

REPORT OF
GOVERNOR BRENDAN BYRNE'S
HAZARDOUS WASTE ADVISORY COMMISSION

Trenton, New Jersey

January 1980

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State of New Jersey

The Honorable Brendan T. Byrne
Governor, State of New Jersey
State House
Trenton, New Jersey 08625

Dear Governor Byrne:

The Hazardous Waste Advisory Commission is pleased to transmit its report and recommendations in accordance with Executive Order 76. You gave the Commission a challenging and important task -- to assess the magnitude of the hazardous waste problem in New Jersey and to recommend a course of action for the State.

This report presents an overview of the hazardous waste problem in New Jersey and a recommended strategy for the State to address this serious environmental, public health, and economic issue. The Commission believes that, in order for the State to develop an effective strategy for hazardous waste, action is needed in three general areas. First, an appropriate institutional structure for a comprehensive hazardous waste management program should be established. Second, issues related to siting hazardous waste facilities must be resolved. Finally, the State's enforcement strategies related to hazardous waste should be changed to control illegal dumping by making it more difficult and costly to those involved. The Commission is hereby submitting a number of recommendations in these areas for your consideration.

The issue of hazardous waste management has emerged as one of the most critical environmental and public health problems facing the State of New Jersey and the nation as a whole. Incidents such as Love Canal in New York and the R&B landfill and Chemical Control site in New Jersey clearly illustrate the implications of improper disposal of toxic and hazardous waste. New requirements, such as the end of ocean dumping and the removal of toxics from wastewater will only compound our problems unless we act to assure adequate treatment and disposal capacity for hazardous wastes.

The Honorable Brendan T. Byrne

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You have already recognized the immediacy of this problem and taken a number of steps aimed at coping with improper disposal. The Commission is recommending several additional measures for the establishment of a comprehensive program to ensure that hazardous waste is adequately handled in the years to come.

We are confident that, under your leadership, the State of New Jersey will establish an effective program, and we appreciate the opportunity to contribute to this effort.

Sincerely,

A handwritten signature in cursive script that reads "Rocco D. Ricci".

Rocco D. Ricci, Chairman
Hazardous Waste Advisory Commission

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August 15, 1979

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EXECUTIVE SUMMARY

In August 1979, Governor Brendan Byrne announced the formation of a special Hazardous Waste Advisory Commission (the Commission) to investigate the increasingly serious problem of hazardous waste management and disposal in New Jersey and to recommend measures to solve it. Establishment of the Advisory Commission was a major component of a broader hazardous waste initiative by the Governor. Other components included increased criminal penalties, a strike force to focus on illegal dumping activities, increased inspections of hazardous waste facilities, and amendments to the State's Spill Compensation and Control Act.

The Hazardous Waste Advisory Commission believes that hazardous waste management is one of the most critical environmental, public health and economic issues facing the State of New Jersey. There must be no delay in moving toward a solution for this problem.

Based on its review of the existing and potential future problems associated with hazardous waste management, the Commission recommends that certain actions be taken in three general areas: management of a hazardous waste program (institutional structure), siting of facilities and enforcement of existing and new regulations.

Following are the Findings and Recommendations of the Hazardous Waste Advisory Commission:

Findings

The Governor's Hazardous Waste Advisory Commission finds the following:

A) Until the beginning of this decade, public policy and the scientific community failed to recognize hazardous waste treatment and disposal as a major public health and environmental problem.

B) Enforcement of the hazardous waste environmental control regulations that do exist has been ineffective. (Section II B, p. 19)

C) There is a growing need for adequate hazardous waste treatment and disposal facilities in the State and in the nation, and this need will become more acute as stringent new regulations are enforced across the country. (Section II C, p. 21)

D) Significant quantities of hazardous waste are being improperly or illegally disposed of. (Section II, B and C)

E) There is a public fear of exposure to the harmful effects of some hazardous wastes and a lack of trust and confidence in government's and industry's ability to protect the public from those effects. This public perception is the single greatest impediment to the siting of new hazardous waste treatment and disposal facilities. (Section II C, p. 21-23; Section V, p. 49)

F) Technology and managerial techniques do exist to treat and dispose of hazardous wastes without unacceptable environmental and public health effects. A portion of the waste stream, however, must in the end be stored in final repositories, such as secure landfills. (Section III, p. 26)

G) The identification, classification and inventorying of hazardous wastes needs to be substantially upgraded in order that proper decisions about the development of treatment and disposal facilities can be made. (Section II C, p. 22)

H) Although technology exists to manage hazardous wastes, research and development aimed at improving technology and managerial techniques is desirable in order to bring down the cost of safe treatment and disposal, and to encourage changes in production methods that reduce or eliminate the generation of hazardous waste. (Section IIIA)

I) Federal regulations and policies that would unnecessarily increase the quantity of waste designated as hazardous, and therefore increase the growing need for adequate treatment and disposal facilities, must be carefully examined by those in a position to affect public policy. At the same time, federal policy makers must take care that such regulations and policies do not exclude wastes that are genuinely hazardous. (Section I, p. 6)

J) No comprehensive hazardous waste management program exists in the State of New Jersey. (Section II)

K) There is no single agency in the State with adequate authority to handle all facets of a hazardous waste management program and to encourage the development of needed treatment and disposal facilities. (Section II)

L) It is important that society not add to the abandoned sites problem by continuing to create new trouble spots. (Section I, p. 7)

M) There are identifiable (but not necessarily quantifiable) risks associated with hazardous waste treatment and disposal facilities, and the public's concern about them must be addressed. (Section I, p. 8, 9)

N) A comprehensive strategy dealing with the hazardous waste crisis must address the social, economic, technical, environmental and political issues related to hazardous waste management. (Section I, p. 9)

O) Insofar as feasible, economic calculations should always be required to consider the external cost associated with any pollution or other public health risk attributable to a waste treatment or disposal technique. (Section III A, p. 26)

P) Protection of human health, welfare and the environment are essential factors that must be considered by all parties when siting decisions are made. (Section V, p. 49). Specific emphasis should be placed on the risk analyses related to specific facilities; such information must be presented in a clear statement that can be easily understood by the general public. (Section V, p. 52, Section VI, p. 53)

Q) There must be full participation by the public in all the steps entailed in making siting decisions. (Section V, p. 49)

R) Post-closure liability is a significant issue with respect to the acceptance of hazardous waste treatment and disposal facilities. The Commission recognizes that such coverage must exist; the exact mechanism to provide such coverage must be determined and requires further study. (Section IV, p. 46)

S. Hazardous waste facilities should be exempted from the rate-setting jurisdiction of the Board of Public Utilities. (Section IV, p. 46)

T. Hazardous waste management is one of the most critical environmental, public health and economic issues facing the State of New Jersey. There must be no delay in moving toward a solution for this problem. (Section IX, p. 64)

Recommendations

A) Establish a management corporation to be responsible for planning, preparing and managing a hazardous waste program for New Jersey (see exception to this recommendation in Appendix D). Such a corporation would have the powers to:

- 1) Establish siting criteria, select sites, and purchase or condemn the necessary land.
- 2) Solicit proposals from the private sector to construct and operate those treatment and disposal facilities determined necessary for New Jersey.
- 3) Construct and/or operate hazardous waste treatment and disposal facilities, but only if the private sector fails to respond to invitations to build and operate the necessary capacity, and then only if the legislature does not object; also, to secure a new operator if a private-sector facility operator is unable to continue in business and the loss of that operator's facility would endanger public health or the environment.
- 4) The corporation should be separate from and subject to the regulatory program which will remain with the Department of Environmental Protection.
- 5) The corporation must develop a formal public participation program to be used in its decision-making process.
- 6) Due to the projected need for treatment and disposal capacity, the corporation should be authorized to assure that permits are processed in a timely manner; the corporation should also be authorized to make final site selections.
- 7) The corporation should mandate that hazardous waste treatment and disposal facilities be self-supporting; the pricing structure should compel the generator of the waste to pay all costs associated with the safe treatment and disposal of the waste.
- 8) The corporation should have all additional powers listed in Section IV of this Report.
- 9) The Board of Directors of the management corporation shall be made up equally of individuals whose background and association is from industry, government and the general public; each sector shall be represented as one-third of the corporation Board. (See Section IV, p. 40)

10) The corporation should work with similar agencies in other states and the Delaware River Basin Commission in order to develop interstate and regional solutions to the hazardous waste treatment and disposal problem.

11) The corporation should determine the need for establishing State-operated control laboratories on hazardous waste facility sites.

B) Establish the necessary regulatory framework for hazardous waste treatment and disposal. The State of New Jersey should do the following:

- 1) Adopt legislation, as necessary, to carry out the intent of Section VII of the report.
- 2) Assure adequate funding and provide the necessary staff at all governmental levels to carry out the enforcement program instituted.
- 3) Complete the adoption of New Jersey's standards governing design and operation of hazardous waste treatment and disposal facilities.
- 4) Work with neighboring states to upgrade regional enforcement programs and standards.
- 5) Evaluate and report on the effectiveness of the federal/state strike force on illegal dumping created by New Jersey and the Environmental Protection Agency to emphasize its role in the enforcement program.
- 6) Adopt legislation to exempt from regulation rates charged by hazardous waste facilities.
- 7) Amend the New Jersey Environmental Rights Act in order to enable citizens to recover the costs of environmental lawsuits brought under the Act.

C) Ensure that adequate funds are made available by the State or federal government to clean up or contain orphan dump sites.

D) Implementation

The Commission recommends that the implementation of a comprehensive hazardous waste management program be initiated by an interim Hazardous Waste Management Board as outlined in Section IX until the detailed analysis of institutional options being carried out by the DEP/DRBC study is completed.

1. INTRODUCTION

The Hazardous Waste "Crisis"

Over the past few years, a series of well-publicized incidents have awakened the public to the dangers posed by the improper disposal of toxic and hazardous waste. The best-known in our region are Love Canal in Niagara Falls, New York; Chemical Control Corporation in Elizabeth, New Jersey and Kin-Buc in Edison, New Jersey. At Love Canal, chemical wastes buried almost 30 years ago contaminated streams, homes and a school. Chemical exposure there has been linked to miscarriages, birth defects, cancer and other diseases. The State of New York had to evacuate over 200 families from their homes, and has so far spent over \$25 million to prevent further human exposure and to find a way to contain the leaking wastes on the site. Chemical Control, ostensibly providing a legitimate disposal service, stockpiled an estimated 35 to 40 thousand drums of chemical wastes before being closed by court order in January 1979. The State has expended almost \$700,000 thus far in simply sorting out the materials on site and disposing of the most dangerous of them. The Kin-Buc landfill, the last commercial landfill in New Jersey authorized to accept chemical wastes, was ordered closed in 1976 after chemicals were found to be leaching into the adjacent Raritan River.

The U.S. Environmental Protection Agency has estimated there may be 30,000 to 50,000 sites nationwide where toxic or hazardous wastes were improperly disposed of in past years, and as many as 1,200 to 1,500 of them may present "imminent" threats to human health. The principal danger from most of these sites is the pollution of groundwater, the source of about half the drinking water supplies in New Jersey and the nation. Another significant health hazard at the same sites is volatilization of organic chemicals and consequent inhalation by neighbors. There are other hazards, however, due to the risk of explosion and fire, contamination of the food chain (crops, cattle, fish, etc.) and public and worker exposure through inhalation, ingestion and direct contact with the wastes.

The term "hazardous waste" applies to a broad spectrum of substances and has been defined in various ways. One of the uncertainties in addressing the hazardous waste problem is that there is disagreement on just how to determine what is and is not "hazardous". For the purposes of this report, two definitions need to be considered.

The first is the federal definition under the Resource Conservation and Recovery Act of 1976 (RCRA).² Section 1004(5) of RCRA defines hazardous waste as:

A solid waste, or combination of solid wastes, which, because of its quantity, concentration, or physical, chemical or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness.
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

In its proposed regulations for implementing RCRA,³ the U.S. Environmental Protection Agency is attempting to identify hazardous wastes in terms of certain characteristics such as ignitability, corrosivity, reactivity and toxicity. Furthermore, EPA has developed lists of waste streams which are to be presumed hazardous. The agency is striving to adopt by mid-1980 a means of identifying wastes by highly specific criteria that can be verified by objective tests, or by reference to an established list of waste types.

The New Jersey Department of Environmental Protection in its solid waste regulations employs the term "special waste" to define a category of wastes in a manner similar to the RCRA statutory definition. Special waste is defined as:

"Any waste or combination of wastes which pose a present or potential threat to human health, living organisms or the environment. It shall include waste material that is toxic, carcinogenic, corrosive, irritating or sensitizing, explosive or flammable. In order to determine whether waste is within the special waste classification, standards and lists issued by the Occupational Safety and Health Administration, the Department of Transportation, the United States Environmental Protection Agency, and the International Agency for Research on Cancer may be used. The Solid Waste Administration will establish and maintain a non-exclusive list of waste categories, types and streams which will provide guidance in determining what waste should be considered special waste."⁴

The existing "special waste" definition is more subjective than what EPA is striving for in its regulations. DEP relies on determinations made in response to inquiries about specific wastes to "fine-tune" the special waste definition.

Considerable controversy exists as to where to draw the boundaries of any hazardous waste definition. Critics of EPA's proposed rules claim that they define as hazardous many things which can safely be disposed of by familiar methods acceptable for "ordinary" municipal solid waste - e.g., sanitary landfill. On the other hand, some people are concerned that EPA's definition of hazardous waste will exclude some things that are serious hazards (e.g., wastes from pesticides manufacture). However, there are broad categories of wastes about which no serious controversy exists. The special waste categories used in New Jersey's manifest system and Industrial Waste survey fall within that area, so statistics based on those sources can be used to arrive at an appreciation of the minimum quantities of waste that will probably be deemed hazardous under any reasonable definition. The terms "hazardous" and "special" waste have been used more-or-less interchangeably in this report.

New Jersey, one of the most heavily industrialized states, has its share of hazardous waste treatment and disposal problems. Hundreds of wells around the state have had to be closed in the last five years because of pollution by toxic chemicals. They included public water supply wells that served Mahwah, Fair Lawn, Camden, Perth Amboy and elsewhere. In one Ocean County community, Jackson Township, private wells serving nearly 200 families were condemned in 1979.⁵ A special act of the Legislature⁶ was needed to provide funds for extending public water supplies into the affected area, whose residents meanwhile lived on bottled water.

and legal difficulties raised by efforts to deal with hazardous wastes after they have been improperly disposed of on or under the land. The questions of what to do about the abandoned sites problem, and who shall pay for it, are now being debated in Congress and the legislatures of several states, including New Jersey. Clearly, it is important that society not add to the abandoned sites problem by continuing to create new trouble spots.

A turning point in New Jersey's efforts to control the disposal of hazardous waste came in 1976 with the closing of the Kin-Buc landfill in Edison. A second step was taken in 1978, when New Jersey became the third state to implement a manifest system intended to track hazardous wastes "from cradle to grave".

Before Kin-Buc was closed, New Jersey was taking in for disposal about 4 times as much hazardous waste as it was "exporting" for disposal elsewhere. Today, the State exports slightly more waste than is brought in for treatment or disposal here. Recent accounts indicate substantial quantities of hazardous waste are being transported out of New Jersey and that some of this waste is either illegally dumped or disposed of at poorly managed or improperly located facilities. This is generally attributed to the manifest system, to New Jersey's toughened stance on illegal dumping and the lack of treatment and disposal facilities in the State.

The implementation of federal regulations under the Resource Conservation and Recovery Act of 1976 (RCRA), anticipated for June of 1980, will mandate the establishment nationwide of manifest systems, regulation of disposal sites and enforcement against improper dumping. Ironically, implementation of RCRA could make matters worse. Already, the capacities of existing facilities that can safely dispose of hazardous waste are not equal to the quantities of waste generated. RCRA will aggravate things by forcing marginal facilities that cannot meet its standards to close and may classify additional wastes as hazardous, increasing the amount of waste requiring special treatment. This, in turn, can only result in one or more of the following:

1. Increasing quantities of waste will be disposed of via illegal channels.
2. Lacking access to sufficient off-site disposal facilities, generators will be forced to build their own treatment or disposal facilities, or discontinue production processes that generate hazardous waste, resulting in economic dislocation.
3. Generators will have to stockpile hazardous waste until sufficient disposal capacity is built to handle it. For some wastes, this could be dangerous (and it may also be prohibited under New Jersey solid waste regulations).

Another factor that could exacerbate an already critical situation is the federal ban on ocean dumping of municipal sludges, many of which contain hazardous contaminants, scheduled to take effect in 1981. There are two million wet tons of sewage sludge from New Jersey communities being dumped in the ocean every year.¹⁰ Switching to land-based disposal methods such as incineration will result in hazardous waste residues for which there is no disposal capacity at present. The implementation of regulations under the Clean Water Act for pretreatment of industrial wastes discharged into public sewer systems is also expected to add significantly to the quantity of hazardous waste requiring off-site disposal -- although it may reduce the municipal sludge disposal problem by rendering some of those sludges safe for land application via composting or landfarming.

Finally, other federal regulations under RCRA may set extremely stringent operating standards for some types of disposal facilities, such as incinerators. This may result in the elimination of current disposal practices which are considered by many to be acceptable, exacerbating the shortage of disposal capacity.

There are only two possible technical solutions to the worsening hazardous waste crisis: either prevent the wastes from being generated in the first place, or build sufficient capacity to treat and dispose of the wastes in a safe manner.

Reducing hazardous waste generation is a desirable long-term goal, but it requires far-reaching changes in industrial methods. It cannot be done overnight. Furthermore, it is unlikely that hazardous waste generation can ever be reduced to zero given a society that continues to seek the benefits of industry. The best incentives to cut down waste generation are economic: the generator of a hazardous waste should be forced to bear the full cost of rendering it innocuous or of sealing it off forever from the environment. If that cannot be done at reasonable cost, then the manufacturer can be expected to change his production processes or discontinue the product.

For the short run, if society wants to protect public health and the environment without causing economic dislocations, there is no alternative to building new treatment and disposal capacity. Substantial evidence and a great deal of professional opinion indicate that the technology, including secure landfills, does exist to safely treat and dispose of hazardous wastes without adverse public health and environmental impact.¹¹ There are existing chemical process techniques that can be applied to the treatment of hazardous wastes. Specific hazardous waste treatment operations can be designed to reduce the discharge and emission of hazardous contaminants to an acceptable level set by government regulation. Examples of fully integrated hazardous waste processing facilities are few in the United States and do not have extended operational records to allow their performance to be judged over the long-term; however, some of the European countries have been operating such facilities for several years and they report satisfactory experiences.¹² Thus, it is the Commission's determination that facilities can be constructed and safely operated to meet environmental standards based on what is presently known. Private capital is available to build facilities, provided such issues as siting, enforcement, and financing are resolved. Already, with enforcement efforts still in their infancy, a number of national firms have moved into the legitimate waste treatment and disposal market, sensing profit opportunities.

The major obstacle to private efforts to establish an environmentally sound, legitimate hazardous waste treatment and disposal industry is public opposition to the siting of facilities. This opposition is rooted in a deep-seated public fear of the effects of exposure to harmful chemicals and a lack of trust and confidence in government's ability to enforce, and industry's willingness and ability to meet, adequate environmental, health and safety protection standards. This fear in part is justified. A series of environmental and public health disasters -- PCB's in the Hudson River, PBB's in food in Michigan, Agent Orange and dioxins, Love Canal and Chemical Control -- have sensitized the public to the dangers.

Within the past year, local opposition has thwarted siting of hazardous waste treatment and disposal facilities in half a dozen states. While proposals for secure chemical landfills seem to draw the strongest objections -- primarily because of their threat to groundwater -- opposition is not limited to landfills. Chemical facilities in general are being viewed with suspicion in many communities.

Recycling facilities such as solvent recovery plants have been built without substantial public objection when the development took place in existing heavily industrial areas. However, the term "hazardous waste" itself arouses anxiety and is a frequent source of misunderstanding. "Hazardous waste" encompass a spectrum of kinds and degrees of hazard. Some are hazardous only because of characteristics like flammability. By no means are all of these substances highly toxic, carcinogenic, or persistent in the environment. It is important the public not be unnecessarily frightened by the mistaken impression that all "hazardous wastes" are the equivalent of PCB's. A public education program is needed to advise the public of the facts about hazardous waste, including any public health risks, so they can make informed judgments about the different kinds of facilities that may be proposed.

Education must not be confused with propaganda, however. Nor will education be an antidote to public opposition. There are indentifiable (though not necessarily quantifiable) risks associated with hazardous waste treatment and disposal facilities, and the public's concern about them must be addressed and resolved.

A comprehensive strategy must be developed to deal with the hazardous waste crisis. Such a strategy must address the social, economic, technical, environmental and political issues related to hazardous waste management. An effective management system, consisting of adequate facilities, strong regulatory and enforcement requirements and a siting process that is responsive to public concerns must be developed and implemented.

The Work of the Advisory Commission

In July 1979 Governor Brendan Byrne initiated a comprehensive program aimed at coping with the increasingly serious problem of improper hazardous waste management and disposal. Components of the program included increased criminal penalties for unlawful disposal, amendments to the State's Spill Compensation and Control Act, and a strike force to track down illegal dumping activities. Another major part of this program was the establishment by executive order of a special Advisory Commission on Hazardous Waste. The Commission was charged with preparing a report to the Governor which would include recommendations for administrative and legislative action for the development of a comprehensive hazardous waste management program. (Executive Order 76, which lists the specific issues to be addressed by the Commission, is attached as Appendix A.)

The Commission held its first meeting on August 15 to discuss the general problem of hazardous waste and to set a schedule and procedure for completing the report to the Governor. Due to the short time available for the Commission's work, it was agreed that the Commission would be divided into two working sub-groups. One group was concerned with the siting and technological issues related to hazardous waste treatment facilities, while the other focused on institutional options, financial and economic concerns regarding such facilities, and issues related to liability and enforcement. Each group developed a work program with assignments to Commission members to generate information on the various issues. The findings of the two groups were periodically debated and discussed by the full Commission.

The Commission recognized that it is extremely important that the interested public have input to the development of a hazardous waste management program for New Jersey. In order to solicit the public's views on questions related to hazardous waste management, the Commission held a public meeting on September 11, 1979. A preliminary draft of the Commission's report was released for public review on October 31 to allow for early public input. A full Commission meeting, open to public observation, was held on November 9, and a draft report was issued on November 15. A formal public hearing was held on December 7 at which approximately thirty persons testified; the Commission received over fifty comments on the draft report. The Commission met on December 14 in a session open to public observation to consider the comments received on the draft report. The final Commission meeting on January 3 was also open to the public. (A schedule of Commission meetings is attached as Appendix B.)

Since the issuance of the November 14 draft report, the Commission has made a number of revisions in the report in response to comments received on the draft. The major revisions are in Section II (overview of generation and disposal), Section IV (management options), additional material in Section VI (public participation) and the new Section IX (Implementation). It should be noted that the public has not had an opportunity to review and comment on these changes. (A response document, attached as Appendix C, details the Commission's responses to comments received on the November 15 draft.)

