency's headquarters in Washington.



recently used to provide uninterrupted water service to communities in the area of a spill.

- Mobile systems for extracting spilled hazardous materials from soil and for detoxification and regeneration of spent activated carbon are under development.
- Also under development is a protective clothing and equipment unit for workers in highly toxic atmospheres. The self-contained, fully encapsulating clothing and breathing apparatus should protect workers from chemical exposure during cleanup operations for two and one-half hours at a stretch.

Since technology transfer is a priority of EPA's research program, the Agency funds conferences and publications so private industry and others can learn about research results. Conferences have been held on control of hazardous material spills, and on management of uncontrolled hazardous waste sites. Publications include a technical handbook on preventing releases of hazardous substances, and a bibliography on hazardous materials analysis methods.

There is a futuristic quality to some of this

research work. One example is the use of remote sensors to detect leaching landfills. Characteristics that may indicate leachate pollution are wetness, gaps in vegetation or snow cover, and anomalies in water, soil, or rock. By tracking these characteristics over a period of time, remote sensing can identify surface water contamination at the land disposal site, and even some distance away from the site.

EPA's Office of Research and Development is coming up with a whole assortment of up-to-the-minute equipment to mitigate the danger of hazardous materials. Industry is picking up on some of these opportunities, and looking over others in development. According to Rita M. Lavelle, EPA Assistant Administrator for Solid Waste and Emergency Response, this illustrates how the Federal government can support the private sector—with frontier-piercing technologies that industry can duplicate. "Private firms know the market," says Lavelle, "and can adapt the new technologies quickly."

Lavelle explains that private sector ingenuity is facing a challenge: how to put prototype technology into practice to rid the

nation of hazardous waste. She is confident the challenge will be met. She emphasizes that Federal and state governments would do well to work closely with industry to put new technology on the road and to carry out cleanup operations. "We must forge a new relationship between regulators and the regulated," Lavelle says, "one that is based on mutual trust."

More Information

A publication entitled *Environmental Emergency Response Unit Capability* contains more information on some of the equipment mentioned in this article. The April 1982 publication describes technology that is either currently available or under development in the Oil and Hazardous Materials Spills Branch of the agency's Municipal Environmental Research Laboratory. It also explains how to order more detailed descriptions of specific pieces of equipment. Single copies are available from James J. Yezi, Jr., Oil and Hazardous Materials Spills Branch, Municipal Environmental Research Laboratory, U.S. EPA, Edison, NJ 08837 □



Land Disposal Regulations



For many years, the traditional method of disposing of waste has been to dump it on land. However, as society is now discovering, unregulated land disposal can endanger the quality of the groundwater, the air and the land itself.

The mistakes of the past in land disposal are now being cleaned up through such programs as Superfund. However, EPA has long realized that to ensure that land disposal does not create future problems, this disposal must be controlled in a way to protect the water, the air and the land.

Since the passage of the Resource Conservation and Recovery Act in 1976, the Agency has examined many approaches for controlling pollution from hazardous waste landfills: surface impoundments (settling ponds), waste piles, and land treatment units. One approach was very vague, with no operational or performance standards. The proposal called for an elaborate "risk assessment" which asked owner/operators to predict what type of pollution could result from the operation of the facility. Another approach was very inflexible, mandating in great detail exactly how a land disposal facility should operate.

On July 8, EPA's Administrator, Mrs. Gorsuch, announced the promulgation of final land disposal regulations. These regulations are stringent, establishing strict environmental protection and design and operation standards that must be met. However, they allow for innovation on the part of the ow-

ner/operator. Although he has to meet the performance standards, the owner/operator can select the appropriate method of controlling pollution.

The land disposal standards, which will become effective in six months, approach regulation from the standpoint of protecting America's groundwater drinking supplies. In announcing the regulations, Mrs. Gorsuch said that "protecting the groundwater resources of Americans has been one of EPA's central concerns in developing a regulatory strategy for the disposal of hazardous waste on land. These regulations include an environmental standard that will ensure that the quality of drinking water for future generations will not be compromised."

Under the new regulations, both new and existing facilities applying for a permit must comply with the requirements for groundwater monitoring, run-off controls, cap at closure, third party liability requirements, and post-closure requirements.

New facilities, with the exception of land treatment units, are required to install an impermeable (e.g. synthetic) liner system as well as a leachate collection and treatment system. They may be exempted from the monitoring requirements if they install a double liner and a leak detection system.

Facilities now operating do not have to retrofit to install liners but must meet all other requirements.

The design features required by the regulations are similar to the pollution control devices presently being installed in many new facilities.

These standards are one of the final parts of EPA's core regulatory program to control the disposal of hazardous waste. The first sets of regulations controlling the disposal of hazardous waste were issued in 1980 under the Resource Conservation and Recovery Act. Together, the regulations provide "cradle-to-grave" management of hazardous waste.

EPA believes that the standards issued will not stifle innovation. The standards clearly set forth the environmental results to be achieved. It is left to the owner/operator to determine the most appropriate design to accomplish this goal. Besides being more cost-effective, such an approach keeps EPA, the States and the public focused on the issue of greatest concern—the environmental results that can be expected. EPA also expects the regulated community to devote its environmental expenditures to measures that will achieve these results.

Agency officials believe the purposes of RCRA cannot be achieved unless the standards for land disposal facilities are capable of implementation within the context of the permit program. To meet this need, EPA's regulatory approach must be one that can be implemented quickly. Therefore, the land disposal regulations emphasize standards that provide a clear indication of what is expected. Such certainty should reduce the time involved in acting on permits and should avoid the need for complex analyses with uncertain outcomes. □

Training Local Health Officials

It's a hot day in mid-August. The air hangs heavy with humidity. In this town of 7,000 residents, everything appears to move a fraction of a second slower than normal.

John Blackstone, the town health officer, is performing his mid-summer Saturday morning ritual, mowing the lawn. Suddenly his wife bursts from the back door and urgently summons him to the phone.

