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ANALYSIS OF COMMUNITY INVOLVEMENT IN HAZARDOUS WASTE SITE PROBLEMS

A Report to the
Office of Emergency and Remedial Response
United States Environmental Protection Agency

July 1981

ICF INCORPORATED International Square
1850 K Street, Northwest, Washington, D. C. 20006

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under subcontract to

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ICF INCORPORATED

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CHAPTER I: INTRODUCTION AND SUMMARY

1. INTRODUCTION

This report summarizes the results of 21 studies of government responses to problems at uncontrolled hazardous waste disposal sites. It presents our analysis of why and in what manner the public becomes involved in these situations and the consequences of that involvement for the implementation of the new "Superfund" program, which Congress enacted to provide authority and funds for cleaning up hazardous waste dumps. Several of the extensive individual reports on which the analysis is based are included as the final chapter.

We were asked to conduct these studies by the Office of Hazardous Emergency Response of the United States Environmental Protection Agency (EPA) to help develop EPA's Superfund program. Rather than simply following the traditional approach to implementing a new program, EPA thought that a fresh look should be taken at the way in which citizens become politically active in connection with an environmental problem in their community, the sorts of actions they undertake, the kinds of relations they develop with local authorities and with state and federal officials, and the kinds of relations that develop between the various government agencies charged with responding to the problem. By using empirical data about what has actually taken place in hazardous waste emergencies across the country, a more realistic program could be designed, one more understanding of -- and responsive to -- the needs of the public and the capabilities of government. In addition, by looking at community relations techniques that have been employed in the past in these situations and seeing which have worked well and which have not, EPA would learn what techniques to use in the future or to avoid. The result, it was hoped, would be a program that could more effectively -- and efficiently -- involve citizens in their government's response to these environmental problems and inform them of actions underway in their community.

The first case studies we conducted held some surprises. It became apparent that uncontrolled waste site problems, more so than most other environmental problems, have a social and political dimension that must be as carefully considered as the technical aspects of the threat to health, groundwater, and air quality posed by the waste chemicals. Without an understanding of the community context in which these problems develop, the job of government agencies attempting to eliminate the environmental threat will be enormously complicated; without an effort to address the concerns of local citizens, the problem may remain a continuing burden for government. Public participation in hazardous waste emergencies, we

realized, is important not only to ensure that the public is kept well-informed and involved, but also to ensure that social and political parameters are not neglected by government authorities. We expanded the scope of our studies accordingly. These matters are discussed at length in this report.

Our methodology throughout was to learn as much about a case as possible through newspaper accounts and interviews with officials in Washington -- the staff of local congressmen and EPA personnel -- and then to travel to the site for at least a week of intensive interviewing. Some studies were conducted by two-person teams; most were conducted by one person. Officials in state environmental agencies and regional EPA offices were spoken with at length. Interviews at the site were conducted with citizens who were actively involved in the problem, civic leaders, local government authorities, and environmentalists, as well as with (in some cases) people living in the vicinity who had taken no interest or expressed no concern. The completed studies will be used as background for a manual to assist the EPA staff responsible for implementing the Superfund program.

The four case studies included in this report are our pilot studies, researched in the summer of 1980. They have not been brought up to date; they are valid only through August 1980. Often we report allegations and opinions that were expressed or believed by those we interviewed, but we do not mean to attest to their accuracy in every case. We tried to report largely what is public knowledge in the chronological backgrounds of our case studies; documentation is readily available for most assertions of fact, but to avoid cumbersome footnote references, we have generally not cited it in this report. The views expressed herein do not necessarily reflect the official policy of the U.S. EPA.

In conducting these and subsequent studies, it should be noted, we did not attempt to make assessments of the geohydrologic situation or the potential hazard to health and the environment. Nor did we attempt to judge the adequacy of the technical measures instituted at the site by government agencies working to contain discharges or eliminate the hazard. We describe the problem and what was done only in order to enable the context to be understood. By the same measure, we try not to fix blame on any party for creating the problem. Our interest was in what the public and the authorities on scene thought and did. Yet we were not conducting an opinion survey: our goal was to gain insight into the relations between government and the public and how they can be improved.

2. ORGANIZATION OF THIS REPORT

Chapter 2 presents capsule descriptions of each of the 21 case studies, which are listed in Exhibit I-1 according to the EPA region in which they are located.

Chapter 3, "Conclusions and Recommendations", is the heart of this report. We offer first a series of conclusions, supported by examples from the 21 cases, about public involvement in hazardous waste emergencies and the conduct of public informa- tion efforts to date. Our generalizations are oriented towards practical consequences for the government staff who will have to carry out the Superfund program. We translate these generalizations into some recommendations for measures to be instituted at each step of a response to or clean-up of a problematic hazardous waste disposal site.

Chapter 4 contains the extended studies written on our four pilot cases. We present only four studies because we think the mass of detail tends to overwhelm the reader after a point, and the general patterns, explained in the "Conclusions and Recommendations" chapter, are of greater importance than the occurrences at any particular site for the purposes of this report.

The following section of this introductory chapter briefly summarizes our principal findings.

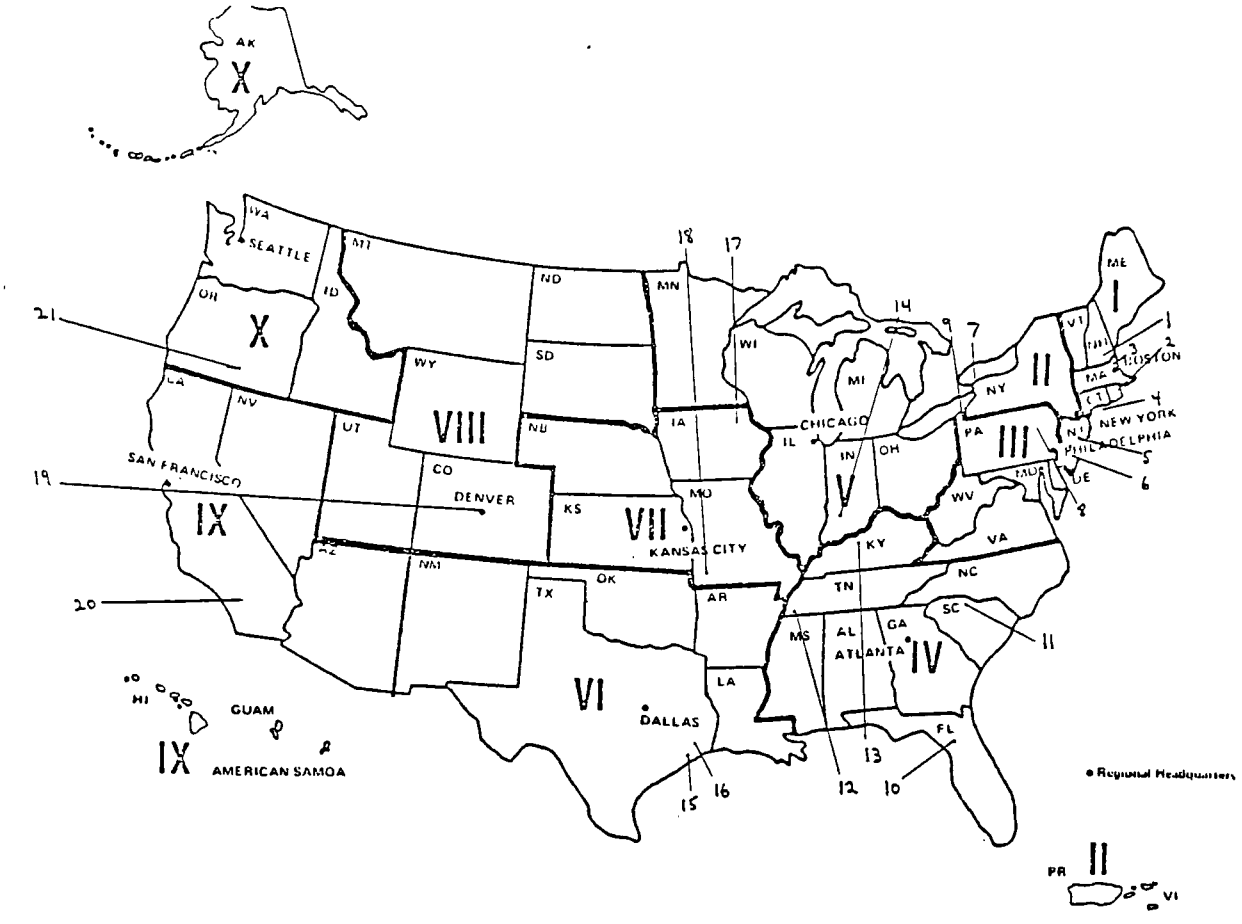
3. PRINCIPAL FINDINGS

The extent of public involvement in hazardous waste problems, we found, has ranged from protracted conflict -- exemplified by the well-known Love Canal case -- to general indifference. Most important, however, is that there is often little relation between the objective severity of the environmental damage or threat to health and the level of public agitation. There are sites considered extremely serious by technical experts that have prompted little public interest; there are other sites where little evidence of hazard has been unearthed that have nevertheless generated extreme anxiety in the local populace.

What, then, makes citizens become involved in or remain complacent about a hazardous waste emergency? Our case studies show that neither their education nor their socio-economic status, nor the region of the country in which they live, matters per se. Prior political activism also seems inessential. Instead, our experience has been that the important factors are generally site-specific and pertain to the political history of the community, the circumstances under which the problem is discovered and initially dealt with, and its apparent effects on people living nearby. For example, in a community where the government enjoys a reputation for credibility and responsiveness, citizens may trust their government to deal satisfactorily with a hazardous waste problem without prodding and therefore see no reason to become involved. On the other hand, if citizens are led to believe that officials are not telling them the whole truth about a problem or a proposed remedy, they may agitate

EXHIBIT I-1

THE TWENTY-ONE CASES STUDIED



Region I

1. Gilson Road Dump Site, Nashua, New Hampshire
2. Picillo Site, Coventry, Rhode Island
3. Woburn, Massachusetts

Region II

4. Islip Landfill, Hauppauge, Long Island, New York
5. Jackson Township, New Jersey
6. Landfill and Lang Property, Pemberton Township, New Jersey
7. Love Canal, Niagara Falls, New York

Region III

8. Butler Tunnel, Pittston, Pennsylvania
9. Dracup Warehouse, Youngsville, Pennsylvania

Region IV

10. Cabot Site, Gainesville, Florida
11. Ferguson Site, Rock Hill, South Carolina
12. Frayser and North Hollywood Sites, Memphis, Tennessee
13. "Valley of the Drums", Brooks, Kentucky

Region V

14. Seymour Recycling Corporation, Seymour, Indiana

Region VI

15. French Limited Site, Harris County, Texas
16. MOTCO Site, LaMarque, Texas

Region VII

17. LaBounty Dump, Charles City, Iowa
18. Farm Site #1, Verona, Missouri

Region VIII

19. Radium Sites, Denver, Colorado

Region IX

20. Stringfellow Disposal Site, Riverside, California

Region X

21. Alkali Lake, Lake County, Oregon

for help from other quarters. Factors like these seem to be additive, in the sense that it is often only a combination of several that heighten citizen concern and spark political activism.

Public involvement in these environmental problems has typically peaked at the time a long-term solution is proposed. For reasons that can be foreseen only by understanding the concerns of local citizens, the cost-effective technically-adequate solution to a hazardous waste problem may well prove unacceptable to a large segment of the public. Two of the cases included in this report -- the "Valley of the Drums" and the "Stringfellow site" in California -- amply illustrate this point and its consequences.

Citizens who have become involved in these matters have generally consolidated their efforts by forming ad hoc organizations, often under the leadership of one charismatic woman. The formation of these groups, the backgrounds of their members, and the intensity and sophistication they are capable rapidly of developing all run counter to traditional assumptions about political activism in the United States. The central role played by these groups in public involvement, compared to the minor -- often negligible -- role taken by established national environmental organizations, distinguishes hazardous waste emergencies from many of the other environmental problems government agencies have had to deal with in the past, and may also be a harbinger of a new national environmental movement.

There are significant implications for the conduct of the Superfund program. The people traditionally assumed to represent "the public" in programs managed by environmental agencies are the members of national environmental organizations, either through their central organizations or local chapters. The traditional centerpiece of a public participation program is the large public meeting. Neither avenue will suffice in hazardous waste emergencies. The people who are most concerned about the problem and who have the greatest need for information, we have found, usually will not be members of established environmental organizations. The best way to reach them is not through formal hearings or widespread publicity campaigns, but rather, through small-scale efforts: living-room briefings, the personal contact of an on-scene coordinator, membership in a workshop or citizens' advisory committee. Large public hearings have often been explosive and uncontrollable; we do not generally recommend them.

The techniques we recommend have been used successfully in the past. But they demand concerted outreach. In general, success in keeping the public well-informed in hazardous waste emergencies requires actively seeking out both affected citizens and local officials (who may have critical roles in decisions about how to

remedy a site's problems). It also requires the identification and utilization of people or organizations (the local newspaper or an important industry, for example) that have long-established credibility with the people in the community. And in light of the surprising sophistication of citizens about the technical aspects of problems that greatly concern them, it requires personnel on scene who are sensitive to and understanding of the public's needs.

Additional considerations important to the implementation of the Superfund program are explored in the remainder of this report. Because our conclusions and recommendations are illustrated with supporting examples from the twenty-one cases studied, we present in the next chapter brief descriptions of those cases, focusing on the causes and form of public involvement.

CHAPTER II: CAPSULE DESCRIPTIONS OF TWENTY-ONE CASES

ALKALI LAKE, LAKE COUNTY, OREGON

The Alkali Lake site is a ten-acre tract on a "playa" -- a desert basin that can fill with water after a heavy rain -- that had been licensed by the state for waste disposal in 1968. The site was closed in 1971; many of the approximately 25,000 drums of herbicide residue deposited by that time had become corroded, allowing their contents to spill on to the lake bed or to evaporate. The Oregon Department of Environmental Quality (DEQ) tried without success to compel the licensee to clean up the site. In 1976, when state funds were appropriated for the purpose, the drums were crushed and buried in unlined trenches on site. The case is now considered closed by both DEQ and EPA Region X, and there are no plans for further action.

The nearest community to the Alkali Lake is Lakeview, a town of 3,000 some 60 miles distant. A number of individuals in Lake County have become involved with this problem over the years, but there has been no organized group activity and no conflict. The burial of the drums in 1976 was one of several proposals considered, and there were some people who opposed it, though without supporting any particular alternative. At present, there is some advocacy of further clean-up and a lingering suspicion of DEQ (one of whose former employees headed the company that was awarded the burial contract). The fact that the state regards the issue as closed, however, has discouraged continued activity; there are, in addition, more pressing environmental concerns: a nuclear waste dump in Lakeview and an abnormally high rate of cancer in the county.

BUTLER TUNNEL, PITTSTON, PENNSYLVANIA

The Butler Tunnel is an abandoned mine shaft in this northeastern Pennsylvania coal-mining town. Quantities of oil and hazardous chemicals were discovered in July 1979 to be flowing directly from the tunnel into the Susquehanna River. EPA Region III and the state Department of Environmental Resources took prompt action to contain the flow, began testing to locate the main deposits of chemicals and any possible build-ups of cyanide gas, instituted legal actions against a number of firms and individuals implicated in illegal dumping, and are drafting a clean-up plan that should be available shortly. There were several low-level indications of concern for the situation among the populace, but no significant involvement either by individuals or groups in the response process to date.

In general, local officials and citizens were pleased with the quick action taken by federal and state authorities. That, together with the fact that the town's drinking water (which comes from a reservoir) was unaffected, partly accounts for the lack of citizen involvement in this problem; by way of contrast, there has been intense organized opposition to the planned conversion of the town's drinking water supply from one source to another. However, there are additional factors that make the public's attitude toward the Butler Tunnel problem ambivalent. Facilities for sewage and waste treatment in the area are archaic; most communities dispose of household and commercial waste without regulation. Yet a modern public waste treatment system--the need for which this incident has made apparent--would be an expense difficult to bear in this economically-depressed area, in the opinion of local officials. Moreover, many residents have engaged in the practice of dumping their wastes into backyard boreholes, which seep into the old mine shafts underlying the town. Residents appear to be hesitant to call attention to a problem in which they fear they could be implicated.

CABOT SITE, GAINESVILLE, FLORIDA

In 1977, groundbreaking activity at a construction site in Gainesville, Florida, uncovered a lagoon filled with phenolic wastes. The wastes, a byproduct of wood processing, had been deposited into the lagoon between 1945 and 1966 by the Cabot Carbon Company. A subsequent owner of the site, Raymond Tassinari, built a drainage ditch into which he emptied the lagoon contents. Liquids from the drainage ditch then flowed directly into the Hogtown Creek and prompted complaints from nearby residents about odors emanating from the water. The tar-like wastes settled in the creek bed and with each rainfall were carried further downstream past residential areas. Following drainage, the lagoon refilled with highly phenolic groundwater. The problem of phenolic groundwater seepage persists today.

Citizen involvement in the Cabot site has been limited to the earlier complaints about Hogtown Creek's unpleasant smells. Government involvement, in contrast, has been extensive. The first remedial action was the city's removal of the wastes that had settled in the creek after Tassinari drained the Cabot lagoons. The Alachua County Pollution Control District has been sampling and monitoring the creek over the years. In 1979, the District requested EPA Region IV assistance in inspecting the site. EPA's investigation led to further analysis by the Florida Department of Environmental Regulation. Future remedial response depends on the outcome of additional tests.

The existence of the site has been extensively reported in the local media ("our own Love Canal"). Members of national environmental groups have recently moved to the area and are beginning to take an interest in the problems at the site, suggesting the possibility of increased citizen activism in the future.

DRACUP WAREHOUSE, YOUNGSVILLE, PENNSYLVANIA

The Dracup Warehouse in Youngsville, Pennsylvania, is located only a few hundred feet from the town's well water system. In April 1980, large amounts of PCB oil were detected outside the warehouse. Under EPA order, the warehouse owner, Daniel Dracup, removed 40 gallons of the oil and placed it in drums inside the building. EPA performed follow-up remedial action and also commissioned a hydrology study to determine the extent of PCB contamination. In June, heavy rains caused runoff from the site; EPA initiated a 311 action to divert surface water from the suspected areas of contamination. When the ongoing hydrology study struck a vein of PCB oil, 311 monies also financed removal of the oil and the contaminated soil.

Members of an ad hoc organization, "Concerned Citizens," are angry at the slow pace at which the PCB oil has been removed. They have attracted extensive media coverage and staged demonstrations at the site. Other citizens have reservations about the activities of "Concerned Citizens." They feel the publicity has given Youngsville a negative image.

FARM SITE NO. 1, VERONA, MISSOURI

In 1971, upwards of 150 drums of dioxin-laden waste residue from the production of a germicide were buried in a shallow trench on a farm seven miles south of Verona. EPA Region VII learned of the situation in 1979, conducted testing, and concluded that the toxicity of the residues and the geological instability of the site presented a "substantial threat to U.S. waters". Temporary protective measures were instituted. The company responsible for the residue has long been out of business, but Region VII obtained a consent decree under which the current owner of the manufacturing facilities, Syntex Agribusiness, would remove and ultimately dispose of the waste. Syntex's plan is supposed to be available as of November 1, 1980. Region VII has conducted a wide ranging public information effort at the site. While the local public was highly concerned about consequences to health and property values when public announcements were first made, its interest diminished rapidly, presumably because the site is on inaccessible private property miles from any town.

However, there remains concern--and sensitivity--in some quarters. Property owners in the vicinity of the farm site worry about well contamination and declining property values. In addition, the Verona Betterment Committee fears that the residues from the site will be transported to town and processsed ín a Syntex facility used once before (successfully) for waste disposal, a possibility suggested in the consent decree, among other places. This small group has been critical of EPA in the past and may well remain so. Region VII's public information campaign has received a mixed reaction: townspeople in nearby Aurora, where a news office was established, are unhappy with the impression thereby created that the "disaster" is in their locality, and a number of individuals feel that the entire effort was excessive. Local officials do not believe the environmental problem to be serious. On the whole, however, relations between Region VII representatives and local citizens have been good. Many residents say they are suspicious of Syntex and believe the situation is in competent hands only so long as EPA is fully in charge.

FERGUSON SITE, ROCK HILL, SOUTH CAROLINA

Sometime between 1960 and 1962, Walter D. Neal began an industrial solvent reclamation operation on property he rented from Lester Ferguson near Rock Hill, South Carolina. In 1966 Neal incorporated the operation as the Industrial Chemical Corporation (ICC). Following a dispute with the landlord, ICC moved its operations in 1970 to a site on Rambo Road in York County near Rock Hill. ICC left 2600 drums of various materials on the Ferguson site. It was not until 1976 that a state official discovered the abandoned materials, which by then were leaking from their containers. The South Carolina Department of Health and Environmental Control (SCDHEC) failed to secure voluntary clean-up by ICC and began to examine the possibility of legal action in 1979. At that time, the Ferguson site was found to pose a threat to surface waters; EPA Region IV initiated a 311 action in January 1980. Despite considerable newspaper coverage of the clean-up, area residents did not express concern over the Ferguson site. The few immediate neighbors had grown accustomed to the dump; several believed that the government had completely cleaned up the site.

The interesting twist in this case is that residents living near ICC's Rambo Road facility, though unaware of their role, were responsible for action at the Ferguson site. A major fire at the Rambo Road site in 1979 led a group of 25 to 35 persons to demand an "environmental impact study" of the site. The group, comprised of Rambo Road area residents and parishioners of a neighboring church, presented its demands and a petition to the York County Commissioners. The group's actions eventually resulted in EPA's

analysis of samples taken not only from the Rambo Road site, but also from other ICC operations, including the Ferguson dump. Although the EPA testing resulted in 311 action at the Ferguson site, no enforcement or remedial action was taken at the Rambo Road facility. Should area residents and parishioners learn of their effect on EPA action at the Ferguson site, they may intensify their efforts to achieve remedial action at Rambo Road. Residents are unaware that SCDHEC is about to review ICC's operations in order to determine if a hazardous waste disposal permit should be granted to the company.

FRAYSER AND NORTH HOLLYWOOD SITES, MEMPHIS, TENNESSEE

In Memphis, the failure to identify the cause of certain health problems attributed to chemical contamination has contributed to conflicts between EPA Region IV and local citizens. Early in 1980, Region IV conducted an emergency action at the North Hollywood Dump, one of several known uncontrolled hazardous waste sites in the Memphis and Shelby County area. Public concern, however, has focused on the Frayser neighborhood, where one woman had complained repeatedly of rashes and hair loss among her children and pets that she blamed upon chemical wastes. A series of health studies and environmental tests were conducted by local, state, and federal agencies but returned with negative findings, although a consultant hired by EPA headquarters (Fred C. Hart Associates) concluded that "it would seem that a health problem due to chemical contamination may be present in the Frayser area." A number of ad hoc citizens' groups, joined by established local and national organizations, have taken an intense interest in the case and have brought continued pressure to bear on government authorities; media coverage has been extensive.

The widely-expressed attitude of the involved public is that EPA Region IV has been engaging in an elaborate "cover-up" in league with city and county officials. There have been widespread public accusations of ineptness, lies, and duplicity. The situation has been aggravated by the confused handling of test results on several occasions. The credibility of EPA personnel has been questioned. Local officials seem to feel that EPA was simply "looking to find something they could pin on the city." Partly in response to Congressional hearings, Region IV organized a citizens' task force, but disputes over the representativeness of its membership have limited its usefulness to date. The fact that the members continue to attend the meetings, however, is a hopeful sign. Local citizens, fearing especially for their children's safety, are convinced that their problems are caused by chemical contamination and will not be dissuaded by negative test findings.

FRENCH LIMITED SITE, HARRIS COUNTY, TEXAS

The French Limited site in Harris County, Texas, contains a 15-acre pond that was once used as a repository for waste chemicals and oils. In 1979, the state found high concentrations of PCBs in sludge at the bottom of the pond and in the surrounding soil. Although residents from nearby Riverdale have complained about foul odors, fires, and floods at the site since 1965, their primary concern is that they are drinking water from wells they suspect are contaminated. The most recent form of government intervention was EPA's initiation of a section 311 action; remedial work is still in progress at the site. Despite past government attempts to abate pollution at the site, Riverdale residents are not convinced that the pollution problems have been reduced. In general, they are skeptical about whether any acceptable remedial action, including the EPA effort, will ever be accomplished. Government efforts to inform the community about the site have been minimal, and resulting uncertainty has created anxiety, particularly among the Riverdale residents.

Community activism is negligible at present. However, any future deterioration of conditions at Sikes Pit, an inactive toxic waste dump located directly across the highway from the French Limited site, may fuel citizen demands for full-scale clean-up of both sites. EPA could use their current involvement with the French Limited site as an opportunity to establish credibility with area residents. This would involve explaining the hazards of toxic chemicals and informing the local people of what is currently known to be at the site and the extent and nature of feasible remedial measures. Such a community relations effort would also emphasize EPA's technical and financial limitations in completing a full-scale cleanup in order to prevent citizen expectations from growing out of proportion.

GILSON ROAD DUMP SITE, NASHUA, NEW HAMPSHIRE

The Gilson Road dump site in suburban Nashua had been repeatedly cited for accepting unpermitted wastes since operations began in 1971. By 1978, reports of large-scale liquid toxic waste disposal and the visible evidence of a pile of 55-gallon drums convinced authorities that the problem was more serious than a mere permit violation. The operator of the site was fined and sentenced. Testing subsequently revealed high concentrations of toxic organic chemicals in the groundwater and a moving leachate plume that by May 1980 had allowed chemicals to enter a nearby stream. The case was thereafter declared a 311 action. All levels of government--city, county, state, and federal --have contributed either funds or technical assistance to the testing and clean-up of the site. At

present, all surface drums have been removed, but a remedy for the main long-term problem--the groundwater contamination--awaits the completion of engineering studies.

The dump is located adjacent to two mobile home parks developed in 1978. The mobile home residents' association wrote letters to authorities in early 1980 complaining of lack of action, but the local public has otherwise not become involved in the case, nor has a state-wide citizens' organization that follows developments at the three other uncontrolled hazardous waste sites in New Hampshire. Local residents evidently feel that government agencies have the situation in control and that the actions taken have been satisfactory. The visible problem has been eliminated (as of the summer of 1980) and the water supply of the mobile homes (the Nashua city system) is not threatened. The concerns of the mobile home residents' association revolve more around zoning and cultivating respect for mobile home dwellers. State and federal officials familiar with the case are surprised that no organized citizen involvement has yet arisen, believing it to be long overdue and soon to come, most likely when the alternatives for remedying the site are presented. Local officials have taken an intense interest in the case, and the site has also been the focus of much partisan political attention.

ISLIP LANDFILL, LONG ISLAND, NEW YORK

The 45-acre Islip Town landfill in Hauppauge, Long Island, New York, is filled with 20 years' worth of municipal solid wastes, including 4,000 gallons of illegally dumped trichloroethylene. Because it sits over a permeable sandy ridge, rainwater and toxins can seep into groundwater drinking supplies. A housing development is adjacent to the landfill; some of the private wells built for its residents have been contaminated with methane. In May 1980, state officials detected vinyl chloride in the air at both the landfill site and the Whiporwill Elementary School, which is located 250 feet from the landfill. The school has since been closed in consequence.

Members of a highly-active grass-roots citizens' group, "Dump the Dump", have been working to compel the closing of the landfill and are becomig impatient. They are unhappy about delays in Islip Town's compliance with a state consent order to cap, contour, and vent the existing landfill. The consent order also calls for designating 16 acres of the existing landfill to be lined and used in an interim disposal program until proposed remedies (opening of the recovery plant and re-opening of other incinerators) are implemented. The citizens are also dissatisfied with the delay in re-opening the incinerators. State officials have cited the contributions that EPA's air standards have apparently made to the delays. If the delays continue without adequate explanation, EPA risks losing the trust of Islip Town citizens.

There is a good deal of additional citizen activity in the Hauppauge area with respect to waste disposal: Four Towns Civic Association; Residents Against Incineration and Dumping; Wyandach Civic Association; and the Taxpayers Association. This indicates a strong need for keeping communication lines open between the government and the community. A citizen's advisory committee, established through the efforts of the local congressman, has been working with EPA representatives from Region II and headquarters.

JACKSON TOWNSHIP SITE, NEW JERSEY

In Jackson Township, New Jersey, the municipal landfill used to dispose of septic wastes was blamed for the contamination by hazardous chemicals of 146 private wells in an outlying residential district. Residents believe the contaminated water may be responsible for serious health problems. Township officials responded by temporarily trucking water to affected families and building a new water system for the district, the only response for which they could secure financing. The residents with contaminated wells, however, were angered by the township officials' failure to answer their questions to their satisfaction when the contamination was first discovered in 1978 and by the subsequent delays in providing a new water system. Moreover, they were unhappy about having to pay the township government, in the form of fees for hooking into the new water system, for a remedy to a problem they believed the township government had caused. An ad hoc organization of affected residents has brought a $51.5 million damage lawsuit against the township. The residents' group and township officials have been engaged in a bitter protracted feud.