Independently, the Delaware River Basin Commission (DRBC) and the New Jersey Department of Environmental Protection (DEP) contracted for a study to determine the specific need for hazardous waste treatment and disposal facilities in the Delaware River Basin and throughout the State of New Jersey. The study will include an assessment of available recovery and disposal technology, the development of siting criteria, identification of siting constraints, estimation of needed new capacity and investigation of options for institutional arrangements. The DEP/DRBC study will be completed in May 1980 and will address many of the same issues that the Commission looked into, although in more detail. It is anticipated that the recommendations of the Hazardous Waste Advisory Commission will set the guiding principles for the implementation of an effective hazardous waste management strategy in the State of New Jersey.

In view of the time constraints on the Commission's work and the detailed work program of the DEP/DRBC study, the work of the two Commission subgroups resulted in a set of general recommendations rather than detailed technical ones, that should form the foundation of a hazardous waste management program for New Jersey.

II. THE HAZARDOUS WASTE PROBLEM IN NEW JERSEY

This section attempts to describe, in a preliminary fashion, the existing situation regarding "hazardous" or "special" waste generation and disposal in New Jersey. A great deal about that situation is not accurately known. The statistics and projections in this section were developed by the Department of Environmental Protection and are derived from available data bases. These included the Department's Industrial Hazardous Waste Survey, computerized manifest system reports, annual operational statements submitted to DEP by industries using on-site disposal facilities, EPA Ocean Disposal permits, and a "Phase I" study of industrial and "exotic" wastes that was done for the Delaware River Basin Commission in 1978.

There are uncertainties associated with each of these data bases, all of which tend toward underestimation. The Industrial Hazardous Waste Survey employed mail questionnaires to which response was voluntary, for example. The annual operational statements are self-monitoring reports, and the manifest system, being difficult to police, is believed to suffer substantial underreporting and non-reporting. (The manifest system is a means for tracking hazardous waste from generator "cradle" to disposal site "grave"; see the description on page 19.) The extent of illegal dumping and underreporting is largely a matter of conjecture. For example, knowledgeable sources within DEP believe that as much as 40 percent of waste that should be manifested is not being picked up in the system. In addition, the DEP "special waste" categories are different from the DRBC's industrial waste classifications, making cross-correlation of data from the two sources somewhat of a problem; and both of them may significantly underestimate the quantity of wastes that will be regulated as "hazardous" under EPA regulations.

That does not mean the figures which follow are useless. At the very least, they define the minimum quantity of hazardous waste that must be handled with special precautions. More precise estimates of the amount of hazardous waste generated in New Jersey need to be developed to define storage, treatment and disposal facility needs. A start on this will be made by the DEP/DRBC study now in progress. In the meantime, the reader is cautioned not to take the figures in this report as the last word on the subject. They are the best that could be obtained, but no high degree of accuracy can be claimed for them.

A. Overview of Generation and Disposal

There may be as many as 10,000 generators of hazardous waste in New Jersey. This estimate was obtained by counting the number of plants in the State whose manufacturing activities place them in Standard Industrial Classifications (SIC codes) known to involve the generation of hazardous waste.¹³ The majority would be generating relatively small quantities of hazardous waste, however. In terms of documented generators, 813 were identified by the manifest system in its first year of operation (May 1, 1978 through April 30, 1979). In addition, there are 24 private companies known to dispose of plant-generated waste on-site.

All haulers of solid waste, of which "special waste" is a subdivision, must by law be registered with the Department of Environmental Protection.¹⁴ The Department had 3,758 solid waste haulers registered as of November 1979. Of these, 287 were registered in an "S" class, declaring themselves special waste haulers.

the "S" classification is only a distinction on the registration forms of the Bureau of Solid and Hazardous Wastes; it is not a legally enforceable distinction. At present any registered solid waste hauler may legally transport special waste as well. Thus the actual number of special waste haulers is not known.

Registered haulers use approximately 14,000 motor vehicles in their operations. About 1,900 vehicles are licensed to haulers in the "S" class.

There are 20 commercial facilities permitted by DEP that provide resource recovery, storage and treatment and disposal services on a regular basis. In addition, small quantities of special waste are occasionally authorized by DEP for disposal at other locations. These authorizations -- for example, to deposit oil spill contaminated debris in a sanitary landfill -- are issued by DEP on a case-by-case basis after determining the suitability of the disposal facility for receipt of the special waste.

Three commercial facilities were shut down by court order in 1979 for failure to meet environmental standards. They included the notorious Chemical Control facility in Elizabeth. Of the 20 still active, 4 are currently the subject of enforcement proceedings by DEP which could lead to shutdown.

Manifest system records indicate at least 400,000 tons of special waste were shipped off-site from New Jersey generators in the system's first year of record-keeping. Operational statements of on-site disposers indicate as much as 320,000 tons of hazardous waste were disposed of on-site last year. (Over 90 percent of the on-site disposal took place in six western counties in the Delaware River Basin.) Thus, there are at least 720,000 documented tons of hazardous or special waste being generated in New Jersey each year, exclusive of ocean disposal.

Ocean disposal represents a special case which should not be lumped in with the land-based disposal picture, because it distorts understanding of the quantities that make up the "problem". Five New Jersey industries and one in Delaware currently are authorized by the U.S. Environmental Protection Agency to dispose of chemical wastes at a dump site 106 miles off the New Jersey coast. The permits authorize the disposal of approximately 3.3 million tons per year. The quantity actually dumped in 1978 was approximately 2.2 million wet tons¹⁵ (of which the New Jersey plants contributed 1.7 million) and is expected to total 3 million wet tons for 1979. However, almost all of the material being dumped in the ocean are acidic or alkaline solutions that are not highly toxic, persistent or bioaccumulative. Both the industries involved and EPA agree that these wastes may continue to be safely dumped in the ocean for the foreseeable future. Thus, wastes now being disposed of in the ocean are not expected to be forced to "come ashore" where they would add to the land-based disposal problem.

Manifest system records show approximately equal quantities of special waste being transported in from out-of-state locations as are being shipped out to other states: about 95,000 documented tons per year being shipped in, and 113,000 tons being shipped out. The out-of-state generators are led by New York, with about 53,000 manifested tons of special waste; Pennsylvania, with 17,000 tons; and Connecticut, 11,500 tons. Delaware, Massachusetts, Maryland and Virginia contributed "imports" in the range of 1,000 - 4,000 tons each. Smaller contributions from 8 other states and the District of Columbia added the remainder.

Pennsylvania receives the lion's share of manifested special waste being shipped out of New Jersey, with approximately 73,000 tons manifested to 32 different locations between May 1, 1978 and April 30, 1979. New York was second, with 24,000 tons going to 13 locations. About 1,500 tons went to Massachusetts during the first year of manifest operations; 17 other states and the province of Ontario accounted for the rest of the manifested waste going out of New Jersey.

However, DEP's Bureau of Hazardous and Chemical Waste believes that the manifest system figures on importation and exportation of special waste may understate the real movements by as much as two-thirds. Large quantities of waste being brought into the State for recovery -- solvents and waste oil -- are not being manifested because the processors contend it is not "waste" at all; this is currently the subject of administrative proceedings. The Bureau also believes that large quantities of waste going out are not being manifested because neighboring states, Pennsylvania in particular, do not have manifest systems and have no requirement for disposal facilities to identify the origin of wastes brought to them.¹⁶

Most of the manifested special waste being brought into New Jersey is destined for resource recovery plants, transshipment to disposal sites in other states or destruction at one of the State's two high-technology treatment/disposal plants, Rollins Environmental Services in Gloucester County and SCA Services' Earthline Division in Newark. Much of the waste being sent out is consigned to landfills, some of which may be closed when RCRA regulations take effect. Examinations of manifest system records have indicated that some wastes being shipped out-of-state are illegally dumped or disposed of in unsuitable landfills. DEP officials believe the same pattern applies to the wastes escaping the manifest system.

It is almost impossible to estimate the quantity of hazardous waste that is being illegally dumped (as opposed to being disposed in out-of-state landfills of questionable safety). The kinds of studies that would be needed to isolate this essentially clandestine activity have not been done. (If it is felt necessary to make such a study, a good point of departure would probably be the financial records of haulers and disposal facilities convicted of illegal dumping.) Whatever the absolute magnitude of the dumping problem, it has attracted considerable coverage in the press and created a great deal of public alarm.¹⁷

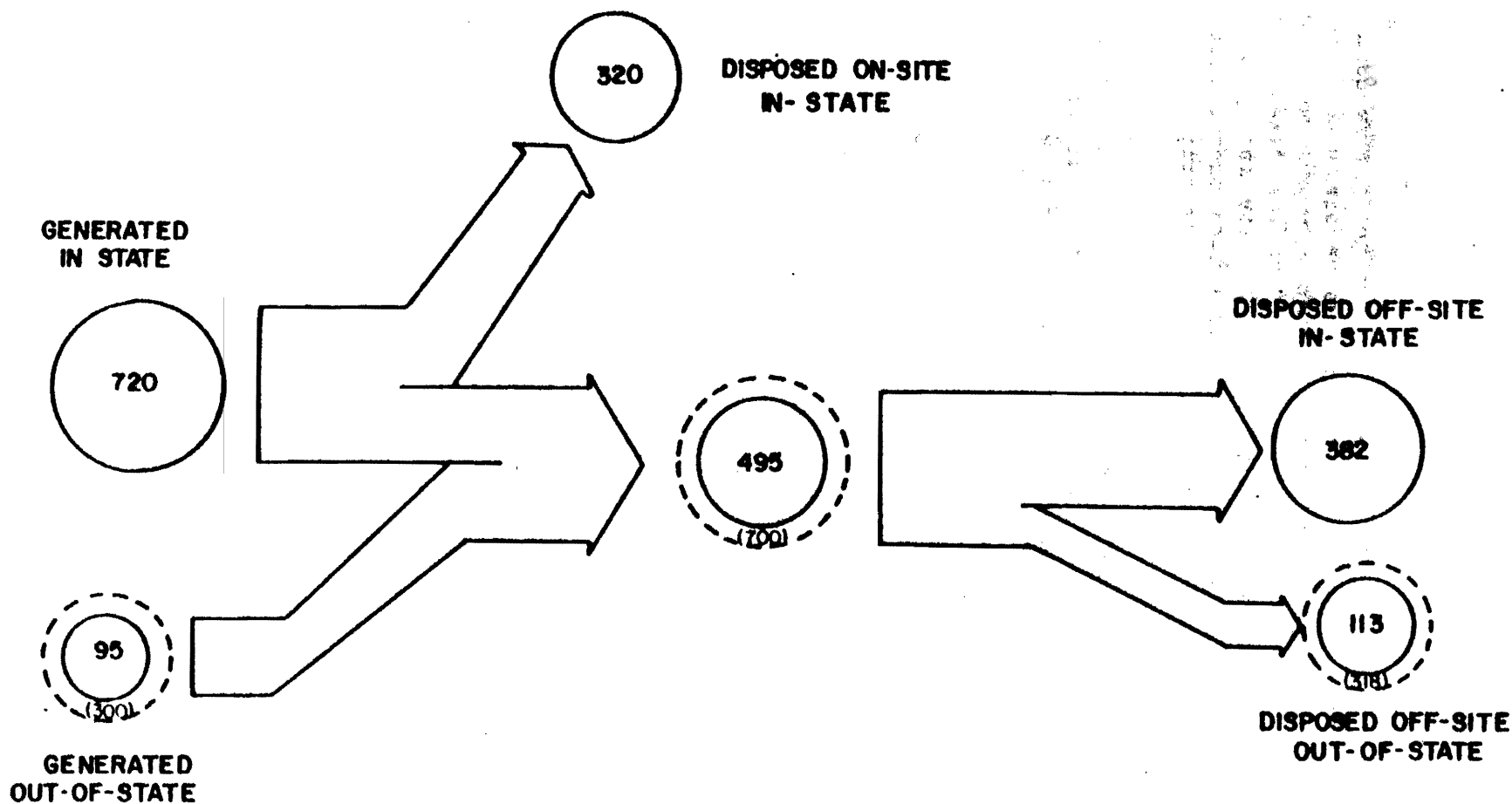
Figure 1 illustrates the documented hazardous waste stream in New Jersey. Figure 2 illustrates the distribution of the generation of manifested special waste (i.e. waste transported off-site for treatment and disposal) by county.

Manifest figures indicate the largest part of the hazardous wastes generated in the State and transported off-site for disposal are accounted for by a relatively small number of firms. The 20 largest (by quantity of waste transported) generators account for 56 percent of the total manifested wastes, while the 100 largest account for about 85 percent.

Significant additional quantities of hazardous waste are likely to be generated in the near future (3-5 years) by the implementation of federal regulations under the Clean Water Act¹⁸ requiring the pretreatment of industrial wastes discharged into sewer systems and prohibiting the ocean disposal of municipal sewage sludges from publicly owned treatment works (POTW's). Implementation of these rules would generate an estimated 640,000 tons of pretreatment sludges each year, and as much as 100,000 tons of POTW incineration ash if the municipal sludge is incinerated.¹⁹

Figure 1. Characterization of the Documented Hazardous Waste Stream in New Jersey.

(Thousands of tons per year. Ocean disposal excluded.)



Source: N.J. Department of Environmental Protection, Bureau of Hazardous and Chemical Waste. Solid circles represent quantities documented by manifest system and on-site disposers reports, 1978-79. Broken circles include Bureau estimates of unmanifested waste moving interstate.

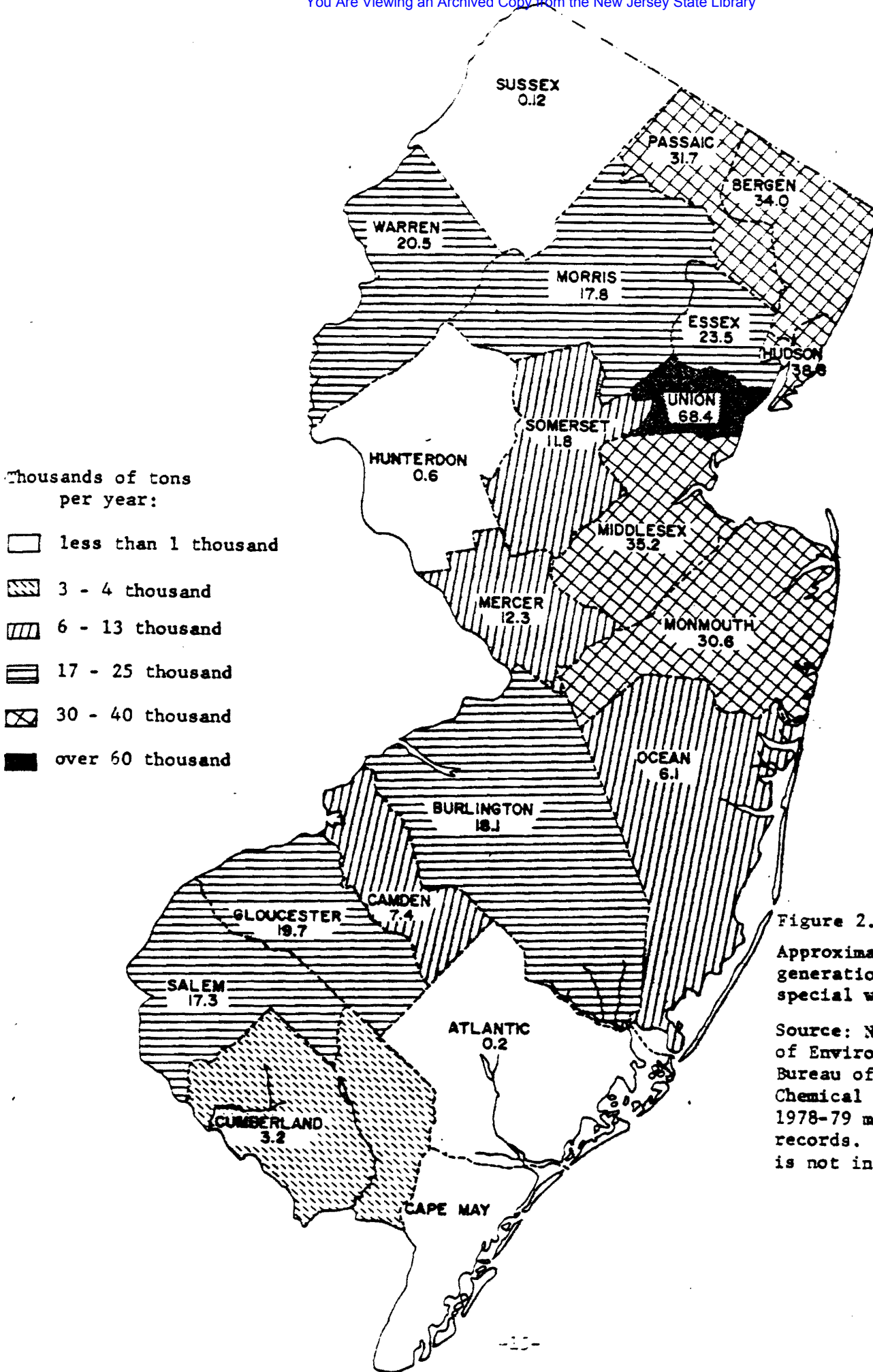


Figure 2.
Approximate annual generation of manifested special waste by county.
Source: N.J. Department of Environmental Protection, Bureau of Hazardous and Chemical Waste. Based on 1978-79 manifest system records. On-site disposal is not included.

Commercial operations providing off-site treatment or disposal of industrial wastes are relative newcomers to the environmental field; before 1970 there were virtually none. Since then the off-site hazardous waste management industry has grown rapidly, but capacity still falls short of what is needed.

Of the 20 facilities that provide off-site treatment in New Jersey, 14 are recovery or reprocessing centers and 5 are transfer stations. Only one, Rollins Environmental Services, attempts to provide a broad spectrum of hazardous waste treatment processes, including high-temperature incineration, aqueous treatment, physical-chemical treatment and secure landfilling of residues. Rollins is the largest hazardous waste treatment facility in the State. The second and third largest are Inland Chemical Company and SCA Services' Earthline Division in Newark. These are regional reprocessing facilities, specializing in solvents and materials recovery. The SCA facility is new and only has about 20 percent of its nominal capacity in use, however.²⁰ The remaining firms are smaller and specialize in petrochemical recovery, waste oil recovery and temporary waste storage pending subsequent transfer to an ultimate treatment or disposal facility.

Virtually all of these facilities have experienced operational mishaps and violations of environmental standards at one time or another. Events such as the explosion and fire at Rollins in December 1977, an accident during repair operations which killed six contractor workers, contribute to the public's doubts about such facilities.

There are no off-site commercial landfills in New Jersey authorized to accept untreated chemical waste. The last one, the Kin-Buc landfill in Edison, was closed in 1976. With that closing began a noticeable trend toward on-site disposal by those industries with enough land and capital to be able to go it alone. This development appears to have been stimulated by four factors: (1) rapidly escalating cost of legal off-site disposal; (2) shortage of legally permitted off-site facilities within reasonable transportation distance; (3) fear of legal liability for waste improperly disposed of off-site by contractors; and (4) public relations problems for firms connected with off-site pollution problems.

On-site disposal gives the generator control over where its wastes go. Three incinerators and five secure landfills have been built and operated by New Jersey firms.

Incinerators are operated by:

Dupont Corp., Chambers Works, Deepwater, Salem County
American Cyanamid, Linden, Union County
Hercules Inc., Parlin, Middlesex County

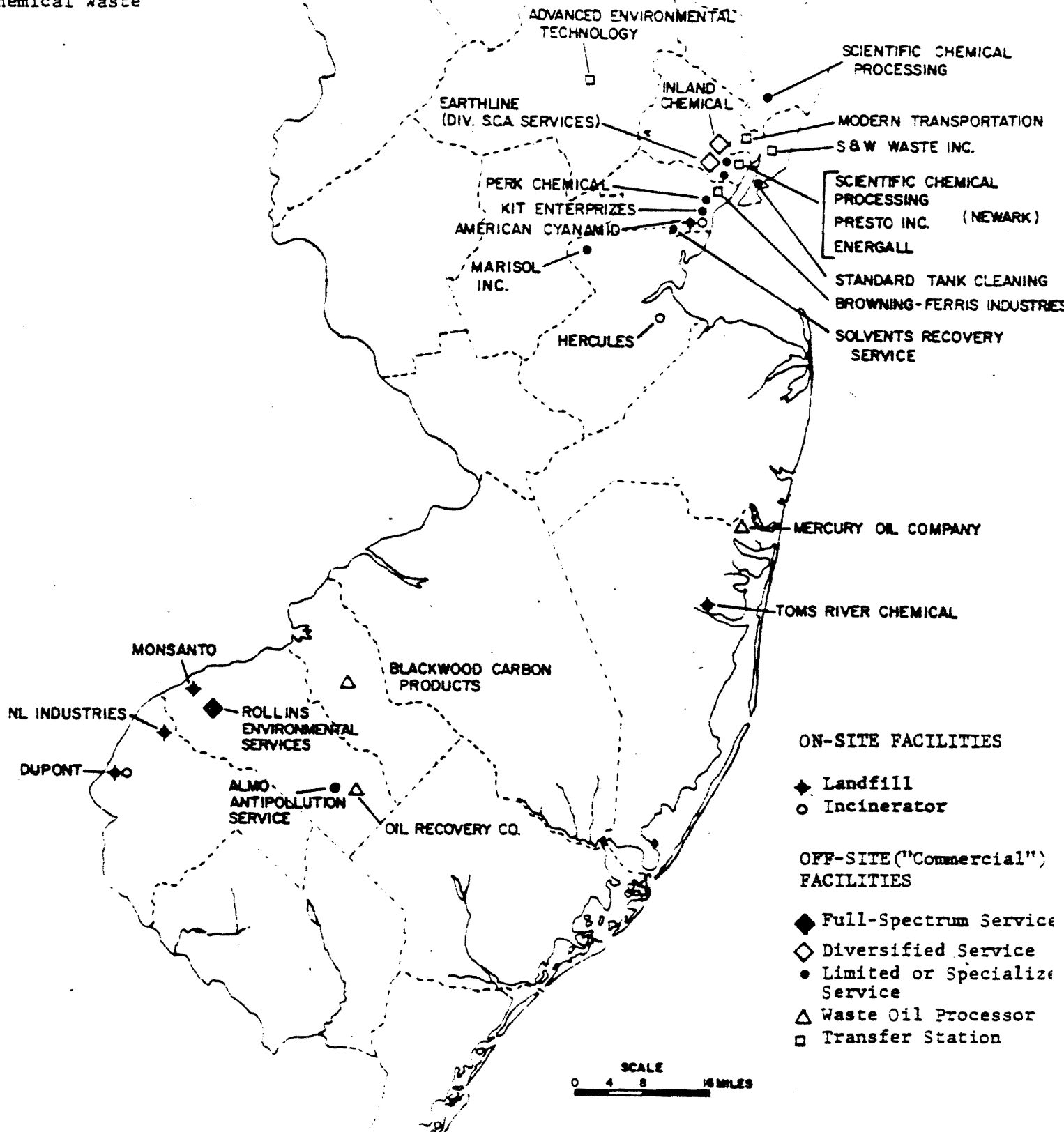
The landfill operators are:

Toms River Chemical Co., Toms River, Ocean County
DuPont Corp., Chambers Works, Deepwater, Salem County
Monsanto, Logan Township, Gloucester County
N.L. Industries, Pedricktown, Salem County
American Cyanamid, Linden, Union County

Figure 3.