It's the town police chief. He is calling to inform Mr. Blackstone of a chemical spill in the stream which flows through the town. Earlier that morning, the chief had been called to the scene by an excited fisherman who had noticed fish floating belly-up in the water. The chief had found four containers: three 55-gallon drums and one paper carboy. The carboy and one of the drums were leaking into the stream. There was a smell of rotten eggs mixed with a curiously sweet odor. On the stream embankment, the chief had started to cough violently. He had moved to higher ground, and now was calling the health officer to find out what to do.

This scenario is part of a final exercise in a course entitled *Hazardous Materials in the Community: The Role of Local Health Officials*. The course and its corresponding student and instructor's manuals were developed by the Department of Environmental Science, Cook College, Rutgers University, under an academic training grant from the Environmental Protection Agency.

While the incident portrayed above is fictitious, real incidents just like it are becoming more common in communities throughout the country. The increasing frequency of such episodes involving hazardous materials has

Final drafts of the course manuals are in preparation. The model course will consist of 40 instructional hours consisting of 30 lectures and one incident response exercise. Further information on the course is available from Dr. Peter Strom, Dept. of Environmental Science, Cook College, Rutgers University, New Brunswick, NJ 08903.



accentuated the need to train people who can respond in an appropriate, knowledgeable way. Training courses abound, but most are not targeted at an important, available manpower resource: environmental enforcement officials from local, regional, and county public health agencies. These individuals typically have a background in biological, physical, or health sciences that, with proper training, would equip them to make routine or emergency responses to hazardous materials incidents.

Some of the activities local health officials could carry out include the following:

- Inventory the community to identify sources of hazardous materials.
- Help develop an intra-local agency contingency plan for emergency responses, spelling out the roles of the police, fire, public works, emergency management, and other departments.
- Inform citizens about hazardous materials.

"Hazardous waste is a matter of unique concern to New Jersey... Our problems with toxic and hazardous waste are not limited to the cleanup of disposal sites or even the siting of new facilities. We need to do a much better job of law enforcement. Poisoning our water supplies and threatening our health is a heinous criminal act."

Gov. Thomas H. Kean of New Jersey

- Respond to public complaints about hazardous materials.
- Make initial assessments of a hazard and associated risks.
- As first-responder, help stabilize and resolve an incident.
- Trigger appropriate remedial and enforcement activities.

The Rutgers/EPA course and manuals are intended to facilitate development of courses for this specific audience: local, regional, and county health officials. Organizations that use the course material to provide quality training for this audience will also supplement course material with state and local expertise. This is absolutely necessary so that regional issues can be adequately addressed.

The course was recently field tested in a pilot presentation to 25 State and local health officials co-sponsored by the New Jersey State Department of Health and the New Jersey Department of Environmental Protection. It will next be revised and offered by the University of New Mexico in association with the American Public Health Association to representatives of graduate-level environmental and public health schools to become part of their own curricula.

Local health officials are knowledgeable about a broad spectrum of hazardous waste issues, and can be a valuable community asset in hazardous waste incidents. The EPA/Rutgers/University of New Mexico/American Public Health Association efforts should help these health officials get the additional training in hazardous materials that they both want and need. □

This article was written by Dr. Jorge Berkowitz and Helen Fenske of the New Jersey State Department of Environmental Protection; and by Frank Flower, Dr. Peter Strom, and Marja van Ouwerkerk of Cook College, Rutgers University. Dr. Berkowitz is technical advisor to the director of the Division of Water Resources, Ms. Fenske is Assistant Commissioner of Natural Resources, Mr. Flower is an Extension Specialist, Dr. Strom is Assistant Professor, and Ms. van Ouwerkerk is Project Consultant.

Simplifying Transport of Hazardous Wastes

EPA has a new plan for relieving some of the paperwork burden on generators and transporters of hazardous wastes.

Currently almost half the states have their own manifest forms, and a transporter may have to carry the manifest of each state through which he travels. If EPA's proposal is adopted, this blizzard of manifests will be replaced by a single, standard form for use in every state.

Multiplying Manifests

A manifest is a control and transport document that describes a collection of waste and accompanies it from point of generation to point of destination. The purpose of a manifest system is to assure that hazardous waste actually arrives at its intended destination for treatment, storage, or disposal (TSD).

The Resource Conservation and Recovery Act of 1976 (RCRA) called for EPA to establish a manifest system. The agency first proposed a system in December 1978, and set it in final form in February 1980. At that time, EPA considered and rejected the idea of a uniform manifest, deciding instead to require only specific information, not specific forms. Members of the regulated community were already required by the Department of Transportation to use a shipping paper for transporting hazardous materials. Trying to minimize paperwork, EPA gave them the option of adapting the shipping papers to function as manifests or designing their own forms.

What the agency didn't foresee was that individual states would require state manifests.

The result was multiplying manifests. At least 21 states developed their own forms, often asking for duplicative information. If a shipment of hazardous waste had to go through five or six of these states to reach its destination, it was possible that the generator would have to fill out five or six different manifests. The lack of uniform require-

ments also kept multi-state generators from standardizing their manifest procedures.

Relief was needed. It came—or at least the promise of it came—this March when EPA published in the *Federal Register* a draft Uniform Hazardous Waste Manifest form. In a companion action, the Department of Transportation declared that any state manifest differing from EPA's would be considered inconsistent with DOT regulations.

The new form identifies the generator, transporters, and final destination site for each shipment of hazardous waste. Wastes are identified by name, hazard class, quantity, type and number of containers, and DOT's key emergency response number. Transporters and facility owners or operators acknowledge, on the form, receipt of the materials listed.