The case of Jackson Township shows the potential for conflict between a local government and its citizens when that government is implicated in a hazardous waste problem. More important, it shows how critical it is to reply at the onset -- openly, consistently, and compassionately -- to the questions of an agitated public if credibility is to be maintained. The affected residents in Jackson Township rapidly became distrustful of and antagonistic towards all government representatives, trusting only their own citizens' group to help them.

LABOUNTY DUMP, CHARLES CITY, IOWA

The LaBounty dump was used between 1953 and 1977 by Salsbury Laboratories--a producer of veterinary pharmaceuticals--to dispose of solid by-product wastes and sludge. Toxic chemicals from the dump were discovered in the mid-1970s to be leaching into the adjacent Cedar River, which bisects Charles City, a town of 9,500 people in a predominantly agricultural region. Traces were found in

shallow wells as far as 100 kilometers downstream. Of greater concern than the leaching, however, was the potential for contaminating the aquifer formations underlying the site. The Iowa Department of Environmental Quality (IDEQ) in 1977 ordered Salsbury Laboratories to excavate all wastes in the dump and move them elsewhere. Salsbury was able to block the order; thereafter, IDEQ asked EPA Region VII to take the lead in the case. Region VII and Salsbury between themselves have worked out a gradual phased response to the site, in the hopes that removal will not prove necessary. Construction of a two-foot thick clay cap, at Salsbury's expense, is currently nearing completion. Additional containment measures may be necessary in the future; they are now being studied.

This case has been marked by a complete absence of public involvement or even overt expressions of concern. People in Charles City have taken the word of Salsbury Laboratories that whatever the problem at the dump may be, it is being handled as well as possible. Their trust is not difficult to account for: Salsbury has been a good neighbor, and it has a history of responsible waste management. Moreover, it is vital to the local economy. If anything has the potential to set off a public storm in this case, it would be an attempt by government agencies to "crack down" on the company. Further publicity would also be resented. The only points of controversy to date have been the widely-reported disagreements between IDEQ officials--who believe that the threat to the aquifer warranted immediate removal of all wastes, even though no contamination has yet been detected--and Region VII staff. At this stage, IDEQ officials say they will rest content only when there is documentation that the aquifer is not imperiled. IDEQ and Region VII, however, have fashioned a working arrangement and progress at the site continues.

LANDFILL AND LANG PROPERTY, PEMBERTON TOWNSHIP, NEW JERSEY

There are two sites in rural Pemberton Township responsible for groundwater contamination. One is the township landfill, which had been used for solid waste disposal since 1973. The other is private property (the "Lang property") on which drums of wastes had been deposited in the mid-1970s. The township landfill is no longer in use, but no provisions for clean-up have yet been made. The presence of leaking drums on the Lang property was discovered in 1975, and the drums (by then mostly empty) were hauled away under court order shortly thereafter. However, when testing conducted in 1977 revealed groundwater contamination nearby, the case was re-opened; monitoring wells have recently been installed at the owners' expense.

Both sites are located far from any residential areas; the water supplies of only four people have been affected. Moreover, the population of Pemberton Township contains a large proportion of military personnel and is therefore partly transient. Presumably for these reasons, there has been very little public involvement in the case. Indeed, some people in the vicinity of the sites were unaware of the existence of any problems. The main actors in this case have been three government agencies generally at odds with one another. The Pemberton Township administration resisted for six years orders from the state DEP to install monitoring wells at the municipal landfill; it now thinks the state should shoulder responsibility for the landfill's consequences (since the landfill's location was originally set by the state). The Burlington County Health Department, taking somewhat of an activist role, prodded DEP in 1977 to re-open the Lang case and is now urging immediate capping of the landfill. At present, what should be done with the sites and who will pay remain unsettled questions.

LOVE CANAL, NIAGARA FALLS, NEW YORK

Love Canal is the most well-known--and most complex--of all uncontrolled hazardous waste sites. No other case has been beset with so many personal clashes and informational conflicts. In no other case has organized citizen involvement reached such a pitch and intensity. The most prominent citizens' group to have arisen in reaction to the problem is the Love Canal Homeowner's Association, led by Lois Gibbs. Other groups formed of individuals with some bonds of commonality have also emerged: for example, one comprised primarily of senior citizens who do not want to be relocated from the area, another of low-income blacks from a nearby housing project. Most such groups feel somewhat resentful that the Homeowner's Association has received a disproportionate share of publicity and consideration, but on the whole, these ad hoc organizations present a united front.

The primary concerns of the local public--containment of the toxics and relocation of the residents--are being responded to by a plethora of government agencies. In spite of continuing tension, most citizens feel that these agencies are genuinely interested in remedying the situation one way or another. Nonetheless, there remain outstanding concerns as well as certain sensitivities upon which future developments will impinge. Pressure remains for comprehensive long-range health studies; efforts to date are perceived as inadequate and have not alleviated anxiety over health effects. Attempts to assist relocation are complicated by the fact that a boundary must be drawn somewhere, frustrating homeowners just outside, who can consequently be expected to press for an extension to include their properties. One general concern is that government representatives not play favorites among the various citizens'

groups; there are also latent racial tensions to be considered. Local citizens have become fairly sophisticated after years of experience and express indignation at the condescending attitude of some government personnel. They also express a need for greater coordination between agencies and more continuity among the personnel on scene.

MOTCO SITE, LAMARQUE, TEXAS

The Motco site in LaMarque, Texas, consists of seven toxic chemical waste pits that were abandoned in 1978. It is located at the junction of three major highways in proximity to a large industrial complex. There is one residence about 600 yards northwest of the site and a housing development across one of the highways. Until the Coast Guard recently completed a section 311 remedial project at the site, studies indicated that the pits were emitting vinyl chloride into the air and contaminating soil and groundwater. The extent to which these problems have been remedied by a subsequent Coast Guard 311 action is not known. The Coast Guard's response involved the removal of 75 drums of toxic wastes, the construction of a fence around the site, and the reconstruction of levees surrounding the pits. Organized citizen participation in activities related to the site have been minimal. In fact, non-governmental involvement consisted mainly of one citizen's complaints to various authorities that dangerous chemicals seeping through the pits were damaging foliage near the site and contaminating soil and groundwater. In addition, an owner of property adjacent to the site has filed suit against several chemical companies, claiming loss of business. The family living near the site has reportedly joined the defendant in the case, claiming assorted adverse health effects.

Prior to the recent clean-up efforts, the state attempted to force Motco, Inc. to remove all liquid and semi-liquid wastes in the pit, neutralize remaining sludges, and cover the pits. None of these was accomplished because Motco had already filed for bankruptcy and was unable to finance the required activities.

It should not be assumed that the complacent attitude of local citizens will continue to prevail in future response activities. If the magnitude of the problem posed by the pits should escalate or directly affect more individuals, there may be organized citizen reaction. The media and organizations such as the Galveston County Toxic Waste Task Force have already started to raise citizen consciousness of toxic waste disposal hazards. In the past, residents have effectively contributed to environmental related policy-making, including the relocation of a chlorine plant that had threatened Galveston Bay residents with potentially hazardous exposures. What residents expect the federal government to do about

toxic waste sites is not clear; they tend to rely on the city and the county to insure that remedial action is taken. The local and state governments, however, have high expectations that Superfund will be able to finance some sort of additional clean-up at the Motco site.

PICILLO SITE, COVENTRY, RHODE ISLAND

The Picillo site in Coventry, Rhode Island, is a dump consisting of one open pit and approximately 11,000 barrels of hazardous waste buried in six 100-yard long trenches. An explosion and fire at the site in September 1977 alerted Rhode Island officials to dumping that they considered to be illegal. At first, the owner, Warren Picillo Jr., denied state officials access to the site. Samples of the hazardous wastes from the site eventually revealed the presence of carbon tetrachloride, toluene, isocyanate, nitrobenzyl cyanide, and other chemicals. In October 1977, Picillo was ordered to remove combustible material from the premises; state funds were made available for cleaning up the site. So far over 1700 barrels have been removed from the site. EPA, which entered the case in 1979, is continuing to re-barrel remaining liquids for on-site storage. Several actions still need to be undertaken: fencing the site, containing chemicals that have seeped into the ground, and testing of nearby wells.

Until recently, citizen involvement with the Picillo site was limited to complaints about heavy truck traffic on the road leading to the site; citizens were not aware that the Picillo property was being used for hazardous waste disposal. However, after more than a year of what they perceived as relative government inactivity, local residents formed Save Our Waters (SOW), an ad hoc group that is pressuring the state government to clean up the site.

SOW has accused the state of moving slowly in the case. According to some reports, however, the state has been the victim of Picillo's delaying tactics and defense maneuvers in court actions. Furthermore, the fact that an unexpectedly high number of barrels were unearthed by clean-up crews may have justified a slowdown of the work effort to reassess the cost of further action. SOW's behavior thus far, which may be partially explained by the Rhode Island governor's failure to meet with the group at its request, suggests that it wants an immediate solution to the problem. SOW may have high expectations for EPA. If this is the case, EPA may want to publicize its current activity at the site and communicate any limitations it faces in achieving clean-up to the extent demanded by the citizens.

RADIUM SITES, DENVER, COLORADO

Since February 1979, a total of 39 sites containing buried radium deposits have been identified in Colorado. The initial discovery came when an EPA official happened across a reference to a "large radium mill" that operated in Denver from 1914 to 1917. Subsequent sites have come to light through widespread publicity and further official investigations. At present, three sites have been cleaned up at the owners' expense, and epidemiological studies are underway. In addition, an agreement has been reached by which construction in the Denver area must be cleared beforehand by the state health department in order to prevent the accidental excavation of a radium deposit. Most government officials on all levels recommend the complete removal of the sites, but the funds to do so are not presently available.

There has not been much active citizen involvement in this case. A number of people have expressed concern over health consequences, and several state and federal elected officials have taken an interest. There is agreement on all sides that the preferred course of action would be complete removal. The situation has received a good deal of publicity; local, state, and federal officials have relied heavily upon the local media to keep the general public and interested groups well informed. The prospects for Superfund being used to clean up these sites are unclear.

SEYMOUR RECYCLING CORPORATION, SEYMOUR, INDIANA

The hazardous waste site at Seymour, Indiana, is the remnant of a waste recycling operation that went out of business. It consisted of a 14-acre area in the middle of a cornfield filled with 50,000 drums and 98 bulk storage tanks containing unidentified wastes. EPA first became involved with the site in March, 1980, when some drums began to swell and smoke. EPA Region V called a 311 action, the first of three, to contain the site. The second 311 action was conducted in July; EPA repaired the dike, fence, and filtration systems they had constructed earlier. In the third 311 action, currently underway, EPA is removing all the liquid material from the containers.

Citizen participation at Seymour has been minimal and has been limited to committee work within existing organizations such as the League of Women Voters and the Chamber of Commerce. The Mayor of Seymour has been a vocal critic of both EPA and the Indiana State Board of Health. Congressional representatives have been extremely active in this case; their staffs keep in close contact with EPA and Seymour residents.

STRINGFELLOW SITE, RIVERSIDE, CALIFORNIA

The Stringfellow site in Riverside, California, is a series of ponds used for hazardous waste treatment and disposal located in hills overlooking a residential area. After spring flooding caused soil contamination nearby, the site was voluntarily closed in 1972 and placed under the control of the regional water quality control board. Frequent heavy rains on several occasions during 1978 compelled officials to release large quantities of liquid wastes to prevent rupturing of the ponds; the run-off flowed through the streets of the nearby residential area. The Regional Board (which now manages the abandoned site) originally favored capping the site as a permanent solution to the problem. Eventually the Board was persuaded by protesting citizens to recommend the complete removal of wastes from the site. While the cost of removal was estimated at $14 million, the state, possibly anticipating federal assistance, has allocated only $4 million for the task.

Two citizens' groups have been prominent in lobbying for a solution to the problems at the Stringfellow site. One group consists of long-time area residents and has been involved in this matter since 1957. A second group formed in 1980 under the guidance of the state-wide Campaign for Economic Democracy and has a generally younger membership whose methods tend to be more assertive and vocal.

The Stringfellow case illustrates the possible complexity of group dynamics in citizen involvement in a hazardous waste emergency. Two groups with similar goals but contrasting memberships and political methods arose at different stages of the site response. One group formed in the 1950's when the site first opened. The second ad hoc group formed only recently, when remedies for a widely recognized problem were under consideration. Through the effective organizing and protests of the second group, the least-cost technically acceptable remedy preferred by government officials was pre-empted.

THE WOBURN, MASSACHUSETTS SITE

The Woburn, Massachusetts, site consists of 800 acres of land and wetland containing open arsenic pits, chromium lagoons, and buried animal hides. These remains are the by-products of 130 years of occupancy by a succession of now-departed chemical, leather, and glue manufacturers. The site is presently being developed anew as an industrial park. Residents of the adjoining town of Reading, a prosperous suburb of Boston, had complained since 1973 of the odor emanating from the site. However, the residents of Woburn itself -- an old, industrialized, blue-collar town upwind -- were unaware of any problem until 1979 when the disclosure of the results of testing

for hazardous chemicals at the site coincided with the release of a study showing an unusually high cancer rate among Woburn residents. Several ad hoc citizens' groups formed. Various state and federal agencies concentrated attention on the site. And a Citizens' Advisory Committee, comprised of representatives of all local interests, was created. A consent decree from a lawsuit brought by the Army Corps of Engineers against the developer to force clean-up of the site was signed in May 1980. A similar suit was brought by the State of Massachusetts and the City of Woburn but its consent decree was postponed by objections from the Town of Reading, which had not been included as a plaintiff. A new consent decree was worked out in August 1980.

Interviews at the site revealed that the public's perception is that the government's response was well-managed. After some initial problems were cleared up, the state and EPA outreach efforts were generally well-received by citizens. In this case, the effectiveness of the response can be partly attributed to an EPA on-scene coordinator who kept the public informed of governmental actions and a citizens' advisory committee that ensured communication and coordination between the government, public interest groups, and local industry. Thus, the Woburn case illustrates the value of certain public participation mechanisms. It also illustrates how a well-conceived action (i.e., the consent decree) can be hampered by neglecting to take into consideration all of the concerned parties at a site.

THE VALLEY OF THE DRUMS, BROOKS, KENTUCKY

The "Valley of the Drums", in Brooks, Kentucky, a rural area near Louisville, consists of the remains of a former hazardous waste disposal operation. The site has been a source of complaints from nearby residents since 1967. Despite repeated findings of mismanagement by state investigators, it was closed by the state only in 1978, after the operator had died. By that time, the site contained thousands of rusty and leaking chemical drums scattered about a field. In March 1979, Region IV EPA conducted a 311 emergency action when chemicals from the drums were discovered leaking into an adjacent stream. To avoid future mishaps, state officials proposed installing an incinerator at the site to clean up the wastes there and to provide a permanent facility for disposing of hazardous wastes. But when the media publicized this proposal, local citizens organized a grass-roots protest. Subsequently, county authorities refused to grant the zoning variance necessary to operate an incinerator and establish a permanent disposal site. The groups that fought the incinerator proposal have now disbanded, but the hazardous waste problem remains a highly visible local political issue. Local politicians have used the opportunity to advertise the failure of the incumbent county administration to solve the problem.

Interviews at the site revealed that the county authorities whose approval was necessary to set up the incinerator facility had not been apprised of EPA's stand on the proposal and had no advance knowledge of the proposal from the state. Local officials had to judge the proposal's merits solely on the basis of information they obtained from the media and from citizens opposed to the proposal. Had state and federal officials actively included county authorities in their deliberations and kept local citizens informed about the nature of the state's proposal, the proposal might well have had the support of local officials as a feasible solution to the problem. Local representation on the Regional Response Team during the emergency phase of EPA's operation could have provided the necessary channel of communication. The "Valley of the Drums" thus illustrates the possible consequences of neglecting local governments and citizens when making decisions about remedies for hazardous waste emergencies.

CONCLUSION

Our analysis of these twenty-one cases follows in the next chapter. While we recognize that each hazardous waste problem is a singular event that is shaped by the community in which it occurs -- that is, in fact, one of our main conclusions -- we think these cases constitute a reasonable basis for generalization. They represent every region of the country and contain a well-rounded mix with respect to the level of citizen concern and political agitation. Our analysis should offer a good indication of what to expect not only when implementing the Superfund program, but also when siting new facilities for hazardous waste transport and disposal.

CHAPTER III: CONCLUSIONS AND RECOMMENDATIONS

1. INTRODUCTION

The extent of public involvement in hazardous waste problems has ranged from outright conflict to placid complacency. In some cases where the threat was serious and the resolution complex, we found an indifferent local public; in other cases where there was not any evidence of great danger, we found anxiety and agitation. In several of the cases that have been quiet to date, the potential for public activism and conflict at a later point is unmistakably present. This wide variance in the reaction of citizens at different sites may come as a surprise to those familiar with the issue through media accounts of Love Canal and similar widely publicized trouble spots. For those who must conduct a program to respond to hazardous waste emergencies, what is most important is that there appears to be little correlation between the objective magnitude of the environmental or health problem at a site and the level of public involvement.

The 21 cases studied for this report were analyzed with a focus upon the factors that prompt or discourage citizen involvement and the pattern that such involvement takes. Our objective was ultimately to guide the design of a public participation component in the Superfund program. During the course of this analysis, we attempted to isolate uniformly-valid factors that could be used to predict whether, and to what degree, the public will take an interest in a hazardous waste problem in its midst. However, one of our principal findings is that there appear to be no such factors. Instead, the most important determinants of public involvement are the particularities of a site's history and the specific context in which the problem emerges. This point is explained and substantiated in the analysis that follows.

There are important consequences of this finding for the conduct of a public participation program. Most obviously, there can be no rigid procedure for the conduct of such a program--no fixed set of steps to be taken in every case--because the range of public attitudes to be encountered will be so great. We present (in the third section of this analysis) a number of alternatives that can be employed at each stage of the technical response to a hazardous waste problem, but we leave open the choice of which is most appropriate at a given site. A further consequence is that an integral part of the response to a hazardous waste emergency must be an initial on-scene investigation of public attitudes towards the site and the political background of the site's development.

Perhaps the most important consequence, however, is a clarification of the role and purpose of public participation in the Superfund program. We save our consideration of this matter until after a discussion of what we found at the 21 sites investigated.

This chapter is organized as follows:

Section 2: Conclusions from Cases. Empirical findings and analysis.

Section 3: The Role of Public Participation in the Superfund Program. How it can help the implementation of the program.

Section 4: Analysis of Public Participation in Each Major Step of Response Plan. Alternatives to be used in remedial actions and emergency responses.

2. CONCLUSIONS FROM CASES

Our generalizations from the 21 cases we have studied are divided into four groups:

A. General considerations on the structure of hazardous waste site problems.

B. The determinants of public involvement.

C. The form of significant involvement and conflict.

D. The conduct of public information and participation programs.

A. General Considerations on the Structure of Hazardous Waste Site Problems

1. Every site can be expected to have a political and social history that will play a major role in shaping subsequent developments. The creation of the site, earlier attempts at closure or clean-up, previous relations between private citizens and government agencies, prior dealings between citizens and industry, etc., all will affect the course of political developments in a hazardous waste incident.

If citizens objected to the initial establishment of a waste disposal site, they will likely be especially irritated if the site later proves to be a health hazard. Jackson Township was such a case. One reason local residents said they were suspicious of the incinerator plan for the "Valley of the Drums" is that the proposed operator was connected with someone who had a history of hazardous waste violations. Woburn's reaction to the discovery of its hazardous waste problems was influenced by the benefits that the site's development as an industrial park were starting to bring to a city that had long been in economic decline.

Perhaps the most important consequence of a site's history is to make some people--but not others--credible in the eyes of the public. Credibility can generally be built only over a long period of time; and once lost, it is virtually impossible to regain, as both the Love Canal and Memphis cases demonstrate. The credibility of an industry that produced hazardous wastes in Charles City was established through decades of being a good neighbor in the community. Local citizens have not been active at this site. Similarly, the citizens of Seymour, Indiana, had every reason to expect that the government agencies responding to the hazardous waste problem in their town would be trustworthy and reliable. Thus their level of activism has been low.

An integral part of the response to a hazardous waste emergency should therefore be an initial investigation into local attitudes towards the site and its social and political history. One goal of such an investigation would be to determine whom the public trusts and who is distrusted. Specific matters to be investigated include what individuals or organizations have established leadership roles, what media sources are relied upon, what the economic base of the community is, what it prides itself upon, how local politicians are regarded, and what experience the community has had with similar issues.

We use the term "credibility" in this report in the sense of "believability" or "reliability." Thus, when we talk of the credibility of a government agency, we mean that its spokesmen are generally believed by the public, rather than being held suspect regardless of what they say. We are not concerned with the establishment of credibility in the vague sense of creating a favorable public image or making a good impression.

2. Hazardous waste problems cannot be equated with individual "sites" in all cases. Uncontrolled dumps are often found in groups. The public may regard every uncontrolled site in a locality as part of one general hazardous waste problem, failing to observe the legal or technical distinctions with which government agents operate. Across the highway from the French Limited site, for example, is a possibly more serious uncontrolled site that has

not been remedied as yet. A Section 311 action in Rock Hill, South Carolina, was thought by state officials to have affected their chances of forcing, through court action, the clean-up at private expense of sites elsewhere. And the real "hazardous waste problem" in the community, as far as the Rock Hill public was concerned, was a troublesome new incinerator operation. In general, a plan of action that addresses only a portion of the perceived problem in the locality will be looked upon disfavorably by the citizens. Moreover, the government may appear silly and overly bureaucratic to citizens if it spends a great deal of money cleaning up one site in an area and practically ignores the others. Multi-site planning is clearly required in certain localities.

3. Local and state governments look to the federal government for leadership, technical resources (to perform health and engineering studies, for instance), and financial support. Moreover, they may delay action until the federal government steps in.

Nothing has been done at the "Valley of the Drums" site (beyond some voluntary clean-up by industries) since EPA emergency actions were concluded in March 1979. California officials allocated far less money to the clean-up of the Stringfellow site than the recommended containment measure requires. Woburn citizens, believing the information they receive from local politicians and businesses to be somewhat self-serving, look to the federal government for an objective report of the facts. And in Nashua, New Hampshire, the freely- offered financial resources of the state and local governments were exhausted before the main problem could be dealt with.

It is important to note that in every one of the 21 cases studied, state governments--though not necessarily local governments--were thoroughly enmeshed in the situation. Usually the state environmental agency was the first place citizens turned for help. In some cases (Oregon's Alkali Lake, for example), the state agency was able to handle the problem entirely on its own. Elsewhere, as at Charles City, the state agency appealed to EPA for assistance only when the problem grew too large or complex for it to manage any longer. However, all state agencies can not be relied upon to involve local governments and the public in decision-making. We have observed several cases (e.g., "the Valley of the Drums") where the lack of state agency contact with local governments and citizens led to serious local opposition to a state-proposed solution to an uncontrolled site. In general, EPA staff will need to develop their own independent community relations program.

4. The Superfund program can learn from the successes and mistakes at each site action. This series of case studies has yielded significant lessons for agency action at other emergency and remedial sites. A routine step at the end of each remedial action should be to evaluate how the public involvement worked and did not work during the clean-up process. Some of the obstacles encountered at each site may be unique, but other problems and their solutions--best understood with hindsight--may offer lessons for EPA action elsewhere. These evaluations, performed after emergency and remedial actions, might be published in an on-scene coordinator newsletter for the benefit of other hazardous waste response teams.

B. The Determinants of Public Involvement

1. A widely-held theory that does not always bear out in experience is that the public will involve itself in hazardous waste emergencies if and only if its drinking water supply is affected. It is true that the disruption of the drinking water supply is the clearest and most tangible way the public can be affected by such problems, and (as we note below) people affected by the problem are more likely to become involved in it. There are several cases that fully support the theory: in Jackson Township, a bitter conflict was precipitated by the contamination of well water; in Pittston, Pennsylvania, where drinking water was not affected, there was little public involvement, even though oily wastes had left a visible sheen on the river flowing by the town. Yet there are also cases that do not conform to the theory: citizens in Waterloo, Iowa, gave no indication of concern when their municipal wells were contaminated by a dump upstream in Charles City; and at the French Limited site in Texas, some of the people who became active in the problem suffered contamination of their drinking water, yet others were concerned only about odors and recreational effects. Most important, however, is that in the cases with the most severe and protracted conflict--Memphis, Love Canal--drinking water was a peripheral concern; in other cases with extensive involvement--Stringfellow, Islip--the drinking water supply, while threatened, had not been found to be contaminated.

2. The emergence of citizen concern and involvement cannot be predicted on the basis of socio-economic status, though it may in hindsight be explained (in conjunction with other factors) on that basis.

Socio-economic considerations can be used to account for involvement in some circumstances: the intensity of the conflict in Jackson Township was undoubtedly caused in part by the fear of lower-middle income residents for their substantial recent investments in homes. However, there are other cases where people with similar backgrounds took no interest in a hazardous waste

problem, or where separate groups with divergent backgrounds (as at French Limited, Islip, Memphis, Woburn, and Stringfellow) became involved in one problem. Thus, socio-economic factors cannot be used reliably to predict who will or will not become involved. They can, however, be used to predict to some extent what style of political activity will be adopted by those who become active.

Orthodox political theory holds that the lower-middle class in the United States is hard to rouse to political activism, lacking both a tradition of activism and the training necessary to conduct it. We found, however, that in a majority of the cases we studied, lower-middle class citizens took the lead in organizing political involvement and agitation. Often these people had no prior political experience. A striking proportion of the highly-active citizens -- and their leaders -- were women, a further departure from orthodoxy. One part of the theory that was borne out was that lower-income citizens seemed more likely to acclimate themselves to annoyances, such as unpleasant odors, that higher-income citizens refused to tolerate (e.g., Woburn).

Citizens who are accustomed to working through established political channels can be expected initially to do the same in a hazardous waste emergency; those without such experience might more quickly take matters into their own hands. Because the people who have become involved in hazardous waste problems have so often been politically inexperienced, the style of activism has usually been highly unconventional.

3. The emergence of citizen concern and involvement cannot be predicted on the basis of where in the country the incident takes place. Citizens have been drawn into hazardous waste incidents in sparsely populated rural areas (like the "Valley") as well as in inner cities and in every region of the country. Generalizations about the character of the people in a locality--say, their passivity or acceptance of authority--do not explain much; what does have explanatory value are the factors that have produced that character (such as a local government with a history of responsiveness).

4. The citizens most likely to become involved in the course of an emergency are those for whom the problem is a daily annoyance, or those with children whose health may be threatened. At the Woburn site, for example, the townspeople of neighboring Reading, who were bothered by foul odors from the site, lobbied for a response long before the townspeople of Woburn, who were closer to and perhaps more seriously endangered by the site. The persistence of the involved citizens in Jackson Township can be explained by the fact that they were deprived of running water and that several people in the area had developed cancer, which they assumed was linked to the contamination of the wellwater.

EXHIBIT III-1

THE CAUSES OF SIGNIFICANT PUBLIC ACTIVISM: A CHECKLIST

- Is the health of children potentially affected?
- Are economic interests threatened?
- Is daily life disrupted, e.g., by contaminated drinking water?
- Is an effective citizen leader available?
- Are critical information sources lacking in credibility?
- Will government not be assumed to have the situation under control?
- Are there no other environmental problems in the area?
- Does the response involve on-site disposal or the conversion of an abandoned site into an active site?

Factors excluded from checklist: Socio-economic status of population; rural/urban; region of U.S.; technical complexity.

EXHIBIT III-2

THE FORM THAT PUBLIC ACTIVISM TAKES: WHAT TO EXPECT

FINDING	IMPLICATION FOR PROGRAM MANAGEMENT
• There is often little relation between the severity of the threat and the amount of public involvement.	-- In some cases, the cost-effective response will be easy to implement.
• Public interest usually peaks when a solution is proposed.	-- Anticipate and prepare for activism in an apparently routine case.
• The lead in citizen activism is invariably taken by grass-roots groups, often under the leadership of an individual woman.	-- Unconventional politics are the norm. "Outside agitators" are not usually present.
• Activism is frequently aimed at forcing the rejection of the most cost-effective solution.	-- Public pressure can cause delays and skyrocketing costs.
• Citizens and local governments have great expectations for Superfund.	-- Sensitive explaining of Superfund's limits is called for; frustrated expectations lead to resentment.
• A new national citizens organization may be developing.	-- EPA management should establish a working relationship. Its tactics may be unorthodox.