Existing hazardous, special waste treatment and disposal facilities in New Jersey, November 1979

Source: N.J. Department of Environmental Protection, Bureau of Hazardous and Chemical Waste



Unlike ordinary landfills, these "secure" landfills feature double liners, leachate collection and leak detection systems. A typical landfill "cell" is about 30 feet deep, 5 acres in area, has a volume capacity of about 3 million cubic feet (equivalent of 400,000 drums) and costs about \$1.5 million. But, unlike treatment plants that have continuous capacity over the years, a landfill eventually fills up and must be closed.

Firms who lack the land or capital to build their own facilities generally have to depend on off-site contract disposal and waste transportation by haulers registered with the State. The shortage of licensed treatment and disposal facilities affects both large and small firms. Although New Jersey law and regulations make the generator directly responsible for the ultimate disposal of his waste materials, no generator has yet been prosecuted because of improper disposal by a hauler or treatment or disposal facility. If waste is disposed of in another state, it is difficult for New Jersey to prosecute. Finally, criminal investigators have found in some cases that haulers have cheated at both ends: charging the generator rates consistent with legitimate disposal, but dumping the waste illegally, and pocketing the difference.

Investment analysts and representatives of technically-sophisticated waste management firms view the industry as having tremendous potential for growth, provided enforcement of environmental regulations is strengthened to the point that cheap, illegal disposal is eliminated as a competitor, and provided public opposition to siting new facilities can be addressed. Firms are trying to grow. Within the past year, several have approached the Department of Environmental Protection and expressed a desire to build facilities in New Jersey if only a site could be found.

Except for small specialized treatment and disposal facilities, or ones limited to providing storage or transfer, future entry into the field of hazardous waste management will probably be difficult and limited to firms of considerable size. First, firms involved in hazardous waste management must be large enough to cover the potential liabilities that could arise from facility operation. Second, the business involves high capital entry costs. Third, the enterprise requires a high degree of technical sophistication and managerial competence if it is to be done right. Experience has shown that a firm of considerable size is able to supply the salaries and work environment capable of attracting and retaining the professional staff needed to run a comprehensive hazardous waste treatment facility. Finally, not only will the State demand technical sophistication, but both State and Federal law will require that firms be large enough to demonstrate their commitment to staying in the business and their capability of shouldering financial responsibility burdens. For example, forthcoming RCRA regulations are expected to require that hazardous waste management firms be able to cover potential operating liabilities, either through insurance or self-insurance, in the amount of \$5 million for 'sudden' occurrences and \$10 million aggregate for non-sudden occurrences.²¹

B. The Regulatory Framework

Two events in 1976 set the subsequent pattern for hazardous waste control in New Jersey. First, in July of 1976, the Department of Environmental Protection, moving to crack down on pollution violations at waste disposal facilities, shut down the Kin-Buc landfill, the largest reception point for chemical wastes on the Eastern seaboard. Then, in October, Congress passed the Resource Conservation and Recovery Act (RCRA),²² subtitle C of which encompasses hazardous waste management.

Under RCRA, the Environmental Protection Agency was required to develop regulations governing all phases of the hazardous waste "life cycle": generation, transport, and treatment or disposal.²³ Delegation of enforcement to the states was authorized, provided the states adopt and enforce laws no less stringent than the federal ones -- though state standards can be tougher.²⁴ The RCRA regulations will provide a means to identify hazardous wastes²⁵ and will set standards²⁶ for waste generators to follow in testing, labeling, storing and packing wastes. Standards for transporters are intended, through the manifest system, to insure²⁷ that the wastes are delivered to a licensed facility designated by the generator. Standards for hazardous waste storage, treatment or disposal facilities are intended to provide for adequate environmental controls over their operation, with emphasis on protecting groundwater.²⁸ A permit system and requirements for the maintenance of financial responsibility are intended to ensure²⁹ that facility owners are financially and technically qualified to manage them. The RCRA standards will also establish requirements for proper closure of landfills and other facilities,³⁰ and limited requirements for post-closure monitoring and maintenance.

Development of state hazardous waste management programs was supposed to follow the adoption of regulations³¹ by EPA, mandated by RCRA³² for 1978. However, EPA did not meet that deadline,³² and the federal regulations are now expected to become effective in 1980. The Department of Environmental Protection decided not to wait for the federal regulations, but chose instead to start developing a regulatory program which would anticipate RCRA requirements and could be conformed to the RCRA rules later on.

Following the closing of Kin-Buc, DEP had expected substantial inquiries from chemical waste generators as to where they could now properly dispose of their waste materials. While there were some inquiries, the Department decided to try to find out more about where the wastes were generated and where they were going. DEP began a survey by questionnaire of the waste disposal practices of some 10,000 plants in the state (about 8,000 responses received to date), and hired a consultant to assess the hazardous waste situation in New Jersey, develop design and operating criteria for hazardous waste treatment and disposal facilities, and make recommendations for a statewide hazardous waste management plan.

A manifest system based on the consultant's recommendations became effective May 1, 1978.³³ The manifest is a multi-part form on which the wastes in each shipment are described and categorized. Copies of the manifest are required to be sent to DEP by the generator, transporter, treatment and ultimate disposal facility. Each person in the chain is required to sign and swear that he has received the wastes described on the manifest. The reports filed with DEP are computerized, which enables enforcement agencies to detect discrepancies that may indicate illegal disposal. Transporters must have a copy of the manifest in their possession while the waste is being transported. This aids in responding to spills and accidents during transport.

The manifest system as presently constituted has several weaknesses. It can be evaded entirely if the generator simply does not manifest the waste. Signatures of treatment or disposal facility operators can be forged; such cheating can only be proven by detailed investigation. The system as presently organized does not require the disposal facility to send copies of the manifest back to the generator as well as DEP, which would put the generator on notice of discrepancies which the generator would have to investigate lest he face responsibility for allowing his waste to be improperly dumped.

The second component of the Department's management program for hazardous wastes is the development of regulations governing treatment and disposal facility construction and operation. Regulations were proposed in 1978 and are expected to be adopted in 1980.³⁴

Several statutes control the treatment and disposal of hazardous waste in New Jersey. The one from which DEP derives its major regulatory powers is the Solid Waste Management Act of 1970, which gives DEP broad power to regulate all solid and liquid waste.³⁵ It is from this statute that DEP derives its power to control facility design and operation, and to require manifests.³⁶ Haulers must obtain permits from both DEP (under the Solid Waste Management Act)³⁷ as well as from the Board of Public Utilities, under the Solid Waste Utility Control Act.³⁸ Unlicensed haulers and haulers who violate their permits can be fined up to \$3,000 and imprisoned for up to 3 years.³⁹

The unlawful disposal of hazardous waste may violate as many as five State statutes, depending on the composition of the waste and its destination. Besides the Solid Waste Management Act, they include the Spill Compensation and Control Act,⁴⁰ the Fish and Game Code,⁴¹ and the New Jersey Water Pollution Control Act.⁴² Each of these statutes provides for civil penalties; the largest is \$25,000 per day.⁴³ Intentional violation of the Water Pollution Control Act carries a criminal penalty of up to 2 years in prison.⁴⁴ A recent amendment to the New Jersey Criminal Code contains a prohibition on hazardous waste dumping that carries a maximum penalty of 5 to 10 years in prison.⁴⁵ Unlawful disposal also is punishable under federal law, including RCRA and the Clean Water Act.

Though armed with ample legal authorities, the State has successfully prosecuted only a handful of violations out of the thousands believed to occur each year. Before 1978, the Division of Criminal Justice had only one attorney and one investigator assigned full-time to pollution matters, and the Department of Environmental Protection, with barely enough staff (4 persons assigned to all hazardous waste matters) to inspect existing disposal sites and respond to pollution complaints, was not really well-organized to investigate criminal evasions of the disposal laws. Since then, the Division of Criminal Justice has significantly increased its staff devoted to pollution investigations, secured 18 indictments and obtained 12 convictions** for illegal dumping. An Interagency Strike Force with representatives from both divisions of the Attorney General's office (Criminal Justice and Law), DEP and U.S. EPA has been set up to direct the work of a 20-person investigative team. These efforts, together with the manifest system, are thought to be a significant factor in the shift of hazardous waste to out-of-state disposal sites. Even so, Criminal Justice authorities acknowledge that at best they can catch only a small percentage of violators. As long as legitimate, sound treatment and disposal facilities remain in short supply, and the price of disposal and transportation stays high, the incentive for illegal disposal will remain. Furthermore, the number of transporters and the lack of substantive licensing requirements which force them to be responsible for their activities make it easy for them to perpetrate fraud behind corporate shells, which are abandoned when the law catches up.

* Indictments: 5 corporations, 13 individuals

** Convictions: 4 corporations, 8 individuals (7 sentenced to prison), \$170,000 in fines levied.

C. The Need for New Off-Site Waste Management Facilities

(1) Demand for Capacity

The Commission has not been able to obtain reliable estimates of how great the need for new treatment and disposal capacity will be. The DEP/DRBC study consultant will be preparing such estimates. The need for gathering additional data is paramount, however. (See the discussion in subsection (3), below)

Several factors are expected to create a growing need for acceptable treatment and disposal capacity beyond what exists at present:

1. Secure landfills operated by on-site disposers will fill up.
2. RCRA and state requirements will close down inadequate treatment and disposal facilities both in New Jersey and in neighboring states.
3. Volume of wastes requiring special controls may increase as a result of economic growth in the generating industries.
4. Volume of wastes requiring special controls may increase as a result of the reclassification of additional wastes as "hazardous" by RCRA rules.
5. Implementation of pretreatment requirements under the Clean Water Act will result in the generation of hazardous waste sludges as industrial dischargers into public sewer systems remove prohibited substances from their effluents.
6. Strengthening of enforcement programs will force generators presently using illegitimate disposal channels to seek the services of authorized treatment and disposal facilities.

For the most part, this additional capacity will have to be supplied by off-site (i.e., off the generators' sites) facilities. This is because most generators lack either the space, the capital, or both to build their own high-technology processing facilities. Centralized facilities, especially large integrated facilities equipped to handle a broad range of wastes, can realize significant economies of scale, energy savings and materials recovery. A facility that accepts both alkali and acid wastes, for example, can use the waste streams to neutralize each other instead of having to purchase raw material to neutralize one kind of waste.

(2) Constraints to Establishment of Facilities

Recent experiences in New Jersey and other states raise doubts that private waste management firms, unless assisted by the State, can establish new off-site treatment or disposal facilities, due to intense local opposition. Examples of the dangers of hazardous wastes and of toxic chemicals, heavily reported in the press, fuel community objections to such facilities. Traditional appeals to economic interests -- the tax ratables and jobs new facilities represent -- do not seem to carry much weight in the face of fears about health and safety. This is especially true of facilities such as secure landfills, which are not labor-intensive and therefore hold out little prospect of gain for the local economy.

It is not only landfills that attract opposition. Proposals to establish chemical product storage tank farms have met vehement public opposition in several New Jersey municipalities since 1975. In each case local officials voted against the applications or the applicants abandoned them.⁴⁶ Rollins Environmental Services in Logan Township, the most diversified hazardous waste facility in the State, has been dogged by operational difficulties almost since its opening in 1970, leading to numerous public protests. These were aggravated by the explosion and fire that ripped through the facility in December 1977, taking six lives. Although the victims were killed by the explosion, not by exposure to toxic chemicals, local residents fear the consequences of another accident. They also are concerned about the effects of long-term exposure to low levels of toxic materials that may be released from the facility. Rollins has been cited for a number of violations of environmental and safety standards over the years. Logan Township attempted legal action to stop⁴⁷ the facility from reopening after the explosion but was not successful in court. Most recently, local opposition was aroused by plans to conduct a test-burn to determine whether Rollins' incinerator is suitable for the disposal of PCB's. The test burn was delayed because the incinerator did not meet standards; meanwhile, DEP and EPA organized an environmental assessment process to answer a range of questions about the Rollins facility, including the issues surrounding the test burn.

It has been suggested that the dire need for siting new hazardous waste treatment and disposal facilities requires that the State be able to override local land use controls. Some states have enacted legislation establishing special "siting boards" or similar authorities. As it happens, no additional legislation is needed to give the State this kind of power in New Jersey. The courts have held that the State has preempted local control over the siting of waste treatment and disposal facilities under the Solid Waste Management Act, and vested control in DEP.⁴⁸

There are, however, practical political limits on DEP's ability to exercise this power. In at least two states where the siting board approach has been tried -- Minnesota and Massachusetts -- local opponents succeeded in getting the State legislature to enact a prohibition on siting chemical landfills in their communities. To avoid a repetition of these events in New Jersey, it is apparent that there must be developed in the Legislature a consensus that facilities will have to be sited somewhere, and a willingness to accept the result of whatever site selection process they sanction.

(3) The Need for Additional Information

The information on hazardous waste generation and the need for new capacity available from existing sources is enough to indicate the broad outlines of the problem. However, a much more detailed data base is needed for facility design and planning, and should be developed by the management corporation recommended in Section IV of this report, building upon the information supplied by the DEP/DRBC study.

In order to provide guidance as to the technology needs and the relevant facility capacity and location preferences (based on the geographic distribution of waste generation), an accurate waste generation inventory should be made. This should include all wastes for which new facilities will be required. The inventory should cover:

- (a) All wastes that will be determined to be "hazardous" under Resource Conservation and Recovery Act (RCRA) regulations expected to be adopted by EPA in 1980.
- (b) All wastes that are determined to be "hazardous" under DEP regulations.
- (c) Wastes designated as "special wastes" by DEP which must be tracked from the point of generation to the point of disposal under the state manifest system.

The inventory should also include additional waste streams as follows:

- (a) Wastes such as Publicly Owned Treatment Works (POTW) sludge which may be exempt from the "hazardous waste" definition by EPA or DEP regulations but which require special handling and similar treatment or disposal technology. These wastes may be competing with hazardous wastes for similar treatment, storage or disposal capacity, so they should be included in the inventory.
- (b) Wastes such as municipal trash which may not be included in any "hazardous" definition but which are disposed of by a technology which is also applicable to the disposal of certain "hazardous" wastes. Also, wastes, including portions of the municipal waste stream, which are co-disposable with hazardous waste in ways that may save energy or money.

The inventory must provide information as to the wastes being generated, their characteristics and generation rate, and current disposal techniques being applied. In addition, since major changes in generation rates may come about in the time it takes to bring new facilities "on-line", the inventory must include projected changes in waste streams that will require capacity in new facilities.

Ideally, the information gathered should be adequate to determine whether each waste falls within the EPA and DEP definitions of hazardous waste or is otherwise required to be handled with particular precautions. However, to the extent that the proposed EPA regulation would require elaborate and expensive testing and is subject to probable revision, it is not recommended that waste generators be required to do these analyses now. Nor is it recommended that the State fund such analyses.

The inventory should contain the following information on each waste stream and, to the maximum extent possible, should be comprised of information available to the generator. New analytical information should only be sought when important to the stated objective. This should include, but not be limited to:

- (a) Significant chemical composition. This data should be adequate to match the waste to the appropriate storage, treatment and disposal technology.
- (b) Significant properties. This data should also be adequate to match the waste to the appropriate storage, treatment and disposal technology but avoid an unnecessary degree of precision. Significant properties include: physical state; combustibility or flammability; reactivity; acidity/alkalinity; biodegradability; corrosivity; solubility; toxicity (acute and chronic if known or can be derived from knowledge of composition); carcinogenicity, mutagenicity, and teratogenicity; bioaccumulativity; and radioactivity.

- (c) Generation rate and type of shipment currently employed: yearly rate; normal shipment size; bulk or containerized shipment; and generation rate (uniform or intermittent).
- (d) Resource recovery potential: heat value; chemical recovery/recycle potential; and applicable processes.
- (e) Current treatment or disposal practice and assessment of its availability after RCRA regulations are adopted: type of facility and technology; on-site or off-site; and in-state or out-of-state.
- (f) Waste management priority or classification based on: amount of waste available; level and kind of physical or chemical hazard; and resource recovery potential.

The inventory will result in an extensive data collection which will be used in various ways to meet the stated objective. To facilitate recall of the data, it is recommended that it be computer stored with flexible access.

Several factors can be identified which will influence, over the next 10 years, the rate of waste generation and the future presence of waste streams that will have to be accommodated. To be useful in properly determining waste treatment and disposal facility needs, the inventory must identify projected as well as current waste generation rates and characteristics. Facility needs should take into account planned waste reductions so as to encourage resource recovery or waste reduction through process changes at the source.

The following source categories are projected to be subject to changes in waste generation rates and characteristics for the reasons indicated:

- Publicly Owned Treatment Works (POTW's) due to increased secondary treatment.
- POTW's due to ocean dumping restrictions.
- POTW's due to different sludge treatment technology.
- Industry due to wastewater treatment and pretreatment requirements.
- Industry due to process changes including on-site recovery/recycle.
- Industry due to new "hazardous waste" criteria being established by EPA.
- Industry and government due to growth.
- Industry and government due to possible termination of treatment and disposal operations as a consequence of regulations being established by EPA and DEP.
- Municipalities due to growth.
- Existing storage and disposal facilities found to be an imminent hazard.
- Out-of-state wastes.

For each of these source categories and any others which project changes in waste generation the following information should be included in the inventory:

- Projected rate and waste characteristics adequate to match the waste to appropriate technology.
- Projected technology.
- Probability of change occurring.

The waste inventory data should be compiled from existing sources available to DEP and by a new questionnaire designed to elicit the information needed for facility planning purposes. Representatives of current or prospective waste generators should be directly involved in the preparation of the questionnaire so that answering and providing needed information is facilitated and delays are avoided. It is also recommended that the active support of industry and business associations be sought to promote quick completion of the inventory.

The inventory generated by implementation of these recommendations would provide necessary input for the program required under Section 4002(b) of RCRA. Federal funding assistance could be sought for this purpose.

Finally, a complete facility needs-analysis requires that more detailed information be obtained about the capacities of those treatment and disposal facilities that do exist in the State as well as those facilities' potential for expansion.

(4) The Need for Action Now

The development of new, technologically sophisticated hazardous waste treatment and disposal facilities requires substantial lead time - up to five years from the start of planning. If the State of New Jersey is going to have sufficient new capacity ready in time to meet the new demands that will be spawned by RCRA and the related developments described above, it is evident that planning for new facilities must begin as soon as possible.

III. TECHNOLOGY FOR HAZARDOUS WASTE MANAGEMENT

The Commission's timetable and resources did not allow for extensive research into the technologies available for treating and disposing of hazardous wastes. However, published literature on the subject indicates that technologies do presently exist⁴⁹ that can safely handle virtually all components of the hazardous waste stream. Furthermore, promising new technologies are being developed, and further progress can be expected as tightened regulation forces disposers away from environmentally unsound alternatives.

Recent studies completed for the New England Regional Commission and the New York State Environmental Facilities Corporation (EFC) included detailed descriptions of technologies that could be used to manage those states' hazardous wastes.⁵⁰ Similar information will be developed for New Jersey through the DEP/DRBC study; evaluation of technologies on a periodic basis should be one of the continuing responsibilities of the management corporation recommended in Section IV. At this time, however, the Commission wishes to recommend a set of guidelines for the management corporation in its consideration of proposals for developing new facilities. Those guidelines are summarized as follows:

1. Minimize waste generation.
2. Maximize resource recovery.
3. Where recovery is not feasible, treat to detoxify or destroy hazardous characteristics.
4. Landfill or long-term storage should be regarded as a last resort, to be used only for waste materials for which no economically or environmentally feasible alternative disposal method exists.

A. Approach to Choosing Disposal Options

The management guidelines summarized above require elaboration. Disposal of hazardous wastes is often complicated. Firms engaged in the business must have considerable sophistication in engineering and chemistry, and the licensing authority (DEP) should require evidence of that expertise. The decision of what technology to employ in the management of a given hazardous waste stream, or group of waste streams, requires a systematic approach to reach an environmentally satisfactory and economically efficient solution.

Cost, of course, will always be a factor. Wherever feasible, economic calculations should be required to consider the external cost associated with any pollution or other public health risk attributable to a waste treatment or disposal technique. For example, if the choice in treating a hazardous waste is between a technology that produces a certain amount of air pollution and a more expensive one that does not, the first method should not automatically be chosen just because it costs less. The public health impact of each technology method must be considered. The relative toxicity and health hazards posed by different technologies must be weighed in any process of selecting disposal options. The Commission believes that forcing the generator to bear the full cost of safe treatment and disposal of hazardous waste will provide the best and most easily administered incentive for reducing the generation of hazardous waste.

The Commission's guidelines are not meant to be inflexible nor should they be applied without regard to cost. While resource recovery is desirable from the standpoint of conservation, and is to be favored where feasible, it need not be chosen over suitable detoxification technologies if the cost differential would be too great. While landfilling - at least of wastes that remain in a hazardous form - should be minimized as a disposal alternative in the long run, for the foreseeable future some waste will probably have to continue to be landfilled in order to avoid serious economic dislocations, or because there is no better alternative.

1. Resource Recovery Strategies

Some, but not all, hazardous wastes are amenable to resource recovery. The price of alternate treatment or disposal methods is also a factor in determining recoverability; as is the cost of alternatives to the recovered material or energy. Just as higher petroleum prices have begun to improve the economics of alcohol fuels, higher alternative disposal costs will improve the economics of resource recovery. Resource recovery means the recovery of materials or energy content for economic use from what was considered a "waste". Four basic resource recovery strategies for hazardous waste have been identified:

- a. Direct recycle for primary use
- b. Use as raw material in a second industry
- c. Energy recovery
- d. Utilization for pollution control

Direct recycle takes place when wastes generated by an industry are treated so as to recover materials that can be re-used in that industry. Some of this already goes on; where it is economic for an individual plant to do so, prudent management will dictate on-site recycling. However, if a plant is not large enough to support its own recycling facility, or if other economic considerations militate against it, off-site facilities may be needed to make recycling a practical option.

Examples of direct recycling include re-refining of waste lubricating oils, industrial solvents recovery, and the recovery of metals from spent plating bath solutions.

Wastes from one industry may be of value to other industries as raw materials. Examples include recovery of phenols from coke ovens for use in chemical manufacture and the recovery of sulfur from coal or coal-burning facilities.

Some hazardous wastes have recoverable energy value. Usually this can be recovered by incinerating them, which also destroys them as hazardous wastes. Energy is presently recovered from waste oils by using them as supplemental (or even as sole) fuel for steam production. Recent literature indicates a promising use for chlorinated hydrocarbons as fuel in kilns used in the production of cement.

Finally, some wastes could be used for pollution control purposes. For example, a report prepared for the N.Y. Environmental Facilities Corporation indicates that waste pickle liquor from the steel industry could be used for the removal of phosphorous in municipal sewage treatment plants.⁵¹ Also, although it

is not a true resource "recovery" strategy in the strict sense, the use of acidic and alkaline wastes to neutralize each other saves virgin material that would otherwise have to be used to neutralize one waste or the other.