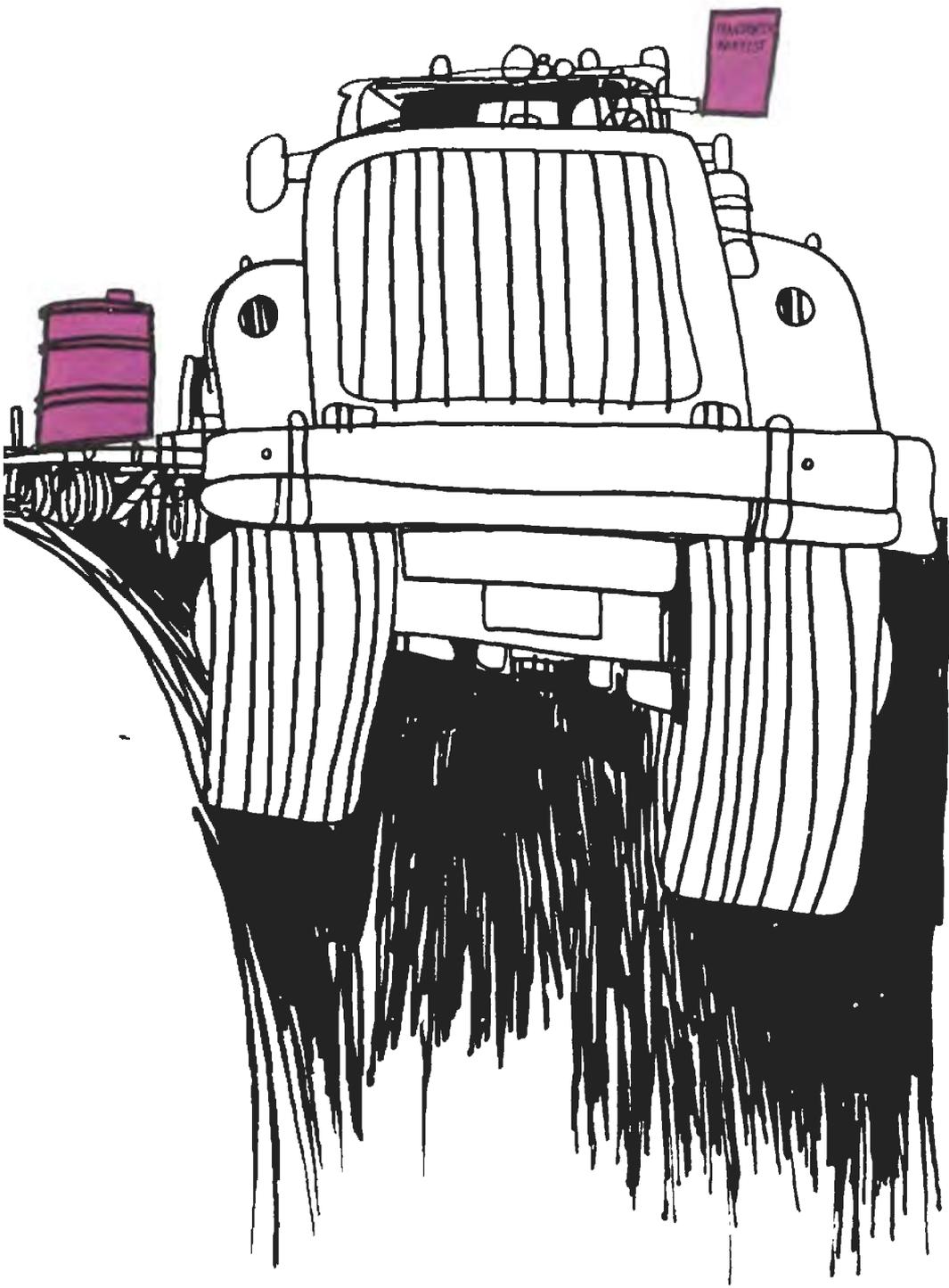
EPA has not increased its requirements for information on the new form except for one minor item, inclusion of a telephone number for the treatment, storage and disposal facility. A unique manifest document number will allow each generator to manifest up to 100,000 shipments before repeating a number. An optional continuation sheet for additional wastes and transporters eliminates the need to fill out multiple separate manifests for one shipment.

Rollerskating in a Buffalo Herd

The period for public comment on the proposed uniform manifest, originally scheduled to end May 3, was extended on request to June 17. In all, more than 150 organizations sent comments. Almost all agreed on the need for uniformity, but almost all disagreed on how to achieve it. Although opposing the uniform manifest is, in the words of an Oklahoma official, like rollerskating in a buffalo herd, many people decided to put on their skates.

Most states want the form modified. They want to continue receiving state-specific information that is required on their own forms but not on the proposed Federal form. They are also concerned about their right to print and control the manifest document.

Industry generally supports the form, favoring rapid implementation. Uniformity is



the paramount concern here. The comments received indicate that companies would rather deal with more requirements for information, as long as they are uniform, than with "optional" spaces. The few firms that do oppose the form are currently under no state manifest regulations.

Both industries and states worked hard to help develop the proposed uniform manifest, and both are making extensive suggestions during the comment period. Through their

professional organizations—the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and the Hazardous Materials Advisory Council (HMAC)—the two factions are trying to reach agreement on controversial issues. Some sort of compromise appears inevitable, possibly a tradeoff of more requirements for fewer options.

EPA will consider all comments before making any revisions in the proposed manifest. However, the Office of Manage-

ment and Budget has the final say because it must approve the form. A lot depends on how broadly or narrowly OMB views the Congressional mandates of EPA to "protect human health and the environment" and of DOT to provide for transportation safety. While inclusion of more information on the form may be important for purposes of state record-keeping, it may not be important for purposes of meeting the mandates of RCRA and the Hazardous Materials Transportation Act.

Question of Compatibility

According to EPA Administrator Ann Gorsuch, "A new hazardous waste manifest system would clear up the current confusion caused by many separate and differing state manifests. Reducing the paperwork burden on the regulated community is one of this Administration's top priorities," she continued. "EPA and DOT have worked hard to accomplish this goal by simplifying the paperwork now required from hazardous waste generators, transporters, and facility operators.