EXHIBIT III-3

GENERAL MANAGEMENT STRATEGIES FOR COMMUNITY RELATIONS

1. Approach each case with the idea that serious controversy is possible. Find out what the community wants done at the site. Study the site as a local political issue. Learn who is who, what their views are, and what the recent history of the community has been like.

2. Exercise care in the choice of an on-site manager for community relations. Look for strong "people skills" as well as technical knowledge.

3. Contact local elected officials and other leaders early. Solicit their advice and reactions. Set up a mechanism for maintaining close contact.

4. Contact the local media, furnish them information, and answer their questions.

5. Get citizens who are directly affected by the problem involved in advisory committees or consultations to prepare for sensitive developments and to address urgent concerns.

6. Set up a mechanism for answering questions from the public--promptly and in plain English.

7. Do not surprise the community. Identify in advance any issues that could cause concern. Develop alternatives for mitigating concern and review the alternatives through the public participation mechanism. The goal is to ensure in advance community support for action plans.

8. Monitor community reactions throughout the process and adjust strategies accordingly.

9. Deliver on commitments. But don't over-commit. A broken promise will destroy credibility, regardless of the effort put into community relations before or after.

10. Recognize that community relations are as important to success as the technical and legal effort at a site.

By far the fear most frequently voiced in connection with hazardous wastes was for the long-term effects on the health of children. Couples with young children were often the most active citizens at a site; the Memphis case well illustrates how intense their concern can become.

Invariably, the majority of the citizens actively working for a response to a hazardous waste problem are those who believe they are directly affected by the problem. Previous political leanings or activity generally have little bearing upon public involvement in such circumstances. In fact, most of the people active at the sites studied consider themselves "non-political" in the traditional sense and probably would not have become involved in local politics if the site had not been discovered. Local political parties were never found to have organized political activism in these cases. These considerations further explain why the political involvement has generally been of an unconventional sort.

By the same measure, people who perceive themselves to be entirely unaffected by a problem in their midst may take no interest it it, regardless of alarming reports in the press. A good example is Charles City, where the local populace voiced no concern over a dump that state officials called an "environmental time-bomb" and compared to Love Canal. In this case, the absence of immediate or tangible effects on the townspeople partly accounts for their attitude.

5. In a region with a multitude of environmental problems, an uncontrolled hazardous waste site may produce little reaction. One additional problem may seem to be little cause for concern. Or, if there has been no visible damage from the other environmental problems that have received attention, the public may toss off yet another problem as an instance of "crying wolf". For example, the Motco site in LaMarque, Texas, was regarded by the local media and citizens as just one of 500 in the state and hazardous waste mishaps as just one of many environmental problems in this highly industrialized region. The local public was far more concerned with nuclear wastes, oil spills, and the plan for a major port facility nearby.

6. Citizens may become acclimated to a site's effects and grow to accept the situation without protest. Thus, townspeople in Gainesville, Florida, having lived for years with phenol odors from a nearby creek, evidently resigned themselves to the nuisance and did not agitate for help. Much the same was true for some people in Rock Hill, South Carolina. Note, however, that citizens elsewhere (as in Reading, near Woburn) refused to adjust to similar annoyances.

7. For want of a credible and effective leader with time to devote to the cause, citizens who might otherwise become active will maintain their distance. Local and EPA officials in Nashua, New Hampshire, believe that organized participation is long overdue and see it arising when the leader of a residents' association begins to focus upon the issue. The general public's attitude toward environmental activism is crucial: in LaMarque, Texas, a local surgeon respected by the media and government representatives has been unable, in spite of strenuous effort, to arouse concern over a site among ordinary citizens; apparently his approach to the toxic waste problem has led some people to dismiss his behavior as that of an obsessed man. In this industrial town, environmentalists are usually not regarded favorably.

8. The credibility of information sources is a crucial determinant of the public reaction. When a credible source--such as the local industry in Charles City--says that a hazardous waste problem is under control, the public may see no need to participate. On the other hand, no amount of assurance from a source that does not have a reputation for credibility will calm a distraught and agitated public, as Regional EPA officials learned in Memphis. As noted above, credibility can generally be built only over time: it is a perception that must be formed (or at least, not blocked) prior to the onset of an emergency and maintained carefully.

9. Citizens may not become involved in a problem that they believe authorities to have well in hand. Examples abound: why seek an active role in an issue that the government is perceived--rightly or wrongly--to be taking care of?

Informing the public that a situation is in control, of course, is one function of a public participation program. It is especially valuable when conflict between citizens and government has developed. The concerted public information campaign mounted in Verona by the regional EPA office has contributed to the feeling of most people in the area that the situation is being handled competently. Elsewhere--in Seymour and Gainesville, for instance--there was no need for such an effort: the local public was inclined from the start to assume that government agencies on scene would have whatever problems existed under control. The degree of local trust in government will independently influence public confidence in a government's response to a hazardous waste problem; this variable must be taken into account when designing a public information program.

10. Proposals that involve establishing a new disposal facility in a community are very likely to be greeted with opposition, even when the facility is said to be entirely safe. It seems that no one nowadays wants a hazardous waste facility in his backyard. Consequently, clean-up proposals that include the

creation of a waste disposal facility (e.g., an incinerator, as in the "Valley", or a photolysis processor, as in Verona) must be handled with special caution.

C. The Form of Significant Involvement and Conflict

1. Public interest in a troublesome hazardous waste site typically peaks at the time a solution is proposed. Perhaps the most striking illustration of this point is the "Valley of the Drums," where there was no sign of public interest until an incinerator was proposed to clean up the site, at which time a flurry of opposition arose. Sites that are presently quiet--Verona, Nashua--clearly contain the seeds of overt concern for the ultimate resolution of the waste problem. Thus, there may be a need for public participation in a site response even when the local public has appeared to be relatively unconcerned.

2. The cost-effective solution to a hazardous waste problem or the technically-best solution may well prove unacceptable to a large segment of the populace. And in consequence, a solution that is more expensive or technically less desirable may have to be substituted. In such an instance, a state or locally funded supplement to the federal Superfund may be required.

For instance, at the Stringfellow site, the public vehemently opposed a solution that local officials felt to be adequate to protect health and demanded, instead, a far more expensive alternative. Similarly, the proposal to set up an incinerator at the "Valley of the Drums" site was rejected by citizens and the local government even though state officials believed the incinerator would not only remedy the problem at the "Valley" but would also provide Kentucky with a badly needed hazardous waste disposal facility.

At several sites that have not presently reached the stage of final dispensation, there are strong indications that certain technically attractive solutions would be met with public opposition. For example, a series of noisome fires at dumps in the vicinity have made neighbors of the French Limited site skeptical of the possibility of safely incinerating wastes there.

3. Involved citizens will form single-issue ad hoc organizations to press for action. Ad hoc groups were formed, often quite rapidly, at every site studied with significant public participation. Pre-existing civic or environmental organizations may take an interest in a problem, but the lead in organizing opposition, advocacy, or just the expression of concern, invariably falls to "grass-roots" organizations. In the 21 cases studied here, members of national environmental groups were very active at only

one site. "Outside agitators" were rarely seen at any site. Frequently civic and environmental groups remain altogether detached from a problem in their locality, a suprising finding whose important implications for the conduct of the Superfund program are discussed below.

4. One or several individuals with considerable time to devote to the cause will assume leadership of these ad hoc groups. The charismatic and persuasive Lois Gibbs of Love Canal is the best example. The leadership of the Jackson Township group fell to a man who was unemployed, had lost a daughter to a disease he attributed to chemical contamination, and who was a persistent and hard-working organizer. One group at the Stringfellow site was led by semi-retired people. A minister took the lead in organizing Woburn residents. The presence of someone able to assume effective leadership may be enough to rouse an otherwise-complacent citizenry to involvement.

The availability of time partly explains why (as mentioned earlier) such a large proportion of these leaders are women. Other considerations may be the greater willingness of women to admit publicly fears for their children's health, or (as at Love Canal) the reluctance of men employed by the industry that produced the hazardous wastes to become involved.

The political sophistication of such leaders--regardless of their prior experience--should not be underestimated by response-team personnel. They can usually be relied upon for effective contact with the general public.

5. Conflicts may arise among citizens at a site; the local public should not be regarded as homogeneous. Ad hoc groups with contrasting objectives or methods can emerge within one community in response to the same problem. This is particularily true in the larger, more complex cases. The affected citizens at Love Canal are represented by a number of groups; there is some feeling that the Homeowners' Association has garnered a disproportionate share of the attention. In Memphis, some citizens received threatening phone calls from others who thought they were attracting too much attention to the situation. The more active citizens in Verona and Jackson Township are apparently resented somewhat by others in their communities. The differences between citizens' groups can be rapidly submerged, however, in the face of a common opponent--a government agency slow to act, for instance.

6. Involved citizens may make contact with their counterparts at other well-known hazardous waste sites, establishing an informal network. Leaders of the active citizens at Love Canal, for instance, have visited other sites; at Stringfellow, the result of such visits was to inflame the situation by inviting comparisons

between the sites. Lois Gibbs reports having corresponded with upwards of 300 people at sites around the country. The advice of people involved in Jackson Township's problems has been solicited by citizens with similar problems elsewhere.

The extent of informal contact that has already occurred suggests the real possibility that citizens affected by hazardous waste problems will band together and form a national organization. Existing national environmental groups have left a gap that such an organization could fill. If the cases we studied are any indication, this organization could be expected to use fairly unorthodox political methods, judged against more established environmentalist groups, and to be composed of people who have not belonged to political or environmental organizations in the past. The approach used by EPA officials in dealings with it would have to be modified accordingly.

7. People can sometimes become convinced that they are suffering from health problems caused by hazardous waste, even when there is evidence to the contrary that should convince them otherwise. Sometimes there simply is no good evidence one way or the other. In either case, the anxiety of those who believe themselves affected will persist. Thus, citizens in Memphis believe their health has been damaged by chemical contamination, although no contamination has yet been located, nor (in some cases) has any health damage been identified. Residents of Jackson Township, Love Canal, Woburn, and Memphis all believe that the incidence rates for certain diseases in their areas are unusually high and must be attributable to hazardous wastes.

When conflicting technical information is available--as is generally the case--there is scientific evidence to back almost any belief. Indeed, a central feature of most hazardous waste emergencies is the conflict of allegedly-expert opinions on safe levels of chemical content, safe disposal practices, adequate protection for groundwater supplies, proper testing procedures and epidemiological methodology, and the like. These conflicts are pervasive obstacles to any attempt to deal with the public. Their presence is a further reason why there is no such thing as a neat, scientifically valid, purely technical solution to a hazardous waste problem.

8. For partisan political reasons, groups of individuals may take advantage of a hazardous waste emergency. Thus, a number of local groups used the "Valley" case as a point of contention in the 1980 election. In a more complex situation, a state-wide California political organization has provided assistance to a splinter group at the Stringfellow site. The organization evidently hopes to garner attention and support, but also wants to encourage

grass-roots public activism over a highly charged political issue. Frequently, elected officials hold press conferences or hearings on site and work hard to find help, gathering publicity in the process.

9. The litigation process can easily become closed to public involvement, resulting in consent decrees potentially unacceptable to the public and leaving measures designed to facilitate citizen participation with little to do. At Woburn, for example, a consent decree was initially blocked by the Town of Reading, a concerned party that had been given no voice in drafting the decree. The transfer of the bulk of decision-making in this case to the courts has, at the same time, left the Citizens' Advisory Committee--which was formed in part to ensure the public some role in the decision-making--with much less influence on the clean-up process. The question of how to clean up the French Limited site was in court for two years, during which time local residents were excluded from the process; because of the appearance of lack of progress over this period, the credibility of both the state and county governments was hurt.

D. The Conduct of Public Information and Participation Programs

1. Publicity about a hazardous waste problem may be resented by the public. Hazardous waste problems can be a stigma on a community, and anything that calls attention to the problem may therefore be considered, by those who care strongly about the community's reputation, to be giving the locality a "black eye."

There is a difference between public information and publicity; at times, media events have been staged under the guise of informing the public. We recognize that in the past, widespread publicity campaigns may have been needed in order to call attention to the extent of the nation's hazardous waste problems and the need for national legislation in response. However, the purpose is transparent to people in the locality upon which the publicity is focused, and the result is suspicion of motives and distrust.

Publicity is an especially sensitive matter when a community is in difficult economic straits and dependent upon an industry that, while implicated in the hazardous waste problem, has otherwise been a good neighbor. Such a situation was found in Charles City. Publicity directed at a national audience may well be wholly out of proportion to the severity of the particular problem--as was the case in LaMarque, where residents wondered why there was a sudden fuss over a problem that had been in existence for 20 years--or out of proportion to the size of the particular community, as in Verona. Local officials in Aurora, near Verona, were also irritated that because a news office was established in their town, outsiders were led to think that a dump seven miles distant was within their locality.

An effect noted at French Limited and elsewhere was the build-up of expectations caused by excessive publicity. When a Congressman and the EPA Deputy Administrator visit a site, the expectation created is that it will be cleaned up. If nothing subsequently happens, the result can be frustration and mistrust.

2. Some of the public participation mechanisms already in use have been fairly successful. On-scene coordinators can serve as conduits of information and services between government agencies and the public. One tactic of an on-scene coordinator that worked especially well was the arranging of a field trip to the Stringfellow ponds. Most of the nearby residents had never seen the site before and had distorted impressions of what was really there. A lesson from these cases, however, is that on-scene coordinators should be given the resources and the skilled personnel necessary to take the initiative and actively seek out public representatives and local government officials if they are to avoid neglecting citizens with critical roles in response plans.

Citizens' advisory committees can also be effective means by which to channel information and encourage communication, as the Woburn and Islip examples suggest. Nonetheless, citizens who participate in a purely advisory committee must be able to see their effect on the policy process, or they will feel that their effort has been wasted. This is a sensitive matter. Public participation efforts must make a clear distinction between actual decision-making--which is the prerogative of government officials alone--and public consultation. The approval or rejection of any specific measure should be responsive to, yet not determined by, the wishes of citizens.

EPA technical personnel dealing with hazardous waste emergencies may be thrust into the political limelight in a manner for which their previous work on other environmental problems will not have prepared them. Supplemental staff training will be called for, especially for those who will come into direct contact with a sensitive public.

3. Public participation can be a disillusioning experience on all sides. Regional EPA staff have found at times that their sincere efforts to help were unwanted. On occasion, the most carefully planned attempts to inform and involve the public have still met with criticism from some quarters. These occurrences are probably unavoidable, but they are dispiriting nonetheless. Many EPA officials complained that the public in an environmental crisis is, in their opinion, irrational and motivated solely by self-interest. The public, on the other hand, has often found involvement to suggest new things to be worried about but to provide no satisfactory answers. There is often little visible influence on policy decisions. The experience of working with government

agencies can also dampen the desire to participate. The organizational intricacies and seemingly petty turf battles of complex bureaucracies are widely-cited sources of frustration to citizens who would otherwise want to become involved in response efforts. Public participation measures can also provoke resentment for calling attention to a problem that, within the community, is not considered to deserve attention. In addition, if local leaders consider public participation measures under their own supervision to be adequate, they may be unhappy (and uncooperative) with the establishment of new measures as part of a hazardous waste response; such was the case in Memphis.

4. There has been confusion during the release of test results to the public. For example, in Memphis, EPA regional officials hastily called a press conference following the return of positive test results but shortly afterwards had to reverse their findings; on another occasion, a weekend delay in testing the contents of an unearthed drum permitted later-discredited rumors to circulate through the media. At several of the other sites, state labs, EPA labs, or contractors have not released the results of drinking water well testing to the well users or have not notified residents before their wells were sampled. There is a clear need for better guidance and oversight in this area.

5. The local press--more so than the national press--has been an important source of information. Local press coverage of every site has been extensive, even where there has been little public involvement. Sometimes the coverage has been found to be uninformative, but citizens still rely far more heavily upon the local press than the national. Consequently, the local press is a valuable vehicle for communication between government agencies and the public.

The local press, in several of the cases we studied, could readily have been put more fully to use as a means of disseminating information. Newspaper stories, however, have to be general and may therefore fail at times to answer the specific questions of individuals (e.g. about property values); in such cases, press accounts must be supplemented with personal contact. Some people in Verona and Aurora, Missouri, for example, found that because all the information issued by the regional EPA office was funnelled through a news office first, it did not speak adequately to their concerns.

In general, the functions of a public information program can sometimes be handled adequately by other sources, relieving EPA of the need to institute a formal program. That is, if newspapers or local government officials have been able to keep the public satisfactorily informed, there is no need to duplicate their efforts. More important, if such sources enjoy a reputation for credibility in their community, it is to EPA's advantage to allow

them to handle the job of keeping the public informed of plans and progress. This technique was used successfully at Islip: Regional EPA officials channelled information through the office of a popular congressman. By the same measure, it is important to avoid appearing too intimate with sources that are held suspect in the community.

6. The public's need for information may necessitate actions that extend beyond the ordinary scope of public participation. In order to provide citizens with the fullest information about an environmental hazard, it may be necessary to conduct testing or studies that might not be warranted on purely technical grounds. For example, in Verona, Missouri, a geological assessment indicated that only three wells could have been affected by migrating contaminated groundwater; recognizing citizens' concerns, however, the regional EPA office expanded the testing to fourteen wells. Here and in Memphis, in addition, medical testing was conducted even though there was no evidence of contact with hazardous chemicals. Insofar as the point of public participation is to keep a community well-informed about matters of direct consequence, these kinds of actions can be important to a public participation program.

Health studies have been a particularly thorny issue in hazardous waste emergencies. The public may demand them on the basis of unrealistic expectations about the ability to make a causal link between a chemical's presence and an occurrence of a disease; in other cases, the public may (more realistically) simply want information about what health problems to be cautious about in the future. In any event, the refusal to perform health studies can raise suspicions about secrecy or a cover-up and, in consequence, rapidly undermine agency credibility.

7. Environmental organizations--the traditional point of contact between EPA and the public--have rarely played an important role in cases with significant public involvement. The lead has invariably fallen to local issue-specific ad hoc groups.

Thus, if EPA wants to reach the people most affected by these situations, it must substantially revise its current procedures. Mailings to national environmental groups, or even their local chapters, will only coincidentally find the people who will be most concerned about a hazardous waste problem. Local members of national environmental groups may be good choices for membership in advisory committees, but EPA must also reach out to the community beyond these activists to ensure that the citizens most concerned about the issue are included.

8. EPA staff often will be unable adequately to control the flow of public information, simply because the agency often will enter a hazardous waste emergency in response to developments long underway and long known by the public.

Public information campaigns work best if they bring the first news of a problem to the public's attention, ensure that the media have access to full and undistorted information, and work to prevent misconceptions and false rumors. However, the hazardous waste problems to which the Superfund program will respond will frequently be long-brewing local concerns that may well be brought to government's attention by the public. Moreover, if they are genuine emergencies, the public information program will not be afforded the luxury of planning. Efforts to provide the public with the best available information will be hampered in these situations. However, our experience suggests that there will still be many cases in which the public is generally unaware of a site or its problems prior to EPA's decision to respond. In Verona, Missouri, the regional EPA office took advantage of a situation of this sort to plan in advance a carefully-orchestrated public information effort.

9. Some issues are more controversial than others; different groups within a community have different concerns; attempts to inform and involve the public must be structured accordingly. These points are too easily overlooked. Two issues in particular, we have found--the health of children and property values--generate the greatest emotion in citizens affected by hazardous waste problems. Moreover, there are never clear and decisive answers about effects on health or the value of property. These issues, once introduced, can rapidly overwhelm a public meeting, forestalling discussion on matters (such as the location of new water lines, etc.), that are not contentious, that can be clearly resolved, and on which the public's views could be genuinely helpful to government planners. Consequently, they may have to be held off for separate consideration and treated, on the whole, differently from the other items addressed in public information. In general, the issues on which information is presented should be distinguished according to the level of public concern for them.

By the same measure, different segments of the public will have different concerns and will want to know about different matters. The public to be informed should not be treated as a uniform mass. It consists, rather, of affected citizens, politicians, environmentalists, etc. Technical information is necessary in some quarters but inappropriate in most. Sometimes timing will need to vary. Local officials will be held accountable by the public for answering questions and may have the final say in any actions undertaken. Therefore, they will usually need to be informed of plans or developments before the general public, so that they have time to learn about the issue and develop positions on proposals.

This technique was used successfully in Verona, Missouri; the "Valley of the Drums" illustrates what can happen when local officials are not informed of plans before they become public knowledge through incomplete media accounts. These same considerations apply to attempts to involve the public in the planning and performance of a response.

3. THE ROLE OF PUBLIC PARTICIPATION IN THE SUPERFUND PROGRAM

In the course of our investigations at these 21 sites, we met many EPA staff members who thought that the problems of uncontrolled hazardous waste sites are purely technical and that attempts to involve the public in responses serve only to produce unnecessary alarm. To a certain extent, that is correct. These sites are cause for concern because they threaten both human health and the environment; the only way to eliminate the threat is through scientific study, engineering, and remedial construction. However, the human health threatened is that of the people who live nearby, and the environment that must be protected is where they work and their children play. The technical problems of uncontrolled hazardous waste sites thus arise in community settings from which they cannot be divorced.

We think that the case studies that follow are sufficient proof that it is the wider problem--the physical problem together with the political context in which it is embedded--with which government agencies must deal in responding to a hazardous waste emergency. In general, a response to a hazardous waste emergency that views the problem as a purely technical matter can easily overlook the concerns of the public. Yet citizens who feel that they have legitimate concerns left unaddressed by a response--whatever its technical merits--may very well press government agencies for additional and usually more-costly measures. In other words, if the local public and local government do not think a plan is adequate, it stands very little chance of being implemented.

A public participation program provides the means by which to incorporate social and political parameters into the response effort. It establishes a conduit for relations between government and local citizens. It enables government agencies to keep the public informed of plans for a site and actions underway. At the same time, by allowing citizens to bring their concerns to the attention of authorities, it can help government agencies fashion a response that will be acceptable to the people in whose community the problem is located.

The benefits of a public participation effort can be expected to vary from site to site. In some cases, it will undoubtedly lead to a smoother and more efficient response effort. For example, government technical experts have, in the past, learned from ordinary citizens of hidden environmental problems or of unforeseen difficulties with intended remedies. A well-designed information

campaign is the best way to prevent a distorted understanding of the problem and unrealistic expectations about what the federal government can do for it. A public participation program is also probably the most effective means of preventing citizen-government conflict from standing in the way of a response to the environmental problem: in situations where there already is excessive conflict, it can contribute to reducing tension; in situations that have remained calm so far, it can help prevent unwarranted opposition to technically-desirable remedies from arising and usually more-costly measures. A public participation effort in the course of a response can therefore lessen the likelihood that a problematic site will remain a continuing financial burden to government agencies.

There will probably be cases, however, in which a public participation program will contribute very little to the clean-up effort. The people who live in the vicinity of a troublesome site may express concerns that prove to be short-sighted and unrealistic. Involving these people in the process may not facilitate action at the site. Sometimes the local people will indicate no interest in the environmental problem and will seek no involvement in the response. At other times there simply may be no people living close enough to a site to see its problems as their own. In situations where the socio-political context of a hazardous waste emergency turns out to be of minimal consequence, public participation measures will not serve much apparent purpose and should be scaled back appropriately.

Nonetheless, our experience suggests that it is extremely difficult to predict from outside the community how valuable a public participation program will eventually be. Because public interest in hazardous waste problems seem to peak at the time a solution is proposed, participation efforts are justified even when the public has made no attempt to become involved in the early stages of a response. Furthermore, it is important to recognize that the public may be very concerned about a problem even when it has given no visible indication of seeking to become actively involved. In localities with a tradition of responsive government, for instance, a letter to authorities may be considered adequate expression of great concern. By the same measure, groups of people with differing political cultures may choose different courses of action (or inaction) in the same situation. Yet genuine concern, whatever the form of its expression, demands sensitive handling.

One reason why the value of a public participation program may be difficult to appreciate at times is that its success can often be judged only by things that do <u>not</u> happen. If EPA's program is successful, the agency will not lose credibility; its statements will not be distrusted; citizens will not feel that their problems

have been left entirely unaddressed. Conflict and opposition may develop, but it will not be wholly devoid of any constructive or beneficial consequences. In short, this may often be a preventive program more than anything else.

By ensuring that the socio-political dimensions of hazardous waste problems are not neglected, and by establishing channels through which the public can voice its concerns and become involved in government's efforts, a well-managed public participation program should make the overall Superfund program easier to implement and more cost-effective in the long run. This understanding of the purpose of public participation dictates the kinds of techniques we have offered in the following section.

4. ANALYSIS OF PUBLIC PARTICIPATION IN EACH MAJOR STEP OF RESPONSE PLAN

Introduction

We outline here a recommended course to take when responding to a hazardous waste site in order to ensure that local citizens are kept informed about the situation and have appropriate means to express their specific concerns. While much of any citizen participation effort will depend on the site history and other local considerations, some of the actions an EPA on-site team could undertake at each step in the response process are foreseeable. We present options for both long-term remedial and emergency responses.

Superfund response to uncontrolled hazardous waste sites can be outlined in seven basic steps for full-scale remedial action at a site. The response plan also includes an alternative for emergency action, if, at any point in the process, emergency action is deemed necessary. The seven steps will be:

A. Site Discovery/Preliminary Investigation
B. Site Inspection
C. Field Investigation
D. Engineering Studies
E. Select Remedy
G. Construction
H. Monitoring/Evaluation

This plan shows the logical sequence of events for remedial action on a hazardous waste site problem. In practice, however, these steps may be condensed; they may overlap; or long periods of time may lapse between steps. Experience suggests that in some cases the situation will already be fraught with conflict when the federal government arrives on scene. A site that warrants federal intervention will often have a substantial local history of

citizen-government interaction. One challenge to the public participation program, therefore, is to channel public involvement into the most effective forums and to keep the public aware of the hazardous waste situation without causing undue alarm during the complete clean-up cycle.

The suggestions made in this section, including anticipated problems and developments at the various stages of the remedial action process, will be illustrated by reference to the case studies. Exhibit II summarizes our recommended management strategies for community relations.

A. Site Discovery/Preliminary Investigation

Public Participation Aspect -- Anticipate and Forestall Problems with Public

Some hazardous waste sites that come to federal attention will be discovered inadvertently. No one realized the extent of the Woburn problem until an EPA engineer, on his way to work, happened to notice illegal wetlands filling. Few were aware of the buried wastes in the Butler Tunnel until they suddenly leaked into the Susquehanna River. Many sites, however, will have been salient local issues before EPA becomes involved. The federal government is likely to enter at some middle stage of development of a problem. EPA involvement may be in response to a Congressional inquiry, which often indicates a politically heated local issue.

One of the first actions EPA staff should take during the preliminary investigation of a site is to establish contact with state and local officials--elected and appointed--and perhaps some key citizen leaders. These people may have some idea of the scope, and certainly the history, of the problem. Local leaders may present different points of view, but their early understanding and aid can be essential. The early contacts should try to gather as much information as possible both on technical aspects of the clean-up contemplated and on the local politics of the hazardous waste situation.

At this step and in subsequent steps, the federal government must make clear the limitations on the help available through Superfund. Unrealistically high expectations of federal action and funds can lead to unmeetable demands at a later stage and a loss of credibility for the agency.

B. Site Inspection

Public Participation Aspect -- Characterize Site Problems

Before the decision is made to expend substantial federal resources in enforcement or remedial action, the problems at a site must be investigated. Site problems go beyond the physically measurable, technical problems of hazardous waste releases; the community setting of the hazardous waste problem must also be characterized to determine a truly viable solution. Thus, issues to be investigated at this stage, beyond water, soil, and air pollution and public health, should include:

- History of site;
- Political occurrences connected with it;
- Citizen involvement;
- Government action and inaction;
- Legal action; and
- Press coverage.

This information can best be obtained through short interviews with the state and local officials involved with the site and citizen leaders representing any ad hoc interest groups, business groups, environmentalists, and other community groups such as the League of Women Voters. The information gleaned from these interviews will be of interest both in contributing to the technical understanding of the site--local officials and residents often know of past dumping practices--and in learning the local attitudes that may shape a feasible permanent solution to the uncontrolled site.

The most effective person or persons to conduct this community impact assessment would be the Superfund on-scene coordinator or a public participation coordinator on his or her staff. Early contact and continuity of local interaction are both important, as illustrated by the problems encountered in the "Valley of the Drums" where no contact was made with local officials before the state proposed its solution. At many other sites, including Nashua, Rock Hill, Stringfellow, and the Cabot site in Gainesville, Florida, EPA made no effort to contact local officials or citizens. At the Woburn site, however, where contact with the local community was extensive, communications were much smoother.