To facilitate greater use of resource recovery strategies, the management corporation (recommended in Section IV) should:

- (1) Assure the development of a waste exchange, and
- (2) Encourage development of sufficient off-site facilities to process wastes for resource recovery.

A waste exchange is an intermediary through which arrangement can be made to transfer a waste generated in one industry to another capable of using it as a raw material or for some other economic purpose. Waste exchanges have been established in Europe and in many American states, including New Jersey.

There are two kinds of waste exchanges. A clearinghouse is basically an information service. Generators supply information about their wastes, and this is used to compile lists from which potential users can select materials appropriate to their needs. A clearinghouse is a passive arrangement, depending for its success on the voluntary efforts of generators in listing their wastes and of users in taking them. In a brokerage, the exchange is operated by a staff who actively seek out waste generators and attempt to match their wastes with potential users, whom they try to convince to use the waste. A clearinghouse is presently being operated in New Jersey under the auspices of the State Chamber of Commerce. Consideration should be given to changing the form of this service to a brokerage, or having the management corporation recommended in Section IV sponsor a brokerage. The efforts of a brokerage could be helped by giving the broker access to the generator reports called for under Section VII (Enforcement).

As a general rule, the more industries there are in the area served by a waste exchange system, the greater are the chances for successful matches between generators and users. The heavy concentration of industry in the Northeastern states makes it logical to organize waste exchange on a regional basis. This could be done by coordinating waste exchange efforts in the several states or by encouraging development of a regional waste brokerage.

2. Treatment and Disposal Technologies

If a waste is not amenable to resource recovery, it should be treated to destroy its hazardous characteristics. If it is not possible totally to do that, it should be treated so that its hazard is reduced to a practical minimum before being landfilled or given over to some other form of long-term storage.

Treatment facilities are necessary for resource recovery strategies as well as for detoxification or destruction of waste. Some hazardous wastes which are unsuitable for waste exchange, for example, can be made re-usable if properly decontaminated, concentrated, or otherwise treated.

A number of unit processes are available for treating hazardous wastes. The following discussion concentrates on proven technologies. The management corporation should consider and evaluate the application of new technologies as their effectiveness and safety are demonstrated.

Figure 4 represents a decision tree such as might be used in determining which system is best suited for treating a specific waste. It is assumed that pretreatment takes place at the generating site. A waste that has been designated "hazardous" can be classified as a liquid, a solid, or a sludge (semi-solid). Note that no mention is made of gaseous hazardous wastes, since the options for handling these are limited to incineration or converting the gas to either a liquid or solid waste problem (containerized storage) for ultimate disposition. By applying various engineering judgments, the hazardous waste is processed until it is rendered suitable for one of the following environmentally acceptable ultimate disposal alternatives:

- . Conventional Treatment
- . Sanitary Landfill
- . Fixation (and landfill)
- . Hazardous (or Secure) Landfill
- . Deep Well Injection or Containerized Holding

Of these alternatives, the first two are most favored since they indicate the material no longer possesses hazardous properties. The last three are stewardship techniques designed to guarantee that the hazardous substance is safely contained.

Of the three stewardship techniques, landfilling of wastes in "fixated" form is probably preferable when it can be used. About 40 proprietary processes exist which are claimed to bind toxic materials into rock-like masses relatively resistant to leaching. EPA has tested some of them, with good results. Several have been operated on a commercial scale in foreign countries and other states. Deep-well injection is not a viable option in New Jersey because of unsuitable geology. Some waste is currently being shipped to states where deep-well injection is permitted, and this may continue in the future.

Several unit operations are interposed between the point where a waste is declared hazardous and one or more of the five ultimate disposal techniques are applied. These can be classified as either separation techniques or conversion techniques. Separation techniques can be used for resource recovery or to reduce the volume of waste requiring ultimate disposal. In either case, two materials result from one, and either one or both may be hazardous. Conversion techniques, however, change the nature of the waste.

Separation processes are oriented towards segregating a waste into two or more parts. Sedimentation is applicable when a solid material is suspended in a liquid. If the solid material does not settle out or does so very slowly, the material is said to form a stable colloid. Various coagulant aids can be added to destabilize the colloid. The mixture can then be gently mixed, that is flocculated, so that the small solid particles can be brought together to form larger particles which then settle. If the resultant solid mass has a specific gravity that is less than the liquid it may be expeditious to add air bubbles to the mixture and float the solid material to the surface for separation.

Some materials can be removed by forming insoluble precipitates. For example, by adding sulfide, many metals can be precipitated as heavy metal sulfides. Some materials, in particular organics, may be truly dissolved in the liquid. Because of free energy considerations, these materials may not be completely stable in the solute and will readily adsorb to a properly prepared medium such as activated carbon.

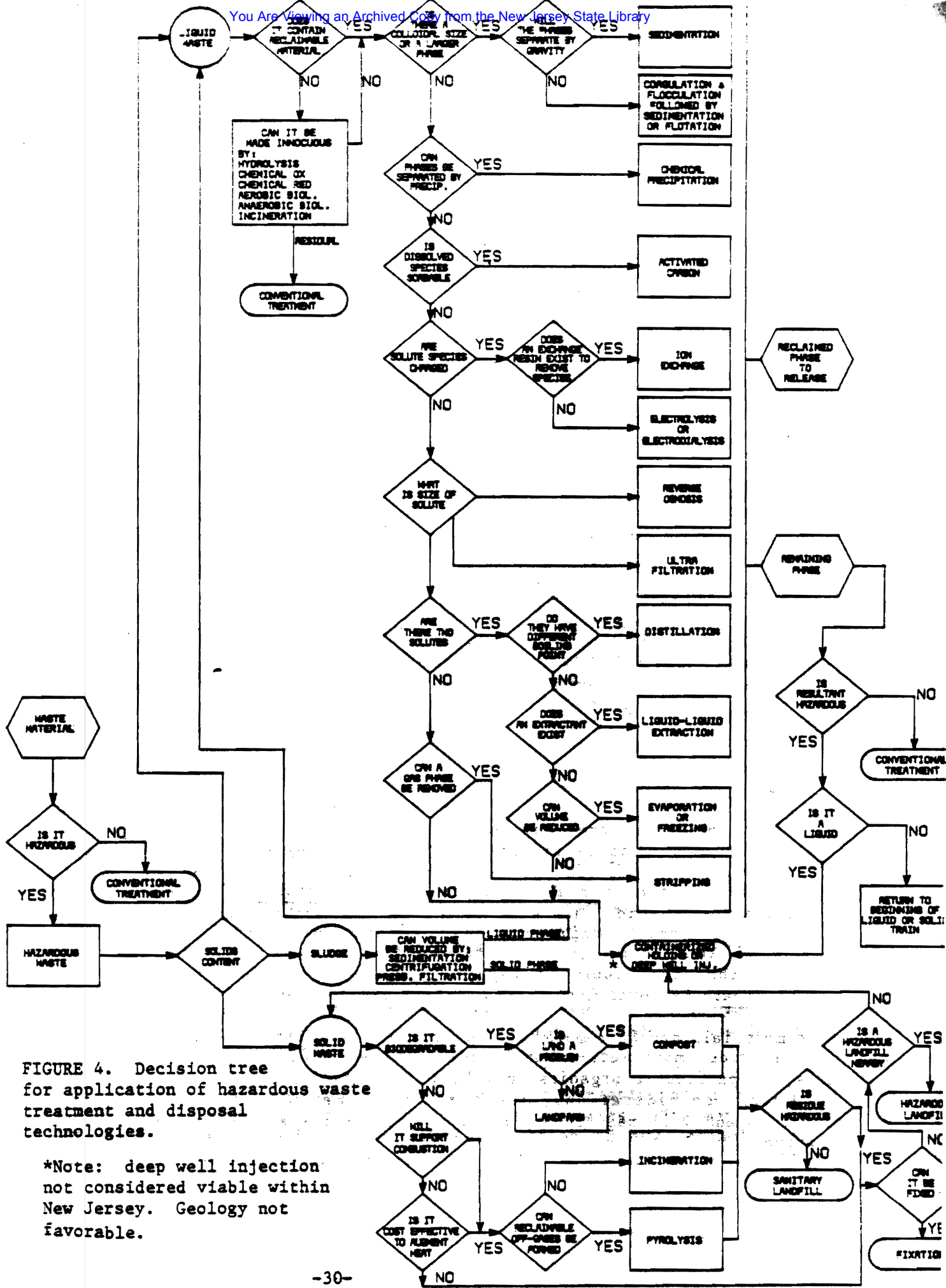


FIGURE 4. Decision tree for application of hazardous waste treatment and disposal technologies.

*Note: deep well injection not considered viable within New Jersey. Geology not favorable.

If the hazardous material exists in an ionic state, it can exchange position with an innocuous ion, e.g. sodium, in a specially prepared ion exchange resin. There are conditions where these exchange mechanisms may be unacceptable. In such situations, it may be desirable to separate the ions by imposing an electrical field (electrolysis). By interposing semi-permeable membranes between the anode and the cathode (electrodialysis), two segregated wastes can be formed. If the driving force across the membrane is pressure rather than electricity, then the process is known as reverse osmosis. By using a semi-permeable membrane with a large pore structure, the process evolves into ultrafiltration.

It may be desirable to separate two liquids. If they have different boiling points, then one can be distilled from the other. By adding an immiscible liquid, vigorously mixing it with the hazardous material, and then separating the two, it is feasible to separate the two liquids via liquid-liquid extraction. The volume of waste can be reduced if the solute readily evaporates. Freezing achieves phase separation by forcing impurities towards a central core for easy removal. If a dissolved gas is present it will preferentially migrate from the solution to the gas phase under proper solubility conditions. By passing a carrier gas through the mixture, the gas phase can be stripped out.

Conversion processes change the nature of the waste from hazardous to innocuous. Hydrolysis is concerned with breaking chemical bonds and thus altering the chemical character of the compound. Using chemical oxidation or reduction techniques, the valence state and thus the toxicity of a material can be changed. For example, hexavalent chrome is more toxic than the reduced tri-valent state.

Some organic materials can be oxidized either aerobically or anaerobically. Composting and landfarming are examples of two such processes. Biological oxidation is in essence the same as chemical oxidation, the difference being that the mediating agent is biological.

One of the more popular conversion techniques is thermal degradation. If the end products are carbon dioxide, water, oxides of nitrogen, and ash, then the process is called incineration. Under conditions of an oxygen limited environment, energy rich exhaust gases can be formed by pyrolysis. All thermal conversion techniques offer the potential for heat recovery.

At present, the technology of choice for the destruction of certain highly toxic, persistent organic compounds is high-temperature incineration. It is the only method approved by EPA for the disposal of PCB's, of which there are millions of gallons stored around the country due to the lack of approved disposal facilities. Incineration at high temperature (in excess of 1200° C.) with relatively long residence time can achieve destruction efficiencies in excess of 99.5 percent; values over 99.9 percent have been achieved in some burns. However, public concern over the possibility of incinerator malfunction has led to resistance to EPA proposals for PCB incineration. One such controversy presently surrounds a proposal for a test burn at Rollins Environmental Services in Gloucester County.

One possible approach to incineration of highly toxic wastes that could avoid siting problems is incineration at sea. By locating the incinerator on a ship well out to sea, the threat of local air pollution in a host community is eliminated. A second advantage is economic: the dilution and neutralization factors provided by the ocean reduce the need for scrubbers to remove hydrochloric acid from the

exhaust gas. The Europeans have successfully operated incinerator ships for several years. An American firm recently approached the New Jersey Department of Environmental Protection with a proposal to build and operate an incinerator ship from a New Jersey port location.⁵² Such proposals should be given serious consideration; however, the evaluation of such proposals must carefully weigh, as part of the environmental assessment process, the possibility of accidents at sea resulting in the release of extremely toxic materials into the water, possibly causing serious ecological, environmental and human health consequences.

A third possibility for incineration is the use of cement-making kilns. Pilot work with cement kilns has achieved good results in New York State and Canada.⁵³ This technology has the advantage of putting the hazardous waste to good use as fuel in the cement-making process. Although there are no cement kilns in New Jersey, shipments to kilns in neighboring states could be part of the State's overall system for hazardous waste management.

The impact that incineration technology can have for the permanent destruction of the most highly toxic class of hazardous wastes requires that this technology be carefully investigated. Public resistance to incineration because of potential air pollution is real; but the alternative disposal method for such wastes is land-filling, which is also subject to considerable public opposition.

B. Special Problems of Landfilling

For at least the foreseeable future, there will be a need for secure landfill facilities for the residuals from hazardous waste treatment processes and for certain kinds of hazardous wastes that cannot be treated or disposed of in other ways. Though landfilling of unstabilized or un-"fixed" hazardous wastes should be discouraged whenever possible, the public must recognize that disposal of wastes into properly engineered, well-monitored and safeguarded secure landfills is far better than the present un-secure practices of improper disposal. Furthermore, the State will be far better off with a few secure landfills whose locations are known and which can be monitored than with scores or hundreds of anonymous "midnight" dump sites. A leak at a secure landfill is far more likely to be detected than an unauthorized dump, and it can be captured with a leachate collection system.

There are several reasons why reliance on landfilling of hazardous wastes should be minimized.

The first is that landfilling of hazardous wastes (unless they are first "fixed", "stabilized" or rendered innocuous) only isolates them from the rest of the environment. They remain forever as a threat. Should the containment system fail, the health of future generations could be harmed. Although new designs for secure landfill hold the promise of perpetual containment, no one can be certain they will live up to that promise. EPA's proposed RCRA standards for secure landfills, for example, cannot guarantee containment beyond 50 years if one of the liners is perforated.

Second, stewardship of a secure landfill calls for perpetual monitoring and perpetual protection of the site from disturbance. There can be no guarantees that a commercial facility would not be abandoned at some point in the future. In addition, human institutions, including nations, do not last forever. There is no way to predict with confidence what will happen to a landfill site 500 to 1,000 years from now.

Third, landfilling uses up land and limits its usefulness thereafter. Because of the possibility of containment failure, it is not prudent to build habitations over a closed landfill. Furthermore, there can be no use of a site that would risk damaging the containment system. Any substantial development on the site risks economic dislocation later on if a containment failure requires major remedial work.

Finally, because of New Jersey's dense population and land use patterns, and the difficulties that can be anticipated in acquiring sites for secure landfills, there will probably be only a few such sites available. When they are filled up, it will be even more difficult to find others. As with any other scarce resource, prudence dictates they be stretched as far as possible.

An interesting alternative to secure landfill was proposed to the Commission during the period of public comment on the draft report. This is the concept of an above-ground containerized holding facility, or "retrievable surface storage facility" (RSSF). The RSSF concept could be applied to waste residues that cannot be rendered innocuous prior to landfilling. The proponents suggest it may be preferable to store carefully containerized, identified and segregated wastes above ground against the day when technological advances and/or economic changes make it practical to apply resource recovery or detoxification techniques to them, instead of burying them underground where they are less easy to monitor and far more difficult to retrieve if they begin to leak out.⁵⁴ The Commission has not had the opportunity to explore this idea in detail, but we believe it merits further study and serious consideration as an alternative to landfilling in at least some cases. The RSSF concept might prove particularly useful as an interim storage system to hold hazardous wastes safely while new treatment and disposal facilities are being developed. Considering that the lead time required for bringing new, high-technology treatment and disposal facilities on-line may be as much as five years, some kind of interim storage facilities may be needed while the State moves toward ultimate solutions of the hazardous waste problem.

Besides minimizing reliance on secure landfill, the State should take every step to ensure that hazardous waste landfills are monitored in perpetuity, so far as that is possible; that their locations remain known and that they are not inadvertently disrupted. The legal measures for doing this include post-closure escrow accounts, State or federal perpetual-care funds, deed restrictions and notices in land title records. Some of these are discussed elsewhere in this report. In addition to these, however, the law should require as part of closure that a landfill operator erect on the site a substantial physical monument explaining what is buried there and warning against excavation. Paper records can be lost or destroyed, and future generations may have no way of knowing where hazardous waste sites are if we do not mark them now.

IV. MANAGEMENT OPTIONS

Having concluded that there will be a growing need for satisfactory treatment and disposal capacity for the hazardous wastes generated in New Jersey, the Commission focused much of its deliberation on management approaches to securing needed additional facilities. The Commission examined a number of institutional models for hazardous waste management that have been proposed in the United States, and several that have already been implemented in European countries. The Commission also considered institutional models that have been applied to environmental problems that raise many of the same issues as hazardous waste. These included privately-owned public utilities and public authorities - familiar entities in water supply, sewage treatment and the handling of municipal solid waste.

It is necessary to point out that any one of these options, applied to the hazardous waste problem, might be successful. Each has certain perceived strengths and weaknesses, but they are not always quantifiable. The choice between management options is therefore necessarily somewhat judgemental.

The construction and operation of environmentally sound treatment and disposal facilities represents the delivery of a technologically sophisticated industrial service. Historically, private enterprises have been the arrangements favored in the American economic system for providing such services. The Commission members believe that private industry is best able to construct and operate hazardous waste treatment and disposal facilities in a manner that will ensure efficient operation and provide incentives for technological improvement. Furthermore, since private industry is the principal generator of hazardous waste, it is most appropriate for private industry to shoulder the responsibility for proper treatment and disposal of that waste.

On the other hand, hazardous wastes are not being properly handled today. The necessary facilities have not been built, in part due to a national failure to perceive the dangers of improperly disposing of hazardous waste. The laws to deal with improper disposal do exist now in New Jersey. However, additions to the strengthening of the State's regulatory program are recommended in this report and are absolutely essential to the success of any future management system - including the one favored by the Commission. But enforcement of prohibitions against dumping will not alone be sufficient to assure the development of new facilities.

It is necessary that the potential builders of hazardous waste facilities be able to plan for them with some degree of certainty. The absence of established design and operation regulations for high technology facilities is at present one factor in private industry's hesitancy to build new ones. Both EPA and the State DEP must be encouraged to adopt such regulations as soon as possible.

However, the major need for a high degree of public involvement in the actual planning and development of future hazardous waste facilities arises directly from the concerns raised by the mistakes and failures of the past. Public opposition to the establishment of new hazardous waste facilities grows directly from the bad experiences of the past. Assurances of oversight by regulatory agencies may not be, by themselves, sufficient to quell public fears. While DEP has the legal authority to respond to a private proposal for a hazardous waste facility, and to permit that facility over local objections, the residents of the proposed host community may ask why they have been singled out.

Therefore, the Commission recognizes there must be considerable public involvement in the process by which the need for new facilities is defined, the kinds and number of facilities are determined, and their locations decided. The Commission believes that this can be achieved by a management system that stops short of full ownership and operation by the State of hazardous waste management facilities. Based on interviews and hearings, it is the sense of the Commission that the private sector is prepared to invest the necessary capital to build advanced, state-of-the-art treatment and disposal facilities, provided government establishes a suitable regulatory climate, enforces prohibitions against illegal dumping, and assists in the matter of siting.

The option recommended by the majority of the Commission involves the creation of a management corporation to be in charge of management, preparation and planning of a hazardous waste treatment program, rather than reacting on a case-by-case basis to various private sector proposals which may or may not be in accordance with the needs of the State. It is believed that the public will have more confidence in an action plan developed by a management corporation that is publicly debated, so that specific criteria for siting and construction of facilities will be agreed upon in advance of the siting of individual facilities. (One Commission member could not agree with the recommendation for a management corporation at this time. That member's separate views are set forth in Appendix D.)

An understanding of how the Commission arrived at this recommendation requires a discussion of the purposes and functions of a hazardous waste management system, the constraints of the social, political and economic structures within which it must function, and some of the institutional models the Commission examined.

Goals and Functions of a Hazardous Waste Management System

In simple terms, the goal of a hazardous waste management system is first, to identify hazardous waste, and second, to assure that it is transported, treated and disposed of in a manner that does no harm to public health or the environment. Such a system consists of physical elements and management functions. The physical elements are capital facilities - the treatment and disposal facilities and transfer stations, the sites on which they are located, trucks and tank cars, laboratories, and so on - and the labor needed to operate them. Management functions are those activities which must be carried out to ensure the physical elements come into being and work together properly so as to achieve the goal.

The choices to be made in designing a new management system for hazardous waste consist in parcelling out various functions to existing institutions or creating new institutions to handle them.

Among the management functions essential to the development and operation of a hazardous waste management system are the following:

REGULATION. Establishment of rules designating wastes as hazardous, and establishing standards for their safe transport, treatment, and disposal.

ENFORCEMENT. Policing the regulations.

PLANNING. Inventorying the hazardous waste stream (present and future); determining what technologies are available and will be needed for treatment and disposal; identifying and stimulating research and development to assure that technology and management practices will be available; and determining what kinds of facilities should be built and how many should be built.

SITING. Determining where facilities will be built.

BUILDING. Construction of facilities according to required specifications.

FINANCING of facility construction, operation, and liability requirements.

OPERATING. Treatment and disposal facilities in a responsible manner.

At present, the first two functions are assigned to government agencies: the federal Environmental Protection Agency and the State Department of Environmental Protection, aided in their enforcement roles by the Justice Department (on the federal level) and the Department of Law and Public Safety (state). Subsidiary enforcement roles are accorded to county and local officials.

Those functions - regulation and enforcement are expected to remain the province of line government agencies. They are traditional government functions and no one has suggested they be relocated. (Specific recommendations on improving the enforcement function are contained in Section VII of the report). In its deliberations the Commission focused on the remaining functions: planning, siting, building, financing and operating new hazardous waste treatment and disposal facilities.

Public Concerns and Institutional Options

Within the past 18 months several state and interstate bodies, responding to the same problems of illegal and improper hazardous waste disposal and associated environmental pollution that moved Governor Byrne to appoint this Commission, have sought ways in which to encourage the development of new hazardous waste treatment and disposal facilities.

Several of them commissioned studies of the problem and of possible solutions.⁵⁵ Two major reports released in September, 1979, were obtained by the Commission and provided valuable information and insights on the question of institutional options. One was a study prepared for the New England Regional Commission (NERCOM) by Arthur D. Little, Inc.⁵⁶ The other was done for the New York Environmental Facilities Corporation (EFC) by the firm of Booz-Allen & Hamilton.⁵⁷

In its report for the EFC, Booz-Allen listed a number of state concerns that affect the choice of institutional options over a range extending from maximum private control (with little or no state involvement) to complete public ownership and operation. Slightly modified to include the Commission's own views, the major concerns are as follows:

1. ENSURE ESTABLISHMENT OF NEEDED NEW FACILITIES WITH FULL PUBLIC INVOLVEMENT IN THEIR SITING.
2. ENSURE ENVIRONMENTALLY SOUND FACILITY OPERATION.
3. ENSURE THAT HAZARDOUS WASTE GOES TO APPROPRIATE FACILITIES.
4. ENSURE ENVIRONMENTALLY SOUND POST-CLOSURE MANAGEMENT.
5. PROMOTE ECONOMIC EFFICIENCY, both in the operation of hazardous waste treatment and disposal facilities and in the waste-generating industries.