The question in many states is whether the regulated community's priority of paperwork reduction is compatible with the states' priority of state-specific waste information. States have commented that their additional information is so important to their hazardous waste programs that, if necessary, they will use other methods to collect it, such as requiring monthly reports from generators and TSD facilities. Therefore, they argue, implementation of the proposed uniform manifest would not alleviate the paperwork burden on the regulated community at all, but would, in fact, actually increase it.

The trick for EPA right now is to find a way to maintain both uniformity and individuality. The agency wants a real solution to this issue, and that will require real compromise between industry and the states. □

Hazardous Waste Enforcement

A change is taking place in the enforcement of RCRA and Superfund, a change best characterized by the terms "environmental results" and "cooperation, not confrontation."

Together these terms should translate into significant benefits for public health and the environment: for RCRA properly enforced means no new hazards due to mismanagement of hazardous wastes, and for Superfund properly enforced means expeditious, effective cleanup of the nation's worst hazardous waste sites.

Enforcing RCRA and Superfund for environmental results places the emphasis on action—where it should be. A few examples of such action should illustrate the point.

- In May a Federal District judge sentenced a landfill operator in Pennsylvania to one year's imprisonment and a \$200,000 fine for criminal violation of federal pollution laws. The landfill operator had been convicted of repeatedly allowing pollution to drain into two tributaries of the Schuylkill River.
- In June 1981, a New York businessman received a two and one-half year prison sentence for dumping PCB-laced oil along North Carolina roads; a second defendant received an 18-month jail term.
- Last November, a Vermont paper-mill executive was sentenced to 90 days and fined \$25,000 for violating an environmental consent decree.

These are examples of environmental results achieved through criminal enforcement actions.

Where enforcement efforts succeed, the bad operators will be prevented from polluting the environment further. Equally important, such actions will deter others from attempting similar illegal activity. In all, the environment stands to benefit considerably from both the measurable enforcement actions taken and the immeasurable effects these actions have on the regulated community.

OSWER's Office of Waste Program Enforcement (OWPE), working with the Office of Legal and Enforcement Counsel and the Department of Justice, as well as various state and local authorities, plans to go after the same type of environmental results.

Another important measure of environmental results achieved by enforcement is the commitment of private money and effort

to improving hazardous waste management and cleaning up problem sites. Enforcement actions are often the catalysts for drawing such commitments from the private sector.

The Hyde Park landfill case in Niagara, New York, is a good illustration. As a result of EPA enforcement actions, the Hooker Chemicals and Plastics Corporation signed a consent decree on April 30 committing the company to an estimated \$30 million worth of cleanup of the hazardous wastes at the site. In all, OWPE enforcement efforts have brought in more than \$82 million in private money for cleanup efforts at 22 hazardous waste sites.

Another measure of environmental results is the number of facility inspections conducted under the RCRA regulatory program's compliance monitoring system. Through these inspections EPA is able to assess the impact

of the RCRA regulations on upgrading hazardous waste management. EPA shares this enforcement responsibility with states authorized to carry out their own RCRA programs. Thirty-two States and territories are currently authorized to monitor the generators and handlers that treat, store and dispose of hazardous waste. It is expected that at least 45 States will obtain authorization to implement the program by 1983. In fiscal 1981, more than 6,000 generators and handlers were inspected. A total of 1,006 EPA inspections and 6,222 state inspections have been conducted so far in fiscal 1982. EPA is projecting a total of 9,100 inspections for the year—an increase of 50% over last year.

In addition to the inspection program, both EPA and authorized states can send warning letters and issue administrative orders requir-

Waste Programs Enforcement

Two of the key offices in the enforcement of hazardous waste laws are the Office of Waste Programs Enforcement (OWPE) and the Office of Legal Enforcement Counsel (OLEC).

OWPE is one of the three program offices within the Office of Solid Waste and Emergency Response. Rita M. Lavelle is the Assistant Administrator responsible for that Office; Gene Lucero is the Acting Office Director. It has authority to act under both RCRA and Superfund.

OLEC is one of two offices within the Office of Legal Enforcement Counsel and General Counsel headed by Associate Administrator Robert Perry. The legal work for each of the environmental media—such as air, water, waste and toxics—is performed here.

Basically there are two types of enforcement activities—administrative and judicial. The tasks associated with these activities are divided between OWPE (administrative) and OLEC (judicial). But, because of the legal and technical complexities of hazardous waste cases, the administrative and judicial enforcement staffs work closely together.

There are two aspects involved in any enforcement action—legal and technical. The legal matters are handled by attorney-advisors in OLEC. The

technical work is performed by the engineers, environmental scientists, toxicologists and hydrogeologists in OWPE.

In enforcing both RCRA and CERCLA, OWPE has the authority to carry out the administrative enforcement activities. These include issuance of notice letters or warning letters, administrative orders, and orders on consent. As a matter of policy and practice, OLEC supports OWPE in these activities. In fact, in the case of Superfund enforcement actions, legal and technical staff members at headquarters and the regional offices form a case development team to handle all aspects of enforcement action at a site.

However, once enforcement actions escalate to the level of bringing a civil action—actually filing suit against a defendant in federal court—the attorney-advisors in OLEC take the lead. At this point, OWPE supports OLEC by providing technical expertise such as expert testimony, developing remedial actions plans, and monitoring cleanups performed in accord with a consent order.

In a nutshell: OWPE asks the question: is the evidence technically sound? OLEC asks the question: is it legally defensible?



ing compliance with RCRA regulations. In fiscal 1982 EPA has already issued 275 notices of violation, the states have sent 862. For the full year EPA is projecting a total of approximately 2,000, nearly a 100 percent increase over 1981. EPA issued 155 administrative orders in fiscal 1981. The states issued a total of 444. So far in fiscal 1982 EPA has issued 164, the states 1,100. The projected total of 1,500 for the year represents nearly a 50% increase. These combined EPA and state efforts have yielded remarkable results.