C. Field Investigation

Public Participation Aspect -- Establish a Mechanism for Public Involvement

If, after the site investigation, sampling, community impact assessment, and priority-setting, EPA decides to proceed with remedial action, a complete field investigation of the site will be necessary. When this decision is made, the community should be immediately informed of the nature of the hazardous waste problem and of the next steps in the remedial action. This can be done through the local press, advertisement, and/or a public meeting, depending on the particular community and its receptivity to the different forms of publicity. The presentation should also be explicit about how the local officials, community groups, and interested citizens may become involved in the process. The lines of communication to the local community must be established as soon as the nature and extent of the problem are known to enhance the credibility of the officials working on the problem and to forestall opposition. In the cases of Jackson Township and Riverside County, poor early communication may have led the community to develop unrealistic expectations of government intervention. The government agencies involved lost credibility, although the agencies involved proposed technically acceptable solutions. Poor communications existing elsewhere may result in similar problems. It is important to remember throughout, however, that the people most concerned about a site and most likely to become involved will frequently have had no prior involvement either in politics or in environmentalist organizations. The public EPA needs to reach will be missed if only the representatives of local or national environmentalist groups are included in these initial public participation and information efforts.

Contact between agencies involved in clean-up and community members can be initiated and sustained in several ways. One of the most important and effective management tools is to have a coordinator at the site to channel both citizen and intergovernmental contact. The National Reponse Plan provides for such a contact person, and the importance of that role cannot be emphasized enough. Diplomatic skills on the part of the coordinator are very important; being a good engineer is not enough for this sensitive position. He or she must also have a thorough understanding of the local situation. The coordinator should expect to hold meetings and be interviewed after office hours, when community people are more likely to be available.

As in Riverside County and Woburn, several ad hoc groups with different approaches to the problem may be involved in the hazardous waste issue in a site community. One of the site coordinator's goals should be to keep the dialogue open between opposing citizen groups and between the citizens and various levels of government. Establishing a citizens' advisory committee -- with representatives from each of the concerned groups -- is one way to help ensure that citizens and governmental agencies continue to talk. It is also a good way to be certain that citizen participation in the process is informed. The citizens' advisory committee can: (1) keep the local involved citizens aware of site developments, (2) keep government informed of community concerns and round-the-clock site developments and (3) let citizen leaders know how other local groups stand on the issues and clear up any misunderstandings or disagreements within the community. This mechanism has been helpful in Woburn, partly because of the inclusive nature of the committee; a committee formed in Memphis has been less effective to date because of disputes over its organization and the representativeness of its membership. The Agency must preserve a delicate balance within such committees. On the one hand, members must be able to influence the clean-up process intelligently. On the other hand, they must be made to understand the limits of their advisory capacity in site developments.

Other less intensive forms of citizen-agency interaction during the field investigation phase include: (1) public information meetings held when significant test results or other developments occur; (2) briefings of local officials, state agencies, and state and federal legislators; (3) public consultations where EPA personnel meet with small groups of citizen opinion leaders to keep abreast of community concerns and pass on site information; (4) fact sheets, newsletters, and press conferences; and (5) site visits. "Low profile" interaction with concerned citizens allows information and views to be aired with less accompanying publicity. Many communities feel that an abandoned hazardous waste site is a "black eye" to their town, and would resent excessive publicity.

It is possible that local citizens will not want to become involved in and extensively informed about the hazardous waste problem at this stage. Some communities, such as the area around the "Valley of the Drums," did not become active until a solution was proposed (although in that case, no group tried to keep local residents informed about the development of proposals regarding the site). Alternatively, some citizen groups will make early and possibly excessive demands for resources on any agency that indicates an interest in helping, as in Riverside County.

A key point, however, is that "citizen involvement" should not be equated with "public hearing." In most of the cases studied, traditional public hearings were not very effective in promoting reasonable solutions for the problems. They were more likely to degenerate into an adversary proceeding of citizens against the government agencies.

Under Superfund, traditional citizen participation mechanisms should be replaced by a comprehensive program of local community relations that is continuous once the site becomes a public issue.

D. Engineering Studies

Public Participation Aspect -- Citizen Input Valuable

Both the engineering firm and the agency responsible for the engineering studies should, while developing clean-up options, make a good effort to understand citizen concerns. Interested citizens and local officials should be permitted to review and comment on the options as they are being developed. Or, alternatively, the agency must review the early engineering options with citizen concerns in mind. As experience at the Stringfellow site, Islip site, "Valley of the Drums," and in Jackson Township illustrates, residents' strong feelings about what constitutes an acceptable clean-up alternative may ultimately restrict the range of options.

Engineering firms should be required to interact with concerned citizens until the clean-up options have been determined. This interaction should be closely supervised by EPA personnel. In past cases, such as the Nashua site, the engineering consultant has been required to set up public meetings between citizens, officials, and the firm, and to publicize and receive comments on the response options. An on-going dialogue, in the form of small-group public consultations, Citizens' Advisory Committee meetings, newsletters, and briefings, will help create acceptable options. At the Stringfellow site, a new ad hoc group opposed the less costly solutions and demanded the most expensive clean-up alternative. If the agency had a better idea of the positions of all groups--old and new--it could have presented the options differently and addressed local concerns more judiciously. It might thereby have permitted citizens to develop a better understanding of government's perspective.

E. Select Remedy

Public Participation Aspect -- Review Options with Concerned Parties

EPA should avoid presenting a *fait accompli* to the public and to local officials. Offering a single alternative without reviewing the idea with local officials and citizen leaders will almost certainly delay the clean-up operation. At "Valley of the Drums", there was very little local consultation by the state government. Instead, the announcement of a single, "elegant" solution condemned a plan that might have been accepted under other conditions. A sensitive presentation of the plan would have included a briefing of local officials, a public meeting with area residents, and a comment period, giving the public an opportunity to air their concerns and suggest possible changes.

Alternative remedies, once determined, are traditionally presented at a large public meeting or a formal hearing where public comment is invited. Overall, our experience is that public hearings may be necessary at this stage, but they should be preceded by extensive but informal interaction with the local citizens, groups, and governments. Newsletters, small-group meetings, briefings, and committee meetings may be the best forums for this exchange, to prepare for a smooth, well-managed hearing.

Adequate advance notification must be given for the public hearing, including newspaper and radio advertisements and posted notices. Even when the responsible agency presents a range of alternatives, an *ad hoc* citizens' group may be committed in advance to a particular solution, perhaps the most expensive option. The local public may force that particular decision by vigorously demonstrating local support and media backing. At this stage of the response, it must be remembered, previously uninterested citizens can suddenly become vocal and demanding.

F. Construction

Public Participation Aspect -- Keep Citizens Informed of Progress

The clean-up remedy has now been selected with the help of the public. However, area residents must continue to be kept informed of the progress of construction, new findings, and the reasons for any delays in the clean-up. Federal officials cannot expect state governments or local officials always to relay information to concerned citizens. Although some state governments have very good lines of communication with local officials, at "Valley of the Drums" and at the Stringfellow site, EPA regional

officials apparently kept state and regional planning officials informed about meetings and site occurrences, but these messages were frequently not relayed to the local level. To ensure that the local public is adequately informed and has reasonable notice for open meetings on site issues, the federal agency must send the messages not only to the state and regional levels, but also directly to local officials and citizen leaders whenever possible.

One technique that was especially successful in Verona, Missouri, was the telephoning of local officials in advance of EPA press releases, which prevented surprises and enabled the officials to prepare themselves for the questions their constituents would be raising after the release.

Federal officials must make sure local residents understand that clean-up of the site will not resolve all problems. If groundwater contamination has occurred, for example, contaminants will remain in the aquifer for years to come. EPA will not completely resolve long-term health questions but the appropriate health agency should, in conjunction with EPA, perform any needed health studies and warn affected residents and doctors of possible public health reactions to exposure to migrating hazardous chemicals. These studies may extend into the construction phase. Where appropriate, EPA and the health agency should discuss health findings with the local populace in person. Disseminating information on health effects by press conference and official briefing only runs the risk of exaggeration and misinterpretation of any health risks. In a personal meeting, questions can be answered at once. Overall, EPA should advertise its clean-up successes but emphasize the limits of the clean-up outcome.

G. Monitoring

Public Participation Aspect -- Evaluation of Process

After the completion of the active construction phase, EPA should let the public and the media know the nature of the solution and its limits. On initiating the 20-year monitoring period, the agency should devote some effort to evaluating its interaction with the local government, interest groups, and citizens during the site response activities. This exercise will help prevent problems at other sites; it will also suggest other ways to continue public awareness at the completed site. Evaluation points to cover include:

(1) At what points were citizens frustrated with government actions?

(2) At what points was citizen impact disruptive to the policy process?

(3) How could participation mechanisms -- role of on-site coordinator, number or quality of public information meetings, public hearings, workshops, etc., role of citizens' advisory committee, involvement of local governments, local ad hoc groups -- be improved to avoid frustrations and problems?

(4) Were citizen expectations of EPA performance met? If not, why were expectations too high or performance so low?

(5) What problems persist at the site? How are they being resolved?

(6) What are citizens' expectations of further EPA involvement? How will EPA meet those expectations?

(7) What lessons can be learned -- good and bad -- from EPA involvement with citizens and local government in this site action?

H. Emergency Response

Public Participation Aspect -- Apprise Citizens and Local Officials of Actions

There are two types of emergency response situations: 1) those where a natural disaster forces immediate response, and 2) those where slow leaking of hazardous materials causes an impending but not immediate danger of human or environmental exposure.

In situations of the first type, agency resources should concentrate fully on mitigating the imminent hazard. Larger or more lengthy responses, however, often warrant a community relations/media specialist on the on-scene staff to respond to citizen and media questions. This would leave the OSC free to respond to the technical aspects of the problem. However, the on-scene coordinator should always interact in person with local officials -- police, fire department, public health officials, and the chief elected official -- particularly in those cases where evacuation plans or other direct community involvement may be necessary.

During smaller-scale hazardous waste emergencies, the on-scene coordinator may be the only appropriate EPA official on site to answer reporter and citizen questions. The technical responsibilities of the OSC, however, will still involve most of his or her time during the initial phase of the clean-up. When the emergency response has progressed to the point where imminent danger

has passed, the coordinator should devote some time to public outreach. An informal information meeting, briefing of officials, field trip to the site, or press conference are possible vehicles to answer citizen questions and concerns about how the site may affect them.

Emergency responses of the second type generally are less emergencies than temporary measures to contain a longer-term threat. These actions usually follow a sampling program and other site investigation activities. A contract bidding process may take place to find an engineering firm to aid in the clean-up measures. This type of emergency allows time for less impromptu community relations. A small-group public consultation with opinion leaders, a fact sheet, and an informal public information meeting as the clean-up commences is appropriate to inform the community of EPA actions and possibly to elicit local knowledge about the site history which may be useful in shaping the temporary response action. In both types of emergency responses, interviews with the local press can often bring information to the public extremely rapidly through a trusted source.

CHAPTER IV: FOUR CASE STUDIES

"THE VALLEY OF THE DRUMS" BROOKS, KENTUCKY

INTRODUCTION

In March 1977, hexachlorocyclopentadiene (HEX) and octachlorocyclopentene were discharged into the Louisville, Kentucky municipal sewer system by Donald L. Distler of Kentucky Liquid Recycling, Inc. During the EPA investigation of this incident, various sites owned by or connected with Distler were inspected in order to locate HEX sources. One of the sites discovered at that time was a 13.68 acre farm owned by Distler's father, which contained both surface and sub-surface drums of chemical wastes. These, along with stream sediment, were sampled and photographed by EPA and FBI investigators. No action was taken at this time at this or the other identified Distler sites because of the legal action pending against Distler for the Louisville HEX dumping.

Distler's conviction in the 1977 HEX incident was handed down in December 1978, a time of heavy rains and flooding along the Ohio River in Kentucky. The Distler farm, situated along Stump Gap Creek, which ultimately feeds into the Ohio River, was inundated. Eight hundred thirty drums containing hazardous substances were floated from their original locations on the farm and deposited throughout the Stump Gap Creek drainage area. On January 4, 1979, EPA Region IV responded to the emergency, handling the situation under authority of Section 311 of the Federal Water Pollution Control Act.

While EPA was engaged in this emergency action, Kentucky Department of Natural Resources and Environmental Protection (KDNREP) representatives advised EPA's on-scene coordinator (OSC) of the existence of another site several miles distant, known as the "A.L. Taylor site", where thousands of drums were stored. Accompanied by KDNREP and Emergency Response Team (ERT) personnel, the OSC at Stump Gas Creek visited the A.L. Taylor property on January 5, and was "appalled at the sight of drums stacked and scattered" throughout the valley in a completely random manner. The OSC estimated that the valley contained "100,000 drums of hazardous substances above ground and an unknown quantity of drums and liquid waste underground. A definite environmental crisis existed in this valley, 'Valley of the Drums'."

I. CHRONOLOGY

The Valley site is located in Bullitt County, Kentucky, just outside the town limits of Brooks, six miles north of Shepherdsville, the county seat. Bullitt County is a largely rural, primarily blue-collar "bedroom community" serving Jefferson County and Louisville. The county population (currently 40,000) has increased by almost twenty-eight percent in the past ten years. The Taylor property covers twenty-three acres, five of which were used for the disposal of drums containing hazardous wastes. It lies between the L&N golf course and the Jefferson County line where it abuts the Jefferson County Memorial Park, a wilderness area frequently used by the Audubon Society.

A. L. Taylor leased rights to the property on August 26, 1967 by entering into a contract with Gilbert E. Wooden, who on that date purchased the land from J. H. Mitchell. The contract, while not recorded, reportedly provided Taylor clearance from Wooden to operate the A. L. Taylor Drum Cleaning Service on the site. The property was conveyed to A. L. Taylor by Gilbert E. and Charlene Wooden on March 5, 1976.

On December 8, 1967, two KDNREP inspectors visited the Valley site in response to a complaint by a neighbor of constant smoke from burning materials on the property. They found the site burning and the wastes improperly covered. They advised Taylor of the necessary procedures for operating a sanitary landfill. Additional inspections by KDNREP personnel on December 18, 1967, and April 8, 1968, confirmed that the site was still being improperly utilized. However, there is no evidence of additional state action until 1975.

Residents of the area report that between 1967 and 1975, Taylor operated a landfill for industrial and hazardous wastes, a junked car operation, and a drum cleaning and disposal business. During this period, they say, the hazardous waste operation consisted largely of pouring the industrial wastes into pits and trenches which were then covered with soil; drums, primarily containing paint, oil and other industrial wastes, were emptied into Wilson Creek, which runs through the property.

In November 1975, neighbors again complained to KDNREP about the condition of the creek. One person had been forced to sell several horses which had been using the creek for drinking water. Another neighbor complained of his pigs coming away from the creek covered with red paint. State officials visited the site ten times over the next five months in preparation for a hearing on the case on April 23, 1976.

At this administrative hearing, Taylor was judged guilty of various violations of the state's water-quality laws, including the discharge of wastes into surface waters, the failure to report these

spills, and the failure to obtain a permit for the discharges. The hearing officer neglected to issue a recommended order at that time. "I just didn't do it, and I don't know why," the officer reported. "It was an oversight on my part."

This oversight was rectified in August 1978. The recommendation from the hearing officer to KDNREP at that time was that the site be closed and fines totaling $3,000 be leveled against Taylor. However, Taylor had died several months before the recommended order was issued, so the order was never finalized by KDNREP.

During the 25-month interval between the hearing in April 1976 and his death in early 1978 Taylor increased the size and scope of his operations at the Valley site. Several Louisville companies hauled thousands of drums to the Valley site. KDNREP officials inspected the site at least a dozen times during this period. State investigators repeatedly forwarded recommendations to KDNREP headquarters that the site be closed, citing deteriorating conditions and increasing health and environmental hazards but KDNREP management never acted on these recommendations.

Twice during this period, Taylor requested application materials from KDNREP for a permit to dispose of non-hazardous wastes. The department responded with the necessary materials, but Taylor never submitted the applications. On November 14, 1977, the KDNREP Non-Hazardous Waste Section notified Taylor that he was to "stop all dumping immediately, provide for the proper disposal of all . . . illegally deposited solid wastes", and prevent any additional dumping. These orders from KDNREP were ineffectual.

The earliest knowledge EPA regional officials had of the Valley site was its mention in a list of potentially hazardous disposal sites prepared for EPA headquarters in October 1978. Information on the existence of the site, but not the extent of the contamination, had been provided by a former employee of KDNREP.

EPA Region IV learned of the extent of the problem at the Valley on January 5, 1979 when the OSC in charge of the emergency operation at nearby Stump Gap Creek inspected the site. While this inspection indicated that the problem was quite extensive (given the number and disarray of the discarded drums), there was no active contamination of surface waters at that time, and, therefore, under the law, immediate emergency operation was precluded. The OSC from Stump Gap Creek consequently advised EPA Region IV of the conditions at the Valley and returned to the supervision of the existent emergency.

Region IV notified headquarters of the potential for serious environmental damage in the Louisville area. HQ dispatched a task force to Region IV to discuss the Louisville sites, including the Valley. Region IV officials worked closely with KDNREP personnel in the development and initial execution of a plan of action to assess the extent of the environmental damage at the site and to explore possible remedies. Water samples and site histories were collected and EPA Enforcement (ENF) dispatched attorneys to search court records for additional lands owned by Taylor. A reconnaissance of groundwater users within a one-mile radius of the site was conducted by EPA (WSB), Kentucky Water Supply, and the Jefferson County Health Department. Incineration criteria were proposed by EPA for the possible destruction of the wastes and a tentative plan for hydrological assessment was presented to KDNREP.

During February, ENF obtained consent from Taylor's widow, to whom the property had been willed, for joint EPA/KDNREP sampling. The site was "staked" for coring in accordance with the topography and hypothesized geologic and hydrologic conditions. Secretary Eugene Mooney (KDNREP) met with regional division directors to propose corrective actions which included the installation of an incinerator at the site. KDNREP began negotiations with William Fluhr, president of Liquid Processors, Inc., of Jefferson County, to install and operate the incinerator. The incinerator being considered had previously been owned by Donald Distler, who had formerly attempted to operate the unit in Indiana.

During this period (January - February, 1979), while EPA officials and state representatives were actively developing plans for long-term action at the site, local officials report that they had no knowledge of any of these developments. Kentucky had assumed primary responsibility for the development of these plans, sought EPA's assistance, involved neighboring Jefferson County officials, but apparently never approached Bullitt County officials, within whose jurisdiction the Valley is located.

On March 2, 1979, a KDNREP inspector notified the Region IV Emergency Response Branch that oil and hazardous substances were leaching into Wilson Creek from the drums located in the Valley. Because of the actual contamination of surface waters, the Emergency Response Branch responded under authority of Section 311 of the Clean Water Act and dispatched an emergency response team.

During the two week emergency operation, sediment and surface water samples were run and analyzed to determine the extent of contamination. Kentucky, EPA, and Department of the Interior biologists mapped and sampled the area. Leaking, non-leaking, and empty drums were separated and several disposal pits were discovered. Trenches were dug to intercept the lateral migration of

wastes and surface runoff was diverted to a holding pond. A limestone and carbon filtration system was designed and installed in Wilson Creek.

Water samples were collected from seven on-site drainage areas to determine the presence of organic compounds. Those compounds present in the highest concentrations were methylisobutyl ketone, methylethyl ketone, acetone, xylenes, and toluene. No PCBs were detected in any of the water samples. Sediment contamination followed the same general pattern as in the water samples analyzed. Organic compounds present in highest concentrations included bis-2-ethylhexyl phthalate, xylene, toluene, acetone, and ethylbenzene. Organics identified in the sediment were in the parts-per-million range, while compounds in the water samples were generally in the parts-per-billion. Two PCBs (Aroclor 1254 and Aroclor 1260) were found at three sediment sampling sites at concentrations of 0.67 mg/kg, 1.6 mg/kg and 14.0 mg/kg respectively.

On March 21, 1979, the emergency operation was concluded. The emergency response was conducted under P.L. 91-500 Section 311 and Section 311K funds in excess of $290,000 were expended. These funds covered the analyses of the materials noted above, the construction of the temporary treatment facility, and provided for maintenance of the treatment system for one year, including power supply and carbon recharge. Any further action at the site would have to depend, again, on the development of an action plan with the State of Kentucky, a process which had been interrupted, in effect, by the emergency operation.

By mid-March 1979, KDNREP had completed its analysis of the soils and geography of the Taylor site and concluded that "the site would be excellent for the disposal of hazardous wastes by incineration or chemical treatment and with proper engineering would be technically sound for burial also." The soils and geology analysis had led to the conclusion that a permanent waste disposal operation should be established at the Valley site. KDNREP, therefore, proposed an expanded action-plan for the site. In an April 6, 1979 meeting with EPA, KDNREP outlined the existing conditions at the site:

- 5,211 drums with contents, of which
  - -- 2,658 contained solids or sludge;
  - -- 1,838 contained liquids;
  - -- 731 had unknown contents.
- 11,000 (approximate) empty drums, crushed and stacked.
- 161 drums empty and re-useable.

Arguing that the remains in each of these categories could be handled by conventional means, KDNREP proposed that EPA assist the state in establishing the Fluhr incinerator at the Valley site as a demonstration project for the proper disposal of hazardous wastes. EPA regional officials noted that: (a) the state's inventory did not account for possible sub-surface wastes; and (b) remaining questions regarding the incinerator proposal would have to be satisfactorily answered before EPA could approve the plan. The meeting concluded without EPA endorsement of the proposed action.

On April 12, 1979, KDNREP announced that it would accept William Fluhr's application for a permit to establish an incinerator, in conjunction with a chemical recycling and barrel-cleaning operation, at the Valley site. Fluhr had taken an option on the property contingent on the ability of Taylor's widow to have the land rezoned by county authorities for heavy industry. On April 16, 1979, Bullitt County Fiscal Court, which must approve all zoning changes, responded to a petition by local residents and indicated that it would refuse to consent to the rezoning.

Since May 1979, KDNREP officials have been negotiating with the major Louisville companies which purportedly produced most of the identifiable wastes at the Valley site for the voluntary removal of the material. At the time of this report, twenty to twenty-five percent of the material was being voluntarily removed. The state has threatened to initiate legal action against the companies if voluntary measures prove to be insufficient. Except for these current removal procedures, the Valley site remains as it was when EPA clean-up operations were terminated on March 14, 1979. The "temporary" filtration system remains in place. Most of the surface drums are stacked in rows or piled (empty) in mounds. KDNREP assures the maintenance of the status quo at the site by continually monitoring it.

II. VISIBILITY OF THE CASE

The Valley of the Drums has become one of the most highly publicized abandoned hazardous waste sites in the country. Its notoriety stems, in part, from its size, the magnitude of the chemical deposits and, possibly, even its memorable name. It was the subject of extensive media coverage -- newspaper, magazine, television, and books -- particularly in the first half of 1979 during EPA clean-up operations. Area politicians have also made use of the hazardous waste issue in the Valley for their campaign platforms. Legislators at both the state and federal levels have taken up the issue and have responded to citizen group concerns. In general, the visibility of the case, while relatively low locally, has been high nationally since January 1979.

III. ACTORS

A. Citizen Participation

Active citizen participation was limited during the period covered in the chronology to the anti-incinerator petition drive. Several local citizens, prompted by media coverage of the proposal to install the incinerator at the site, and operating independently, began circulating petitions to be presented to the next meeting of the Bullitt County Fiscal Court. The Court which is the county executive body, rules on all zoning changes within its jurisdiction. Petitions were circulated in at least three separate areas of the county: Brooks, Hillview and Shepherdsville. At least four individuals in Shepherdsville made separate efforts to contact others in an attempt to organize the petition drive. As these individuals became aware that they were all similarly involved, one of them sought the assistance of a local attorney and drew up a petition format to be used by the entire Shepherdsville-based operation. This format was used in the majority of petition forms ultimately presented to Fiscal Court, and opposed any "dump or . . . incinerator . . . in Bullitt County for the disposal of chemical, or other industrial waste."

The organizers of the petition drive traced the intensity of their opposition as due to:

- Mistrust of William Fluhr, the proposed operator of the incinerator, because of his connections with Donald Distler, from whom the unit was acquired;
- Suspicion of the technical feasibility of the incinerator plan based on newspaper reports of:
  - -- conflicting claims regarding maximum heat-generating capacity of the unit;
  - -- refusal by three other communities to accept the unit when Donald Distler previously attempted to operate it;
- Conviction that the site would become the repository of wastes "from all over the country";
- Resentment against Jefferson County and Louisville (as the origin of the wastes) because of a perceived continual encroachment on and disruption of life in the more rural Bullitt County.

Members of one of the *ad hoc* groups from Hillview which were circulating petitions contacted their local state representative and requested that he present the petitions on their behalf to the

court. Prompted by the ad hoc groups, the state representative and the county director of Emergency and Disaster Services first appeared before the Hillview City Council at the April 16 meeting and received unanimous support for opposition to the incinerator proposal. They subsequently presented the county-wide petitions to Fiscal Court with 2,408 signatures. The court registered its opposition to any zoning change at the A. L. Taylor site, even though formal application for the change had not yet been made. This action by Fiscal Court effectively terminated the state's plan to install the incinerator.

Copies of the petition were also forwarded to EPA Region IV and to KDNREP but, since the petition drive had been successful from the community's standpoint, the ad hoc groups dissipated and apparently no further interaction between them and state or federal officials took place.

For political reasons, however, the Valley appears to be emerging once again as an issue in the county. State politicians have attempted to use the Valley incident for their own purposes. Legislators have held press conferences at the site and one gubernatorial candidate entered the site, had campaign photographs taken while seated on drums, and campaigned on a "This won't happen if you elect me" platform. Incumbent county officials expect that the Valley site will become an issue in the May 1981 primary elections (which have more local import than the general election because of the predominance of the Democratic Party in the county).

Several community groups have been formed since January 1980 which are attempting to capitalize on the Valley problem as the primary election approaches. In Brooks, Hillview, Zonton, and Mount Washington, these groups, formed around issues other than the Valley, have adopted the Valley issue as a means of widening their appeal. They are actively recruiting other groups in neigboring communities. Issues of primary concern in each group include the efficiency of county government, Fiscal Court salaries, road conditions (exacerbated by heavy traffic to and from Jefferson County), busing, local services, etc. But each of these community groups has adopted the Valley issue as proof of the presumed incompetence of the incumbent county administration. The Brooks Citizens Council, for example, has sent letters to various state and federal officials (including the President) indicating its concern over the matter. At the time of our field investigation, the group had received responses from Rep. Carroll Hubbard, Rep. Timothy Lee Carter, KDNREP Secretary Swigart (via Jack Wilson) and State Representative Frank L. Smith.

Citizen participation in the Valley issue appears to be a real "grass roots" phenomenon. Identified organizers of the petition drive to halt the state's incinerator plan included several

housewives, the operator of a local construction company, a railroad laborer, and a local postmaster. These organizers elicited the assistance of their state representative and the county Director of Emergency Planning in presenting their views to Hillview City Council and their petitions to Fiscal Court. These officials, however, had not been involved in the organization of the petition drive. Similarly, the newly-formed citizen groups which are attempting to use the Valley issue to broaden their base of popular support are headed by the manager of a local hardware store, a retired engineer (who has also been a lobbyist for environmental concerns in Frankfort), and several teachers. As with the ad hoc groups which emerged to oppose the incinerator, these citizen groups are pressuring elected officials for both information and action. Letter-writing campaigns, phone calls to Frankfort and the county seat, and an increasing number of meetings at which elected officials are being asked to speak are the tactics currently employed by these groups.

To summarize, interest groups developed on an ad hoc basis when the state proposed the installation of an incinerator at the site, defeated the proposal, and disappeared. Community groups unrelated to the original ad hoc organizations have arisen as an ex post facto phenomenon and, while primarily interested in other issues, have adopted the Valley issue as a rallying point to attract additional membership; these groups are now proselytizing in neighboring communities.

B. Media Influence

Media attention to the Valley site was intense between January and June 1979. In January 1979, EPA and KDNREP officials began negotiations for the development of an action-plan to deal with the situation. Aware of these activities, two Louisville Courier-Journal reporters began an exhaustive series on hazardous wastes in general and gave special attention to the Valley. Their newspaper articles reported the twenty-eight month delay in the issuance of the recommended order from the administrative hearing officer to close the site, the fact that KDNREP had known of the illegal dumping at the site as early as 1967, the history of citizen complaints to KDNREP regarding the site, and the state's unexplained inaction at the Valley during 1977-78 despite repeated visits to the site by state officials and investigators. These disclosures, in turn, prompted national media coverage (New York Times, CBS, ABC).