6. LIMIT THE PUBLIC SHARE OF FINANCIAL RISKS.
7. GUARANTEE COMPENSATION FOR PERSONS HARMED BY FACILITY OPERATIONS OR POSTCLOSURE RELEASE OF HAZARDOUS WASTE.

The list does not reflect any order of priority. All of these concerns are important and must be dealt with by any institutional option ultimately selected by the Legislature. Differences of opinion arise over various institutional arrangements' abilities to meet those concerns. For example, some of the comments received by the Commission on its draft report indicate suspicion of private firms' willingness to put health and safety ahead of profit maximization. These comments urge that at a minimum the government should own hazardous waste treatment and disposal sites and facilities and perhaps should operate them as well. The Commission believes that with improved enforcement tools and adequate resources the government can effectively police privately-operated hazardous waste treatment and disposal facilities without having to opt for complete state ownership and operation.

The Commission is unanimously in agreement on one principle. That is, that no matter who owns or operates hazardous waste facilities, the pricing structure should compel the generator of the waste to pay all costs associated with the safe treatment and disposal of the waste. The purpose of this policy is not merely the promotion of economic efficiency; it is intended to encourage generators to reduce their production of hazardous waste.

To this end, and believing that private capital is available for facility development, the Commission recommends that to the greatest extent possible there be no public subsidization of hazardous waste treatment and disposal facilities beyond programs already offered. However, financial and tax incentives established for industrial development in general may also be extended to the development of hazardous waste facilities. In particular, new facilities could be encouraged to take advantage of Industrial Development Revenue Bonds issued by the New Jersey Economic Development Authority.

The Booz-Allen report for EFC identified three general categories of management options, designated I - Private Ownership, II - State Assistance, and III - State Ownership and Assistance. Option I essentially means acceptance of the status quo, and was rejected principally because without state involvement private firms will be unable to secure sites for new facilities. For the same reason, the Commission also rejected this option for New Jersey.

The other two categories in the EFC report actually cover a number of possible combinations of public/private arrangements for ownership, operation, financing and liability coverage of hazardous waste facilities. Among the most prominent:

- * PRIVATE OWNERSHIP AND OPERATION, with state assistance in site acquisition.
- * STATE OWNS SITE, leases to private operator who also builds and operates facility.
- * STATE OWNS SITE AND FACILITY, contracts operation to private firm..
- * STATE OWNS AND OPERATES FACILITY.

The minimal level of state involvement that would be necessary was found to be state assistance in site acquisition. As noted earlier, in New Jersey, DEP has the legal authority to do that, but can exercise its power only in passive response to a private proposal. Reported experiences in other states, and in related areas such as the siting of energy facilities, lead the Commission to conclude that state preemption of local control over siting will be politically acceptable only if there is an equitable procedure established at the State level that will ensure that all parts of the State are given equal consideration as candidate sites, subject to objective selection criteria developed in advance of actual site selection. These considerations, in turn, imply the necessity for a State hazardous waste management plan, and that inescapably leads to the necessity for designating a State planning body.

The concerns which militate for State involvement beyond the level of siting assistance and planning are essentially a desire to maximize the government's ability to ensure environmentally sound operation of facilities and to guarantee compensation of persons harmed by facility operation or postclosure release. As to the first concern, the thinking is that a public agency has less incentive to cut corners on operations. Also, policing is considered easier when the government does not have to deal at arm's length with an independent private firm. Private companies have to be accorded full legal process, and administrative and court proceedings take time. Control is maximized when the State owns and operates a facility. It decreases somewhat but is still strong when the State owns the facility but contracts for operation; a contractor can be replaced. Control is attenuated still more in a lease arrangement.

On the other hand, the greater the degree of State involvement, the greater the public's exposure to financial risk. If the State owns and operates, the State will have to be responsible for compensating any damages that may occur as a result of the operation. If the agency managing the facility proves inept, generators will have to pay more for treatment or disposal than need be. And, of course, the greater the State's involvement in actual operation, the more public employees there will have to be. The Commission takes the view that government expansion should be limited to only what is absolutely necessary to remedy the problem.

To a certain extent, however, some State responsibility for liability is not unwelcome and may in fact be necessary. As explained below in the discussion on liability, it is unlikely that private firms can be made to take responsibility for closed hazardous waste facilities in perpetuity. Where facilities such as secure landfills require care beyond a reasonable horizon after closure, it is more sensible at some point to transfer responsibility to the State, and pay for it out of collective revenues (either general ones or by a levy on the hazardous waste-generating industry). But this does not require that the State own a site or a facility outright from the start. It can as well be accomplished by transferring title to the State after closure - e.g., after the 20-year period of private responsibility to be mandated by federal regulation runs out. The Commission favors minimizing the State's exposure to liability, to the extent that private insurance and assets are capable of guaranteeing adequate compensation to persons harmed by mishaps at hazardous waste facilities.

The Commission examined and discussed a number of "working models" of hazardous waste management systems exhibiting various degrees of public involvement in ownership and operation.

A familiar one in American experience is the public authority, with full powers to own and operate facilities and to finance their construction by issuing revenue bonds. In the State, there are scores of sewerage and utility authorities. At the State level, there are the examples of the Turnpike Authority, Sports and Exposition Authority, and others; there are also interstate authorities - the Delaware River and New York-New Jersey Port Authorities, to name only two.

No public authority has yet built a hazardous waste treatment or disposal facility, but a number do have the legal power to do so and one, the Gulf Coast Waste Disposal Authority (Gulf Coast) in Houston, Texas, is developing one now.⁵⁸

Gulf Coast is a somewhat unique institution and it is using a somewhat unique means to finance its hazardous waste facility. A publicly chartered agency authorized to provide treatment and disposal facilities for public and private industrial wastes in the Houston area, Gulf Coast has for several years operated a central wastewater treatment plant exclusively for industrial waste. The plant is connected by interceptor lines to 10 major industrial firms. In developing this plant, Gulf Coast, like any other sewer authority, floated revenue bonds which are being paid off out of user charges.

The capital costs for Gulf Coast's new hazardous waste plant are being funded by four large firms, who in return will each receive guaranteed use of about 22.5% of the facility's capacity. The rest of the available capacity can be sold by Gulf Coast to other customers. Such an arrangement may not be sufficient to answer the needs of a large number of smaller contributors, as there are in New Jersey, who must also be served.

A common objection raised to public authorities is that they tend to be insulated from public input. In its recommendation for a management corporation the Commission has attempted to build in responsiveness to public concerns by providing for representation of affected interest groups in the makeup of the corporation's governing body, and by calling for explicit procedures for public participation in the making of important decisions.

An interesting variation on the public authority concept is found in Europe. In Denmark and West Germany, hazardous waste treatment and disposal has been made the responsibility of specially-created shareholder corporations. In Denmark, the shares are held partly by the municipal governments and partly by the national government. Facility operation is contracted to a private firm.⁵⁹ In Germany, ownership is split between private firms and the government (74% vs. 26% in the State of Hessen; 30% vs. 40% in the State of Bavaria, with another 30% held by municipal governments).⁶⁰ Still another approach is Switzerland's, where hazardous waste treatment facilities and secure landfills are under the control of a private corporation which has public representatives sitting on its Board of Directors. They include representatives from the client cantons (equivalent to our states), and the national environmental protection and health departments.⁶¹

A principle virtue claimed for these public-private partnership arrangements is that they allow for public representation and oversight of the facilities' operation, while letting the facilities operate on the management principles of private industry.

There is an example of a public-private partnership arrangement in the U.S. as well: the Communications Satellite Corporation (COMSAT), chartered by Congress and having representatives on its board appointed by the government as well as elected by the private stockholders.⁶²

The Management Corporation Proposal

Having considered the various options and alternatives, the Commission developed its management corporation recommendation out of a desire to minimize the government's role in direct ownership or operation of new facilities while providing for overall state planning, guidance, and public participation.

In developing this role for the State, there was concern that having the same agency which regulates industry being in the position of proponent for facilities related to industry would result in an internal conflict of interest and a loss of credibility. Therefore, the opinion of the Commission is that a management corporation for the State should be created, distinct from existing agencies so that its proponent role is well understood, to be in charge of the development of the strategy for hazardous waste management. This new corporation would be responsible for assisting in the development of facilities to treat and dispose of hazardous wastes generated in New Jersey, either in the State or through interstate arrangements.

The management corporation would be a public, not-for-profit entity established by an act of the Legislature. Similar entities have been established before in order to apply private sector-style management to the operation of public enterprises.⁶³ Examples include the federally-established Corporation for Public Broadcasting and the Legal Services Corporation.⁶⁴ Perhaps the most comparable example is New York State's Environmental Facilities Corporation, established in 1967 to promote the development of pollution control facilities.⁶⁵ The corporation would be charged with operating on the principle of maximizing private sector involvement in the construction and operation of new facilities.

A number of safeguards to assure the management corporation takes heed of local and regional concerns have been recommended, including an open public process for developing siting criteria and for site selection, environmental assessment requirements, public participation in all decision-making, and the issuance of an Annual Report by the corporation.

One of these safeguards would be the composition of the Corporation's Board of Directors. The basic concept is that the corporation be controlled by an unpaid Board of Directors, appointed by the Governor, made up equally of individuals whose background and associations are from industry, government and the general public. To keep the Board to a manageable size, the Commission recommends that there be three representatives with backgrounds and associations from each sector. The Board members should be selected by the Governor from nominations solicited from industry trade groups and environmental groups. In addition, the Commission recommends that one representative from the industrial sector be chosen from nominees submitted by the Chemical Industry Council of New Jersey, and that the public representation include at least one person nominated by organized environmental groups. Finally, when the Board of Directors sits in consideration of a facility proposal for a particular site, two representatives named by the local governing bodies of the potential host communities would be added as temporary members.⁶⁶

The Governor would appoint the chairperson of the Board from among the nine Board members. An Executive Director hired by the Board would recruit and supervise the necessary staff and would be responsible for carrying out the duties

of the corporation. A large staff should not be required to carry out the functions envisioned for the corporation. The Board would set overall policy for the corporation and make the final decisions on siting and facility construction and operation, subject to all DEP regulations. Initial terms of the Board members should be of varied lengths to provide a phased turnover of the representatives.

Another safeguard to help ensure the accountability of the management corporation would be the requirement that the corporation issue an Annual Report. This report would not only cover corporation activities such as fiscal matters, proposals reviewed, etc., but would also include specific information on each operating facility under the corporation's purview, as well as statistical data on hazardous waste generation, transport and treatment and disposal in the State, and an account of DEP's enforcement activities. Regarding specific facilities, the report would discuss the results of ongoing environmental and public health monitoring programs.

The corporation would be given the authority to expedite State licensing of facilities, to overview existing and emerging technology, to help obtain low interest loans for facility construction and, in general, to identify adequate treatment and disposal capacity for the hazardous waste stream. The authority to expedite licensing would not in any way lessen the thorough analysis required to make certain appropriate environmental safeguards are applied; it would only be used to assure that decisions are rendered in a timely manner. The management corporation would also be empowered to establish fees to support its own operation.

The powers appropriate for this agency to enable it to carry out its charge expeditiously are considered to be the following:

- a. To inventory waste generation and determine the hazardous waste treatment and disposal facilities needed to service the State's industries and government agencies, and further, to determine the shortfall in adequate facilities based on what exists today both in New Jersey and other locations in the country where the State's wastes are presently sent for disposal.
- b. To obtain information from any person about hazardous waste generation, transportation, treatment or disposal, if necessary by the issuance of subpoenas (subject to appropriate safeguards to protect trade secrets and other confidential business information).
- c. To consider the effect of anticipated Federal requirements on treatment and disposal capacity that presently exists, and estimate any additional shortfall that would occur in the 1980's and beyond as a result of existing treatment and disposal facilities being closed.
- d. Based on the shortfall and the existing and projected quantity of hazardous waste being generated in the State, to determine the types of treatment and disposal facilities necessary in the 1980's and beyond.
- e. For the various types of treatment and disposal facilities, to establish specific siting criteria for the selection of sites; to apply those criteria to the State and possibly to an interstate region; to select candidate sites, to hold public hearings and to make a final determination on sites for the facilities, including having the power, if necessary, to acquire the sites by purchase, gift, or eminent domain. The

corporation would be responsible for all necessary environmental studies and reports required to establish hazardous waste treatment and disposal facilities. The cost of carrying out such environmental studies would be borne by the applicant.

- f. For the sites acquired, and based on the determination of need for treatment and disposal capacity, the management corporation would entertain and solicit proposals from the private sector to build and operate the necessary treatment and disposal facilities. The proposals would include not only the technology options, but also deal with the issues of long-term maintenance, safety, the establishment of closure funds, the requirement for liability coverage, and the ability of the State to carry out its landlord function.
- g. To apply for and receive Federal grants.
- h. To employ an adequate staff.
- i. To maintain oversight of hazardous waste facility operation.

The Commission believes that it is important to distinguish between the responsibilities of the corporation and DEP for siting, construction and operation of hazardous waste facilities. The following list and flow chart (Figure 5) is an attempt to delineate these responsibilities during the decision-making procedure related to such facilities.

- a. Siting criteria developed by corporation, with advice from DEP.
- b. Candidate sites selected by corporation based on siting criteria, with advice from DEP.
- c. Environmental Assessment prepared for candidate sites by corporation; approved by DEP for adequacy and completeness.
- d. Site selected for possible acquisition by corporation.
- e. Specific proposals received from private companies; developer(s) selected by corporation.
- f. Full Environmental Impact Statement prepared for site and facility by corporation; EIS approved by DEP.
- g. Developer acquires site. (If necessary, corporation acquires site and transfers it to developer.)
- h. Developer submits permit applications to DEP for approval.
- i. The regular DEP regulatory process begins. DEP issues permits and monitors for operating permit compliance.

The above list is to clarify the respective roles of DEP and the management corporation. Full public participation would be included in each step of the decision-making process.

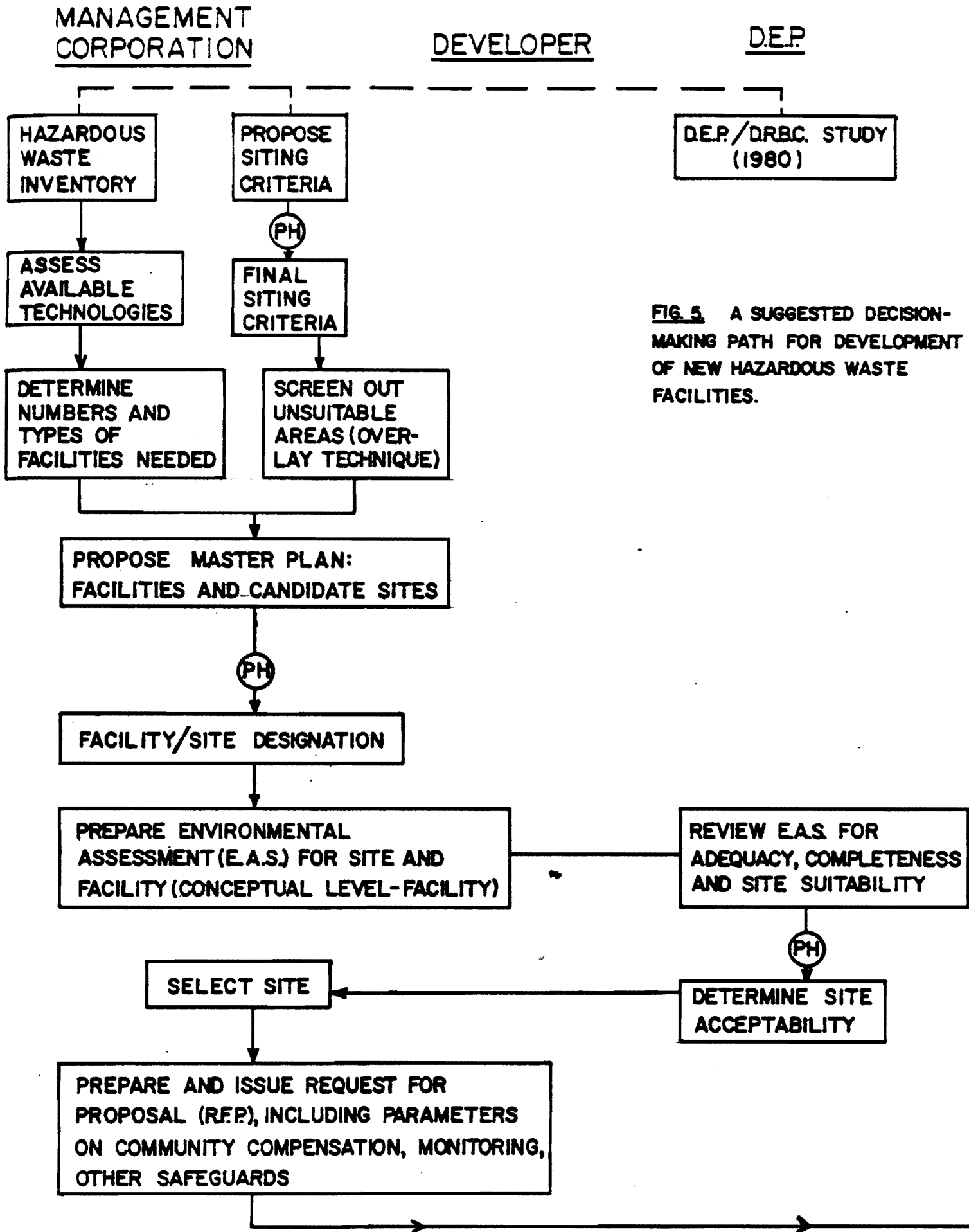
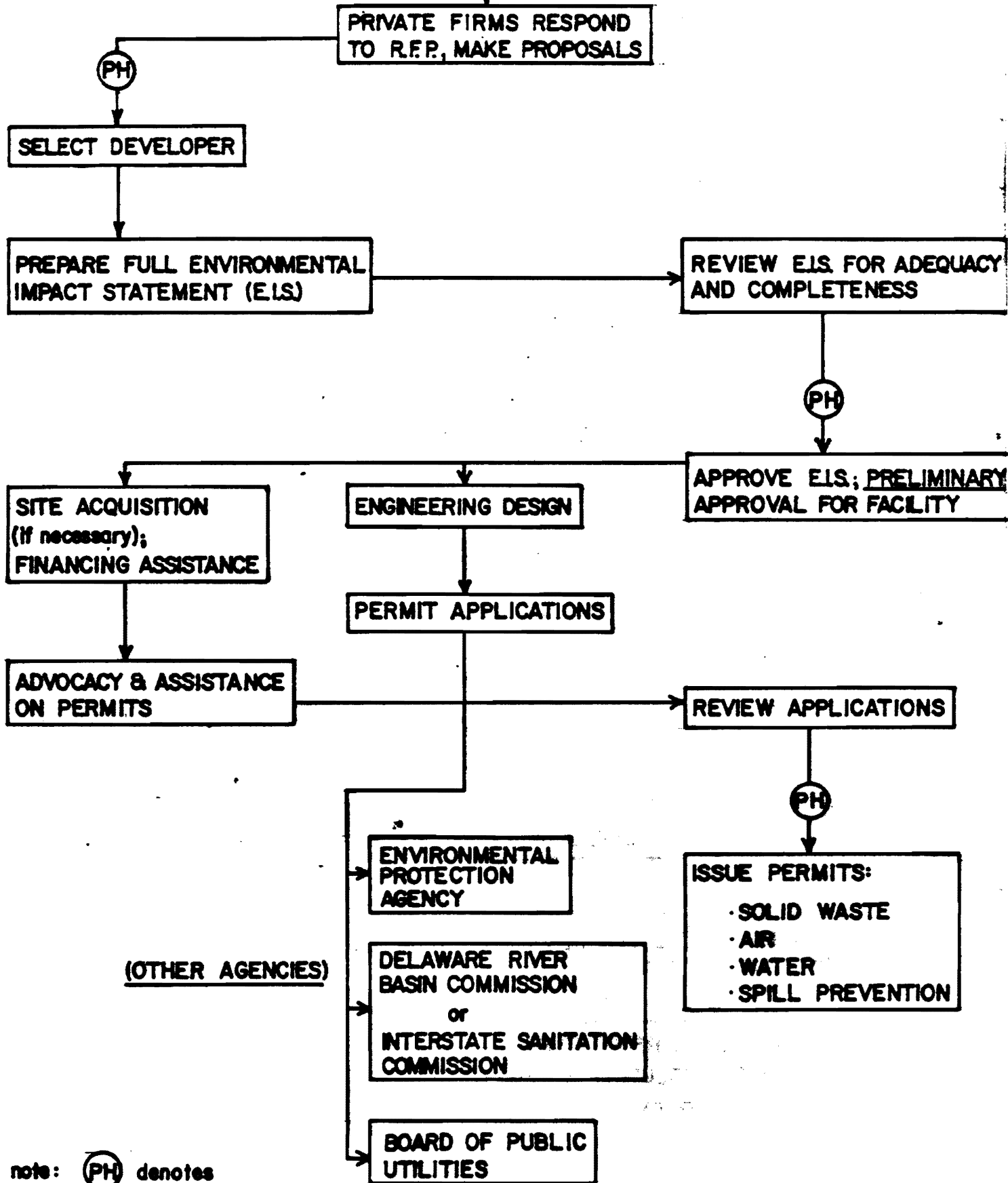


FIG. 5. A SUGGESTED DECISION-MAKING PATH FOR DEVELOPMENT OF NEW HAZARDOUS WASTE FACILITIES.

MANAGEMENT CORPORATION

DEVELOPER

D. E. P.



note: (PH) denotes public hearing or similar opportunity for public participation

The management corporation would mandate that the facilities operate without subsidy through the establishment of user charges which, in addition to paying for construction and operation, would include monies to cover closure, long-term maintenance, liability protection and any other areas determined to warrant coverage by the management corporation. This policy promotes the use of the most cost-effective technology and the development of facilities in the State from amongst environmentally acceptable alternatives, with some out-of-state facilities being used to meet the demand. The corporation would also be charged with working with similar agencies in other states and the Delaware River Basin Commission in order to develop interstate and regional solutions to the hazardous waste treatment and disposal problem.

The management corporation should assure the development of a waste exchange system to provide for the use of waste from one industry as a raw material in another industry, with the objective of minimizing the volume of hazardous wastes requiring treatment.

The Commission believes, however, that the State management program should allow for facilities to be constructed and operated under the existing regulatory scheme with no siting assistance or financial involvement from the State if proponents can secure the necessary approvals. In view of the need for treatment and disposal capacity, it is not warranted to stop development of promising facilities that can be part of the overall hazardous waste management scheme for New Jersey.

The management corporation should have the power to construct and operate hazardous waste management facilities, but only on a contingent basis - if the private sector fails to respond to the incentives offered by the management corporation by building and operating sufficient facilities to serve the State's needs. The exercise of this power should be subject to stringent limitations. Specifically, before building on its own, the management corporation should be required to hold a public hearing, issue findings of fact detailing its inability to find a private sector developer, and report to the Legislature its intention to build on its own. The Legislature would have 90 days within which to pass a resolution barring the management corporation from proceeding. If the Legislature did not act (or if it endorses the management corporation's proposal), the corporation could then proceed.