More serious problems, repeated violations or failure to comply with such orders will lead to judicial action. Twenty hazardous waste cases have recently been referred to headquarters from the regions, 60 more are under development in the regions, with some 200 others in various stages of investigation and development. There are currently nine referrals to the Department of Justice seeking injunctive relief for serious RCRA violations.

The first results of EPA's efforts in criminal enforcement are also beginning to appear. After signing a memorandum of understanding with the FBI on criminal investigations, EPA referred eight cases to the Agency in the past year. Many of the 65 criminal investigations and referrals currently being made in the Agency are RCRA cases. This number represents a real shift in criminal investigation emphasis from Clean Water Act violations to RCRA actions. It also reflects the high Agency priority given to hazardous waste enforcement.

A final measure of environmental results in enforcement involves progress in hazardous waste litigation. Impressive results have been achieved in litigation based on the "imminent hazard" provisions of RCRA and, most recently, under Superfund. Some 63 cases have been filed under these statutory authorities. They involve both active and inactive sites, and incidents of contamination of ground water, surface water, air, soil, and danger of fire and explosion. So far, this litigation has led to 10 preliminary judicial orders and 20 consent decrees which have resulted in privately financed cleanup—impressive environmental results.

Cooperation, Not Confrontation

Upgrading hazardous waste management practices in this country will require the full cooperation of the regulated community. The same is true for cleaning up the thousands of sites where hazardous wastes have been buried. Thus, effective enforcement of RCRA and Superfund must place a new emphasis on cooperation with all parties in order to achieve the desired results.

The confrontational strategies of the past have proved more effective at producing conflicts than true environmental benefits. A strategy of cooperation between EPA and the parties affected by RCRA and Superfund should change this pattern and begin to realize the environmental improvements which these laws were designed to effect.

A case in point is the agreement reached with Browning Ferris Industries in New

Brunswick, New Jersey. This company purchased a landfill which it subsequently discovered was leaking pesticides and toxic chemicals. Wastes migrating from the site contaminated ground water, surface waters, and the surrounding soil.

The company volunteered to undertake the assessment and cleanup of this site. The case could have been litigated literally for decades had the company not acted responsibly, and had the EPA enforcement team not carefully negotiated a satisfactory agreement. Under the terms of the agreement Browning Ferris must:

- carry out a remedial investigation plan;
- drill wells and take groundwater samples;
- conduct hydrogeological studies and report results;
- propose a remedial plan to prevent further releases;
- implement remedial action and conduct monitoring for three years.

This agreement represents a significant dollar investment in cleanup at that site. The enforcement action leading to this agreement probably did not cost the government a fraction of that amount. An extended legal battle might well have reached the same result, but at much greater cost to the government and to public health and the environment as well. In cost-benefit terms the choice is clear: cooperation is preferable to confrontation in achieving environmental results.

The most recent actions taken under Superfund provisions include the first two consent agreements negotiated under this law, those reached with the Stauffer Chemical Company in Woburn, Mass., and Aerovox, Inc., in New Bedford, Mass. EPA Administrator Anne M. Gorsuch cited these two agreements as examples of companies "coming forward voluntarily" to undertake desired environmental actions. In the first example, Stauffer Chemical committed itself to an extensive, \$2-3 million program of studies, cleanup, and monitoring at its Indurplex site. In the second, Aerovox agreed to conduct an estimated \$300,000 worth of studies and cleanup efforts on PCB-contaminated soil behind its plant on the Acushnet River.

Assistant Administrator Rita M. Lavelle emphasized that in the enforcement area: "... while I much prefer the carrot to the stick approach, the stakes are too high to hide the stick or fail to use it when justified."

□

Emergency Responses by Industry and Government

(The roles of industry and government in controlling hazardous material emergencies are described in the following articles.)

Industry

The Leaking Tank Car on TC-4

"The common conception of cleaning up hazardous material spills is one of government specialists rushing to the rescue. In fact, 93 percent of the responses to such environmental emergencies are taken care of by the industrial concerns directly involved. The majority of the problems are eradicated quietly and efficiently long before they become a source of public concern. The few emergencies in which Federal or State governments get directly involved in cleanup are fully coordinated and usually include industry experts."

"EPA's Emergency Response Program encourages industry and the States to take all available countermeasures without direct Federal intervention. Indeed the response program is an excellent example of the Administration's New Federalism approach."

Henry Van Cleave,
Acting Director,
Emergency Response
Division

At 11:05 a.m. on May 11, a Union Pacific railroad dispatcher reported that as Train TC-4, Extra 2830 East, stopped at a siding near Topeka, Kansas, the conductor had detected a possible leak of sulfur dioxide from one of the tank cars.

That report set off an effective response, an example of how industry can handle hazardous substance emergencies.

At 11:11 a.m., six minutes after the initial report, the emergency response information dealing with sulfur dioxide was obtained. A call was made to L. R. Tierney, manager-environmental control in the railroad's Omaha headquarters, for instructions.

As a slow rollby inspection yielded no further evidence of damage, the train was allowed to proceed to the 18th Street Yards in Kansas City, Kansas, where it was stopped on the outer belt track. Radio contact with the conductor established the fact that he had smelled a strong sulfur odor and heard a "hissing" sound coming from the top of one car.

Bob Stine, designated by Tierney as emergency response manager, donned protective gear, including self-contained breathing apparatus, and inspected the car. Hearing the same hissing sound reported earlier, he checked valves and fittings and sought unsuccessfully to tighten the manway cover plate nuts.

At 1:20 p.m., another call to Tierney confirmed the car definitely was leaking and that attempts were being made to secure the manway nozzle bolts to stop the leak.

At 2 p.m. a buffer car was coupled to the leaking tank car and the latter was isolated in the yard.