The Courier-Journal's coverage--both of the Valley and of the hazardous waste disposal problem in general--was praised unanimously by EPA Region IV officials. The newspaper published a twenty-page special report entitled "Warning: Toxic Waste" in December 1979 as a supplement. This report received several journalism awards, was lauded by EPA and local (county) officials, but was branded "yellow journalism" by KDNREP personnel.

Regional television stations in Louisville ran several specials on the Valley and other Bullitt, Jefferson, and Hardin County sites during the first several months of 1979. These quickly decreased in frequency when EPA clean-up operations at Stump Gap Creek and the Valley site were completed. Local citizens reported that the televised publicity at the time was instrumental in collecting the 2,400 signatures on the anti-incinerator petition.

IV. COMMUNICATION STRATEGIES

EPA and state officials have disseminated informtion primarily through the media; there has been little or no contact with local elected officials. Prior to the activation of the RRT for the emergency action, (i.e., between January 5, when EPA first inspected the site and March 2, when emergency operations began), EPA and KDNREP cooperated closely in the preparation of a site action plan. During this period, a reconnaissance of groundwater users within a one-mile radius of the site was conducted, a tentative plan for hydrological assessment was developed, consent was obtained from Mrs. Taylor for EPA and state personnel to collect samples, a detailed monitoring plan was developed, the Valley was staked, William Fluhr's application to install and operate an incinerator at the site was received and evaluated, and water and sediment samples were obtained by S&A within the site boundaries. These were normal operating procedures characterized by full cooperation between EPA and the state. At no time during this two-month period were local (county) officials informed of the actions.

During the emergency operation, the Public Information Assist Team (PIAT) established a communications center at a local motel in the county seat, contacted the media, provided them with twenty-four hour telephone numbers from which updated information could be obtained and provided on-site inspection for reporters. The members of the PIAT reported that they did not, however, initiate any contacts with local (county) officials, and were unaware of any such contacts being made. In fact, on separate occasions, the Chairman of the RRT and the OSC each assigned the responsibility for such contact to one of the members of the RRT. Apparently, however, those contacts were not made, beause county officials claim to have had no contact at all with the RRT and no access to information regarding the site beyond what was provided by the media.

Within forty-eight hours of the conclusion of the $290,000 clean-up operations, EPA staff reviews of the incinerator plan had been completed. Evaluations, recommendations, and additional questions to be answered by Liquid Processors, Inc., were forwarded to the KDNREP Division of Air Pollution (though it could not be determined whether these questions were ever satisfactorily answered). The Louisville Courier-Journal, in the meantime, had

printed that the incinerator plan was under consideration. Thus, while county officials were left in the dark about EPA and KDNREP planning, local citizens, prompted by the media's disclosure of the Fluhr proposal, moved to block installation of the incinerator. Had county officials been kept aware of developments at the state and federal levels, conflict might have been significantly reduced.

There is no way to determine, now, if improved communication between EPA, state, and county officials would have lead to the installation of the incinerator and the establishment at the Valley site of a permanent disposal facility. However, there are clear indications that information dissemination could have been improved, and, according to county officials, that at least a portion of the proposed plan would have been acceptable to the county. While EPA Region IV had posed some question about the specific incinerator proposal being considered by the state, the concept of incineration at the site was judged to be technically feasible. In addition, the state's analysis of the site indicated that it would be technically acceptable as a permanent disposal site. The local citizens who organized the anti-incincerator drive were primarily concerned about the technical feasibility of the Fluhr incinerator and mistrusted Fluhr's association with Donald Distler; they reported that their principal concern was with that particular proposal, not with the idea of incineration. County officials, in turn, perceived practical benefits for the county in the establishment of a permanent disposal facility at the site. These factors indicate that close attention to information dissemination to local citizens and officials is necessary if any long-term solution is to have a chance of succeeding. The disclosure by the media, however, of a single solution, about which local citizens and officials had been unaware, galvanized immediate opposition to the proposal in the Valley case. Interviews with local citizens and officials which support these conclusions include:

- The local county attorney, in a memorandum prepared for the Chief Judge Executive of the Bullitt County Fiscal Court, decried the politicization of the incinerator question and the lack of information provided to county government. He noted that "County Government could act more responsive(ly) by possibly permitting the rezoning of this area and the use of an incinerator to destroy the waste deposited on this farm. Local government should also consider the location of a permanent hazardous waste landfill in Bullitt County, Kentucky due to our close proximity to a large metropolitan area."

- The state Representative who presented the petition to Fiscal Court opposing the Fluhr incinerator plan also indicated during an interview that he potentially favored incineration at the site. He noted, however, that it was not politically feasible to support Fluhr's proposal.

- There was no attempt to counter local residents' fears of groundwater contamination. The geological indications supplied by the state are, however, that the Valley site would be an excellent secure landfill, but this information was never communicated to citizens or local authorities. None of the local authorities or citizens interviewed knew of the state's study.

- Local opposition to the proposed incinerator plan was clearly linked to Donald Distler, who had previously attempted, and failed, to install the same incinerator at other locations. (One respondent noted that the residents feared that Fluhr might "Distlerize" Bullitt County.)

- Because EPA and KDNREP evaluations of the incinerator proposal were never communicated to local officials, the assertion in the local media that "Distler's incinerator" was incapable of generating sufficient temperatures to handle the disposal problem was accepted at face value. This assertion, in turn, was cited by local organizers of the anti-incinerator proposal as a key factor in their decision to object to the plan.

These considerations indicate that: (a) if EPA and state officials had more actively included the county in their deliberations; and (b) if information available to EPA and KDNREP had been disseminated to the local population, the county may have accepted the establishment at the Valley site of some form of incineration in a permanent disposal operation.

Interviews with local residents and officials also indicate that a continuing program of public information dissemination is needed in Bullitt County, beyond that which could have applied to the incinerator proposal. County residents continue to request information from a host of elected officials, some of whom have no involvement in the site. This shows that the citizens are unsure of a credible source of information, and are seeking assurances from diverse sources. At the time of our interviews, the local situation could be characterized as one of confusion and mistrust:

- General confusion regarding the current status of the Valley site:

  -- residents expressed the belief that Kentucky now plans to "import waste from all over the U.S.," "ship all the barrels to New Jersey" or "do nothing -- they're just going to leave it there";

  -- local officials offered to "include the press" when meeting with the investigators for this report because these investigators were the "first EPA" people they had met. These officials hypothesized that our investigators were on-scene to announce an EPA "solution."

- General mistrust of KDNREP expressed by local residents based on the department's inaction prior to 1979 and on its subsequent approval of the Fluhr incinerator proposal;

V. EFFECTS OF PUBLIC PARTICIPATION

While the immediate result of public participation in this case was the refusal of the Bullitt County Fiscal Court to approve the zoning change necessary for the installation of the Fluhr incinerator at the site, additional factors must be considered in assessing the public's role. For example, constituency pressures on county officials served to postpone, rather than effect, a solution to the problem. These same officials, however, were not provided any assistance, information, or consideration by either state or federal personnel.

Citizen interaction with KDNREP in this case consists of a history of departmental unresponsiveness. Internal departmental problems including jurisdictional disputes, a lack of sufficient technical personnel, and an apparent inability to expend state monies because of a lack of legislative authorization contributed to KDNREP's inaction. State personnel are farther removed from the affected constituency than local officials and, consequently, may sometimes be unable to attend to a particular problem because of departmentally established priorities. When asked about the department's lack of response to contacts initiated by local residents regarding the site, one state official noted: "That's not public participation, that's just a complaint." It does appear, however, that the recent appointment of a new Secretary to KDNREP who previously served on the environmental quality commission and who is committed to effective citizen participation in all elements of state government may change this attitude.

EPA officials, while concerned with public participation, limited their contacts, in this case, to the media. Because the media did not report complete information -- e.g., the media had no acess to EPA's evaluation of the incineration proposal -- the public reacted negatively. One member of the Coast Guard Public Information Assist Team who served at the site during the emergency operation remarked that the practice of dealing exclusively with the media may be shortsighted. The facts in the Valley case would appear to confirm this judgment.

It is also clear that the inadequacy of communication problems documented here are more extensive than not providing information to the public and local officials. Some confusion persists at the state level regarding EPA activities. Although EPA Region IV management was informed of the initiation of emergency actions at the site by the chairman of the RRT, this information was not passed on to KDNREP management. At the operating level, EPA regional personnel reported that they consistently stressed the limited authority under which Section 311 emergency operations are permitted to proceed, but state officials remain convinced that the agency could have "done more." KDNREP officials claimed that EPA's actions at the site were limited because they "wanted to use the publicity in order to effect passage of Superfund." Even the terminology employed at the federal and state levels differs, and in a way reveals the differences between EPA and Kentucky officials: the former refer to the site as the "Valley of the Drums", while the latter consistently speak of the "A. L. Taylor site"; EPA officials note the effectiveness of the temporary treatment facility and the "clean-up operation", while state personnel refer to the action as a "partial clean-up," or a "straightening-up operation." Under existing legislation, EPA's role was limited to the prevention of surface water contamination, but state personnel consider this to be almost inconsequential. As one official noted: "The major accomplishment of the activities to date at the Taylor site consists almost entirely of the publicity given the U.S. EPA for the establishment and the need for 'Superfund' legislation."

The history of the A. L. Taylor site, according to local residents, must be viewed with due consideration to their long-standing feud with the former owner. Residents report that Mr. Taylor previously operated a landfill at a different location (although the location remains unconfirmed) which they succeeded in shutting down before his operation at the current property. Apparently, Mr. Taylor was considered by the local residents to have absolutely no regard for the community or for the effect of his operations on the environment. Numerous instances were cited in which Mr. Taylor sidestepped local prosecution through a series of legal maneuvers. Judicial officials confirmed that previous attempts to prosecute Taylor were largely unsuccessful. Now some residents report that they do not expect Taylor's widow to be cooperative in effecting a solution to the problem either.

VI. SUMMATION

The rejection by the local community of the Fluhr incinerator proposal demonstrates what can happen when plans are drafted by one level of government without consultations with those who will be affected by the plans. In this case, the state released the proposal to the media, but local political leaders had no advance information on the proposal and were thus forced to rely on media coverage. Since the media coverage did not present all of the facts (through no particular fault of the newsmen), the local citizens' fears about the past activities of the people involved in the incinerator led to a rejection of the plan.

Under the Superfund program, it is possible that EPA could help include local authorities in the decision-making process. For example, while the responsibility for contacting local officials was delegated to a member of the RRT, that responsibility was not discharged. In a similar situation under the Superfund program, the absence of local representatives at a meeting of the RRT should serve as a "red flag" to the OSC that local authorities may have to be more actively encouraged to participate. Local representation, in this case, would at least have provided an avenue of communication between the various levels of government.

The Valley case also demonstrates how much important information can be learned by investigating the politics of a local area prior to the proposal of a solution to a hazardous waste problem. If EPA or the State had been able to anticipate the emergence of citizen opposition and the receptivity of local government, and addressed these concerns, some variant of the incinerator proposal may have been accepted. The lesson here for Superfund is that as much information as possible about the local political situation should be gathered by the Agency prior to the generation of a proposed solution. Thus, the Valley provides considerable insight into the degree of cooperation and communication which will be necessary for a successful Superfund program.

THE STRINGFELLOW DISPOSAL SITE
RIVERSIDE COUNTY, CALIFORNIA

INTRODUCTION

The Stringfellow site consists of a series of artificial ponds that had been used for the disposal of hazardous waste for some 16 years. It has been closed to additional wastes since 1972. While the site had been beset with problems since it began operation, three consecutive years of heavy winter rains have increased the severity of these problems greatly since 1978. That, in turn, has led to a sharp increase in the intensity of the surrounding community's reaction. Though local citizens had conducted organized opposition to the site from the time it opened, the issue came to a head in 1980.

The central interest of this case lies in the dynamics of the citizens' groups active in the surrounding community. In spite of general agreement about how best to resolve the problem, the two principal groups differ significantly with respect to their length of involvement, their membership, their methods, their attitudes towards the political process, and their overall political objectives. The combined effect of local citizens on policy in this case was substantial and has important implications for the conduct of programs to respond to hazardous waste incidents.

I. CHRONOLOGY

A. The Site

The Stringfellow Class-I Disposal Site was established in 1955 and began operation in 1956. It was managed by the J. B. Stringfellow Quarry Company. The site occupies approximately seventeen acres in Pyrite Canyon in the Jurupa Mountains just north of Highway 60 (the Pomona Freeway). It lies 400 feet in elevation above the residential area of Glen Avon located in the valley two miles below. The site's close proximity to the Pomona Freeway provides easy access to the area.

In 1961 the Santa Ana Regional Water Quality Control Board (RWQCB) adopted a resolution updating waste discharge requirements. The resolution added new rules for storm water diversion, routine monitoring of a nearby well, and self-monitoring of the well by the operator four times a year.

In 1969 heavy rains fell in the area. The resulting storm runoff produced overflows, washing waste out of the site into the residential area south of the Pomona Freeway. The RWQCB asked the Stringfellow Company to cease taking waste until the dam and

drainage works could be repaired and made capable of controlling the runoff created by a once-in-a-100 year storm. Company officials immediately responded to the request to the apparent satisfaction of regional officials, and dumping was subsequently resumed.

In the spring of 1972 it was found that increased leachate from the pond area had produced high levels of dissolved materials in the groundwater in the monitoring wells immediately below the site. Hexavalent chromium, nitrates, salts, and higher conductivities were present in the wells. In May 1972 a sample from the water supply well for the Glen Avon School contained a small amount of hexavalent chromium. The incident received considerable media coverage. This finding alarmed the community, but was later attributed to the surface flooding, not groundwater contamination. In November 1972, the owners responded to financial and public pressures by closing down the site.

In 1978, because of recent heavy rains and the possible overflow or rupturing of the dam, James Anderson, the Executive Officer of the RWQCB and a member of the Board's staff, ordered the discharge of acid wastes from the site. Over a five day period, more than one million gallons of waste water were released into Glen Avon drainage channels, and some of the waters flooded the backyards adjacent to the channels. Law enforcement officials stood guard along the running water's path to ensure public safety. In addition, approximately one and a half million gallons were hauled away to another Class-I disposal site. Note that the flood control channel empties into the Santa Ana River which is ultimately used for drinking water.

Heavy rains again fell in the area in 1979 and 1980. In 1979 the RWQCB increased recycle pumping and removed over one million gallons to other Class-I disposal sites in Southern California. In March 1980, at the request of the Regional Response Team (RRT), officials from the Environmental Protection Agency's regional office (Region IX) and the United States Coast Guard Strike Team were brought on to the site to abate flooding, overflow, and leachate conditions. The intensive twelve day operation was financed with 311k funds. Leaders and citizens report that the operation was well managed and highly successful. The total amount spent was just under $300,000.*

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*Since the Stringfellow site visit for this report, a second section 311 action ($380 thousand) was undertaken in August 1980 to reduce the liquids in the ponds and to increase the holding pond capacity. The RWQCB has also made some site improvements.

On July 2, 1980, the RWQCB recommended to the State Water Resources Control Board (State Board) complete removal of the Stringfellow site. The estimated cost of removal was placed at $14 million. On July 17, 1980, the State Board decided to allocate $4 million for cleaning up the site. State Board officials hope that EPA will contribute the additional funds needed to remove the dump.

Currently, the site contains thirty-two million gallons of toxic wastes. To the dismay of area residents, the liquid in the ponds has been aerosolled over the years in order to hasten evaporation. While in operation the site received large quantities of sulfuric, nitric, and hydrochloric acids as well as heavy metals, organic solvents, and pesticides from industries located in Nevada and California. Waste disposers included steel and aluminum firms, aerospace industries, chemical producers, and agricultural concerns. A four month study by the Hazardous Materials Laboratory of the State Department of Health Services found that the soil where the overflow in 1978 had collected (about three miles from the site) was contaminated with chromium, manganese, zinc, lead, and cadmium that exceeded normal levels by 100 to 300 percent.

Although the surrounding area is rural, it has grown considerably the last few years. Many people are moving into the community from nearby Orange County. Residential subdivisions have been built within one and a half miles immediately downstream from the site. Glen Avon residents tend to be lower middle class.

B. Public Participation

Public activism against the Stringfellow site began almost immediately after it was opened in 1956. The Parents of Jurupa, led by Ruth Kirkby, have telephoned and written countless letters to local, state, and federal officials demanding that something be done about the site. Over the years they have held a large number of public and group meetings concerning the disposal area. Many believe the Parents of Jurupa was responsible for the site's closure in 1972. The group was incorporated in 1973, and presently has a core membership of about twenty people.

After the disposal site ceased operation, the group remained active. For instance, in January 1973 the Stringfellow Company submitted a report prepared by their consulting engineers which stated that the degradation of the groundwater in a nearby well was the result of surface runoff from the site caused by storms during the spring of 1969. The report stated that with the improvements of the storm drainage facilities and the seepage control at the dam area, no further waste should escape from the site. In June 1973 the RWQCB established new waste discharge requirements providing additional protection for the waters of the state. One month later the Parents of Jurupa filed a petition with the State Board stating

that the actions of the RWQCB were improper and inappropriate. A State Board hearing was held in Riverside regarding the petition by the citizens' group in March 1974. In June the State Board denied the petition but added an amendment specifying additional operating procedures to be implemented at the site. However, the Riverside County Board of Supervisors, at a public hearing in November 1974, revoked the land use variance originally issued to the Stringfellow Company in 1955. The Board of Supervisors declared the site a public nuisance, and ended all attempts to reopen the area for dumping. This was a major victory for Ruth Kirby and the Parents of Jurupa. The group continues to lobby public officials for more scientific study of the area and complete removal of the site.

In December 1979 another citizens' group, the Concerned Neighbors in Action (CNA), became involved in the controversy. This group was organized by the California Campaign for Economic Democracy (CED), an activist organization headed by Tom Hayden. Like the Parents of Jurupa, CNA favors complete removal of the site. In fact, many of its members once belonged to the Parents of Jurupa. The major difference between the two organizations is that CNA has adopted a more visible and assertive strategy in bringing their demands to local, state, and federal agencies. The group hopes to increase its influence by attracting as much media coverage as possible. It has a core membership of about fifteen citizens. Penny Newman is the leader of the organization.

Beginning in December 1979 Jeffrey Robinson, a CED organizer, went door-to-door in the community with the first members of CNA, trying to enlist support and enlarge the size of the new group. During January and February 1980 about six house meetings were held to: (1) define the issues, (2) decide what the organization's goals would be, and (3) select a way to attain those goals. They then went door-to-door again distributing leaflets announcing a public meeting to be held on March 25 at the Jurupa Community Center. Advertisements were also placed in the local newspapers. The West Riverside County Businessmen's Association co-sponsored the meeting. Each of the approximately 175 people attending the meeting was asked to place his or her name, address, and telephone number on a sheet of paper. A large "telephone tree" was developed from this list of names. People were contacted by CNA members and urged to attend a public hearing called by the RWQCB on July 2 in the City of Riverside. The same strategy was later used to inform people about a public meeting to be held at the Jurupa Community Center on July 15. During this time three CNA committees were formed: (1) clean-up, (2) health survey, and (3) public hearing. The group has also written a considerable number of letters to local, state, and federal officials urging removal of the Stringfellow site. Some have written letters outlining their maladies possibly due to the site. Like the Parents of Jurupa, CNA enjoys the public support of other community organizations in the area.

With the help of CED, the group was a major force at the July 2, 1980, public hearing convened by the RWQCB. The purpose of the hearing was to review alternatives for abatement of the problems at the Stringfellow site. A list of six alternatives was prepared by James M. Montgomery, Consulting Engineers, Incorporated. James Anderson recommended, among other things, removing liquid from the site and placing a clay cover over the pond area (Alternative 2). This alternative would cost over two million dollars. Yet a large turnout of about sixty parents and children carrying signs and representing CNA were able to persuade the Board to recommend complete removal of the site to another location (Alternative 6). Complete removal would cost at least fourteen million dollars. As previously mentioned, the State Board agreed on July 7 to allocate four million dollars for the clean-up effort.

CNA held its own public meeting on July 15, an event which was fairly well attended. About ninety people heard Tom Hayden, Lois Gibbs (President of the Love Canal Homeowners Association), and Penny Newman speak about the dangers of toxic wastes. Gibbs also showed slides of Love Canal. An aide to Congressmen George Brown and several members of the press attended the meeting.

CNA was also successful in persuading the Riverside County Department of Public Health to conduct blood tests for sixteen adults and fourteen children. Blood samples were taken July 14 and 15, 1980 and produced no abnormal results. A large health survey, designed by Gary Spivey, Professor of Epidemiology at the University of California, Los Angeles, will be conducted in the fall.

On two occasions, area legislators held public meetings to bring information about the site into the open. Representative George Brown held the first public meeting in the Glen Avon community. Formerly, all hearings were in downtown Riverside. A number of state and regional water and air officials spoke about the Stringfellow site problem on September 9, 1978, five months after the flooding of the wastewater. Residents of the surrounding communities, notably Parents of Jurupa members, also voiced their concerns. Most recently, State Senator Robert Presley, who has been instrumental in appropriating special state funds for Stringfellow clean-up, held a public meeting on August 16, 1980. The EPA Region IV hazardous waste contact person, representatives from the State Board and Department of Health, and regional and county officials presented the facts of the Stringfellow site as they understood them and answered questions from area residents.

II. VISIBILITY OF THE CASE

During July 1980 major community leaders and citizen actors in the Stringfellow controversy were interviewed. Leaders and citizens were asked how visible the issue was compared to other issues in the

community. A large majority of people felt that it was one of the most prominent issues in the community. The problem was particularly visible when heavy rains fell in 1969, 1978, 1979, and 1980. During the first two times the ponds containing toxic wastes overflowed, and the overflow posed a threat to the community. Public officials report they were inundated by letters, telephone calls, and petitions urging them to action. Media coverage was also exceptionally high during these periods.

III. ACTORS

A. Agencies

1. Local

A number of local agencies have been involved in the controversy. The Jurupa Community Services District, which manages the area's water supply, has demonstrated continued concern about the disposal site due to flooding, leaching, and the possible contamination of the water supply. William Huckle, the General Manager of the district's office, has testified at a number of public hearings called by the RWQCB. The Riverside County Planning Commission approved a zoning variance in 1955, laying the way for the establishment of the site. Until 1974 the Riverside County Board of Supervisors had been involved in overseeing the operation of the site. On the legal advice of the State Attorney General and its own counsel, the Board relinquished all responsibility after 1974. The Riverside County Department of Public Health, however, has continuously kept a watchful eye on the area for possible health problems. In conjunction with state health officials, the Department sponsored blood tests of thirty community residents thought to be most affected by the site. A large health survey will be administered in the fall.

2. Regional

The South Coast Air Quality Management District (SCAQMD), an autonomous agency created by the state, conducted air and soil samples around the pond area in the fall of 1978. The state, which now owns the site, was cited for violating the agency's Rule 403 regarding fugitive dust levels. No action has been taken thus far. In addition, the Regional Response Team, which is comprised of regional EPA, United States Coast Guard, and other interested federal and state agencies, agreed to provide 311K funds for the site's clean-up in March 1980.

3. State

Several state agencies have also entered the Stringfellow controversy. The Santa Ana RWQCB has been the primary body involved in the conflict since dumping commenced in 1956. It

adopted major oversight responsibility in 1975. The State Water Resources Control Board, the Regional Board's parent agency, has agreed to follow the recommendations of the RWQCB on a number of occasions. In July 1976, for instance, the State Board funded a major engineering study of the site at the Regional Board's request. From time to time, the State Board has appropriated money for the clean-up of the pond area. In addition, the Hazardous Waste Management Section of the State Department of Health Services conducted a comprehensive study of the chemical content of the ponds and the surrounding soil in late 1978. The study's findings were released in March 1979. State health officials have also helped Riverside County health officials investigate the possible ill effects of the site on the community. Both the state health officials and water officials have called Stringfellow the state's number one hazardous waste problem. The National Guard was called in during the heavy rains of 1978 to help sandbag the area. In May 1980 the State Department of Fish and Game voiced its concern about the site's potential impact on the region's fish and wildlife in a letter to the RRT. Finally, Governor Brown created the Toxic Substances Coordinating Council to advise him on toxic waste problems in the state. The Stringfellow site was discussed at the Council's meeting in August 1980.

4. Federal

The regional EPA office and the United States Coast Guard joined forces in March 1980 to correct overflow, flooding, and leachate conditions brought on by heavy rains in the area. A considerable number of water samples were taken. Also, the Army Corps of Engineers inspected the site and made recommendations to the OSC during this time. The national EPA office dispatched a media specialist for the first two days of the operation. Finally, in June 1980 a high ranking official from the EPA headquarters telephoned State Senator Robert Presley, the district's representative, to tell him that funds for the site's clean-up would become available once the RRT recommended a method of clean-up. There is reason to think that Presley told the State Board about his conversation with EPA headquarters. This may explain why the State Board (at its July 17, 1980 meeting) only allocated four million dollars instead of the fourteen million dollars needed to remove the site.

B. Interest Groups

1. Ad Hoc Groups

Parents of Jurupa was the first citizen group to become involved in the Stringfellow issue and the group has remained active since 1957. Members of the Parents of Jurupa tend to be at least middle aged and long-time residents of the Glen Avon area.

Most are middle class homeowners. They are more knowledgeable than average citizens on topics such as geology, chemistry, and hydrology, especially as these subjects relate to the Stringfellow site. Their primary concern is for their own health and the health of their neighbors. Maintaining property values may be a secondary concern. In general, the Parents of Jurupa prefer to use traditional methods of political participation to bring about change.

Many officials interviewed feel this group is, for the most part, "level headed" and "realisitic." Some believe Ruth Kirby, the group's leader, has been too vocal emotional about the possible dangers posed by the site. Others think that she has never been given a fair hearing, and that her demands for more rigorous scientific study of the area have never been seriously considered. All agree that she is an extremely bright and persistent woman who has contributed a great deal of time over the years to further her cause.

Members of Concerned Neighbors in Action tend to have lived in the community a shorter time. They are likely to be young housewives with young children. Their greatest fear is for the health of their children -- a fear which drove them, in a very short time, to collect 2200 signatures on a petition calling for the removal of the site. Older residents and local officials consider them to be emotional and very impatient. They believe they must put pressure on the political system in order to achieve their goals. This characteristic more than any other distinguishes the two citizens' organizations. For the most part, the Parents of Jurupa and CNA are single issue groups.

Campaign for Economic Democracy, headed by Tom Hayden, first entered the Stringfellow controversy in December 1979. CED is a professional and grass-roots political organization with a specific ideological cast. Its members desire more democracy within the economic and industrial sphere. They claim that while corporate executives prosper through the use of advanced technologies, the general population contracts cancer and other debilitating diseases as a result of increased chemical pollution. CED members tend to be young, liberal, and possess considerable political savvy. They know how to organize citizens at the grass roots level and to attract and shape media coverage. Their skill is evident from the role they played in the Stringfellow conflict.

According to CED, Governor Brown requested Hayden to investigate the Stringfellow site as part of his duties as a member of the Southwest Border Regional Commission. It is interesting to note that recently State Senator Presley, who has worked on abating the site, successfully sponsored a bill giving the Senate veto power over Governor Brown's appointment of Hayden to the Commission. While the site is in Presley's district, the headquarters of CED is

in Santa Monica seventy miles away from the area. Many of those interviewed believed Hayden and his group became involved in the controversy to further their own political cause through the media coverage they knew they would get. Others maintain that Hayden and his group became involved because they wanted to help the citizens of Glen Avon improve their situation.

2. Community Groups

In addition to the Parents of Jurupa and CNA, a number of other community groups have publicly supported removal of the site. They include: Crime Watch, Pedley Women's Club, Jurupa Junior Women's Club, Glen Avon Women's Club, Glen Avon PTA, Glen Avon Babysitting Cooperative, and the West Riverside County Businessmen's Association. The latter group had originally supported continued operation of the site. There is some overlapping membership among the different groups.

3. Industrial Representatives

Representatives from the Benjamin K. Kasarian Company (BKK) have testified at several hearings regarding their willingness and ability to accept contaminated earth and liquid waste from the Stringfellow site. BKK operates a Class-I disposal site in West Covina, the closest one to the Glen Avon area. A number of questions about the site's complete removal still remain unresolved including the energy, environmental, and economic costs involved, the logistics of such a large operation, and the attitudes of West Covina residents toward such a policy.

4. Political Involvement

State Senator Robert Presley and Assemblyman Walter Ingalls have also played a role in the Stringfellow issue. In 1977 they both worked together to introduce and pass a bill in the state legislature appropriating $370,000 for partial clean-up of the site. Since then they have acted together to find ways to abate the site. In December 1979 Presley chaired a Senate subcommittee hearing in the City of Riverside on toxic wastes. The Stringfellow problem was addressed at the hearing. Recently, he successfully co-sponsored a measure restricting the building and selling of homes on hazardous waste dumps. He has been a member of the State Senate for over sixteen years and has been the most active elected official in the conflict.