The management corporation should have the power to secure another operator for a facility if a private sector operator becomes unable to continue operations -- e.g., because of bankruptcy or revocation of operating permits. At least for so long as there is no surplus of treatment and disposal capacity, the failure of a hazardous waste treatment or disposal facility must be regarded as more than simply an economic setback -- it can be a public health threat. At the very best, loss of a portion of a state's or a region's hazardous waste treatment and disposal capacity will result in the need for dangerous stockpiling of waste until the capacity deficit can be remedied.

Finally, recognizing there is a shortage of personnel with broad experience in technology and management of hazardous waste, New Jersey must make every effort to attract the professionals necessary to staff an effective hazardous waste management program. Along this line, it was considered necessary to have the management corporation staff operate outside the State Civil Service structure to provide for competitive salary ranges to entice the qualified professionals needed; such persons will be in great demand.

The Commission is of the opinion that economic regulation of the hazardous waste treatment and disposal industry -- that is, regulation of the rates charged by haulers and treatment and disposal facilities -- is unwarranted. Furthermore, the possibility of being subject to such regulation may tend to discourage private capital from seeking to invest in new facilities in the State.

This issue was raised during discussions of the role of the Board of Public Utilities (BPU) under the Solid Waste Utility Control Act of 1970. Under that act the Board is given power to require solid waste haulers, treatment and disposal facilities to obtain certificates of public convenience and necessity in order to operate legally in New Jersey, and to regulate the rates charged by such operators.⁶⁷ The definition of "solid waste" in the act covers hazardous waste. In the early 1970's, the BPU appears to have forsworn jurisdiction over hazardous waste facilities, but in recent years the BPU Commissioners have reversed themselves and now assert jurisdiction.⁶⁸ To date, the BPU has not actually sought to regulate the rates charged by such facilities but has indicated it can if it wants to.⁶⁹

Because the treatment and disposal of hazardous waste does not have natural monopoly characteristics and because hazardous waste treatment and disposal facilities serve industrial customers, who can exercise considerable economic power in their own defense where individual consumers cannot, the Commission recommends that hazardous waste management facilities be exempted from the jurisdiction of the Board of Public Utilities. On the other hand, the Commission recognizes that until the State and the region have built up sufficient new treatment and disposal capacity to handle adequately all the hazardous wastes generated by industry, the shortage of capacity may confer temporary, de facto monopolies on those treatment and disposal facilities that are able to secure sites and begin operation. The management corporation should, therefore, watch the industry closely for signs of price-gouging.

Liability Considerations

Among other things, public acceptance of hazardous waste facilities hinges on there being adequate assurances of liability coverage - that is, that money will be available to pay for remedial work or to compensate damages caused by a hazardous waste facility. There are two time-periods of concern: site-life, the period during which the site is receiving hazardous waste and is actively treating or disposing of it, and post-closure, the period after operations have ceased.

While the Commission finds it difficult to reach a definite consensus on some aspects of the liability question (i.e. the exact level of coverage needed for specific facilities), agreement was reached on certain basic principles:

- Site-Life Liability:

Until fairly recently, insurance policies available for environmental pollution covered only liabilities resulting from so-called "sudden and accidental" occurrences, such as fires, explosions or spills. Coverage for long-term damage caused by slow emission of contaminants over a period of time had been virtually unattainable. A few insurance companies have begun writing coverage for so-called "environmental impairment."⁷⁰ Though expensive and not yet widely available, it is anticipated the cost will come down as RCRA and court decisions make it necessary for facility operators to obtain it.

In keeping with its recommendation that the private sector be responsible for the construction and operation of hazardous waste facilities, it is the Commission's feeling that the owner of a facility should be responsible for providing liability coverage for both sudden occurrences and "environmental impairment". Such coverage should be considered a cost of doing business as well as a requirement to operate.

These conditions do not appear unrealistic to the Commission in light of the facts that similar requirements are proposed under RCRA, and that the Commission has found that both types of coverage have been acquired by major hazardous waste processors. The extent to which liability coverage during this period should or should not be supplemented by a state or federal fund has not been determined.

- Post-Closure Liability:

Two major concerns about hazardous waste facilities are not adequately addressed under present laws: who is responsible for making sure a facility does not harm public health or the environment after it is closed, and who will pay if someone is injured after the facility is closed. Although these concerns apply to secure landfills more so than to other kinds of facilities, even facilities engaged only in treatment can leave residual contamination whose effects may not show up for years.

Federal regulations proposed under RCRA will deal with a portion of the post-closure problem, but only a portion. Besides requiring establishment of an escrow fund during the facility's operating life to pay for closure itself, the proposed rules call for additional funds to be set aside to pay for monitoring and maintenance of the site for 20 years after closure.⁷¹ However, if wastes leak from the site and damage people or the environment there are no guarantees under RCRA that these people will be compensated or that funds will be available to pay for cleanup work and other remedial actions. And once the 20 years is up the facility owner need not continue to even monitor.

Private firms cannot be relied upon to provide perpetual management and financial responsibility for closed facilities. There are no assurances private firms will remain viable in perpetuity, nor is it likely an insurer will insure against risks forever. Even if one was willing to do so, insurance companies, too, can fail. However, local communities cannot be asked to accept the risk of having a hazardous waste facility operating in their midst unless they are guaranteed protection should potential for harm become actual harm. Since only government has likelihood of perpetual existence, government must at some point take over responsibility for closed facilities.

One way of doing this is to have the State take ownership of the site after closure - or perhaps 20 years after closure, after the operator's RCRA-mandated responsibility has expired. The State would then become responsible for monitoring and for compensating any damaged parties for subsequent pollution. To prevent this from being a form of subsidy to the facility operator, there should be a requirement that the operator leave with the State an escrow fund built up from revenues during the facility's operating life.

- Funding of post-closure liability

A variety of proposals are being considered in Congress and various state legislatures to deal with postclosure management and liability or related issues. Proposed federal "Superfund" bills would tax chemical production, hazardous waste generation, or both, to pay for cleaning up and compensating damages from current spills and abandoned hazardous waste disposal sites.⁷² A bill sponsored by Sen. Randolph of West Virginia and endorsed by the National Solid Waste Management Association would levy a fee on waste disposed into landfills to build up a post-closure liability fund.⁷³

In the absence of federal legislation providing the necessary coverage, the Commission believes that a hazardous waste fee to support a post-closure liability fund should be assessed against all New Jersey generators of hazardous waste who ship their wastes off-site for disposal and levied at disposal facilities against all hazardous wastes brought in for disposal from out-of-state. The fee should be significantly higher for those generators and facilities that choose secure landfills as a disposal option both because such landfills are expected to need the most attention over the long term, and in order to discourage the use of secure landfills when other treatment options are available.

A mechanism is also required to cover post-closure costs and liabilities for New Jersey generators of hazardous waste who treat and dispose on-site. In this case, the generator should have the option of paying a fee or providing bonding or escrow funds adequate to cover post-closure costs and liabilities. Again fees, bonds or escrow funds should be significantly higher if on-site secure landfills are involved.

V. SITING

The most basic and controversial issue related to hazardous waste management is the siting of hazardous waste treatment and disposal facilities. While it is recognized by both the public and private sectors that illegal and improper disposal of hazardous waste has grave environmental and public health consequences, it is also clear that there must be some central mechanism to ensure that sites for facilities are available and that proper siting decisions are made.

In general, a proposed hazardous waste treatment or disposal facility faces the same siting problems encountered by many industrial plants with polluting potential. The nature of the facility, physical characteristics required of the site, environmental considerations, economic factors and competing land uses will limit the number of potential sites. There will be opposition from the public to new facilities arising from the fear of contamination by toxic or potentially carcinogenic chemicals handled by the facility, and from the lack of trust and public confidence in the past and present practices of government and industry. Finally, the government approval process (local and state) tends to be expensive and time-consuming, because of the complexity of the facilities. The lack of specific regulatory requirements for hazardous waste facilities makes the outcome of the review process uncertain and may tend to discourage private initiatives.

The Commission believes that protection of human health, welfare and the environment are essential factors that must be considered by all parties when siting decisions are made. The Commission also recognizes that there must be full participation by the public in all the steps entailed in making siting decisions, beginning with the development of site criteria and culminating in the final selection of sites. The technology to treat and dispose of hazardous waste properly does exist, and private industry is willing to invest in the construction and operation of such facilities. The public, however, needs the assurance that these facilities will be sited, constructed and operated in a responsible manner, and that they will be safe.

The Commission anticipates that the hazardous waste management corporation recommended in Section IV will be responsible for the development of a hazardous waste management program that will include the determination of specific criteria for siting facilities which will address both environmental constraints and socio-political issues. While the Commission recognizes that there are certain categories and types of land that would be unsuitable for the siting of such facilities, it is not, at this time, recommending specific criteria. There are a number of reasons for this. The development of siting criteria is a complex matter and the Commission could not undertake the task in the time available to it. In addition, in parallel with the establishment of the Governor's Hazardous Waste Advisory Commission, the Department of Environmental Protection (DEP), working in concert with the Delaware River Basin Commission (DRBC) and the affected states of Pennsylvania, New York, and Delaware, has contracted for the development of specific siting criteria, and an evaluation of necessary treatment and disposal capacity. Since this effort will have much greater resources available to it, the Commission decided not to attempt to repeat or duplicate the development of siting factors.

The management corporation must undertake the development of siting criteria with full public participation as a first order of business and can be expected to use the siting criteria established through the DEP/DRBC contract, and any other criteria it determines necessary to meet public concerns in selecting the sites for treatment and disposal facilities: DEP/DRBC effort will involve a full public participation process in which the Commission urges citizens to become involved. (See Appendix E for more details.)

Nevertheless, the Commission did discuss siting issues because of the recognition of the importance of the siting process to the development of necessary hazardous waste treatment and disposal facilities. These discussions centered on both the specific criteria to be considered as well as the process for the selection of sites. While no attempt is being made here to set forth an all-inclusive list based on the Commission's deliberations nor to indicate how each criterion should be considered, it is thought appropriate to set forth some of the Commission's general concerns in the area of siting.

First, since New Jersey is the most densely populated state in the nation and has a great amount of industrial and manufacturing facilities with the resultant population exposure to pollution, the air, land and water resources of the State must be protected for the health and economic viability of this and future generations. Second, because over 50% of New Jersey's drinking water comes from groundwater resources, groundwater must be given special protection from degradation by hazardous wastes.

General issues to be considered include the following:

- Aquifer recharge areas for our groundwater resources.
- Wetlands and flood plains as a vital link in the ecological cycle.
- Prime agricultural lands.
- Impact on populated areas.
- Park-land and natural areas which are important to our quality of life. There is also a general concern for those parts of the ecological cycle that are so important to the quality of life in New Jersey such as our coastal resources, fish spawning areas, the Pinelands, historic sites, and habitats of endangered species.
- The requirement to meet applicable air, water, solid waste, occupational safety and other environmental standards that apply to the types of processes used by hazardous waste treatment and disposal plants. It is recognized that various design and operating parameters will have to be developed where standards do not presently exist to ensure adequate public health, environmental and safety considerations in the decision-making process for specific treatment and disposal operations, since comprehensive standards for all operations are unlikely to exist.
- Location should be considered so as to encourage energy efficiency, reuse, recycling, co-disposal with other forms of solid and liquid waste, and the minimization of hazards associated with the transport of waste.

Full public participation should be provided for in laying the groundwork for sound siting decisions. The management corporation must develop a formal public participation program to be used in its decision-making; DEP's recently developed public participation policy can be used as a starting point. The corporation, shortly after its formation, must establish a public participation program setting forth policies, guidelines, responsibilities and standards of effectiveness. This program itself must be developed with full public involvement.

The management corporation will use existing data generated by state government and private industry on quantities and types of hazardous waste and collect additional data to define and establish the need for specific types of treatment and disposal facilities. The Commission has identified several types of unit operations that are necessary for the treatment and disposal of different types of waste in Section III of this report. Siting criteria will differ depending on the kind of facility under consideration.

Once siting criteria and the number and types of facilities needed have been established, specific sites that are suitable for facility development must be identified. Final site decisions must be reached with full public participation in the decision-making process.

In addition, when the management corporation prepares to make specific siting decisions, two representatives of the affected local government(s) should be appointed to the corporation Board; nominations for these temporary Board members will be provided by the local government(s) and the Governor will make the final selection.

The management corporation would have the power to acquire sites as necessary as indicated in Section IV of the report. Present and future land use restrictions for the facilities and the surrounding areas will be determined at the time of site selection making full use of the public participation process.

The Commission recommends that the enabling legislation for the management corporation provide for compensation to host communities in order to make up for land use impacts resulting from the facility's location and for the communities' acceptance of whatever risks go with the facility. Since these will vary depending on the kind of facility, it is probably best to determine the appropriate levels of compensation as part of the site selection process. Enabling legislation and implementing regulations should specify criteria for determining the level and types of community compensation, which can take various forms, including:

- gross receipts tax on facility revenues or payments in lieu of taxes to local governments, allowing reductions in property taxes.
- direct payments to landowners to compensate for diminution of property values.
- cleanup and rehabilitation of existing "orphan" dump sites.
- purchase of buffer zones or development rights of adjacent lands.
- provision of recreational areas.

While compensation measures may provide an incentive to a host community that will serve to dampen local resistance to a proposal for a new hazardous waste treatment or disposal facility, there is some danger that such measures will be mistakenly perceived as a kind of bribery. To prevent that perception from developing, community compensation should include measures aimed directly at minimizing the risks associated with a facility. Such measures could include aid to local police and fire departments in training their personnel to deal with a mishap at the facility; assistance to the host community in developing an evacuation plan, and so on. In communities that rely on groundwater, community compensation measures should include regular testing of water supplies and guarantees of replacement supplies if the hazardous waste facility contaminates existing ones.

Evaluation of a proposal for construction of a facility must include the establishment of parameters under which the facility shall operate, as well as strategies for monitoring the operation and for monitoring the facility after closure. A recommended monitoring and operating strategy is given in Appendix F. A license to operate a treatment or disposal facility will depend on strict adherence to environmental performance standards. There will be a risk from residual emissions from a facility as well as from accidents; a risk analysis should be used to consider the pollution potential of accidents or malfunctions and to set design criteria to minimize the consequences of such occurrences. This risk analysis would be part of the environmental assessment/impact statement process. It is essential that such information is presented in a way that can be easily understood by the public. Perpetual control requirements, closure regulations, liability and bonding provisions and training of facility personnel would also serve to minimize the consequences of accidents or malfunctions at facilities and to promote public confidence in siting decisions.

Finally, the process of establishing operating parameters for a facility should include consideration of controls on the routing of shipments going to the facility, in order to minimize the chances of transportation-related spills and other mishaps, or the consequences resulting from such incidents.

While the general public may never be convinced that hazardous waste facilities can be completely safe, full participation by the public in the development of siting criteria and selection of sites should help by providing an opportunity to air differing points of view and to discuss the facts. It is clear that there is a need for State authority on land use decisions regarding hazardous waste facilities, and if the public has confidence in the siting criteria, site selection procedures and in the adequacy of facility operating parameters and monitoring procedures, a State-level decision to site a facility may find general public acceptance.

VI. PUBLIC PARTICIPATION

The Commission wishes to highlight the fact that public participation is essential in the decisionmaking process for hazardous waste facility siting and development. Public opposition to such facilities has been identified as an important constraint to the implementation of an effective hazardous waste management program. In order to deal with the hazardous waste crisis in a timely and effective manner, the public must be included in the decisions related to the development and implementation of a hazardous waste program. Public participation must be a part of all major decisions; issues should be presented and discussed at the earliest possible stage of the decision-making process so the public will be informed of all facts and alternatives and the decision-makers will have the full benefit of public input.

The importance of public participation is discussed in several parts of this report, most notably in the sections on management options and siting. In the management section, the Commission identified the need for public accountability of the management corporation in order to assure that the corporation will be sensitive to regional and local concerns. The Commission believes that in order for the corporation to be successful in carrying out its responsibilities, it must provide for full participation by the public in all decisions, beginning with the development of siting criteria and continuing through the establishment of requirements for specific facilities. In the siting section, the Commission reemphasizes the need for public participation in siting decisions. Unless the public is involved in the initial development of siting criteria for hazardous waste facilities and public concerns are addressed by the decision-making body, the public will not be confident that such facilities will be sited, constructed and operated in a responsible manner.

In particular, the public should be provided with a carefully explained and detailed review of the risks associated with operating a hazardous waste facility. Such a risk analysis, presented in a clearly understandable fashion, will be an important component of the environmental impact statement prepared prior to a final decision on a site and facility. With this information, the public will better understand the alternatives for treating or disposing of hazardous wastes and the safeguards that will be instituted to reduce any risks to public health and the environment.

The Commission also believes that in order for the public to participate fully in siting decisions and to have confidence in the analysis of specific hazardous waste disposal or treatment facility proposals, the public should have the capability to undertake independent analyses of such proposals. To meet this need, the Commission recommends that a special program be set up in the Department of the Public Advocate to allocate grants to eligible persons or organizations for independent analyses. Whenever the management entity has a specific proposal for a hazardous waste facility under consideration, the Public Advocate's office would hold a public meeting at which the proposal would be outlined and questions from the community and interested public would be addressed. The Public Advocate's office would receive an adequate sum of money from the management corporation (negotiated on a case-by-case basis) to contract for the necessary independent analysis. (The management corporation would be reimbursed by the

company submitting the proposal for a hazardous waste facility.) The grants under this program would cover the cost of consultant time, document fees and other expenses incurred in studying the proposal.

Acceptable siting decisions will only be reached through an open and informed public decision-making process.

VII. ENFORCEMENT

Enforcement will play a crucial role in the development of an adequate hazardous waste management system in New Jersey. First, the economic viability of a legitimate disposal industry hinges on the ability of authorities to prevent hazardous waste from being disposed of illegally. Second, an essential element in the resolution of the siting problem will be gaining the public's confidence that public health, environmental and safety standards at hazardous waste facilities will be vigorously enforced and that violations will be speedily corrected.

A. Control of Illegal Disposal

The main thrust of the Commission's efforts have been aimed at the development of sufficient treatment and disposal capacity to accommodate the volume of hazardous waste that needs to be handled in New Jersey. However, it is essential to the success of an effective hazardous waste management system that it not be undermined by the alternative of cheap, illegitimate disposal. With respect to wastes from which raw materials or energy can be recovered, illegal disposal can be expected to dry up spontaneously as former "wastes" become economically valuable commodities. But for many kinds of hazardous waste, environmentally sound treatment and disposal will remain more expensive than disposal by unsound methods. Both to protect the viability of the legitimate treatment and disposal industry, as well as to prevent the environmental harm it directly causes, illegal dumping must be stopped.

One inducement to illegal disposal - a shortage of legitimate treatment and disposal facilities - would disappear if sufficient new facilities are built. But the financial incentive will remain. Dumping is profitable. The illegal hauler, in some cases, need not even cut his price to the waste generator: he can charge a price commensurate with lawful treatment or disposal, dump the waste in a pit, and pocket the difference.

It has been suggested that vigorous enforcement of existing laws is all that is needed to curb illegal dumping. However, it appears that the existing structure of statutes and regulations cannot be enforced effectively without a much greater commitment of money and manpower. Numbers suggest the reason why. There are over 3,500 registered collector/haulers in New Jersey, and there may be as many as 10,000 or so generators of hazardous waste. Thousands of truck loads of hazardous waste are shipped around, into and out of the State each year. Even with increased enforcement staff, the Department of Environmental Protection could not hope to observe directly more than a fraction of these movements.

Prosecution of criminal dumping violations is extremely costly and time-consuming. To win a conviction under the present system, authorities must virtually catch the violators in the act of dumping. This is difficult to do and often requires considerable manpower and lengthy investigation. Even with the addition of 20 new enforcement personnel as a result of the Interagency Strike Force buildup, criminal justice authorities acknowledge they cannot hope to catch and convict more than a fraction of the violators.

The Commission believes it is necessary to change the regulatory structure so that illegal dumping becomes more difficult and more detectable; to weed out dishonest operators from the hazardous waste business; to improve the State's

ability to penalize violators without having to resort to the cumbersome processes of the criminal law, and finally to require the generators of hazardous waste to exercise reasonable vigilance over the behavior of haulers. The State has already implemented a manifest system, increased civil and criminal penalties for unlawful disposal, and added enforcement staff. The Commission's recommendations for new strategies are aimed at correcting shortcomings in the existing manifest system and at making the entire hazardous waste management system easier to police with a reasonable number of staff.

The Commission's recommendations focus on the following areas:

- (1) Record-keeping and Disclosure by All Parties in the Disposal Chain.
- (2) Generator Registration and Reporting.
- (3) Substantive Requirements for Hauler Licensing.
- (4) Generator Responsibility for Disposal.

1. Record-keeping and Disclosure by All Parties in the Disposal Chain

The existing manifest system has several acknowledged shortcomings. One is that the State has no effective way to determine whether hazardous waste manifested to an out-of-state disposal facility actually reaches that facility or is dumped somewhere else. Implementation of federal RCRA regulations setting national standards for manifest systems is expected to narrow or close that loophole. In advance of the EPA rules, the states could greatly improve the situation by adopting uniform interstate or regional manifest systems and exchanging information about hazardous waste movements. However, even an improved manifest system can be evaded if the generator does not report the wastes as existing in the first place, or if one or more of the parties in the disposal chain falsify their reports. The Commission believes several specific steps should be taken by the State's regulatory authorities to ensure there are adequate records of wastes generated and destined for disposal:

- (a) The State should develop a list of hazardous waste materials.
- (b) Each generator, hauler and treatment or disposal facility that handles any waste on the list should be required to maintain records on the amounts of waste generated, transported, treated or disposed of, the source, and the methods used for treatment or disposal. This record-keeping requirement would apply not only to wastes transported off-site for treatment or disposal (as required under the existing manifest system), but also to wastes treated or disposed of on the generator's site.
- (c) The regulatory agency (DEP) would be required to audit periodically the records of firms in a manner that is statistically sound.
- (d) Violation of record-keeping requirements alone would carry civil penalties, and if willful or grossly negligent, criminal penalties.

The goal is to base enforcement actions on violations of the record-keeping system, rather than the much more difficult task of actually proving where the wastes went. Inability of a generator, hauler or treatment or disposal facility to account for the disposition of wastes would be presumptive evidence that the wastes were not properly treated or disposed of.

Records should be available for inspection at any time.

2. Generator Registration and Reporting

Under this proposal, generators of hazardous waste would be required to:

(a) Register with the regulatory agency (DEP) and give notice of intent to generate hazardous waste.

(b) File regular reports (e.g., on a quarterly or annual basis) with the agency summarizing their generation, treatment or disposal of hazardous waste.

Generator registration and reporting would strengthen several links in the enforcement system.

First, it would identify generators of hazardous waste not presently known to regulatory authorities. By requiring the generator to file a certified list of all sales products and information about his wastes, regulatory authorities can gain some idea of what wastes a facility should be generating. If the registration or subsequent reports failed to account for such wastes, a closer look would be in order.

Second, any generator trying to avoid detection by staying out of the registration and record-keeping system would be committing a crime, as would any hauler, or treatment or disposal facility accepting waste from an unregistered generator.