At 3:30 p.m. the owner of the car had been contacted. His quality assurance supervisor was unsuccessful in controlling the leak.

At 5:30 p.m., a conference call among the emergency response specialists agreed that another effort should be made to tighten the nuts with a wrench.

At 7:15 p.m. an effort was made, to no avail.

At 8 p.m. a conference call was initiated to critique the situation. It was decided the car should be isolated insofar as possible from populated areas as well as from employees. The spot was selected and the car moved at 11:30 p.m. Barricades were erected to seal off the area.

On May 12, Tierney provided other guidelines regarding safe distances from the car and the necessity of protective equipment. Self-contained breathing apparatus was used by those working on the platform. A total of 38 cylinders of oxygen were required during the response.

Other emergency response experts arrived at the scene and further efforts were made to reset the manway cover. The process of finding another tank into which to transfer the substance was undertaken.

Sulfur dioxide is a colorless gas or liquid with a sharp,

pungent odor which is detectable at three parts per million. It is soluble in water, forming sulfurous acid, a suffocating, sulfur odor and highly toxic by ingestion and inhalation. It is also a strong irritant to the skin.

Neutralization processes were suggested and approved. Two steel drums of a water solution of soda ash were placed at the car and hoses were inserted between the lips of the manway cover plate and manway nozzle to direct some of the leaking vapor into the drums, reducing emissions.

On May 13, a repair crew arrived with torches and air impact wrenches, but it was unable to stop the leaking. It finally was decided to cover the troublesome area with lead wool, diverting the leaking vapor into the soda ash solution which would neutralize it.

Meantime, another tank was dispatched to the scene, arriving the morning of May 15.

Pumping of the substance from the leaking car to the new one began at 8:35 a.m. on May 16. It continued until 10:30 p.m. when the pumps failed.

On May 17, an air compressor was placed at the site. The transfer of the substance was completed by 11:30 a.m.

By utilizing the soda ash solution from 2:30 p.m. until 7:30 p.m., the crew was able to neutralize the remaining vapor pressures inside the car.

On May 18, the hoses were removed and the leak area packed with lead wool. After inspection, the car was declared acceptable for movement. It was stenciled "LEAKY TANK. DO NOT LOAD UNTIL REPLACED" in accordance with Department of Transportation regulations.

Documentation of the incident was completed. Approximately one ton of sulfur dioxide had been released during the period. There were no injuries.

What might have been a serious threat to human health and the environment had been successfully controlled by an industrial environmental response team.

CHEMTREC

By John C. Zercher
Director,
Chemical Transportation
Emergency Center

WASHINGTON—One morning recently, newspaper readers were greeted with headlines about three major transportation incidents involving hazardous materials.

Trains had derailed in Florida, Michigan and Canada. Chemicals were spilled. People and communities were threatened.

Story followed story on the emergencies themselves. But little was said about the behind-the-scenes action triggered by such incidents—or about the even more important efforts to prevent them from happening and to limit their effects when they do.

While hundreds of millions of tons of chemicals are produced and shipped across the United States each year, only one-hundredth of one percent of shipments over five gallons result in problems. When these rare incidents do occur, and carriers and

emergency services require special assistance, CHEMTREC is ready to respond.

In 1970, with the encouragement of the United States Department of Transportation, the Chemical Manufacturers Association (CMA) authorized the creation of CHEMTREC, the Chemical Transportation Emergency Center. Funded solely by CMA, CHEMTREC, through its single telephone number, provides assistance on handling chemical incidents to emergency services and carriers throughout the United States using various forms of transportation such as ships, tank trucks, barges, and trains.

CHEMTREC operates on a two-step basis. First, when the caller identifies the product involved, the center provides information from its extensive files.

Next, the center contacts the shipper or other source of expertise for additional telephone advice or on-site assistance.

When an incident occurs, CHEMTREC might receive a call from a fireman, or a policeman, which is taken by the communicator on duty. He records the essentials of the incident, including the caller's name and callback number. This typically represents the newspaperman's "who, what, when and why" approach. When the essentials are determined, the communicator obtains the proper file card and reads this information to his

caller. The information includes guidance on the general nature of the product, and information on spill, leak, fire or exposure, and a limited number of physical characteristics of the spilled material.

Once the communicator has passed this information to the caller, he contacts the involved company immediately. This is done either directly by telephone, or with other equipment which transmits an identical copy of the message on the screen to a receiver at the shipper's facility. This eliminates problems of transposition, improper spellings, and other delays that occur with telephone transmission of the same type information.

In making this call, the communicator turns the problem over to a company representative, who could be a plant manager, a product superintendent, a technical service representative or another knowledgeable person. Hundreds of companies have people available to handle these calls, giving CHEMTREC access to thousands of experts.

Under certain circumstances, the call will go to a mutual aid team such as that operated by the Chlorine Institute or the National Agricultural Chemical Association. In these incidents, the nearest producer will be called on for assistance.

There are also mutual assistance groups handling

specific products such as hydrogen cyanide, vinyl chloride, hydrogen fluoride and phosphorus.

In the ten and one-half years since the program started operating, CHEMTREC has handled 163,000 calls, involving 22,700 reportable incidents. There has been considerable growth of activity in these years. Also, there is a definite seasonality in the operation with lower activity in the winter.

The percentage of shipments by various means of transportation varies little over the years. Most of the tonnage is sent in bulk shipments.

Tank cars and drums are consistent in occurrence rate, with tank trucks experiencing a lower rate because of more knowledgeable drivers.

When CHEMTREC started most of the calls were expected to be from police, firemen and other emergency workers. However, usually the first person to encounter a leaking drum, tank or tank truck is the carrier employee.

CHEMTREC, a central coordinator of the emergency response capability of the industrial community, plays a major role in helping to ensure safe shipment of hazardous materials. The safe shipment of hazardous materials is critical, and CHEMTREC is the key component of the shipment support system. □

Dow's DAISY

If a chemical spill threatens nearby areas, Dow Chemical U.S.A.'s Louisiana Division calls on DAISY.