C. Media

1. Print

The Stringfellow controversy has been given considerable attention by the local and regional newspapers. The Riverside Press Enterprise, the Riverside City Record (a weekly newspaper), and the San Bernardino Sun Telegram have followed the issue closely, and have printed many news articles on the topic. The Los Angeles Times, with a circulation of over one million readers, has also reported on several events pertaining to the disposal site. In fact, a long feature article by Joy Horowitz of the Times in May 1979 alerted leaders, citizens, and CED members to the possible dangers of the dump. Overall, the issue has received substantial coverage in the newspapers. In other publications, the Stringfellow site was included in a New West magazine story on hazardous waste sites, and the site was featured in Michael Brown's book, Laying Waste, Pantheon Books, 1980.

2. Broadcast

The same can be said about the local television and radio stations. The local affiliates of the three major networks, KNXT (CBS), KNBC, and KABC have each covered the conflict. The science reporter for KNXT visited the site and collected soil samples for testing by an independent laboratory. The results of the analysis were different from those of previous studies by local and state agencies. These divergencies were part of a special week-long report on the site. KNBC just completed a week-long report on the toxic waste problem in California and included the Stringfellow dump in its investigation. Channel 13 (KCOP), an independent television station, has also covered the events surrounding the site. Finally, the local radio stations, including KCAL (in Redlands) and KPRO (in Riverside), have given the topic a lot of air time.

IV. COMMUNICATION STRATEGIES

A. Source of Information

1. Credibility

There are a number of information sources that public officials and citizens accept as credible. They include the national and regional EPA offices, the United States Coast Guard, the SWRCB, the Hazardous Materials Management Section of the State Department of Health Services, the SCAQMD, the RRT, the Riverside County Department of Health, and the Jurupa Community Services District. The local citizens also felt that the print and broadcast media have supplied them with credible information Several local leaders, however, expressed dismay over a news report by KNXT.

After collecting and testing soil samples from the Stringfellow site, a KNXT reporter showed the results of the station's study to James Anderson of the RWQCB while on camera. Without prior notice Anderson was asked to explain why the county's and state's test results were different from those of the station. KNXT later refused to share its findings with anyone. Interestingly, this incident attracted additional media coverage in the region.

Several local officials and active citizens have questioned the credibility of the information provided by James Anderson. His own credibility on this issue is believed to be low because of his attempt to reopen the site in 1973, his decision to discharge over one million gallons of liquid from the pond area into the drainage channels of Glen Avon during the heavy rains of 1978, and his staff's recommendation at the July 2, 1980 public hearing to remove the liquid from the ponds and place a clay cover over the contaminated area. He has also maintained over the years that the dam at the site was securely keyed to the bedrock. Anderson and his staff may have placed too much trust in the assertions by the Stringfellow Company that the site was resistant to leakage. Lack of adequate funding to ensure proper maintenance of the pond area has also been a problem which makes Anderson's position more difficult.

2. Control over Information

No evidence was found to indicate that information had ever been withheld by a public official. Members of the public (or any agency) who have shown interest in the site have been sent information automatically on a regular basis by county health officials. State health officials have been equally cooperative. Citizen participants do think, however, that there is not enough scientific data on the disposal area and that more studies need to be done. Several public officials disagree and believe that enough studies have been conducted to determine a solution. State and county health leaders believe that additional epidemiological information is needed, and are in the process of gathering these data.

B. Types of Information

Mainly general information rather than technical information has been distributed to the public. The Parents of Jurupa have occasionally called in a chemist (who resides in the area) to comment on various test results. In addition, CED has enlisted the help and advice of Paul Blanc who holds a Master of Science in Public Health. Leaders feel the public cannot understand complex, technical information and that reports of low but detectable levels of chemicals in the soil or water will give rise to distorted perceptions.

While most officials believe that no conflicting or distorted information has been released, citizen participants strongly disagree. Activists argue that there has been conflicting testimony concerning the actual health risks of the site. Clearly, there has been little coordination between those supplying this kind of information. The biggest problem, according to the citizens, is that there has not been enough investigation regarding many aspects of the site.

C. Effect of Information on the Public

1. Issue Saliency

Everyone interviewed agreed that new information, particularly when it was disturbing, helped increase visibility of the issue. There was more media coverage when heavy rains fell.

2. Information Distortion by the Public

A number of leaders believe certain active citizens have overreacted publicly to test results and official statements. The finding of a small trace of hexavalent chromium in the well next to the Glen Avon Elementary School and the public outcry which ensued was often cited as an example. Also, the showing by CED of "The Killing Ground," an ABC documentary on toxic wastes, to community residents led to increased alarm about the Stringfellow site. Lois Gibbs' comparison of the problem to Love Canal during her visit to the pond area and later in her talk to a public meeting appears to be an exaggeration. In this case, however, such "consciousness raising" has led to increased public participation and official action.

3. Citizen Participation, Conflict Escalation, and Conflict Mitigation

All those who were interviewed agreed that information provided by the media during the heavy rain periods, particularly in 1978 and 1980, and the involvement of Hayden's group in the conflict resulted in increased public awareness and participation. Citizen activism led to greater media coverage and, in turn, placed added pressure on public officials to act. Nearly everyone felt that the activities of CED and CNA have escalated the conflict and have increased leader responsiveness. This seems to have moved the entire problem closer to a settlement. Both citizens and officials wonder whether anything would have been done had public participation not been so high.

4. The Impact of National Events

There is little doubt that the Love Canal incident had an impact on the Stringfellow controversy. Even before the arrival

of Lois Gibbs, the New York Times had referred to the site as "Love Canal West." There also appears to have been greater sensitivity and responsiveness by public officials to the demands and concerns of the Parents of Jurupa just after Love Canal became nationally prominent. For some members of the newly formed CNA group, Gibbs' visit only reinforced similarities -- already clear in members' minds -- between the two sites. While touring the pond area she commented, "This looks like Love Canal all over again," and "I can understand why they call it Love Canal West." Her visit to California received substantial media coverage.

V. METHODS OF INTERACTION

A. Public Hearings

Throughout the 1970's the RWQCB used public hearings to consider public comments on the abandoned hazardous waste site. Hearings in 1974-1975 centered around either re-opening the site or closing it properly. A petition to the State Board from Parents of Jurupa succeeded in tightening the conditions under which Stringfellow could reopen the site. In January 1977 the RWQCB held a public hearing to choose among the alternatives offered by the James R. Montgomery engineering study to close the site. A clay cap was decided upon.

Because that work was not completed before later floods altered the site, another public hearing to choose closure alternatives was held on July 2, 1980. By this time, substantial public opposition to capping the site had grown. In this hearing, the initial recommendation for capping was changed to a recommendation for complete removal of the wastes.

B. Public Meetings

Several less formal methods of public interaction were used during the Stringfellow controversy. In this case public meetings were used more to provide information to citizens than to solicit input. Congressman George Brown sponsored a public meeting in the Jurupa Junior High School in September 1978. A number of local, regional, state, and federal officials made statements, and comments were also solicited from local residents. The meeting was well-attended, and the outcome was a formal request to the state to test the soil and water testing below the site.

The Concerned Neighbors in Action and CED have sponsored at least two public meetings at the Jurupa Community Center: one in March 1980 to discuss the action taken by EPA and the Coast Guard and to plan for future citizen involvement, and the second in July 1980 where Lois Gibbs of Love Canal spoke.

C. Other Forms of Citizen Participation

Letter-writing and phone calls to responsible officials and legislators have been used throughout the Stringfellow controversy. A petition by Parents of Jurupa to the State Board in 1974 helped close the site initially. Ruth Kirby's calls to the Air Quality agency triggered sampling of air particulates in 1978 which showed the site was in violation of dust standards. The CNA has also launched a letter-writing campaign to state legislators and others.

In March 1980 when the 311K action was taken, the EPA on-scene coordinator invited local citizens on a tour of the site to see what EPA and the Coast Guard had done at the pits. This gesture helped alleviate citizen "fear of the unknown" regarding the site.

At the July 1980 public hearing, the CED organized a small demonstration before the RWQCB hearing. Children of CNA members carried signs advocating the removal of the waste because of the potential for health problems.

VI. EFFECTS OF PUBLIC PARTICIPATION

A. Effects on the Community

Most agree that the involvement of the Parents of Jurupa and especially CNA in the conflict led to increased awareness and concern on the part of the community residents. The two groups also persuaded all the community organizations mentioned above to take a clear and favorable public position on the issue of complete removal of the site.

The involvement of Tom Hayden in the issue has had an interesting impact on community politics. At the grass roots level, several CNA members said they seriously considered the costs and benefits before they agreed to collaborate with CED. They feared that the conservative-leaning residents of Glen Avon would be repelled by the involvement of an outside "leftist" organization. Yet they needed the organizational and political expertise that CED could provide, as well as Tom Hayden's name, if they were going to have a significant impact on the governmental process. Looking back, CNA thinks it was all worth it. In fact, because of recent successes, some residents who originally were dismayed at Hayden's involvement are now happy he chose to become involved in the problem. There are still people living in Glen Avon who fear that his continued participation will eventually bring too much attention to the site and lower their property values.

At the local and regional level, a few officials feel Hayden is only using the people of Glen Avon to further his own political career. In general, most leaders do not welcome Hayden's

involvement in this issue, although they recognize that he is a legitimate actor in the political process.

B. Effects on Policy

Overall, public participation in the controversy has had a significant effect on policy-making. Because of the early activities of the Parents of Jurupa, there has been increased monitoring of the wells. Also, air and additional water samples have been collected. As a result of the actions taken by this group, the site was closed and has remained closed. Recently, CNA and Parents of Jurupa have managed to persuade a number of leaders to support the removal of the site. There are a few people who are opposed to this position. As previously mentioned, the State Board and the SWRCB have responded positively to their demands. In addition, investigations by state and county health officials are about to begin. Citizen participants feel that because of their actions, something is finally being done. This, in turn, has probably led the community to perceive these agencies as competent and effective.

During the interviews, leaders and citizens were asked who they thought could best handle the Stringfellow problem. A little over half of the people questioned said that if the RWQCB had more funds it could best deal with the site. Some mentioned the State Board and the regional EPA office because of their expertise in such matters. Most people agreed that funding and not a shortage of expertise was a major obstacle to abating the site.

VII. SUMMATION

The Stringfellow case illustrates how an organized public can thwart the conclusions of technical experts and shape policy decisions to their own wishes. Of the various alternatives presented by the consulting engineers, the RWQCB staff preferred the capping of the site. Yet to satisfy the public, the Board was obliged to recommend the complete removal of wastes at five times the cost. Moreover, the public group that had the most influence over their decision was not the group that had been active in the matter for nearly 25 years, but a group of relative newcomers to the area, organized only months before. Thus, the least-cost solution to the hazardous waste problem was pre-empted by a citizens' group whose formation and whose political skill may well have been unanticipated by policy-makers.

The magnitude of the reaction in the surrounding community to the Stringfellow site's problem has increased greatly in the past few years. That is not only because the problem itself increased in severity; nor is it only because of media attention and the visit of a Love Canal representative. Citizen concern is growing partly

because the surrounding community itself is growing. While isolated at the time of the site's establishment, the Stringfellow pits are being increasingly encroached upon by the vanguards of urban sprawl. And the people who move to the area generally are young couples with growing children, people with substantial recent investments in their home and a young family to protect. These are the people who appear to be most amenable to political activism. They are also people who had not been formally active prior to their involvement with hazardous waste issues and whose political activism is most likely to reflect impatience and dissatisfaction with operating through normal political channels.

The Stringfellow case also illustrates the extent to which local and state governments can be expected to rely upon the federal government financially. Even before any federal "Superfund" program has been established, the California state government allocated far less for the clean-up of this site than would be required. Evidently the state government expects the federal government to pay the bulk of the costs.

JACKSON TOWNSHIP, NEW JERSEY

INTRODUCTION

Jackson Township is probably more typical of a hazardous waste emergency than the massive chemical spills that draw attention elsewhere. But it is also a peculiar case because of the political battles that developed at the site.

The basic problem at Jackson Township is groundwater contamination. The municipal landfill the township used to dispose of non-hazardous solid and septic wastes is allegedly the source of the contamination. Several factors we discuss here turned public involvement in the problem into a bitter feud and transformed relations between citizens and local government into mutual hostility and disdain.

While other cases illustrate contention between local citizens and state or federal levels of government, a large part of the confrontation at Jackson Township has been between one part of the community and the local government. Like other cases in populated areas, the residents who have children exposed to the hazardous chemicals have been the most active, impatient, and emotional about the problem. Jackson Township residents have also been in contact with representatives of the Love Canal citizens' group.

Jackson Township, Ocean County, is situated in central New Jersey in the northern portions of the "Pine Barrens," a sparsely-populated, semi-wilderness region bounded by major population centers. The soil is sandy, replete with bogs, and capable of supporting little vegetation beyond scrub pine trees. Underneath is the Cohansey aquifer, an important fresh water supply. Highway construction in the past two decades has transformed Jackson from an isolated rural area with a stable population of marginal-income "pineys" into a lower-middle and middle class bedroom community. Most of the new residents, attracted by low housing costs and a rural setting, have come from northern New Jersey or New York and many still commute back each day to jobs in their former communities. The township's population has grown from 18,000 in 1970 to an estimated 24,000 today.

Most of Jackson's residents receive water from the municipal water system, which taps an aquifer lying 300 feet below ground-level. Residents of Legler, however -- an outlying district of some 165 houses, far less heavily developed than other sections of the township, and more recently developed as well -- have relied upon water from their own wells. Several of these are shared

"community" wells that reach the deep aquifer and have experienced no problems, but most are individual wells that extend between 29 and 55 feet deep and tap a separate shallow aquifer. A total of 146 of these individual wells in a four-square-mile portion of Legler are now contaminated. All lie within 1.5 miles of the township landfill.

I. CHRONOLOGY

A. Events at the Site

The history of well contaminations attributed to municipal landfills in Jackson Township extends back at least nine years. In 1971, contaminants were discovered in the wells of residents bordering the municipal landfill that, until then, had been used for the disposal of locally-generated refuse. The township argued that the source of the contaminants was the residents' own septic tanks. However, the New Jersey State Department of Environmental Protection (DEP) indicted the township, brought suit, and forced the township to suspend operations at the site.

The township government was able to locate a new site for refuse disposal in the form of a 135-acre parcel of land in the Legler district, purchased from Glidden Industries for $1.00. Glidden had used the land for mining a mineral used in paint manufacture; what remained on the 135 acres was mine tailings consisting of clean sand to a depth of about 25 feet. The low purchase price was in exchange for relieving Glidden of its obligation to reclaim the mined-out land. Only about 20 acres were used by the township for disposal purposes. At present, the site is a desolate expanse of sand dunes, bordered in the distance by low pine trees, bearing none of the gruesome reminders of noxious chemicals and illegal dumpings that distinguish other problematic hazardous waste disposal sites.

The township's announcement that it would transfer its waste disposal operation to the Legler site was greeted with protest by the few residents then in the area. A petition circulated in the township, which received 319 signatures, claimed that the unnatural conditions of the site -- the fact that it consisted of clean sand -- made it inappropriate for waste disposal. There were accusations of fraud in the soil borings used by the township to establish the site's suitability. Nevertheless, on April 24, 1972, DEP granted Jackson Township a license to accept solid waste at the Legler site. Shortly after the beginning of operations, the township began to accept locally-generated liquid septic tank wastes. When the decision was made to begin charging for waste disposal (at a rate of $6 per thousand gallons), the site was opened to outside sources, although the liquid wastes accepted were supposed to be limited to septage. Legler residents claim that as much as 300,000 gallons of waste per day were dumped at the site.

On several occasions between April 1972 and November 1978, DEP accused the township of accepting liquid wastes in a quantity far in excess of what could be absorbed by the solid material at the site; and in early 1974, DEP cited the township for "lagooning" raw or untreated sewage. In August 1974, the Ocean County Public Health Coordinator stated that an "environmental crisis" existed at the site. The township was also faulted on all sides for inadequate security measures; no fence protected the landfill against illegal dumping at night, nor was there said to be sufficient testing of the chemical make-up of the liquid materials being deposited in the landfill. According to a suit brought by DEP in 1980, township officials knew "or should have known" that dangerous chemicals were leaking from the site into the underlying aquifer since 1975. Township officials respond that they tested the wastes accepted and guarded against illegal dumping to the best of their ability.

Sometime in 1976, a few Legler residents began to complain of unpleasant odors from their well water. The township health officer appealed to the state DEP for help in testing, but nothing more serious than an increase in iron content was detected until tests for the presence of organic chemicals were first conducted in the summer of 1978. These were returned with a finding of exceptionally high ammonia content, which DEP attributed to sewerage contamination from the landfill. On November 8, 1978, the township sent letters to 96 families in Legler, advising them no longer to drink water from their wells.

The state thereafter conducted additional testing of well water. On December 20, DEP ordered the township to cease accepting liquid wastes at the landfill and on December 21 advised residents to limit their use of well water to cleaning purposes alone. The New Jersey Department of Health announced on January 3, 1979 that it had detected the presence of known carcinogens in several wells, including benzene and 1,1,2,2 tetrachloroethane, as well as other chemicals that are toxic in large doses. Additional toxics found subsequently include chloroform, trichloroethylene; 1,2 dichloroethane, toluene, chlorobenzene, cadmium, lead, and mercury. Of these chemicals, benzene is probably the most widely feared and certainly the most widely cited in connection with the case.

Legler residents have attributed a long list of ailments to drinking contaminated well water. Kidney diseases predominate on the list. Seven residents have experienced serious kidney maladies since moving to Legler, resulting in one death (an infant), two kidney removals, and two people currently on dialysis. Several pet animals have died of kidney disease. There have been seven or eight known miscarriages in Legler in the past several years, and an "abnormal" amount of vaginal infections in young girls. Residents display pictures of the serious skin rashes that have broken out following showers in well water. State officials acknowledge that

the chemicals discovered in Legler wells are toxic, but they deny steadfastly that there is any evidence to connect the Legler residents' problems to drinking contaminated well water.

The township government's response to the situation, following the November 8 letter, was to truck drinking water to the affected residents as a temporary measure and to build a new water system in the Legler district as a permanent solution. Water deliveries of two 17-gallon drums per family were made daily or at least several times a week. Legler residents continued to bathe in well water although the township eventually offered them shower facilities at a school some 5 miles away. The 21 months during which water deliveries have taken place have been marred by accusations of vandalism, deliberate spoiling of the water by disgruntled municipal employees, and inadequate supplies.

Legler residents would have preferred that the township permanently resolve the situation by digging new individual wells that reached the deeper uncontaminated aquifer. Both residents and the township obtained cost estimates for individual wells. The township government, however, decided to opt for the construction of a new water system, even though it would be more expensive than digging new wells and would take longer to complete. According to its attorney, the township felt legally proscribed from making what it saw as private improvements at public expense. Moreover, the state was unable to offer financial assistance for anything other than a new water system. Accordingly, in December 1979, the township began construction of a new water system stemming from a single deep well and capable of servicing 200 houses. Financing was provided by an $850,000 bond issue and a loan of $1.2 million from the New Jersey Clean Waters Fund, made available through special legislative action. The township is also negotiating with the federal Farmers Home Administration for a grant to replace the loan from the state.

Legler's new water system began operation on July 3, 1980, but at the time of this report, only a portion of the Legler houses have been hooked into the system. The township is requiring Legler residents to pay a hook-up fee of $210 down and about $600 total with various financing provisions available. But the residents, who had previously received their well water for free, object both to the fee and to a rate for water use somewhat higher than that charged other township residents. A court decision recently affirmed the legality of the hook-up fee. The township is currently also trying to convince Legler residents with uncontaminated community wells to hook into the water system.

The Jackson Township landfill itself ceased operations on February 11, 1980, sixteen months after the well contamination was disclosed. Acceptance of liquid wastes was suspended in November of 1978, but the State Public Utilities Commission ordered the township

to resume liquid waste disposal until a connection to the well contamination could be established. When DEP officially charged in December 1979 that the landfill was to blame, the acceptance of liquid wastes at the site was halted. In January 1980, the landfill was closed to everything except solid wastes generated within the community, and on February 11 the landfill was closed altogether. The New Jersey DEP brought suit against the township in January 1980 to have the site permanently capped but that has not yet been done. The state has dug numerous monitoring wells and continues water testing. The township government has maintained all along that its landfill is not the source of the groundwater contamination; it points instead to illegal dumping on an adjoining property, and it has hired a consultant engineer to corroborate its claim.

B. Citizen Involvement

For most Legler residents, the November 8, 1978 letter from the township was the first indication that anything might be wrong with their well water. The reaction of most residents was probably similar to that of one woman who, when asked what she did when she learned her water was unsafe, replied, "I got hysterical." Legler residents phoned the township offices with questions; they showed up in numbers at the biweekly public meetings of the Township Committee; they organized meetings to become acquainted -- few people in the sprawling rural district had known their neighbors before -- and to discuss their problems. People recounted their ailments at these meetings and were struck by the number of seemingly related problems among their neighbors. When the township government failed to answer the questions of Legler residents to their satisfaction, or to give adequate signs of concern and compassion for their problems, tempers rapidly began to flare. Township officials, on their part, claim that they could provide no firm answers without further testing, and that the state DEP was delaying reports of test results. They began to perceive the Legler residents to be unreasonable.

The history of citizen involvement at Jackson Township from this point is largely a chronicle of the progressive deterioration of relations between Legler residents and the township government. Both sides began increasingly to regard one another with suspicion; the public township meetings became confrontations dominated by strong and conflicting personalities. Legler residents began to think that the township officials were lying to them; they accused the officials of withholding information and even of destroying evidence.

Legler residents formed an ad hoc organization, the Legler Concerned Citizens Committee, shortly after their water problems were disclosed. This group has continued to represent the interests of the affected residents with some degree of unity. Its de facto

leader and spokesman has been Mr. James McCarthy. The issues that have dominated the organization's efforts have shifted over time in accordance with actions taken -- or not taken -- by government officials as described above.

Media awareness of the situation in Jackson Township grew gradually. One event, however, changed both the quantity and character of media attention overnight. On June 6, 1980, Mr. McCarthy and another Legler resident testified in Washington at hearings before the Senate Labor and Human Resources Committee's Subcommittee on Health and Scientific Research, chaired by Senator Edward Kennedy (citizens from Woburn, Massachusetts also testified). Pictures of McCarthy in tears before Kennedy were published nationwide the following day, and as the "human interest" potential of Jackson Township's problems became apparent, news people from all quarters descended upon the township. This groundwater contamination problem has since been regularly cited as a prime example of the nation's hazardous waste problems.

The legal developments in the case have centered around a $51.5 million damage suit brought by over 300 Legler residents against the township in August 1979. The suit charges the township government with mismanagement and stipulates that the money awarded be placed in a trust for cleaning up the site and covering future medical expenses of the children of Legler residents, rather than being distributed among the plaintiffs. The township subsequently countersued, denying negligence and blaming illegal dumping instead. The New Jersey DEP filed suit against the township in February 1980 in order to force the closing of the landfill and the construction of a permanent cap.

This report describes citizen involvement in Jackson Township and analyzes how that involvement arose and why it took the form that it did. In any such analysis, the important factors do not necessarily coincide with the technical facts of the matter. Rather, what is important is how the various participants perceived each other and the events that surrounded them. The political situation that has evolved in Jackson has been a reaction to a perceived sequence of groundwater problems, health problems, administration and communications problems, and seeming bad faith on all sides.

II. VISIBILITY OF THE CASE

Hazardous waste emergencies are fairly common in the state of New Jersey. Virtual replicas of Jackson Township's groundwater contamination problems are presently developing or have recently occurred in several nearby Pine Barrens communities. Few, however, have generated as much political heat.

The saliency of this case may be gauged by several indices. Press coverage of any development is now regularly front-page news in the Asbury Park, Trenton, and even Newark newspapers. The New York Times has run a number of stories, and several items have been carried by national wire services. Philadelphia television was present from the beginning. New York television discovered the case six months later, and since Mr. McCarthy's testimony in Washington, Jackson Township has been featured on nationally broadcast stories about hazardous wastes.

The political repercussions of the situation in the locality have been strong. Republicans were able to win control of the township government from the Democrats last year. One of the Republicans' main campaign planks was the promise to be more responsive to Legler's problems; Legler residents accordingly organized a voters' drive on behalf of the Republicans and now take credit for their victory. Outside of the community, the Jackson Township case has had no political effect. However, it is widely known and discussed within regional and federal EPA offices, in Trenton, and among Congressional staffs in Washington.

The widespread attention given Jackson Township's problems is clearly attributable to the clamor raised by the extremely strident and persistent leaders of the Legler residents. Mr. McCarthy, in particular, is a hard-working organizer and a highly effective presence before cameras. The Washington hearings, as mentioned before, had a marked effect upon the recognition given the situation. Certainly here as elsewhere, when newspeople are looking for an example to illustrate a story, they tend to focus on cases that they know will be effective and that they can research easily because of past coverage. In this way, a few select cases may attract considerable attention and grow to prominence.

III. ACTORS

A. Government

Jackson Township is governed by a five-member elected committee, with one member serving as mayor. All are part-time politicians earning their livings through other jobs. None presently are from Legler. The township also employs a full-time administrator, attorney, and support staff for administration and municipal services.

The attitude of township officials towards the Legler residents and their problems was generally one of sympathy, even to the point of saying that "I would do the same thing if I were in their place." Nonetheless, they felt that all the hostility between the township and the Legler residents was caused by a small minority of the affected residents who were intent upon raising a commotion and

unwilling to be "reasonable." Township officials acknowledged that there had been delays in responding both to the Legler residents' questions and to their water problems. But the officials say that they could not answer questions until tests had been done, and that the results of the tests -- performed by DEP -- were invariably delayed. They plead that the new water system was delayed by difficulties in arranging financing, the impossibility of continuing construction during the winter, and a complicated permitting process (construction in the township is affected by a moratorium on development in the Pine Barrens). On the whole, say township officials, they were equally as frustrated as the Legler residents by these delays and irritated that the residents refused to be understanding. "What else could we do," they ask, "given our limited resources?" They also report frustration at being unable to quell opposition from the residents.

Relations between the township government and DEP were poor from the start. DEP's apparent procrastination in returning test results subjected township officials to verbal abuse from Legler residents who blamed the township for the delay. Township officials responded, as the mayor said, with the feeling that "the state let us down." DEP subsequently filed suit against the township for the well contamination, generating bitterness among township officials and the belief that DEP was acting only to save face and to present the appearance of being responsive to citizens. Those township officials who deal most closely with the state complained that they were continually given the "run-around" and had great difficulty getting the right agency to do the right thing at the right time.

On its part, the New Jersey Department of Environmental Protection has substantially changed both its programs (because of new legislation) and its structure in the last two years. According to both DEP staff and outside observers, the result has been a rapid rise in sensitivity to hazardous waste problems and in the expertise and resources to deal with them. Control over hazardous waste problems was shifted from the Division of Solid Wastes, whose primary focus is on refuse disposal, to the Division of Water Resources, whose focus is increasingly on groundwater protection. This division is now run by geologists. A $3 million spill fund is newly available in New Jersey, but it was put only to minimal use in Jackson.

Legler residents complain that "the state," by which they mean the Governor and DEP administration, was of no help to them whatsoever. Nonetheless, when pressed, they do cite several state officials who demonstrated great concern for their problems, and who went to great lengths to help. Prominent among these are a geologist in DEP's Division of Water Resources, who now devotes about one-third of his working time to the case, and a lawyer formerly in the public advocate's office.

Region II EPA has had little to do with the Jackson Township case. Indeed, EPA headquarters in Washington has had more contact with participants through pre-existing personal relations. Region II officials explain that the state DEP was already thoroughly involved in the case and appeared to be acting responsibly. And they say that they had no jurisdiction because only private wells, not public water supplies, were in question. This explanation has not satisfied Legler residents; DEP officials believe Region II should still have been more responsive to requests for laboratory aid in analyzing water samples. An additional reason why Region II appears to have avoided this case is that they want to prevent citizens from appealing to duplicate agencies and exhausting limited government resources, so they stay entirely away from certain cases. Accordingly, Region II EPA and DEP now delegate responsibility for individual hazardous waste cases in New Jersey to one agency or the other.