Third, the registration statement and reports filed by a generator would provide a cross-check on manifest system reports. Appropriate computer search routines could detect discrepancies and flag them for further investigation by agency staff.

Generator reports would cover hazardous waste treated or disposed of on-site as well as off-site.

Generator reports, besides being useful in enforcement, would also serve as an important research tool for the management corporation in determining the State's needs for treatment and disposal capacity.

3. Hauler Licensing

There are thousands of collector/haulers, and it is members of this group who do almost all of the illegal dumping (except in cases of on-site disposal). At present they are subject to few controls. All transporters of hazardous waste (and of non-hazardous solid waste as well) are required to register with the Department of Environmental Protection, but there are no substantive licensing requirements. Requiring hazardous waste haulers to demonstrate honesty, financial responsibility and competence in the handling of hazardous wastes may be a good way to drive irresponsible operators out of the business.

Among the requirements for a license to haul hazardous waste should be:

(a) Sufficient assets or bonds posted with the State, to assure that a corporation cannot be used as a front to escape liability for negligent or illegal actions.

(b) A level of financial responsibility sufficient to cover liability for damages, including environmental damages, resulting from accidents or improper handling of wastes.

(c) Disclosure of the identities of major shareholders/owners.

(d) Employees bonded against criminal acts.

(e) Training of all employees who will handle hazardous wastes in the safe management of such wastes.

The purpose of requirements (a) and (b) is to weed out fly-by-night haulers. Requiring haulers to put significant financial stakes into their businesses means they run the risk of substantial monetary loss, as well as criminal sanctions, if they are caught dumping. Requirement (c) is intended to alert the licensing agency (DEP) to possible links between firms or to persons previously convicted of dumping violations.

The requirement that employees be bonded against criminal acts - similar to requirements applicable to persons who hold positions of trust in financial institutions - is designed to provide a check against criminal control of a hazardous waste hauling firm. Rather than requiring the State to do background checks on licensees' employees, the bonding requirement shifts that burden to bonding firms. Should the employee ever be caught in a criminal act, the bond provides a source of compensation for whatever damages result.

The training requirement's purposes are three-fold: first, it promotes the general policy of requiring licensed haulers to demonstrate a serious commitment to remaining in business and conducting their operations responsibly. Second, it will reduce spills and transportation accidents. Third, many illegal dumping schemes threaten the health of workers who participate in them. Workers who have been taught the dangers of hazardous materials may be less likely to participate in actions that endanger their health and safety.

Along this line, consideration should be given to licensing the individual driver as well as the company, so that his livelihood is directly at stake if he participates in illegal dumping.

Criminal convictions under environmental statutes should be grounds for automatic revocation of a hauler's license. DEP should be authorized to suspend or revoke a license on civil grounds as well, subject to legal requirements for notice and hearing.

4. Generator Responsibility

While the Commission believes that holding a hazardous waste generator strictly liable for hazardous waste until it reaches an authorized treatment or disposal site would unnecessarily inhibit a generator's ability to contract for the off-site transportation and disposal of hazardous waste, it is proper for the State to require that generators exercise a reasonable degree of vigilance over haulers' behavior. The Commission recommends:

(a) Generators should only be allowed to contract with haulers for transportation, not disposal (unless the hauler is also the operator of a licensed disposal facility).

(b) The manifest system should be changed to provide that a copy of the manifest be sent from the disposal facility back to the generator to confirm the disposal facility's receipt of the waste.

(c) If a manifest receipt fails to come back within a specified period of time, the generator should be required to report the discrepancy to DEP. Likewise, the generator should be required to report any violations by the hauler that he learns of to DEP.

(d) Haulers should not be paid until the generator receives confirmation that the wastes have been received at the designated disposal facility.

B. Control of Facility Operation

Public confidence in the siting of new hazardous waste treatment and disposal facilities demands that environmental and safety standards be rigorously enforced and that violations be swiftly detected and speedily corrected. In addition to the monitoring and compliance reporting required of other kinds of facilities with potential for air or water pollution, the management corporation should determine during the licensing procedure any additional safeguards necessary to ensure adequate facility monitoring, inspection and enforcement, including the need for a State-operated control laboratory on-site.

It may be desirable to base inspectors at the local level in order to guarantee quick response to complaints about a facility. The County Environmental Health Act⁵ affords a statutory means to delegate inspection authority to county Boards of Health, for example. To date this Act has not been funded, however, and this is an impediment to county governments being able to bolster their inspection capabilities. If the State retains most of the enforcement power, then State inspectors should be based in a manner that permits them to respond rapidly to complaints. Facilities that handle highly hazardous wastes may require very frequent inspection or inspectors stationed on-site full time.

Finally, responsibility for assuring environmentally sound operation of a hazardous waste facility should be placed on a personal basis by requiring each facility to be under the general supervision of a licensed operator. This program would be similar to the one DEP currently enforces for operators of municipal and industrial wastewater treatment plants.⁶ Licensed operators would be required to demonstrate technical proficiency. Since violations at a facility could lead to loss of the operator's personal license, the operator would in effect act as another level of control.

C. The Need for Adequate Support of Enforcement Programs

Even though many of the Commission's recommendations on enforcement are aimed at making it easier to police the hazardous waste cycle with a reasonable number of enforcement personnel, it is extremely important that adequate levels of money and personnel be provided for enforcement functions. The Department of Environmental Protection's enforcement efforts in the past have suffered from a chronic shortage of investigative staff, laboratory capacity and attorney time. Continued inadequate support of enforcement programs will poison the climate for public acceptance of new hazardous waste treatment and disposal facilities. If the public comes to believe that these facilities will not be adequately policed and that violations of environmental and safety standards will not be swiftly corrected and penalized, opposition to new facilities will grow.

Therefore, both the Legislature and the executive branch must take special care when adopting or modifying enforcement programs in the hazardous waste field to make sure that budgets and personnel procedures provide for adequate staffing and support services. In particular, Civil Service practices and structures should be examined to assure that the necessary qualified personnel can be attracted and retained.

The Legislature should also consider putting teeth into the State's virtually unused "Environmental Rights Act", which gives individuals standing to sue to enforce any environmental law.⁷⁷ The costs of environmental litigation have discouraged the act from being used in more than a handful of cases in its 5-year history. The act's usefulness could be greatly improved by amendments providing for the recovery of attorneys', expert witnesses' and consultants' fees by victorious plaintiffs.

Finally, the State should give serious consideration to picking up the funding for the Interagency Strike Force, whose federal allocation is due to run out within 18 months. Well before the expiration of funding, the Strike Force's effectiveness should be evaluated and if the results warrant the unit's continuation, its life should be extended.

VIII. ORPHANED DUMP SITES

While most of the Commission's work focused on what to do to provide future hazardous waste treatment and disposal capabilities, there was also consideration of what should be done with the legacies of improper hazardous waste disposal -- sometimes referred to as "Orphaned Dump Sites". An outline of an action plan to identify and take corrective action at such sites is contained in Appendix G.

It is recognized that the State Department of Environmental Protection presently has under way a small program for this purpose. However, it is also recognized that only very limited funds are available to pay for cleaning up orphan sites should the owner be unable or unwilling to do so. Furthermore, the funds which are available are generally not specifically earmarked for orphan sites and are subject to statutory restrictions on their use. Thus, when crisis situations arise, they are dealt with on a case-by-case basis. Cleanup is meant to include correction, mitigation, or containment of the problem as well as paying for losses to the public, private, and governmental sectors that result from the contamination. Because of limitations on the use of existing funds, however, actions at present are usually designed to contain rather than to clean up pollution.

In this area, the Commission recommends that the State government and all affected interests vigorously support and lobby for the development of a federal fund to provide necessary cleanup resources. This is not meant to be an endorsement of the existing "Superfund" legislation submitted by the Carter Administration or of any other specific bill before Congress. All factions seem to agree in principle that a federal fund would raise money more quickly to deal with a problem that is truly national in scale.

Recognizing that federal legislation, even with vigorous lobbying efforts, may take some time (a federal oil spill fund is still awaited after five years of consideration in Congress), it is recommended that the State act on its own to provide some funds to begin to handle the problems created by unregulated or illegal hazardous waste disposal which are now just being discovered.⁷⁸ The funding mechanism decided upon should be reconsidered when the federal fund passes to avoid duplication or double taxation.

In order to create an atmosphere of public confidence to assist in the siting of new facilities, State government must be able not only to locate hazardous waste pollution problems presently occurring but also to do something to mitigate their present and potential harm to the public. Adequate funds must be allocated to this task or government efforts to deal with the problems of hazardous waste will lose credibility in the public's eyes.

IX. IMPLEMENTATION

A principal recommendation to the Governor's Advisory Commission is the establishment of a management corporation to be responsible for the management of planning and implementing a comprehensive hazardous waste management program for New Jersey. The recommendation is based on substantial discussion and consideration of alternatives by the Commission.

At a public hearing held on December 7, 1979 to seek reaction to the proposals contained in the Commission's November 15 draft report, the management corporation proposal received support from many who testified. However, there was also substantial public comment that the analysis of institutional options was not thorough enough and that other possible options had not been adequately presented to support the formation, at this time, of a management corporation. There was serious public concern over moving ahead and creating the recommended management corporation based on the information presented. This reaction might be due, in part, to the brevity of the discussion in the draft report on alternative management options. A more thorough discussion is presented in this final report.

The Department of Environmental Protection (DEP) and the Delaware River Basin Commission (DRBC) are engaged in a hazardous waste study for the Delaware River Basin and the entire State of New Jersey; a facet of this study is a thorough analysis of all institutional options for managing hazardous waste. Some public comment suggested that the Governor's Commission wait for the completion of that analysis before making any final recommendations to the Governor.

Considering the magnitude of the hazardous waste problem in New Jersey, and the fact that the more time that passes without positive action will only compound an already serious situation, the Commission believes it is necessary to make recommendations now and not wait for further study. Over the course of their deliberations, the Commission considered various management options and has decided that a management corporation as outlined in this report would be the best institutional arrangement to manage a hazardous waste program in New Jersey. However, one Commission member has expressed concern, particularly in view of public comment, over going ahead with this management corporation without further study. (See Appendix D)

Therefore, being sensitive to public comments and concerns regarding the Commission's recommendations, while at the same time recognizing the length of time needed to enact legislation and the need for swift action, the Commission recommends the following course of action.

An interim Hazardous Waste Management Board should be created. The Board membership should be constituted as described under the discussion of the management corporation. The Board would be appointed by the Governor and report to the Governor through the DEP Commissioner. The Board would use, as its starting point, the Commission's report and would implement immediately those recommendations concurred with by the Governor. At the same time, the Board would have an active oversight role in the DEP/DRBC hazardous waste study. The detailed institutional analysis that is underway and the development of siting criteria and information on generally acceptable sites for facilities would take place with the Board's active participation. The Board would ensure effective public input in its activities

activities by using DEP's Public Participation Procedure. Final institutional recommendations resulting from the DEP/DRBC study would be available to the Governor by May 1980. Once the Governor implemented the appropriate institutional scheme for the management of hazardous waste, the Board, if not part of this scheme, would cease to exist. Thus, the interim Board is meant to serve the important and necessary function of beginning the implementation of a comprehensive hazardous waste program until a permanent institutional arrangement is agreed upon.

Recommended responsibilities of the interim Board are discussed below. The Board's responsibilities would fall into two categories: immediate implementation and action on agreed upon recommendations of the Governor's Hazardous Waste Advisory Commission and an active lead role in the oversight and resolution of remaining issues (e.g. development of siting criteria, decision on permanent institutional structure).

Immediate Implementation/Action

The Board would be responsible for carrying forward specific portions of the Commission's report. This would include an assessment of personnel, laboratory services, technical support and funding needs for the implementation of an effective management program. In addition, the Board would undertake a detailed study of liability and insurance considerations regarding treatment and disposal of hazardous waste and post-closure liability issues. The Board would also be responsible for designing a public participation process for the long-term (institutional structure) hazardous waste management program.

Oversight Activities

While these are identified as "oversight" responsibilities, it should be emphasized that the Board will play an active and aggressive lead role for the State in these activities. The Board would become involved in the DEP/DRBC study concerning institutional options and siting of hazardous waste treatment and disposal facilities, ensuring that the development of recommended siting criteria and the identification of generally acceptable areas in the State for treatment and disposal facilities includes a full public participation process. The Board would also be responsible for evaluation of institutional options and development of legislation for the implementation of the agreed upon institutional structure; this would include the incorporation of a public participation program. The DEP/DRBC study also provides for hazardous waste projections (5 and 10 year) and an assessment of available treatment and disposal technology; the Board would have an active role in the work in this area and would evaluate the study results to determine if further independent work is needed. The Board would provide direction and assistance to the ongoing program within DEP to identify orphan dumpsites.

Development of Recommended Legislation

In addition to being responsible for the development of legislation for the implementation of a permanent institutional structure, the interim Board should also have an active role in the identification and development of any other legislative initiatives necessary to the establishment of an effective hazardous waste program.

Staffing

The interim Board should identify its staff and support service needs. The DEP Commissioner should act to meet these requirements, as appropriate, to enable the Board to carry out its functions.

The Governor's Hazardous Waste Advisory Commission believes that hazardous waste management is one of the most critical environmental, public health and economic issues facing the State of New Jersey. There must be no delay in moving toward a solution for this problem. The Commission believes that, in view of the public concerns regarding the overall institutional framework for a comprehensive hazardous waste management program, the creation of the interim Board to spearhead the implementation of measures to address the hazardous waste problem will be the best course of action over the next several months.

NOTES

1. Hazardous Waste Disposal - Report by the Subcommittee on Oversight and Investigations of the House Committee on Interstate and Foreign Commerce, 96th Cong., 1st Sess., p. 1. Statement of Barbara Blum, Deputy Administrator, U.S. EPA, to Senate Environmental and Public Works Committee, March 2, 1979 (citing study done by Fred C. Hart Associated for EPA), reported in New York Times, March 3, 1979, p. 11. On January 3, 1980, the N.J. Department of Environmental Protection (DEP) released a list of 247 sites in the State where chemical and hazardous wastes are known or alleged to have been disposed of in the past.
2. Resource Conservation and Recovery Act of 1976, P.L. 89-272, as added P.L. 94-580, 42 U.S.C. 6901 et seq. (1978 ed.).
3. Proposed Regulations on Identification and Listing of Hazardous Waste, 43 Fed. Reg. 59054 (Dec. 18, 1978).
4. New Jersey Administrative Code (N.J.A.C.) 7:26-1.4.
5. Case files, Division of Water Resources, N.J. Department of Environmental Protection.
6. L. 1972, c. 232 (approved Oct. 22, 1979) authorized the loan of \$1.2 million from Clean Water Bond Act funds to finance the extension of water pipes in Jackson.
7. See note 72, below.
8. Assembly Bill 3542, passed by the New Jersey Legislature on January 3, 1980, provides for up to \$3 million per year from the State Spill Compensation Fund to be spent on cleanup or containment of abandoned hazardous waste disposal sites. A.3542 amends the Spill Compensation and Control Act of 1976 (L. 1976, c. 141, N.J.S.A. 58:10-23.11 et seq.).
9. See, e.g., N.J.A.C. 7:26-1.1(a)(5).
10. Source: N.J. Department of Environmental Protection, Office of Sludge Management and Industrial Pretreatment (OSMIP).
11. See note 49 below.
12. See notes 59-61 below.
13. The generator estimate given here is based on the proposed RCRA definitions of hazardous waste. New Jersey's "Special Waste" definition does not include some categories EPA will include.
14. Solid Waste Management Act, Sec. 5, N.J.S.A. 13:1E-5.
15. Source: U.S. Environmental Protection Agency, Region II, Surveillance and Analysis Division, Edison, N.J.

- 16,17. Commission interviews with DEP and Division of Criminal Justice staff; also press accounts. See, e.g., "Poison at Our Door Steps", series in the Philadelphia Inquirer, September 23-29, 1979.
18. The Federal Water Pollution Control Act as amended by the Clean Water Act of 1977, Section 307, 33 U.S.C. 1317. (1978 ed.)
19. Estimates developed by Office of Sludge Management and Industrial Pretreatment, N.J. Department of Environmental Protection.
20. DEP officials attributed the low usage rate of the Earthline facility to the facility's not yet having full capacity on-line. SCA officials, in comments filed with the Commission, attribute it primarily to economic factors: the availability of cheaper disposal methods, e.g., out-of-state landfills, depresses the market for the more expensive treatment processes offered at the Earthline facility.
21. Proposed Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (proposed 40 CFR 250.43-9), 43 Fed. Reg. 59007 (Dec. 18, 1978).
22. Resource Conservation and Recovery Act of 1976 (RCRA), P.L. 94-580, 90 Stat. 2795, 42 U.S.C. 6901 et seq. (1978 ed.).
23. RCRA Sections 3002-3005, 42 U.S.C. 6922-6925.
24. RCRA Section 3006, 42 U.S.C. 6926.
25. RCRA Section 3001, 42 U.S.C. 6921.
26. RCRA Section 3002, 42 U.S.C. 6922.
27. RCRA Section 3003, 42 U.S.C. 6923.
28. RCRA Section 3004, 42 U.S.C. 6924.
29. Id.
30. RCRA Section 3005, 42 U.S.C. 6925.
31. RCRA Sections 3001-3006, 42 U.S.C. 6921-6926.
32. Environmental Groups sued EPA in 1978 to force promulgation of the RCRA regulations. EPA is under court order to produce them in 1980.
33. R. 1978 d. 72, N.J.A.C. 7:26-7.1 et seq.
34. Proposed Rules Concerning Requirements for Chemical and Hazardous Waste Facilities, Docket No. DEP-052-78-11, 10 New Jersey Register 532(c), Dec. 7, 1978.
35. L. 1970, c. 39, amended by L. 1975, c. 326, N.J.S.A. 13:1E-1 et seq.
36. N.J.S.A. 13:1E-6.
37. N.J.S.A. 13:1E-5.

38. L. 1970, c. 40, N.J.S.A. 48:13A-1 et seq.
 39. N.J.S.A. 13:1E-9. Violation of the Solid Waste Utility Control Act is punishable by fine up to \$50,000, imprisonment for 3 years, or both. N.J.S.A. 48:13A-12.
 40. L. 1976, c. 141, N.J.S.A. 58:10-23.11 et seq.
 41. L. 1971, c. 173, Sec. 11, N.J.S.A. 23:5-28.
 42. L. 1977, c. 74, N.J.S.A. 58:10A-1 et seq.
 43. Spill Compensation and Control Act, Section 22, N.J.S.A. 58:10-23.11u.
 44. N.J.S.A. 58:10A-10(f).
 45. L. 1979, c. 178, N.J.S.A. 2C:17-2(a).
 46. See, e.g., Singer, People and Petrochemicals: Siting Controversies in Hudson County, New Jersey, Report (PU/CES #80) by the Princeton University Center for Environmental Studies to the Division of Policy Analysis, Office of the Environment, U.S. Dept. of Energy. Princeton, N.J., February 1979.
 47. Township of Logan v. Rollins Environmental Services, (unreported decision) docket No. L-16751-77, Superior Court of New Jersey, Law Division, Gloucester County (April 21, 1978).
 48. Carrino Contracting and Trucking Co., Inc. v. Twp. of Little Falls, (unreported decision) Docket No. A4241-77, Superior Court of New Jersey, Appellate Division (Sept. 27, 1979).
- See also Southern Ocean Landfill v. Mayor & Council, Twp. of Ocean, 64 N.J. 190, 194 (1974); Ringlieb v. Parsippany - Troy Hills Twp., 59 N.J. 348 (1971).
49. A bibliography of references on the subject of technologies for hazardous waste management was proposed for the Commission by a member of its subgroup on technology and siting. In the interest of brevity that bibliography (22 pages) has not been reproduced here. Copies are on file along with the Records of the Commission, and may be obtained from the Department of Environmental Protection (DEP).

See also Arthur D. Little, Inc., A Plan for the Development of Hazardous Waste Management Facilities in the New England Region (hereinafter: NERCOM Report), Appendix D, Cambridge, Mass., September 1979; Rensselaer Polytechnic Institute, Technology for Managing Hazardous Wastes, report prepared for the New York State Environmental Facilities Corporation, Troy, New York, September 1979. (The Rensselaer report contains extensive references, and is available through the N.Y. State EFC, 50 Wolf Road, Albany, New York, 12005. A copy is on file with the N.J. DEP.)

Additional support for the Commission's conclusion that technologies that can solve the hazardous waste management problem do exist was obtained during the public comment process (See, e.g., statements of Widmer & Ernst, Inc. and the Research and Development Council of New Jersey).

50. See note 49, above.
51. Rensselaer Polytechnic Institute, Technology for Managing Hazardous Wastes, (see note 49, above), p. III-2.
52. Program Plan of At-Sea Incineration, Inc. (attachment to letter dated October 2, 1979, to Paul Arbesman, Assistant Commissioner, N.J. DEP).
53. McDonald, et al. (Environmental Protection Service, Montreal), Burning Waste Chlorinated Hydrocarbons in a Cement Kiln, Environmental Protection Publication SW-147c, U.S. EPA, Washington, D.C., January 1978. (PB-280-118)
54. Written comments of Katherine and Peter Montague, on preliminary draft (Oct. 31, 1979) report of the Commission, pp. 5-8. Also, testimony of Robert Simkins before the Hazardous Waste Advisory Commission (Transcript Vol. II, pp 69-74), Dec. 7, 1979.
55. See, e.g., Scully, Gebhard and Noble, Hazardous Waste Management Facilities - Ownership, Financing, Siting and Liability, paper presented at 52nd Annual Conference, Water Pollution Control Federation, Houston, Texas, Oct. 11, 1979. (Based on study for State of Minnesota).
56. Arthur D. Little, Inc., A Plan for the Development of Hazardous Waste Management Facilities in the New England Region (NERCOM report), Cambridge, Mass., September 1979.
57. Booz, Allen & Hamilton, Options for Establishing Hazardous Waste Management Facilities/Technology for Managing Hazardous Wastes, Report Prepared for the New York State Environmental Facilities Corporation, Bethesda, Md., September 1979.
58. See Scully, Gebhard and Noble, note 55 above. See also Vernon's Texas Civil Statutes Art. 7621d-2 et seq.
59. Koppers Environmental Elements Corp., "Kommunekemi, the Danish Hazardous Waste Disposal Facility", (private publication), Baltimore, Md., 1979. See also Scully, Gebhard and Noble, note 55 above, pp. 26-27; and "An Orientation Published by Kommunekemi A/S", paper, translation in NERC Library, U.S. EPA, Washington, D.C. Jan. 1975. Also, P. Henrikson, "One Private Plant Treats Oil, Chemical Residues in Denmark," Solid Wastes Management Magazine, May 1974.
60. Special Refuse Disposal in Bavaria, Gesellschaft für Beseitigung Von Sondermüll in Bayern MBH [Company for the Disposal of Special Refuse in Bavaria, Ltd.], Munich, W. Germany, June 1978. (Translation available from U.S. EPA, Washington, D.C.) P. Luchsinger, "Industrial Waste Treatment Plant - Biebesheim, Germany". (Description of Hazardous Waste Disposal in the State of Hessen) Text of Speech delivered in Zurich, Switzerland, April 19, 1979. Furmeier, "Refuse Industry Gets Sole Charge of Hazardous Materials", Solid Wastes Management, June 1974, p. 16.