DAISY is the acronym for a dispersion analysis information system which tells emergency response personnel at Dow whether a gas will travel outside the plant and reach nearby homes.

The new response system, developed in 1978, was prompted by a chlorine release that heightened public awareness of chemical spills and accentuated the need for improved coordination with local emergency forces.

Fed information about weather conditions, size of a spill, dispersion characteristics of gases, and wind speed, the DAISY computer determines what action if any must be taken to protect 135 homes located adjacent to the Dow plant, plus an additional 300 homes within a one-mile radius.

If DAISY says the release will travel outside the 1,100-acre plant site, local authorities are notified to coordinate safety activities.

Only once in three years has DAISY called for action outside the plant. In that case about 20 homes were evacuated temporarily.

The Environmental Response Team

by Steve Dorrier
EPA Environmental
Response Team Leader

A flat-bed tractor trailer rig, placarded with diamond-shaped signs reading "DANGEROUS", spills its load near a freeway interchange during the morning rush hour. Boxes and 55-gallon drums litter the site. A deputy sheriff arrives, reroutes traffic and radios his office that a serious situation involving hazardous materials could exist. He requests expert assistance immediately to assess the situation and advise on cleanup.

If uncontrolled, release of hazardous substances in this incident could have adversely affected public health or the environment. The incident, however, was not real. It was simulated, as it is periodically, by EPA's Environmental Response Team at the Agency's Region 2 facility in Edison, New Jersey.

"Assistance" in this and similar simulated cases is provided by participants in a crisis training course conducted by the ERT for emergency response officials from Federal, State and local agencies and industrial facilities.

Teaching this and comparable courses is only one of many associated duties of the busy ERT, which serves as the focal point of on-site assistance for EPA's Office of Emergency and Remedial Response.

Origin and History

The ERT is composed of eleven experts who provide multi-disciplinary assistance to the Agency's other hazardous waste and emergency response experts located in the ten Regional of-

fices. Together, the members of the ERT have nearly 100 years of technical experience in dealing with hazardous wastes.

The ERT was established in 1978 under the National Contingency Plan, the vehicle through which the coordination of Federal hazardous cleanup and response efforts was directed under the Clean Water Act.

The basic ERT function initially was to advise On-Scene Coordinators and Regional Response Teams on environmental issues dealing with the cleanup of oil spills in navigable waters, and accidents involving approximately 300 hazardous substances.

When Congress enacted the Superfund Act in 1980, it directed EPA to broaden the emergency response authority in the National Contingency Plan. Thus, Superfund is currently activated by emergencies at sites as well as spills, by threats to air, land, and non-navigable as well as navigable waters, and by accidents involving a much larger number of hazardous substances.

When local communities are afflicted by environmental catastrophes, they often are unable by themselves to deal with them. Through its Regional offices and the ERT, EPA is able to furnish support personnel, highly skilled in various aspects of environmental emergencies.

The eleven ERT members have experience in major disciplines involved in dealing with hazardous substances, including: biology, ecology; chemistry and chemical engineering; civil and sanitary engineering; environmental health and science; and industrial hygiene.

ERT training emphasizes application of new technology and equipment, especially safety equipment and decontamination procedures.

Functions and Duties

Primary functions: Team members are equipped to perform include: chemical, biological and physical treatment and monitor-

ing techniques; control, restoration, disposal and contingency planning during emergencies; installation, operation and evaluation of instrumentation and field response systems; sampling and analysis of air, water and soil; water pollution biology and toxicology; environmental response training; occupational health and safety risk assessments; extent of contamination studies; preparation of cleanup contracts; groundwater and soil contamination studies.

The ERT's major duties include: Maintaining an around-the-clock activation system; dispatching team members to emergency sites to assist Regional and program offices; consulting and providing specialized equipment; training and developing training materials.

The Changing Nature of Response

Since its founding in 1978, the ERT has responded to more than 170 emergency incidents and hazardous waste sites. It has provided technical assistance in another 250 incidents.

The type of support provided has changed since 1978, however. During its first year of operation, the ERT responded to 42 incidents, approximately half of which were oil spills. Such incidents can be handled by a single individual with little or no respiratory protection. Now cleanup cases involving various hazardous materials take longer, require a minimum of two people operating on the "buddy system", and generally utilize sophisticated personnel protection equipment.

The average duration of responses has increased from 4.5 days in 1978 to nine days. Some responses have entailed intermittent actions over several months. At its present rate of response, the ERT will be on-site at more than 60 incidents during fiscal 1982.

Overall, preventable incidents such as housekeeping-type oil spills, which formerly comprised

90 percent of all reported hazardous substance episodes, have decreased steadily in recent years. Credit for this welcome trend is due to a growing sense of responsibility by industry, to rapidly advancing waste disposal technology, and to the Spill Prevention Control and Countermeasure Program provided by the Clean Water Act.

How the ERT is Activated

The ERT is available 24 hours a day. Once an EPA On-Scene Coordinator determines that ERT assistance is required, he may telephone these officials:

- During working hours: Kenneth Biglane, Director of the Hazardous Response Support Division (FTS 245-3048).
- During nonworking hours: Steve Dorrier, the ERT leader (or his designee) at the 24-hour response telephone (201-321-6660) or FTS (340-6660).

The authority to activate the ERT rests with the Director of Hazardous Response Support Division or his designee. Upon activation, appropriate ERT personnel and resources are dispatched to operate under the direct operational control of an On-Scene Coordinator.