B. Legler Citizens

Virtually all public participation in this case has been channeled through the Legler Concerned Citizens' Committee, an ad hoc group organized shortly after the November 8, 1978 notice of well contamination was mailed. Existing civic and community groups in Jackson Township have done nothing in this matter and have said little one way or the other. The Legler residents and their lawyer appealed to New Jersey environmentalist groups (e.g. the Sierra Club), but found them either unwilling to help or naive in their recommendations. Several academic people in nearby universities (Princeton and Rutgers) were said to be both interested and very helpful. However, the outside groups most frequently cited as valuable were similar ad hoc citizens' groups from other localities with hazardous waste troubles. Legler residents maintained telephone contact with some of these groups and furnished reciprocal aid.

The Legler residents' group consists of 107 of the affected families; about 40 affected families do not participate. The degree of participation in the group varies, but there is a core group of about 30 people. The primary organizer and de facto leader is the aforementioned Jim McCarthy. Mr. McCarthy is unemployed, allowing him to work full-time on this matter. He also has a strong emotional impetus: he lost his infant daughter to kidney disease several years ago, and he later had to have one of his kidneys removed. Under the direction of Mr. McCarthy and several others, the group is well-organized and efficient. And there seems little question that although Mr. McCarthy takes the spotlight, he is representative of the concerns of the group's members in general. Whether his personal manner and tactics -- which are consistently confrontational and even abusive -- are representative is a different matter. Some residents interviewed felt that while Mr. McCarthy's tactics have been effective, they would have preferred

him to have toned down after a point. Township officials claim that his "irrational" attitude is unrepresentative of anything more than 10% of the Legler residents. On the whole, the group's cohesiveness seems largely the product of Mr. McCarthy's diligence and organizational skill. Interviewed group members cite the need for such a leader in this sort of situation.

None of the Legler residents had previous experience with any comparable activity, nor had any been politically active in a conventional way before this incident. Some had participated in civic or fraternal organizations, but none could be found who had belonged to environmental groups or had even thought about environmental matters before (beyond desiring to escape the noise and pollution of the city for rural Jackson). Their experience has now made them think highly of activists like those at Love Canal.

Some Legler residents had distrusted the township government prior to this incident because of opposition to the siting of the landfill and dealings with building inspectors. They also thought that township officials were inclined from the start to be unconcerned about Legler's problems. If this is true, it is not because of differences in socio-economic status. People in Legler generally have lower incomes than people elsewhere in the township, but the differential, except for the "pineys" in Legler, is not great enough to represent a class distinction; and the origins of most residents in the township -- emigres from northern New Jersey or New York -- are the same. Rather, geography plays a more important role: Legler lies "off in the woods" away from the major development in the township.

The residents involved in the Concerned Citizens' Committee have all been affected by well contamination. Some people elsewhere in the township expressed support for the Legler residents, but on the whole, other Jackson citizens have maintained their distance. There is an undercurrent of resentment at the Legler people because of the increase in local taxes necessitated by their new water system as well as their "rabble-rousing." Indeed, there were some affected Legler residents dissuaded from involvement by the tactics of the Citizens' Committee.

The concerns of Legler residents are not surprising. The intensity of their reaction to the contamination of their wells was undoubtedly the product of the feared effect on their health. Those recently afflicted with serious kidney maladies reacted most strongly. While residents recognize that their problems are probably not as acute as those of the people at Love Canal, they worry especially about the possibility of illness among their children. At the time of this report, the main demand of Legler residents upon the state was for a health survey. Residents had obtained copies of the survey used at Love Canal, circulated them,

and given the results to the state health department. The state concluded that no link could be established between the drinking of contaminated well water and the more serious of the local ailments (the kidney problems, in particular); yet residents reject this survey as inadequate. What residents say they want from an adequate survey is some indication of the kinds of health problems that may, with time, threaten them and their children. That, they say, would warn their doctors about possible health developments to be guarded against in the future.

The concern that dominates the community, however, is money. The current point of dispute between Legler residents and the township is over the payment of the fee to hook up to the new water system. There is anger at having to pay the township for correcting a problem that is perceived to be of the township's own making. The belief that township officials have been concerned has increased their anger over this matter. The need to pay for water that used to be free and the expected loss in property values also causes displeasure. In fact, according to Mr. McCarthy, Legler residents would never have brought suit had the township simply dug them new wells or installed a new water system at no cost. Cynical observers say that Legler residents are concerned solely about money and use the health issue as a rationalization. Even some Legler residents say they are "counting on" the money from the lawsuit, although no award from the lawsuit would be distributed to individuals. Some residents are now resisting the township's order to cap their contaminated wells: they want to be able to use the free water for watering their lawns.

Daily concerns have been the lack of running water for drinking and bathing purposes, the problems with the delivery of water in cans, and the delays in receiving a permanent new water supply. Some residents convey the strong impression that once they have running water in their homes again, much of the flame of political activism will die out; the problem will then be over.

IV. INTERACTION AND INFORMATION

A. Citizens' Tactics

The leaders of the Legler Concerned Citizens' Committee have persistently explored every conceivable source of action or assistance. Their initial move was to circulate a newsletter among residents and to appear *en masse* at township committee meetings. Subsequently, they hired a lawyer and sued the township. They rapidly organized a successful appeal to lower their county tax assessments. They solicited the help of every possible state and federal elected representative. Their persistence may have been counterproductive at times: the initial willingness of state representatives to help evidently declined as requests for aid were

repeated. The tactic cited by Legler residents as most effective was the threat to call in the press. While township officials are clearly not happy with the adverse publicity, they deny that media attention has in any way altered their actions.

B. Information Sources

The cause of the initial friction between Legler residents and the township was residents' claims that their questions went unanswered. On the other hand, township officials say that they told the residents everything they knew, but that some questions simply did not have answers (e.g. questions about standards for permissible chemical content in water). They also claim the residents simply did not like the answers they got, saying "They just were not the answers they wanted to hear, namely, that everything would be done for them immediately and at no cost." The former township health officer -- whom several Legler residents cited as trustworthy -- gives the same explanation for the friction between residents and township government. Residents claim that, on the contrary, they asked questions that township officials should have been prepared to answer -- When will the landfill be closed? When will we get water? What are our legal rights? -- but that the only answers they received were that their questions would be looked into and that no money was available.

The result, in any event, was that residents lost confidence in township officials except for the former health officer, who remained an important source of information. The primary information sources for residents have been their lawyer and Mr. Wayne Saunders, the DEP geologist. Mr. McCarthy says that other government officials have leaked information to him.

Perhaps the most appreciated information source, however, were citizens from other communities with hazardous waste problems. Legler residents report that they obtained from such people information they could find from no other source: advice on how to prod unresponsive government agencies to action as well as the comfort that comes from talking over traumatic experiences with others who have been in the same situation.

The media played no role in providing information of value to local participants. Published information was largely derived from what Legler residents, their lawyer, or township officials wished to disclose. There was no revealing investigative journalism. Residents found newspaper reportage repetitious and sometimes inaccurate. Both township officials and residents found coverage to be generally fair, except for an occasional attempt to sensationalize the case. Television news stories by WABC-TV of a health catastrophe had the unwanted consequence of scaring residents. None of the Legler residents were cognizant that

reportage that attempted to side with the residents sometimes had the opposite effect: some outside observers received the impression of an irrational and obstreperous group with excessive demands. Reports that their health problems could not be tied to the contaminated well water corroborated this impression.

The Jackson Township case is distinguished by an absence of conflicts in information from different sources. There was no conflicting information in part because people like Mr. Saunders and the former township health officer knew the importance of presenting information sensitively and intelligently. They stressed the need to be as open, informative, and consistent as possible, and they were careful to avoid giving partial information or bits of a story which could easily be distorted when taken out of context.

Most material of a technical nature could be comprehended by leaders of the Legler residents with some supplementary explanation. Expectations from medical and epidemiological information were realistic. Residents say that they do not ever expect a health survey to establish a causal link between their contaminated well water and any particular individual's disease, but they do expect to learn what problems they stand a greater likelihood of developing because of the chemicals they had ingested over time. Some residents were afraid of medical information and admit that, in consequence, they did not answer the questions on the health survey truthfully. They simply did not want to know that they might have serious health problems.

C. Conflict Mitigation

The stimulus to conflict in this case was a lack of satisfactory information. The nature of the conflict at Jackson Township shows how important it is to provide as much prompt information as possible and to present it in a sensitive way. However, it is doubtful if information alone -- even in adequate supply and skillfully presented -- could have prevented conflict in this case. Township officials firmly believe that Legler residents would have been unhappy with anything they were told other than that their problems would be rapidly remedied at no cost. And certainly, once antagonism had grown, no amount of information alone would have been able to restore relations. The only way to quell the agitation of the Legler people would be to eliminate their main concern by furnishing a new water supply. Yet even that would not wholly dispel anxieties over health.

An important distinction must be drawn here between what is technically preferable, what is politically preferable, and what is economically feasible. The politically preferable solution to the problem would have been to dig each family a new well at no cost the family; that is what Legler residents asked for, what the Republican

candidates wanted to give them, and what would therefore have most effectively ended the conflict. The technically preferable solution was to build a new water system with one deep well as its source. Only one well would have had to be monitored. Furthermore, the risk of contaminating the deep aquifer with wells that puncture the shallow contaminated aquifer first is less with one well than with 160 individual wells. The only economically feasible solution, however, was to build the new water system. Even though one deep well was more expensive than individual wells, the township could not obtain financing for any other course of action. Thus, the township government was compelled to choose a response that, while technically preferable and economically feasible, was not the best means of mitigating conflict.

Region II EPA officials, in commenting on the case, explained the value of having an on-scene coordinator to channel all communication between citizens and government -- a mechanism absent in this case. However, the new Jackson Township government understands the need to have one person to whom all questions are directed and who must provide answers. All water problems are now handled by one person recently hired by the township to supplement the administrative staff. This coordinator relieves the township attorney of what had previouly been an additional duty.

Legler citizens suggest further means of allaying the fears of a traumatized public. When asked what they would recommend to protect others from their problems, most suggested bringing citizens from various communities with hazardous waste problems into contact with one another, perhaps by establishing some sort of formal network. The experience of Jackson Township shows the positive utility of these contacts for calming a distraught public. Other cases, however, indicate that such contacts can have an inflammatory effect by inviting unwarranted comparisons to the most serious hazardous waste emergencies.

V. EFFECTS ON PARTICIPANTS

Legler residents came away from their involvement in these events with a deep bitterness towards government on all levels and a thorough disillusionment with the intentions of government officials. Many evidently expected the government to step in with an unlimited purse and resolve their problems. Now anything said by anyone in government is distrusted and their motives held suspect. Legler residents recognize that certain government workers were concerned and helpful. But they regard such people as acting on their own in defiance of "the government." They do not see them as an integral part of government.

Many Legler residents have claimed psychological injury; complaints of stress, excitability, tension, and their consequences -- such as failing marriages -- were heard.

The implications of this case for maintaining long-term citizen involvement in the process of remedying hazardous waste problems are somewhat negative. Bitterness towards government is not conducive to long-term involvement, nor is the attitude of some Legler residents that "once we get our new water system, our problems are over." Resolution of the tangible personal problem, it seems, can lead to an end to concern for other people's problems. On the other hand, Legler residents who became politically active for the first time in their lives said they would not hesitate to do the same thing again. They did not say this in a spirit of cooperation with government, however.

For the Jackson Township government, the involvement of Legler citizens had little effect upon which course of action was chosen. The decision to construct a new water system, for example, was compelled by financial constraints. Township officials admit, however, that citizens' involvement speeded such decisions. The effect of the Legler citizens' agitation on DEP may have been greater; it certainly focused the attention of certain DEP officials on this particular site in a state with so many similar problems.

This incident has, as a whole, made government officials more sensitive to the inflammatory nature of such situations and to the care that they must take to contain them. The Republican administration (now in office for one year) gives indications of greater political adeptness than its predecessor. It was initially able to exploit the situation to its advantage, winning election on a platform of willingness to listen to Legler's problems. Once in office, it found itself unable to control events, in spite of its attempts to keep Legler residents better informed by means of a staff coordinator and increased mailings. The new government was clearly in well over its head, and was further hampered by personality clashes, for which it bears half the responsibility. More important, though, is the new administration's attempts to ward off future developments of this sort. Thus, the township is trying to persuade Legler residents with uncontaminated community wells to hook into the new water system, although these residents naturally are opposed to doing so. The township government's approach has been to identify the apparent leader among the concerned residents, become acquainted with him, and, under the coordination of one person within the township administration, respond promptly and consistently to all of his questions. This approach reveals a degree of foresight, caution, and calculation that is undoubtedly the fruit of experience with political developments no one wants to relive.

VI. SUMMATION

The turn of events in Jackson Township was, in large part, the product of the inexperience of a local government unprepared to respond to the questions Legler residents brought to it very early

on. The public, already disturbed, reacted angrily when it could not get the information it sought; rightly or wrongly, it began to perceive its government as deceitful and fraudulent. In essence, the township government's image began to suffer: it could no longer control the way its citizens perceived it. And once residents perceived their officials as negligent and callous, there was no recouping. The current township government seems to have learned to some extent from its predecessor's experience, but its efforts continue to be hampered by personality clashes.

There is perhaps no way to be fully prepared for a hazardous waste problem of this sort. But local governments can, regardless of where the fault lies, control the political environment by demonstrating sensitivity, consideration, and some measure of foresight.

WOBURN, MASSACHUSETTS

INTRODUCTION

In 1979, EPA tests revealed to the public for the first time that 800 acres of land and wetland in North Woburn at the crossroads of two major highways, north-south Interstate 93 and the Boston beltway, Rt. 128, were scattered with the wastes of 130 years of chemical, leather, and glue manufacturing in the area. The Woburn site is the oldest of this series of cases in the sense that toxic wastes have been dumped there unsafely since the beginning of the Industrial Revolution, yet it is one of the most recent sites to come under public scrutiny as a hazardous waste problem.

Woburn also stands out for the complexity of the issues involved. EPA and Army Corps of Engineers officials found hazardous chemicals in 1979 at a site being developed as an industrial park, Industriplex-128, in North Woburn. On that site, the investigators found a series of open arsenic pits, chromium lagoons, other heavy metals, and buried or piled, decaying animal hides, hair, and carcasses soaked with a chromium solution and emitting a strong odor of hydrogen sulfide. Area residents are concerned about the chemicals, but they are more worried by recent statistical analyses of cancer deaths, showing Woburn to have the highest cancer rate in Massachusetts for cities over 20,000 people. They wonder whether the cancers were caused by exposure to the chemicals in North Woburn, or by other chemicals, such as the trichloroethylene and chloroform, two suspected carcinogens, discovered in two drinking water wells in early 1979 before they were closed. The source of those contaminants has not yet been found, nor has any link between the contaminated drinking water and the high levels of cancer and childhood leukemia been established.

Citizens who are potentially affected by Woburn's hazardous chemical problem -- parents of leukemia victims, residents downwind from the decaying animal parts, businesses having trouble recruiting employees to work in North Woburn -- have been the most persistent voices calling for a solution to the hazardous waste problem. Other more general environmental activists in the region have also become involved, but in fewer numbers and with less intensity than actual residents of the area. Government offices at all levels, including the Woburn city engineer, the Massachusetts Secretary for Environmental Affairs, EPA headquarters personnel, and the National Center for Disease Control (CDC) epidemiologists have become involved. After some initial problems, the exchange of information and the coordination of both citizen and government participation have been extraordinarily good. But the lack of an adequate program

to solve the problem and perceived government inaction continue to frustrate residents. At the time of this report, the community is still far from a complete understanding of the whole problem -- the location and type of wastes, the degree and means of human exposure to the chemicals, and the likely health effects of that level of exposure -- much less a solution to a very complex situation.

I. CHRONOLOGY

A. Early Industrial Dumping, 1853-1969

The northwest quadrant of the crossroads of I-93 and Rt. 128 has long been the site of hazardous waste-producing industries. Merrimac Chemical Company, the largest chemical concern in New England at the turn of the century, manufactured acids and other chemicals for northeastern industries from 1853 to 1929 at its Woburn plants at the site. For seventeen years prior to World War I, Merrimac manufactured arsenic and lead-arsenic compounds for use as pesticides. During WWI, it made explosives for the French government.

Woburn had dozens of leather tanning industries during those times. The chemical company which provided chromium and acids to burn the skin and hair off hides for tanning may have allowed the tanneries to deposit the animal wastes on its North Woburn properties. Pockets of hide wastes have been discovered throughout Woburn. The Massachusetts Department of Public Health (MDPH) has records of hydrogen sulfide testing in response to odor complaints in Woburn as early as 1863.

In 1929, Monsanto Company took over chemical manufacturing at the site, and in turn sold the property and buildings to Consolidated Chemical Industries. This concern manufactured hide and bone glue at the site, further adding to the buried animal material. Consolidated Chemical worked the site until 1969, when the present owner, William D'Annolfo, as trustee of Mark Phillip Realty Trust, bought the site. His plans were to redevelop the old industrial site from the Woburn-Wilmington boundary south along the Boston and Maine Railroad tracks on the west and I-93 on the east to the Route 128 beltway as an industrial park called Industriplex-128.

B. Industriplex-128 Development, 1970-1979

Most of the hazardous waste problems are located in the northern third of the Industriplex property. The developer and the Woburn City Engineer who recommended the permit to develop the property, and the State Department of Natural Resources (as it was called then) knew of the presence of the chromium lagoons and the buried hides. A permit, #P-988, was granted by the DNR to proceed with the development, with the condition that the abandoned chemical

lagoons would be covered and sealed within one year of the permit date of December 23, 1970, that suitable material would be used to fill the wetlands, and that appropriate stormwater channelization and holding ponds would be provided.

The work began in late 1972 from the southern end of the property. A consulting engineer, Melvin W. First, tested construction worker exposure to chromium, arsenic, hydrogen sulfide, and particulates and found the levels to be about half the threshold level for worker safety, on average, but explained that the testing was done during the wet season when airborne dust was low. He recommended that operations cease during the dry summer months.

Excavation work progressed on the property, with permit extensions granted yearly without inquiry by the state. The summers of 1973 and '74 were noted by residents in Reading, a town northeast and downwind from the development, as being the smelliest in years. D'Annolfo's workers were uncovering pockets of buried animal hides and depositing them in uncovered piles at the northern end of the property. Reading complained to the state air quality officials of nausea, headaches, loss of apetite, paint peeling off houses, and other problems from the "rotten-egg smell" from Woburn. The state issued notices of air pollution violations to Mark Phillip Trust, which were ignored.

Building slowed with the recession of 1975, but 1976 and 1977 again brought hydrogen sulfide into Reading at the slightest breeze. Beginning in the summer of 1977, the state government, reorganized as the Department of Environmental Quality Engineering (DEQE), began to deal more forcefully with the Industriplex nuisance. The DEQE issued a series of notices of violation of air pollution regulations, agreements between the state and the developer on methods to reduce odor, and finally a threat of a state legal action. The "Woburn odor," as it was now known in Reading and Wilmington, continued, but was more noticeable at night and on weekends.

In a January 1978 lawsuit, the Town of Reading, through the effort of an organization of residents called CAP, Citizens Against Pollution, obtained a preliminary injunction from work on two lots on the D'Annolfo property where the hides were concentrated the thickest. D'Annolfo, however, sold those lots to another developer and, on April 2, 1979, when Reading citizens complained again of odors from the site, the new developer was found bulldozing more hides and claiming no knowledge of the injunction.

C. Public Discovery of the Hazardous Waste Site, 1979 to Present

While Reading, a middle to upper-middle class bedroom community, was feeling a significant impact from the wastes in North

Woburn, the City of Woburn was unaware of any problem. Woburn was near bankruptcy in 1972 when a new mayor took office, and his pledge was to increase the tax base for the old, industrial, blue-collar town. The "clean industry" that Industriplex was attracting was an asset to Woburn, so potentially noticeable problems with the site may have been overlooked during the seventies. Instead, residents and officials focused on the greater good of community solvency and jobs.

In May 1979, the first of four discoveries, which were to become associated that year as "the Woburn problem," came to light. Two bad-tasting wells in East Woburn, the "G" and "H" Wells which had been used for drinking water in the neighborhood for 15 years, were tested for organic contaminants for the first time. Trichloroethylene (TCE) and chloroform, both suspected carcinogens, were found and the wells were closed on May 22. Investigations to find the source of those chemicals led to the discovery of illegally dumped drums at a property at the southwest corner of the Industriplex development, but those drums did not contain TCE or chloroform. The source of contamination has not been found to date.

In mid-June, an EPA wetlands engineer riding a bus on I-93 to work noticed some workers filling in wetlands of the Aberjona River on the Industriplex site. He knew that no 404 permit was registered for the fill of that waterway and notified the Army Corps of Engineers facility in nearby Waltham. The Corps investigator was refused admittance to the Industriplex property, but issued a cease and desist order until a 404 permit was obtained. The developer continued operations on the uncompleted northern end of the Industriplex site, which activity was discovered in an Army overflight of the area. The Corps filed a non-compliance action against the developer in federal court which finally brought work at the site to a halt.

Throughout the month of July 1979, the site was investigated and tested by a team of Army Corps, EPA, and DEQE engineers, who found the site apparently mismanaged. They discovered that the chromium lagoons and arsenic pits had never been covered, sealed, or even fenced, and decaying hides were piled up under Boston Edison 115,000-volt lines to within 18 feet of the wires. The Industriplex developer was using the decaying, chemical-laced animal material as part of the fill for a pond on the property. This evidence triggered the court case brought in August 1979 against the Mark Phillip Trust.

The federal agencies coordinated activities with the state DEQE during the July testing. Although the State DEQE personnel met with people who lived near the site and could relate its history, neither the press nor the City of Woburn was notified of the hazardous chemical findings. Finally, in the early weeks of September 1979,

the story broke. The City Council, Board of Health, and other Woburn officials immediately complained of lack of communication and asked state and federal representatives to the next Council meeting for a briefing. Later, on November 1, the Woburn Board of Health held a public meeting at City Hall where Woburn and DEQE representatives answered the five residents of Woburn and Reading who asked questions for the benefit of an audience of about 50.

Earlier in the fall of 1979, another meeting took place at Trinity Episcopal Church in Woburn. Reverend Bruce Young, who had been investigating since 1972 what he thought was an unusual rate of leukemia among the children of his parishioners, called an open meeting on October 4 for East Woburn cancer victims and their relatives. The timing of the meeting was coincidental with the surge of interest in hazardous waste in Woburn. Rev. Young was more inclined to link the cancers to water from the now-closed well, if anything. His objective in the meeting was to get a better understanding of the leukemia and related cancer problem he felt existed in Woburn.

Two months later, a routine five-year statistical study of the incidence of cancer deaths in Massachusetts towns revealed that Woburn had the highest cancer death rate for a city over 20,000 in population in the state. Cancer of the liver and kidneys was very high and increasing in Woburn. Leukemia incidence (not deaths) were subsequently found to be over two times the normal rate, particularly for the East Woburn community. This finding had much more of an impact on traditionally apathetic Woburn than the hazardous waste discovery. The average Woburn resident blamed the cancer problem on the water, and many now use bottled water for drinking, though the only wells known to be contaminated were closed earlier in 1979.

Finally on December 30, the Woburn Fire Department evacuated several Industriplex buildings on the completed southern half of the site due to high levels of explosive methane gas. The gas is thought to seep into the buildings from the decaying animal hides buried beneath some of the Industriplex structures. Several of the businesses on the site now monitor the indoor air for the odorless, colorless methane gas.

D. Public Involvement in the Woburn Site, 1980

The 1979 discoveries in Woburn shocked most of the city into an awareness of the extent of the hazardous waste problem. The only ad hoc community organization previously involved in the problems of the site was the Reading CAP. January 1980 marked the formation of a Woburn group centered around Rev. Bruce Young: "For A Cleaner Environment" (FACE), which is mostly concerned with the public health problems that may be associated with the wastes, but

has been benefitted and broadened by the involvement of a Woburn resident who also works for the Hazardous Materials Branch of EPA's Region I. Her insights into the workings of government have been a great help to Woburn's citizen activists.

The Region I EPA office intensified its interest in the Woburn site in January 1980. The Region I Administrator wrote a memo to EPA Administrator Costle requesting money for testing at Woburn. The Region also appointed a full-time coordinator for the site, who channeled citizen concerns to the correct government branch and coordinated intergovernmental actions.

At the same time the Army Corps of Engineers brought suit against Mark Phillip Trust in federal court, the DEQE and City of Woburn sued the developer in the state courts for proper clean-up of the waste site before any construction could resume. In early February 1980, a consent decree was worked out between the Massachusetts Attorney General, the DEQE, the City of Woburn, and the Mark Phillip Trust, and it was signed. The decree was not finalized, however, because the negotiations failed to include all the local interests. Reading was not consulted. The court date was postponed until August 1980, when Reading was signed as a co-plaintiff with Woburn and the DEQE.

A series of public meetings were held in April 1980 to exchange information on Woburn site findings and concerns. The Mystic River Watershed Association (MRWA), a regional environmental interest group concerned with the Mystic River groundwater and surface water quality, and several other environmental groups sponsored a public meeting at the Trinity Church on April 1. Representatives from DEQE, EPA, the Army Corps of Engineers, and the MDPH were present to answer area residents' concerns about the hazardous waste problem and its effects on the nearby communities. Over 300 people attended the meeting which ended with a call for an epidemiological study of Woburn residents.

In the meantime, the agencies themselves were preparing a public meeting to present a management plan drawn up for site clean-up by Fred C. Hart Associates and to announce EPA funding of $130,000 for Woburn testing. EPA and DEQE first briefed Woburn officials and area legislators on April 8, 1980. Then they announced a public meeting on April 16 at the Woburn Junior High School auditorium. Due to the previous recent meeting, fewer citizens attended the EPA/DEQE meeting, though it received coverage in all the local and regional newspapers and television, including the national networks. It was aired by ABC and CBS on May 5, 1980, with the promulgation of final RCRA regulations.

Two unofficial studies on the Woburn site were completed in May 1980. The Tufts University Department of Urban and Environmental

Policy's Urban Advocacy Project published a report entitled "Hazardous Wastes in Woburn." It was initially part of an ongoing study of the "Woburn odor," but expanded to include the entire hazardous waste problem when the extent was revealed. A second study was released internally by the North Suburban Chamber of Commerce (NSCC) a thirteen-community business leaders' group. The NSCC has coordinated very little with other interest groups involved in the hazardous waste problem in Woburn, but it has produced its own report and is lobbying through its members for the passage of Superfund.

Also in May 1980, the federal consent decree between the Army Corps of Engineers and the developer was signed by both parties. D'Annolfo, however, will not begin the work required in the federal decree until the state order is also settled.

The Massachusetts Secretary for Environmental Affairs announced in May that the state legal action in Woburn constituted a "major and significant" action, which requires an environmental impact assessment. The Massachusetts Environmental Protection Act also provides for a Citizens' Advisory Committee (CAC). The members of the CAC were appointed by town, through a formula providing for a specific number of members from each area town. Representa- tives from EPA, DEQE, and the Corps of Engineers attend but do not vote. The CAC has met almost weekly on Wednesday nights since its formation, although due to the group's limited agenda, the interest is beginning to fade. The meetings do, however, provide a forum for the free exchange of information between citizen activists and responsible government officials.

On June 6, 1980, Senator Edward Kennedy invited three Woburn and Reading residents to testify before his Senate Subcommittee on Health and Scientific Research in a hearing on the health effects of abandoned hazardous waste sites. Residents from Love Canal and Jackson Township, New Jersey, as well as researchers from CDC also spoke.

The epidemiological study requested at the April 1 public meeting was begun in June, and the data collection continued through August 1980. This modified case study for possible cancer causes is being conducted with 47 cases and 30 control individuals from Woburn. The results are due in October 1980.

The most recent site samples were taken by the EPA site coordinator in late July 1980. These 15 groundwater and surface samples were tested by EPA laboratories for 129 chemical pollutants in August.

II. VISIBILITY OF THE ISSUE

The Woburn hazardous waste problem has received extensive local and national media coverage. Most Woburn residents, who are known to be unsupportive of "issues," are aware that a hazardous waste site exists somewhere in Woburn, and that it is getting a lot of press. Some feel the attention is giving Woburn a bad name. Most residents, unless they live in northeast Woburn where the wells were contaminated, do not think the problem potentially affects them.

The citizens of Reading, on the other hand, are much more aware of and actively involved in the issue for at least four reasons. Reading residents are, on the whole, better educated and have bigger property investments to protect than Woburn. They have been aware of the problem in North Woburn for years longer and are more mobilized because of it. They also are more directly affected by the site: smells are more immediately attributable to the Woburn waste than are potential long-term health effects. Finally, several citizens from both Woburn and Reading mentioned that the Reading form of government (open town meetings) is much more conducive to active involvement than is the City of Woburn, with a strong mayor and more centralized city bureaucracy.

At the state and regional level, Woburn is viewed as the first priority for hazardous waste site clean-up, now that the Lowell, Massachusetts, site is better under control. State and federal legislators have a keen interest in keeping briefed on Woburn site-related events and have passed bills or lobbied effectively for money for the Woburn chemical dump testing and management.

III. ACTORS

A. Agencies

1. Local Officials

The Mayor of Woburn and his administration are very much affected by the problems which surface in their city, particularly when the scope of the problem expands beyond their means to control the issue, to abate the problem, or even to understand the problem fully. The mayor and his administration were able to turn the economy of the City of Woburn around in the seventies by attracting new industry to the old manufacturing town. One of the centerpieces of the prosperous, new Woburn was the development of Industriplex-128 on what had been wasteland. With the discovery of an uncontrolled hazardous waste site in their city, present through no fault of any living person, the administration realistically sees a future loss of new residents and businesses who fear "the water" or merely the idea of a hazardous waste site in the city. The mayor feels that his best strategy in Woburn is to try

not to call any more attention to the problem than there is already, and hope that the developer, the state, or the EPA will come up with a clean-up solution that is publicly acceptable.

The City Engineer is even more directly involved in this issue than is the mayor, for he approved the developer's plans and permit applications throughout the development period. He still has the engineering plans for the sealing of the chromium lagoons and feels the arsenic can be contained similarly. Why these plans were never carried out during the early stages of Industriplex development is not understood; the city does not feel responsible. The City Engineer is one of Woburn's representatives on the CAC.

Another city representative at the Wednesday night meetings is the Woburn Conservation Commissioner. The Conservation Commission was on hand several times during the Industriplex development period to protest the use of illegal, "slimy and putrid" fill material in the wetlands of the Aberjona River. At the time, the developer's standard answer to all agency protests was that the body had no jurisdiction over his operations, that another agency did. The Woburn Conservation Commission was no exception. Now that all levels of government have met in a more united front, the Conservation Commission's interests in preserving the land and water quality in Woburn are being addressed.

The Woburn Board of Health, with no full-time staff, is not qualified to intervene in matters of such complexity as the interactive effects of the various chemicals potentially abroad in Woburn and their effect on the public health. In some states, local health boards are well-funded, and well- staffed. The Woburn Board is neither of those; satisfied with being kept informed, it leaves the health studies to the state.

The Woburn City Council has been actively involved and interested in the hazardous waste site problem. The City Council called the first public meeting in September 1979 with the state and federal engineers to answer questions on the Industriplex site investigations. The Council formed a three-person Subcommittee on Hazardous Waste to keep apprised of the progress of the site studies, but the Council feels that the problem is "bigger than the City of Woburn." Like the citizens of Woburn, they are concerned about all public health findings and also about the impact of the problem on area business and property values. But they are most interested in matters of health.

The official body in Reading is its Town Selectmen. Reading has been active longer and more effectively in the Woburn waste problem, because of its citizens' groups and because of the way the town has been able to respond to the problem. Reading, as a town, has been able to intervene effectively in the state consent decree with the

Industriplex developer when it was excluded from the initial negotiations. Another member of the C.A.C. is Reading's Conservation Commissioner, who makes sure Reading's concerns about airborne pollutants are taken into consideration in any management decision over the Industriplex site.

2. State Agencies

The Department of Environmental Quality Engineering has been involved in the Woburn site throughout the Industriplex development phase, initially under the DEQE's former title of the Department of Natural Resources. The original DNR permit mentioned capping the old Stauffer chemical lagoons as a condition of development, giving evidence of the state's knowledge of the chromium lagoons a decade before they became a major public issue. In the mid-seventies, when most of the Industriplex development was constructed with little regard to the air pollution nuisance or the integrity of wetlands fill, the state government was being reorganized. In 1977, the DEQE was well enough established to fight the developer on his air pollution violations. The Town of Reading was happy to see some official action, after years of complaints. According to Reading residents, however, the state did not pursue the developer vigorously enough. The odor was still present after cease and desist orders from the State Attorney General, so Reading itself, through its Board of Selectmen and town attorney, went to court against the developer.

In the 1979 discoveries, the DEQE was consulted by the federal site investigators from EPA and the Army Corps of Engineers. DEQE had done a study in April 1979 researching the history of the property and speculating on what chemicals might be present. That spring, DEQE and Reading had taken the second developer, to whom D'Annolfo had sold his enjoined properties, to court to work out an agreement to abate the odor. When the July 1979 tests of the site proved the presence of open hazardous chemical deposits, the state was still in court with the two developers on the odor nuisance. The DEQE and state Attorney General expanded the existing case to include the wetlands violations, the water pollution aspects, and the hazardous waste problem as well as the air pollution issue. The state consent decree being negotiated is very similar to the federal decree, due to early coordination of the federal and state engineers and attorneys in August 1979. One difference is that all three co-plaintiffs, DEQE, Woburn, and Reading, must agree on the approval of testing, clean-up, and monitoring decisions on the Industriplex site.

The DEQE has been very open and responsive to citizens since the hazardous waste problem became an issue. Although DEQE has a very small staff, less than 30 professionals, they have given much personal attention to Woburn. DEQE representatives have been

present at every public meeting on the subject, and a DEQE engineer attends the CAC meetings each Wednesday night to answer questions and receive citizen comments.

The Massachusetts Secretary of Environmental Affairs has also been responsive to the hazardous waste problem in Woburn. As a part of the governor's office, the Secretary has general oversight over all state environmental and natural resource agencies. According to the Secretary's 1981 plan, Woburn is the number two priority for the state in uncontrolled hazardous waste goals. Promulgating state regulations on hazardous waste sites is the state's first priority. In May 1980, the Secretary formed the Citizens' Advisory Committee on the Woburn site issue, and has met with the CAC chairperson several times since to keep abreast of the problem.

The Massachusetts Department of Public Health has a vital role to play in the Woburn hazardous waste problem, warning the citizens of nearby communities what exposure they may have to hazardous chemicals through various environmental media, what health effects the substances can cause, and what residents can do to prevent the health problems. The MDPH has been involved in the problem at Woburn for over a century, having tested the water in Woburn for dissolved hydrogen sulfide in 1863. Until recently, specific responses to Woburn have always involved an odor problem. When the high and growing cancer death rate was found in Woburn in 1979, the MDPH followed up with two more intensive studies. Because the first study was only a statistical count of those whose cause of death was listed as cancer, not actual incidence of cancer, the second study investigated cancer in Woburn from hospital records -- a difficult process since Massachusetts has no tumor registry. The second study confirmed the first statistical analysis and found the leukemia rate in Woburn to be over two times the national average. The report of the third study is due in October 1980. This is a modified case study with 47 cases and 30 control subjects who were questioned on their length of residence, jobs, habits, and family history as well as their medical problems.

Although the MDPH addresses an issue of great concern to the citizens, they have been less involved in the public information/citizen participation process than the DEQE or the federal agencies. According to the latter, the MDPH is not a "team player." The MDPH answered questions at the two April public meetings, but has not been involved with the CAC process. Their responsiveness to specific questions and requests for studies, however, has helped those who are interested in the health problem.

3. Federal Agencies

The Region I Environmental Protection Agency has been involved in the Woburn site since June 1979 when (as noted above) an EPA wetlands engineer noticed illegal fill activity on the site and notified the Army Corps of Engineers. EPA personnel and labs did soil and water sampling and testing for the Corps, and have followed up the July 1979 tests with more extensive testing in August 1980. Citizen activists feel EPA has been very responsive to local inquiries and give much of the credit to the EPA site coordinator located in EPA Field Office in Lexington, just west of Woburn. The local people are not as pleased with the speed of response to the needs for testing and containment of the hazardous chemicals. A year passed before the second round of water tests were done to measure the migration of the chemicals off-site, and air monitoring stations are planned but not in place at the time this report was drafted. Eleven months passed before EPA put up wire fences and warning signs around the chemical pits. But the townspeople did appreciate EPA taking these protective measures. At least, they did not have to wait for the developer to do so.

EPA is presumed to be the only agency with the money and manpower to clean up the site if the developer reneges. Even if he does agree to do the work necessary to contain the wastes, the concerned citizens will want EPA as well as the state agencies to oversee the project to assure that it is done properly and on schedule.

Like some of the other cases studied, Woburn community leaders believe that EPA should use their site -- with its multiple chemicals, multi-media pollution problems, and potential public health effects -- as a prototype for managing other hazardous waste site clean-ups. EPA has moved in that direction by appointing a site coordinator, but the approach to testing and management appears somewhat piecemeal. With the intergovernmental coordination as smooth as it has become at this site, many feel EPA should use a more comprehensive approach at Woburn. That, however, would take more resources than EPA has allocated to the Woburn problem -- resources that are highly limited.

The Army Corps of Engineers took the initial federal action in the Woburn Industriplex case. They are well-regarded by the Reading citizens as the first government body able to put a stop to the North Woburn development. Like the EPA and DEQE, the Corps has been present at all public meetings and C.A.C. meetings to answer questions and field citizen complaints. At this point, the Corps of Engineers is not viewed as the longer-term manager of the waste site cleanup. The Corps does not have the chemical testing laboratories EPA uses, and their authority does not extend beyond wetlands dredge and fill permitting.

A host of other federal agencies have been involved in the Woburn hazardous waste problem less centrally than EPA and the Corps. The U.S. Fish and Wildlife Bureau was involved with the 1979 investigation of the illegal wetlands fill and its impact on the flora and fauna of the Aberjona River and downstream. The National Center for Disease Control was consulted by Rev. Young on the leukemia problem, and by the MDPH in designing the epidemiological study of the cancer incidence in Woburn. The Occupational Safety and Health Administration (OSHA) and the National Institute of Occupational Safety and Health (NIOSH) have been involved. An OSHA investigator was called in to test the safety of the air around the decaying animal hides for worker exposure in July 1977 and was himself sickened. NIOSH has not yet been involved with the Industriplex workers, but has studied kidney cancer problems of workers in a cat food factory about a mile north of the Industriplex waste areas. As Industriplex company workers organize, these agencies may be called into the Woburn problem more directly.

B. Interest Groups

1. Ad Hoc Groups

The only ad hoc interest group formed to date in the City of Woburn is FACE (For a Cleaner Environment). It was organized in January 1980 after the site was exposed by the media as a major problem. An EPA employee who lives in Woburn met Rev. Bruce Young at one of the fall 1979 public meetings and a core group of about ten people, mostly from the affected East Woburn, formed around the two organizers. The group has an agenda for seven areas of concern, but public health is by far the central focus. Rev. Young, the key figure in FACE, is highly respected by almost everyone interviewed because of his persistence in following the leukemia and hazardous waste problems and his hesitance in going beyond established facts in the case. Young is a Woburn representative on the CAC.

The other major local interest group presently involved in the hazardous waste issue is the long-running CAP, Citizens Against Pollution, from Reading. Formed in 1977, the group consolidated in January 1978 when Reading brought suit against the Industriplex developer for the hydrogen sulfide odor nuisance. The Reading residents in general and CAP members specifically are more active and involved in the problem than the Woburn group has yet been. Although CAP was initially interested only in the odor problem, including the health effects of breathing hydrogen sulfide and other chemicals blown over the town line, CAP now takes a broader view of the hazardous waste problem. At first, CAP worked actively to prevent any disturbance of the hides, but now the Reading group better understands the complexity of the health problem as well as

the nuisance. Reading citizens realize that the hides may need to be moved in order to clean up the site. Through letters, phone calls to state and federal officials, and representation on the CAC, CAP intends to be sure that the air pollution problem is addressed in any clean-up scheme. At one point, however, just before the April public meetings, a faction broke from CAP, advocating a more radical stand. Members wearing gas masks handed out leaflets at the Woburn Industriplex Mall advertising the Woburn problem and the April 1, 1980, public meeting. After a brief flurry of media interest, this group, Citizens for Direct Action, folded back into CAP.

Three broader-based environmental interest groups have become involved in the Woburn hazardous waste site issue. The Mystic River Watershed Association (MRWA) is a regional, watershed-wide environmental group interested in preserving the quality of the Mystic River, Mystic Lakes, and their tributaries, of which the Aberjona River and its Industriplex wetland is one. The MRWA is involved in pollution cases throughout the watershed, but the Woburn case, due to its potential magnitude and the extent of media involvement, has received much attention from the MWRA. Its president, Dr. Herbert Meyer, is a member of the CAC and speaks at the meetings for special consideration of groundwater contamination from the site. Friends of the Earth is another group based in Boston which has become involved with the Woburn waste problem. Their representatives have aided the Woburn FACE group in particular, helping them write press releases on their meetings and findings. The third broader group involved in the Woburn problem since the 1979 publicity is the Safe Drinking Water Coalition, a regional water quality group.

2. Community Groups

Other groups in the community which are not solely concerned with environmental or public health problems have become involved in the Woburn problem include the League of Women Voters in Winchester and Wilmington. Woburn has no LOWV at present, again demonstrating its general non-involvement in issues.

The North Suburban Chamber of Commerce, a thirteen-community businessmen's organization, has been concerned about public health and the effects of the Woburn hazardous waste problem on business since the media attention in fall 1979. This group, however, has not coordinated with any of the other interest groups and is generally unaware of what the others are doing. On its own, the NSCC put out a report on the hazardous waste site at Industriplex and has been sending telegrams to federal legislators advocating Superfund. They are also urging the U.S. Chamber of Commerce to back the bill. In its Woburn site involvement, the NSCC has been

accused of "shooting from the hip" in its first pronouncements criticizing state and federal action and the efficacy of the C.A.C. The NSCC was later invited to join the C.A.C., but the business group does not want to become involved in any advisory body until its responsibilities are better defined (for example, by means of the formal Management Committee suggested by the Hart Report, (see page 61). The NSCC businesspeople have a legitimate interest in the clean-up process, which they want to see performed as quickly as is feasible. Members of the Chamber of Commerce have businesses in Industriplex and are themselves exposed eight hours a day to any migrating hazardous chemicals. The business leaders also have had trouble recruiting employees to the area, and they worry about the resale value of their property. The NSCC could help bring money and management expertise into the public participation process; however, some of the other less-powerful groups are afraid of being coopted or taken over by "business interests."

3. Industrial Representatives

William D'Annolfo of the Mark Phillip Realty Trust is often painted the villain in the Woburn problem. However, D'Annolfo did not put the wastes on the site, regardless of whether or not he made any effort to properly contain the wastes he found there or to prevent the current problems. With extensive federal, state, and media involvement, an acceptable plan is being drawn for chemical containment to be overseen by federal, state, and local officials. The developer's concern is to make a profit on the final third of the Industriplex-128 site. The costs of containing the wastes, completing all the testing, and taking precautions against odors, in addition to the grading, filling, and road-building necessary to complete the site for industry will be high. Costs for preliminary testing of the location, concentration, and migration of the chemicals alone will cost $250,000. Should the costs be higher than the potential return on the sale of the developed land, D'Annolfo will quit the project and declare the Trust bankrupt. For this reason, the state and federal officials are working with D'Annolfo on a consent decree; they are also working with concerned citizens. The government would rather persuade D'Annolfo to pay for the clean-up. Since July 1979, the developer has demonstrated good faith by suspending operations and even sending a representative to the C.A.C. meetings to hear citizen concerns, but, to date, D'Annolfo has performed no clean-up operations or testing.

4. Labor Groups

Employees of Industriplex do not belong to any single union, but in September 1980, a group of employees met with members of FACE to discuss issues of mutual interest, mainly, the public health issue. Exposure to the chemicals on the site, especially

airborne particulates, will have the first and heaviest impact on those who work near the site every day. This is the concern of the employees' group, as yet unnamed.

C. Legislative Actors

1. State Level

Again in matters of legislation, Reading actors have gotten involved faster and have been more effective. The Reading State Representa- tive, Michael Barret, was instrumental in getting a special state appropria- tion of $100,000 for the site clean-up. He has also been involved in the state consent decree negotiations. Woburn State Senator Rotundi helped the state funding pass the other state house. Rep. Nick Paleologus from Woburn became involved later than the others but has been supportive of FACE.

2. Federal Level

Representative Edward Markey has been involved locally with the hazardous waste problem in Woburn and supports Superfund strongly in the House. His district administrative aide is in contact with the local ad hoc groups. Rep. Tip O'Neill from the district south of Woburn has been contacted by the Chamber of Commerce group and supports Superfund to the point of saying that he would call a lame-duck session if the bill is not resolved before the November 1980 elections.

Senator Tsongas held a "town meeting" in Woburn in March 1980 where he listened to citizen concerns about the abandoned hazardous waste problem. Senator Kennedy has received letters and phone calls on the problem in Woburn and has assigned a district staff person to represent him at all public meetings on the subject. Kennedy also held a Senate hearing on June 6, 1980, where he listened to testimony from Rev. Bruce Young, another member of FACE, and the president of CAP on suspected public health effects of the hazardous wastes in Woburn.

D. Media

1. Newspapers

Two local papers have treated the Woburn hazardous waste site issue very differently. The Woburn Daily Times reporter assigned to cover the Industriplex site story is cited in almost all interviews as very conscientious and careful to check all facts before publishing a story. The local media in Woburn has been praised for keeping the issue alive in Woburn without resorting to exaggeration or allegation. The Woburn reporter won a UPI/New England Newspaper Editorial Award in 1979 for his editorials on the

hazardous waste problem in Woburn. On the other hand, the Reading Chronicle, until recently a weekly newspaper, was said to have as sensationalized the stories of chemicals and smells in Woburn.

The Boston papers received mixed reviews from those involved in the Woburn case. Some felt that the Herald and especially the Globe simplified the problem, linking the chemicals and local health problems without a caveat. Woburn officials did not appreciate the region-wide publicity. Others recognized that the more regional papers must spend less time on any one issue and must therefore gloss over some of the finer distinctions. A weekly Boston newspaper, the Real Paper, published a lengthy feature article on the Woburn hazardous waste problem in May 1980. The article is considered the most complete newspaper account of the situation.

2. Broadcast

Television, by its nature, provides a much less detailed, less analytical account of an event or issue. Since fall 1979, local and national television has featured Woburn in almost every discussion of public health linked with hazardous waste problems. A recent local cable television documentary focused on the Woburn chemical waste problems and featured panel discussions with the major actors.

IV. COMMUNICATION STRATEGIES

Communicating information from government agencies to the public about a hazardous waste site is one of the important functions of citizen participation. Informed citizen participation is much more positive and useful than an uninformed or misinformed public. At Woburn, citizens can generally be well informed through the media. Those most actively involved have fairly free access to officials with supplementary information.

A. Sources of Information

Area citizens do not see Woburn City officials as a credible source of information on the hazardous waste site. Citizens feel that the local government officials knew of the Industriplex site problems long before they came to public attention and did nothing about those problems. Many citizens believe cover-up theories and stories of the political influence of the developer at local and state levels. Distrust is so strong that many East Woburn families believe that Woburn water is still unsafe, despite extensive tests to the contrary, and they buy bottled water. Although the residents may not understand the technical aspects of the problem, they feel they do know the local political aspects, and they do not trust their local government to handle the hazardous waste site problem.

Information from state officials has in the public view, fewer partisan overtones. But Reading CAP members are still suspicious of the state's failure to stop the odors from Industriplex development in the '70's. Residents want answers to questions about exposure to the chemicals; they want to know what low-level, long-term exposure might do to their health and their children's health. No one has those answers, although some of the Woburn citizens may expect definite answers when the state epidemiological studies are released in October 1980.

Local residents consider federal officials--the Army Corps of Engineers and the EPA--their most credible sources of information. In the public's view, federal scientists and engineers are removed from local politics. In this case, however, the federal team lost some of its good standing at the beginning by communiating poorly with the local officials and press. The local people did not find out until over a month after test results were in that a major hazardous waste problem existed in North Woburn. Later, communications were greatly improved, although Woburn activists are not happy with the physical progress of clean-up at the waste site. Federal officials must take care not to raise local expectations about the solution they may be able to offer or the time it will take, especially, as in the Woburn case, when no federal program exists for cleaning up abandoned hazardous waste sites.

The media--newspapers, television, radio--generally have the highest credibility. People feel that the press has no particular stake in the issue, as government officials have, and that the press has better access to the right officials. The more active citizens, however, are sensitive to any distortion or misstatement of facts about a site made by the press.

B. Types of Information

Most of the information provided by government officials to Woburn and Reading citizens has been general information, as opposed to raw technical data. Citizens may request and will receive the technical results of testing as well as an explanation of the meaning of tested levels of chemicals in the air, water or soil.

Conflicting information on the Industriplex site was fairly common through the seventies as the developer practiced a "divide and conquer" strategy against local and state regulations. Since the appointment of an EPA coordinator in January 1980, most distortions or conflicts of information, at least among the active citizenry, have been corrected.

C. Effect of Information on the Public

When the news broke in September 1979 that the Woburn site was a serious hazardous waste problem, reactions were mixed. Woburn officials were furious they had not been consulted on the federal waste and soil sampling results. Reading residents felt vindicated that there was a serious problem in Woburn. Many connected the findings with the closure of the G and H Wells in East Woburn in May 1979, although no trichloroethylene or chloroform has been discovered on the Industriplex waste site. The visibility of the hazardous waste issue increased dramatically in December 1979 when MDPH released the cancer death study. With each major release of information about the site, the problems appear worse and the issue becomes more salient. The residents only become more frustrated as new aspects of the hazardous waste problem emerge, partly because no plan for solving these problems has been put into effect.

Although the series of public meetings and C.A.C. process has greatly helped educate the active minority, many local citizens have a distorted view of the situation. The average resident of Woburn still traces the problem to the Woburn water, and many parents of children with leukemia firmly believe that the Industriplex site wastes are the cause of Woburn cancer.

Publicity about the site and the cancer problem has had a number of negative effects on the town. Rev. Young, EPA officials, and the Woburn city engineer receive telephone calls from people considering buying a home or becoming employed in Woburn, asking whether it is safe there.

V. METHODS OF INTERACTION

A. Public Meetings

The most prevalent form of participation offered by government officials thus far in Woburn is the public informational meeting. As no decisions about the site clean-up have yet been made, no public hearings have been required. Unless the developer goes bankrupt and remands the property to the state for clean-up, no public hearings will be held; the state and federal consent decrees will prescribe containment methods without benefit of public comment. Public meetings called thus far have presented the problem of the site, discussed possible health effects, and presented the Hart Management Report.

B. Citizens' Advisory Committee (C.A.C.)

At this site alone, among the four cases presented here, a C.A.C. was formed. The state, in May 1980, called for a C.A.C. under the provisions of its Environmental Protection Act, to channel

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and legitimize citizen input. C.A.C. members represent the City of Woburn, the Town of Reading, FACE, CAP, MRWA, the League of Women Voters in Wilmington, and the Town of Winchester. Although the problems at the Industriplex site and the solutions set in the consent decrees constitute actions with major environmental impact, the fact that the state consent decree is still tied up in the courts at the time of this report leaves the Citizens Advisory Committee with little opportunity to advise. The group spent the summer of 1980 studying the problem to date and becoming acquainted with each others' positions. Members feel that the experience of sitting down and examining each others' positions has lessened the likelihood of conflict. Without the resumption of a more substantive agenda, however, the C.A.C., which has been so helpful in disseminating information and correcting misunderstandings, may dissolve for lack of mission.

C. Other Forms of Interaction

Telephone calls and letters to officials voicing citizen concerns, generally the concerns of those about to move into or out of Woburn, have been frequent since September 1979. A more informal yet significant exchange between government officials and area citizens took place in July 1979 when federal investigations met with residents near the site to research the local history of the Industriplex site. One of the North Woburn residents had worked for the chemical and glue factories and knew of other chemical pits and lagoons on the site, as well as the existence of deeply buried chemical drums.

Another kind of citizen participation in the process occurred when Reading CAP formed the impetus behind the Town of Reading's lawsuit against the Industriplex odor nuisance. Reading's involvement in the current consent degree was confirmed at a public hearing held by the Town Council on August 22, 1980.

VI. EFFECTS OF PARTICIPATION

A. Effects on the Community

Participation in Woburn, limited to FACE, a half dozen public meetings, and memberships in the Chamber of Commerce, has helped increase public awareness of the problem without overly alarming many citizens. Those citizens with liver or kidney cancer or leukemia naturally tend to blame the waste site, and some have become very frustrated at the lack of action in cleaning up the site. Officials' lack of answers to citizen questions on human exposure and health effects has also increased frustrations. The residents do not know what to do to prevent health problems from the chemicals.

Community image has also suffered from the combination of the hazardous waste problem, the odors, and the cancer rate. City officials worry about the public financial problems this adverse publicity is causing. City administration officials do not have the expertise, the manpower, or the money to do the monitoring and clean-up necessary at the site. Woburn will be dependent on federal and state funding if the developer abandons the Industriplex site. Local officials and some citizens view the process of public participation as burdensome because citizen involvement complicates and slows the clean-up process. Some city officials also resent the extended press coverage of city problems. Other city officials enthusiastically support the citizens' right and duty to know about problems that affect them and their community, and would like to see more activism in Woburn.

B. Effects on Policy

Participation in Woburn occurred only after government officials were aware of the hazardous waste problem. Therefore, citizen participation from Woburn has not had much effect on official awareness of the problem, and has only marginally helped speed the process of testing and appropriating funds. When a policy choice must be made on containing the chemicals, officials may hear more from the Woburn citizens.

Reading citizens, on the other hand, have been agitating for official action on the Woburn odor problem for years. The odor problem as perceived earlier is only one aspect of the current issue. More vigorous investigation of the site when Reading complained of the odors in the early '70's, including cross-checks with the original permit, might have revealed the chemical contamination problem much earlier. Now, however, Reading has been accused of slowing the clean-up process. The initial state consent decree negotiations, completed and signed in February 1980, had not included Reading. That town has a strong interest in the air pollution problems that may be caused by the clean-up process itself. Failure to include Reading, and Reading's appeal, has cost area citizens three extra months of worry and frustration. Had the state decree been ready, the developer's clean-up schedule would have begun when the federal consent decree was signed in May. Here, lack of participation resulted in delays and lost effectiveness.

Rev. Bruce Young's efforts to expose the cancer problem in Woburn have been highly lauded. His careful persistence and his subsequent vindication have earned him the trust of the community. He continues to bring this force to bear on officials to speed up the process.

Government efforts to increase citizen participation have generally eased problems and avoided potential ones. The state's provision for the C.A.C. has helped coordinate citizen response and has provided a weekly forum for the exchange of ideas between citizens and government. Had this body existed earlier, the problems with Reading and the consent decree might have been avoided. The federal EPA site coordinator has been a touchstone for both citizens and government officials to assure coordination and responsiveness. After a few initial blunders involving poor communication with the local administrations in Woburn and Reading, the program of citizen involvement in the site clean-up and monitoring at Woburn, down stream, and down wind, is functioning smoothly. The problems now to be solved in the Woburn case are timeliness of clean-up and funding.

VIII. SUMMATION

The Woburn case differs from some of the other sites studied in the reduced emotionalism and impatience displayed by the local residents. The reason may be that government treated citizens concerns more sensitively her than elsewhere. While Woburn and nearby communities are very concerned, the citizen groups have tended not to make unreasonable demands on EPA or the state. It is true that Woburn residents do not trust local officials to handle clean-up of the site. Local government's inexperience, past record of inaction and lack of funds do not recommend it. Nonetheless, the animosity towards government seen in Jackson Township has not characterized the Woburn problem.

The pattern of participation in *ad hoc* citizens' groups continues at the Woburn site. Those directly affected -- by the smells, by the suspected long-term health effects -- tend to become involved, and these residents generally do not have a history of citizen activism, in fact, quite the contrary in Woburn. A relatively apathetic community is forming interest groups for the first time. In Woburn, however, the residents with a stake in the solution to the problem, those who feel they are affected by the hazardous wastes, have not opted for some of the more flamboyant tactics of their counterparts in other sites. For instance, they have not invited any Love Canal spokespeople to date to address Woburn public meetings, and they have not encouraged parallels to Love Canal.

Perhaps the level of frustration in Woburn is lower than at other sites studied because the hazardous waste site has been a major issue for only a year, while the others have been in the public eye longer. Another explanation for the lowered disillusionment among citizens at the Woburn site may be the conscientious efforts of state and federal authorities to keep the

local government, interest groups, and the public informed of the progress of clean-up decisions and involved, to the extent possible, in that process.

PROJECT STAFF

This report was prepared by ICF Incorporated based on interviews, analyses, and other substantive contributions from ICF staff and its subcontractors. ICF staff for this project include: Edwin Berk, James Edwards, Mitchell Gaynor, Michael Gibbs, Lori Hashizume, Jim Janis (Project Manager), Sara Nielsen and Mimi Voorhees. We were assisted in this effort by outstanding support from Phyllis Austin, Nathaniel Watkins, and Zella Williams.

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