On-Scene Cleanup

When Federal assistance is requested under Superfund, an on-scene coordinator is appointed by the lead Federal cleanup agency to guide and monitor all protective and precautionary measures. The overriding mission of the coordinator is to see that every possible measure is taken to protect human health and the environment. Each year EPA answers hundreds of calls for emergency assistance and cleanup expertise at spills and hazardous waste sites. The Agency's on-

scene coordinators are drawn from more than 100 emergency response specialists located in EPA's 10 regional offices. After reaching a removal site, these highly trained on-scene coordinators assess the problem and then make a decision to assist or monitor industry and local officials in the cleanup or to seek assistance from the EPA Regional Emergency Response offices and the special Environmental Response Teams based in Cincinnati, Ohio, and Edison, N.J.



Official takes soil samples to determine extent of contamination.

Officials wearing self contained breathing apparatus and special protective "moon suit" clothing investigate contamination at site.

Work at hazardous sites sometimes continues through the night when safety hazards are found.



The California Enforcement Program

By George Deukmejian
Attorney General, State of California

Californians can certainly take pride in their State's hazardous waste program. It is one of the largest and most active State programs in the country. Based on State laws modeled after the Federal Resource Conservation and Recovery Act (RCRA), the Department of Health Services has established a regulatory program which should markedly improve hazardous waste management practices in California and effectively protect public health and the environment from the risks of improperly managed waste.

As Attorney General of the State, I am responsible for the legal enforcement of California's hazardous waste laws and regulatory program. I would like to take this opportunity to cite the progress in enforcement which is guaranteeing compliance with the regulatory program and securing the cleanup of California's interim priority Superfund sites.

In October 1981, the Department of Health Services created a new Toxic Substances Control Division. Its function is to provide recognition and dedicate sufficient resources for development of a comprehensive State program to regulate the handling, processing, resource recovery, and disposal of the growing quantities of hazardous wastes and other toxic materials being produced in California. Within this division the Hazardous Waste Management Branch consists of 146 authorized positions with a budget of more than \$7 million—making it one of the largest State waste management efforts in the nation.

The State's hazardous waste management program has received Phase I interim authorization under RCRA. This allows the State to undertake full enforcement of the program's regulatory provisions. In carrying out its enforcement responsibilities, the Department of Health Services (DHS) performs compliance inspections and issues administrative orders for failure to comply with State regulations. So far in fiscal year 1982, DHS has inspected 226 of the State's 840 treatment, storage, and disposal facilities, and 139 of the State's 6,506 generators. As a result of these inspections, DHS has issued 119 compliance orders for violations of regulatory requirements. All indications are that the violations cited are being expeditiously remedied. For example, in followup on those in the Berkeley office it

was found that 30 of the 36 violations noted have already been resolved.

Where DHS enforcement actions do not result in compliance, however, legal enforcement action may have to be taken. DHS refers such cases to my office and to the District Attorneys for prosecution. As an indication of our aggressive enforcement policy, between March 1979 and May 1982 we filed some 20 hazardous waste cases in State court. Several of these cases, such as the litigation involving the Occidental Chemical Co. in Lathrop, Calif., have received national attention and should have far-reaching results.

The Occidental case involved soil and groundwater contamination resulting from the improper disposal of inorganic, organic and radiological chemicals. A consent decree was filed in February 1981. After the company completed contamination surveys and feasibility studies, a remedial action plan was approved in January 1982. The remedial plan includes use of extraction wells to draw the contaminated groundwater out, treatment of the water to prescribed performance levels by granular activated carbon, and the subsequent injection of the effluent into a lower, isolated aquifer that is not suitable for drinking water.

Another example of enforcement is the case involving the Capri Pumping Service, a company which recycles electroplating hazardous waste and precious metals. The company had maintained deteriorating tanks and containers which resulted in soil contamination and off-site migration of hazardous materials. Both the State and EPA have taken enforcement actions. The State obtained a preliminary injunction against Capri in July 1980, and instituted State Superfund cleanup activities at the site in November 1981. Capri was found in contempt of the State injunction not to operate in December 1981. The company will submit its plans for cleanup of the site to EPA and the State for review.

Superfund

California has also actively pursued enforcement actions under the Federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund). There is a similar State Superfund statute as well. Three California sites were included on the Superfund interim priority sites list

published in October 1981. These actions followed:

- California began legal action in 1979 against Aerojet General in Rancho Cordova for improper disposal of industrial waste solvents and chemicals which resulted in groundwater contamination. The State filed a Cease and Desist Order in December 1979. Aerojet began an approved groundwater treatment plan in February 1982. The State is currently monitoring compliance with the Order and reviewing the company's groundwater monitoring data.

- At the Iron Mountain Mines site in Keswick, acid leachate from open pits containing heavy metal mining wastes have resulted in river and lake contamination. The State has instituted several enforcement actions for violations of water pollution control permits (NPDES).

- The Stringfellow Acid Pits in Riverside County contain 32 million gallons of acid and DDT wastes which are contaminating a groundwater basin used for irrigation and industrial purposes and the Santa Ana River. An interim abatement program was ordered in December 1980 to provide protection from leaching or washout of the waste material. The State has assumed ownership of the site and has completed on-site containment measures. A long-term cleanup plan is being developed by the State. In July EPA announced the award of \$6.1 million of Superfund money to the Department of Health Services for cleanup work at the site.

As the cases mentioned above indicate, California is fully assuming its enforcement responsibilities under the RCRA and Superfund programs. But the State also relies on a high degree of cooperation from industry in tackling these problems. Active State enforcement and industry cooperation so far have permitted California to take one of the leading roles in the nation in hazardous waste regulation and cleanup. We have charted the right course, and we look forward to continued cooperation with EPA in the enforcement of both State and Federal requirements intended to upgrade waste management practices and effect the cleanup of sites which pose a hazard to public health and the environment. □



These are the ruins left after a 1981 fire and explosion at the Chemical Control Corp. waste disposal site in Elizabeth, N. J., shown in the inside front cover photo before the fire.

Back Cover: Workmen assemble new EPA mobile incinerator for a demonstration behind EPA Headquarters in Washington.



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