61. A number of unpublished documents pertaining to hazardous wastes management in foreign countries were obtained from the U.S. EPA. These included several prepared for a Pilot Study on Hazardous Wastes by the NATO Committee for Challenges to a Modern Society. The Commission wishes to acknowledge the assistance of the Hazardous Waste Division, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C.
62. Communications Satellite Act of 1962, P.L. 87-624, 76 Stat. 419, 47 U.S.C. 701 et seq., as amended, P.L. 91-3 (1969). Board of Directors is described at 47 U.S.C. 733. (1978 ed.)
63. See 47 U.S.C. 396 et seq. (1978 ed.).
64. Legal Services Corporation Act of 1974, P.L. 93-355, 88 Stat. 378, 42 U.S.C. 2996 et seq. (1978 ed.).
65. See New York State Environmental Facilities Corporation Act, L. 1970, c. 744, N.Y. Pub. Authorities Law Section 1277 et seq. (The EFC replaced an earlier Pure Waters Authority established in 1967.)
66. A provision for local representation on a siting board is provided in a New York State law which establishes a "Board of Electric Generation Siting and the Environment", N.Y. Public Service Law, Section 140-149a (1978).
67. N.J.S.A. 48:13A-6, N.J.S.A. 48:13A-7.
68. Compare Rollins-Purle, Inc., In the Matter of Violations of Law and Regulations of the Board, Bd. of Pub. Util. Comm'rs Docket No. 726-570 (Jan. 11, 1973), with In the Matter of the Petition of Suntech, Inc., Bd. of Pub. Util. Comm'rs Docket No. 6812-1662 (August 24, 1979).
69. See Suntech, note 68, above.
70. R. Tuminski, "Liability Coverage for Hazardous Waste Facilities", memorandum prepared for Hazardous Waste Advisory Commission, September 24, 1979.
71. Proposed Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities [proposed 40 CFR 250.43-9(a)(2)], 43 Fed. Reg. 59006 (Dec. 18, 1978).
72. S. 1341, "Oil, Hazardous Substances, and Hazardous Waste Response, Liability and Compensation Act of 1979", (Administration Bill, intro. June 14, 1979); S. 1480, "Environmental Emergency Response Act", (Muskie-Culver Bill, intro. June 11, 1979); H.R. 5617, "Hazardous Waste Disposal Act of 1979", (Findley, intro. Oct. 17, 1979); H.R. 5790, "Hazardous Waste Response Fund Act of 1979", (Florio bill, intro. Nov. 1979).
73. S. 1325, "Hazardous Waste Post-Closure Liability Act", intro. June 12, 1979.
74. A provision for funding local parties' expert witnesses and consultant costs is found in N.Y. Public Service Law Section 140-149a (1978).
75. County Environmental Health Act, L. 1977, c. 443, N.J.S.A. 26:3A2-21 et seq.

76. See N.J.S.A. 58:11-14 to 18.22; N.J.A.C. 7:10-5.1 et seq.
77. Environmental Rights Act, L. 1974, c. 169, N.J.S.A. 2A:35A-1 et seq.
78. See note 8 above.

Text of
EXECUTIVE ORDER NO. 76
of Governor Brendan Byrne

WHEREAS, development of a comprehensive system for the generation, storage, transport and ultimate safe disposal of hazardous waste generated in the State involves all segments of society including private citizens, local and State officials and representatives of the State's industrial and manufacturing companies which generate hazardous waste; and

WHEREAS, the development of a system of waste processing facilities and disposal sites to safely and economically handle the hazardous waste stream generated by New Jersey's industrial, manufacturing and business community is in the interest of the State and the long term viability and stability of New Jersey's economic base; and

WHEREAS, the lack of such facilities is a significant factor in the indiscriminate and illegal dumping of hazardous waste; represents a significant danger to the public health, safety and welfare; threatens ground and surface water; causes unnecessary air pollution and results in a substantial burden on the public treasury for remedial action; and

WHEREAS, the technical, legislative and administrative solutions to this problem must involve the development of a partnership between the public and private sectors after open and frank public discussion and full participation of all segments of society;

NOW, THEREFORE, I, BRENDAN BYRNE, Governor of the State of New Jersey, by virtue of the authority vested in me by the Constitution and statutes of this State, do hereby Order and Direct:

1. There is created an Advisory Committee on Hazardous Waste Control (hereinafter "the Committee"), consisting of such members as are appointed by and shall serve at the pleasure of the Governor. The membership of the Committee shall include representatives of the industrial community, private citizens, an elected municipal official, an elected county representative, and members of the Legislature. The members of the Committee shall serve without compensation but shall be reimbursed for necessary expenses incurred in the performance of their duties, subject to the availability of funds.

2. The Governor shall designate a Chairman and Vice-Chairman from among the members of the Committee. The Chairman shall preside over the meetings and affairs of the Committee. The Chairman shall have such further powers as may be conferred upon him by the Governor.

3. a. The Advisory Committee shall prepare a report to the Governor within six months of the effective date of this order which shall include recommendations for administrative or legislative action for the development of a comprehensive hazardous waste management program. Such report shall specifically address the following issues in addition to any others the Advisory Committee deems appropriate:

1. Alternative administrative systems for the regulation of hazardous waste disposal, including siting requirements and site selection procedures for the following: (i) an exclusive State owned and operated hazardous waste authority that would process and dispose of all hazardous waste generated in the State, (ii) State licensing of privately owned facilities, (iii) a combination of i and ii which could include State ownership of land combined with lease agreements with private contractors who would build and operate processing or disposal facilities, and (iv) regional and interstate authorities.
2. Alternatives for financing hazardous waste facilities evaluated pursuant to paragraph a. including: revenue bonds, state regulation of rates, value added tax, and volume fees on generated waste.
3. Methods relating to discouraging to the greatest degree possible illegal dumping including: improved enforcement mechanisms, increased penalties and reduced cost or free processing to encourage use of treatment facilities.
4. Appropriate alternatives for long term protection of the environment at generation, storage and disposal facilities including: monitoring systems, insurance bonds, escrow accounts and closure requirements.
5. Methods relating to reducing the quantity of hazardous waste requiring disposal, including: resource recovery, recycling, waste brokerage, fuel-from-waste and incentives for reducing the quantity of hazardous waste generated in the State.
6. Regional issues associated with hazardous waste disposal, facilities, equalization of rates and the feasibility of an interstate compact for the disposal of such waste with Connecticut, New York, Pennsylvania, and Delaware or such other states as the Committee deems appropriate.
7. The legislative and administrative programs of other states or countries to determine their applicability to New Jersey.
8. A suggested timetable and work program for implementation of the recommendations made.

b. In the furtherance of these duties, the Committee may:

1. Review and evaluate matters related to the manufacture, storage, transportation, reuse or disposal of hazardous waste.

2. Request from the Department of Environmental Protection, Labor and Industry, Health, Treasury or any other department or agency of the State government such information concerning hazardous waste as it may deem necessary.

4. The Committee shall develop and implement a public participation program which will make available to the public significant and meaningful opportunity to make its views known on the development of a comprehensive hazardous waste disposal program. As part of the public participation program the Committee shall conduct public meetings or hearings and shall solicit information from and consult with relevant public and private agencies and groups, including county and local government, environmental and industrial organizations and other interest groups.

5. The Departments of Environmental Protection, Health, Labor and Industry, and Treasury and all other State agencies are authorized and directed to the maximum extent possible, not inconsistent with law, to cooperate with the Committee and to furnish them with such information, personnel, and budgetary assistance as is necessary to accomplish the purposes of this Order. The Department of Environmental Protection shall provide technical staff to assist the Committee in its deliberations.

6. This Order shall take effect immediately.

GIVEN, Under my hand and seal this 15th day of August in the year of Our Lord, one thousand nine hundred and seventy-nine [and] of the Independence of the United States, the two hundred and fourth.

/s/ Brendan Byrne
GOVERNOR

[seal]

Attest:

/s/ Robert E. Mulcahy, III

Chief of Staff, Secretary

APPENDIX B

SCHEDULE OF MEETINGS OF THE
HAZARDOUS WASTE ADVISORY COMMISSION

- August 15 - first meeting of Commission
- August 30 - workgroup 1 (Siting and Technology)
- September 4 - workgroup 2 (Institutional)
- September 11 - Public Meeting held by Commission
- September 26 - full Commission meeting
- October 2 - workgroup 2
- October 3 - workgroup 1
- October 17 - full Commission meeting
- October 22 - workgroup 2
- October 23 - workgroup 1
- October 29 - full Commission meeting
- October 31 - release of preliminary draft report
- November 9 - full Commission meeting (open to public observation)
- November 15 - release of draft report
- November 26 - full Commission meeting (open to public observation)
- December 7 - public hearing on draft report
- December 14 - full Commission meeting (open to public observation)
- Jan. 3, 1980 - full Commission meeting (open to public observation)

Appendix C

Response to Public Comments Submitted on
the Draft Report of the Hazardous Waste
Advisory Commission

The following questions/points were raised by the public regarding the November 14 draft report of the Commission.

I. Management Corporation proposal

1. The Commission did not consider fully other institutional options before recommending the formation of the management corporation.
 - Section IV of the report has been expanded to include a discussion of the types of institutional arrangements examined by the Commission. Further, the Commission now recommends that an interim Hazardous Waste Management Board be established (Section IX) for an interim period until the detailed institutional analysis being done by the DEP/DRBC study is completed and a final institutional arrangement is agreed upon and implemented.
2. The report needs to spell out more clearly where DEP authority fits into the corporation's decisionmaking process; the corporation should not be able to override environmental regulations.
 - A new flow chart has been included in Section IV which lays out the interface of corporation and DEP responsibilities. The Commission strongly agrees that the corporation should not be able to override environmental regulations; the corporation's authority to expedite licensing would not in any way lessen the thorough analysis required to ensure that environmental safeguards are applied.
3. What measures will be taken to ensure the accountability of the corporation?
 - Section IV (pg. 40-41) discusses the safeguards that should assure that the management corporation will be accountable. These include the open public process for developing siting criteria and for site selection, environmental assessment requirements, public participation in all decisionmaking, the composition of the Board of Directors (and the temporary members from local communities during siting decisions), and the issuance of an Annual Report.

4. The discussion of membership of the Board of Directors should include requirements that a majority of members be public representatives and that members meet specified qualifications.
 - The Commission continues to believe that the Board membership should be comprised of equal representation from government, industry, and the public. Section IV, pg. 40, contains some elaboration on membership qualifications.
5. The Commission should consider the concept of a siting board for specific siting decisions, which would include members from communities being considered for sites.
 - Section IV, pg. 40, Section V, pg. 51 incorporate this concept. When the Board of Directors sits in consideration of a facility proposal for a particular site, two representatives nominated by the local governing body(s) of potential host community(s) would be added as temporary Board members by the Governor.
6. The corporation should have the authority to operate facilities under certain conditions (e.g. operator incompetence or bankruptcy).
 - The Commission has recommended that the corporation have this authority (Section IV, pg. 45).
7. The corporation should have subpoena power.
 - The Commission has recommended that the corporation have this authority in order to obtain information (Section IV pg. 41).
8. How has the Commission provided for interface with the DEP/DRBC institutional study?
 - The new implementation section (Section IX) of the report addresses this concern.
9. How will the corporation interface with county and local governments?
 - The Commission has specified that the corporation Board membership include two temporary representatives from local government during siting decisions. The public participation process will provide additional opportunities for county and local government to participate in the corporation's activities.

10. The corporation's authority to provide bonds and low-interest loans for facilities will "subsidize" the industry.
 - The Commission deleted the recommendation that the corporation have authority to issue bonds for site acquisition and to issue pollution control bonds to fund facility construction. The Commission believes that existing financial and tax incentives established for industrial development in general may also be extended to the development of hazardous waste facilities (Section IV, pg. 37).
11. There is a risk of political influence concerning the corporation Board of Directors.
 - The Commission has recommended that initial terms of Board members be of varied lengths to provide a phased turnover of the representatives (Section IV, pg. 41).
12. There should be adequate local representation in corporation decisionmaking.
 - The Commission believes this concern is addressed by the provision of temporary local representatives on the corporation Board during siting decisions.
13. The annual audit of waste generators' records should include more than 10% of the firms.
 - The language in the report regarding the audit requirement has been changed so that the regulatory agency (DEP) would be required to audit periodically the records of firms in a manner that is statistically sound (Section VII, pg. 56). The appropriate percentage of firms to be audited would be determined by sound statistical and auditing practices.
14. The corporation should be required to issue an annual report.
 - This is now provided for in Section IV, pg. 41.
15. Qualifications for operators of hazardous waste facilities should be specified.

These qualifications should be determined as part of the environmental assessment for facilities. A minimum requirement is that hazardous waste facilities be operated under the general supervision of a licensed operator (Section VII pg. 59.) Specific qualifications for operators will vary depending on the type and extent of the treatment facility.

II. Public Participation

1. The report lacks specificity on how the public will be involved and who the public is.
 - The Commission believes this point is addressed in the new implementation section (Section IX) which requires that the interim Board use DEP's Public Participation Procedure during the Board's development of a public participation process for the long-term (institutional structure) hazardous waste management program.
2. Public participation procedures need to be defined explicitly.
 - (see #1)
3. Funds should be available to the public for consultants; a program could be set up in the Department of the Public Advocate to make grants to organizations and local governments.
 - The Commission has recommended that such a program be established (Section VI, pg. 53).
4. Any enabling legislation for a hazardous waste program should provide for citizen suits.
 - The Commission believes that this opportunity is already provided for in existing State laws - the Environmental Rights Act (see Section VII, pg. 60).
5. A public health education program should be developed for each siting situation.
 - The Commission has addressed this concern by requiring that a risk analysis be an integral and important component of the environment assessment/impact statement process for a site and facility (Section V, pg. 52).
6. An ombudsman for hazardous waste should be established to represent citizens' interests.
 - (see #3); the Commission also believes that the Public Advocate's general role as a citizens' advocate will meet this need.
7. A public education program for hazardous waste should be established.
 - The Commission agrees with this point (see pg. 9) and believes it is addressed in the Siting and Public Participation Sections.

III. Transportation

1. Transportation is an important aspect of hazardous waste management, but it is not really addressed in the report.
 - The Commission recognized the importance of this issue and that it will be an integral part of a hazardous waste management scheme. The Commission believes this issue is addressed in the recommendations for hauler licensing (Section VII pg. 57-58) and siting considerations (Section V, pg. 50).
2. Specific requirements should be recommended for: training and licensing haulers and drivers; routing; types of vehicles.
 - Licensing haulers and drivers is recommended in Section VII. Training for drivers would be determined by DEP license requirements. Routing and types of vehicles should be assessed in facility environmental assessments.

IV. Volume of Waste

1. The report should emphasize the importance of minimizing waste generation.
 - The Commission agrees that this is an important point. (Section III, pg. 19)
2. The definition of hazardous waste will be very important; the hazardous waste problem should not be "defined away". (A number of people were concerned about Finding I.)
 - see Section I, pg. 6 and revised Finding I, pg. 2.
3. It has been suggested in public comments that there should be an explicit social mechanism for weighing the utility to society of products whose manufacture entails the generation of hazardous wastes, and that manufacture of some products might be banned if the risks associated with their manufacture are not justified by the benefits they confer on society.
 - The Commission believes that this idea is of interest but has several obvious drawbacks. It would inject the government into a myriad of manufacturing decisions unless inquiry was limited to a narrowly-defined category of high-risk wastes.

(Actually, there already may be a basis for such inquiries afforded by the federal Toxic Substances Control Act.) In general, the Commission favors limiting the role of direct government regulation to the minimum necessary, and believes that economic incentives that leave managers free to decide how to meet environmental constraints are preferable to direct controls.

V. Technology

1. More information/data is needed before treatment and disposal capacity needs can be identified realistically.
 - The Commission agrees that this is essential (Section II C (3), pg. 22) and has identified this issue as a top priority item to be addressed by the interim Board (Section IX, pg. 63) in conjunction with the DEP/DRBC study.
2. Serious concerns were expressed regarding secure landfills. It was noted that landfills should not be considered as a permanent disposal option, only temporary. Landfilling should be strongly discouraged; wastes that can't be safely landfilled should not be produced.
 - The Commission believes that secure landfills are a legitimate disposal method for hazardous waste residues for which further treatment is not appropriate or available. Landfill design criteria, including leachate systems, will be part of the criteria used by DEP in permitting such facilities. The Commission has addressed the issue of landfilling in Section III (pg. 32-33), and has emphasized that use of secure landfills be regarded as a last resort (Section III, pg. 26), and that landfills will be monitored in perpetuity.
3. Resource Recovery should be stressed as a top priority and an important disposal option.
 - The Commission has identified resource recovery as an important option (Section III, pg. 27) and anticipates that disposal costs will encourage the use of resource recovery strategies for hazardous waste management.
4. The waste exchange program concept should be spelled out; such a program should be a responsibility of the management corporation.

- The Commission believes this point is addressed in Section III, pg. 28, and has now included language in the management section (pg. 45) directing the corporation to assure the development of such a program.
5. The concept of retrievable surface storage facilities should be addressed in the report.
 - The report now includes a discussion of this issue. (Section III, pg. 33)
 6. Even small amounts of residue from incineration of wastes may be highly toxic; incineration practices should be carefully monitored. In addition, accidents on incineration ships could cause serious pollution of the coastal zone.
 - The Commission recognizes and agrees with both these points (Section III, pg. 32).
 7. Treatment and disposal fees for hazardous waste should be graduated, with the highest fee for landfill disposal.
 - The Commission anticipates that the economics of free market will make landfill disposal an expensive option. Also, in view of the design and monitoring requirements for landfills, this method of disposal will be costly. The Commission does not believe that treatment and disposal rates charged by facilities should be regulated (Section IV pg. 46). However, in terms of potential fees assessed by the State for establishment of a post-closure liability fund, the Commission has endorsed the concept of higher fees for generators who choose secure landfill for disposal. (Section IV, pg. 47).
 8. Rehabilitation of existing dump sites should be considered.
 - The Commission has recognized this need (Section VIII and Findings and Recommendations) and supports a government capability to deal with those sites which represent a hazard to public health or the environment should facility operators be incapable financially of mitigating such a hazard. Cleanup and rehabilitation of existing "orphan dump sites" is also included as a potential community compensation measure in Section V, pg. 51.

VI. Generators

1. Generators should pay a waste disposal fee whether disposal is off-site or on-site. Such fees should go into a fund for post-closure liability.
 - The Commission endorses this concept (Section IV, pg. 48), and recognizes the importance of the post-closure liability issue. It is recommended that the interim Board examine and make specific recommendations for liability and funding mechanisms for post-closure for both on-site (privately owned) and off-site disposal sites (Section IX, pg. 63).
2. Generators should be strictly liable for disposal of hazardous waste.
 - The Commission discussed this point at great length and, in particular, has reviewed the comments submitted by the Environmental Defense Fund; however, the Commission still endorses its original decision which fixes liability at each point in the treatment or disposal "chain" of those responsible for hazardous waste management. (see Section IV, pg. 59).

VII. Community Compensation

1. Community compensation should be specified in enabling legislation.
 - The Commission has incorporated language in this regard (Section V, pg. 51).
2. More detail on different types of compensation should be included in the report.
 - see Section V, pg. 51-52.

VIII. Orphaned Dump Sites

Many of the public comments stressed the importance of identifying and cleaning up such sites and that DEP should have more resources for this effort.

- The Commission agrees with this sentiment. (Section VIII), and believes that it is essential that adequate funds are available to clean up sites which pose an imminent threat to public health and the environment.

IX. Regulation/Enforcement

1. There is a need to upgrade State laboratory facilities.
 - The Commission recognized that there is documentation that such facilities are inadequate. There was not an opportunity to look into this issue in detail but it is recognized that adequate lab facilities will be very important to the effectiveness of a hazardous waste program. The Commission has recommended that a thorough evaluation of this issue be carried out by the interim Board (Section IX, pg. 63).
2. There should be State-run labs on each hazardous waste facility site.
 - The Commission believes that this should be considered by the management entity, relevant to specific types of facilities and covered in the facility environmental assessment. (Section VII, pg. 59)
3. Facility inspection/monitoring program should be developed concurrently with the overall hazardous waste management program.
 - The Commission believes that this will be an integral part of the development of the program and notes that DEP must be provided with the necessary resources to enforce environmental regulations for hazardous waste treatment and disposal facilities. (Section VII pg. 60)
4. Inspection/monitoring program should be a shared responsibility of local, county and State governments. Inspectors should be based on the local level and inspections should be unannounced.
 - The Commission believes this has been adequately discussed in the report. (Section VII pg. 59)
5. There should be periodic reports to the public on the ongoing monitoring programs at facilities.
 - This point has been incorporated in the requirement for the corporation to issue an Annual Report (Section IV, pg. 40).
6. There is a need for monitoring the health of workers at hazardous waste facilities.
 - The Commission believes this is addressed adequately in Appendix F.

7. The Commission should recommend to the Governor that funding be made available to make the Strike Force a permanent institution.
 - The Commission does not wish to recommend such action until the effectiveness of the Strike Force has been ascertained. The Commission has recommended, however, an evaluation of the Strike Force's effectiveness (Section VII, pg. 60 and Recommendations, pg. 4), and, if the results warrant the unit's continuation, the State should seriously consider providing funds to continue its operation.
8. A bounty system for hazardous waste violations should be established.
 - The Commission has not fully evaluated this concept.
9. The State should establish a special monitoring program for water supplies in the vicinity of hazardous waste facilities.
 - The Commission recommends that this idea be pursued by DEP under the Safe Drinking Water Act.

X. Civil Service

Many comments on the report noted the constraints of the Civil Service system; some suggested that these constraints will affect DEP's effectiveness.

- The Commission has highlighted the importance of having well-qualified personnel for both DEP's and the management corporation's hazardous waste programs. In terms of the management corporation, as well as DEP, the Commission stressed that the types of persons with the qualifications needed to run a hazardous waste program will be in high demand and the State must be able to compete with private industry for these people. Having the management entity outside the Civil Service system will facilitate the ability to have competitive salaries. The Commission has also emphasized that the State must provide adequate support for DEP's enforcement program. (Section VII, pg. 60).

XI. Perpetual Care

This issue should be explicitly addressed by the Commission; it is an important part of gaining public confidence in a hazardous waste management program.

- Perpetual care for those facilities requiring such attention is recommended. Also, a charge on hazardous waste generators is recommended to establish a fund for this purpose. (Section IV pg. 47-48). The specific requirements for the fund and its use should be developed by the corporation and are recommended for study by the interim Board (Section IX).

SEPARATE VIEWS OF COMMISSION MEMBER DIANE GRAVES

I generally concur with the Hazardous Waste Commission report and its recommendations. However, the following is a minority view of two issues raised in the report.

1. MANAGEMENT CORPORATION AND PUBLIC PARTICIPATION

In his Executive Order Governor Byrne directed the Hazardous Waste Advisory Commission to "... develop and implement a public participation program which will make available to the public significant and meaningful opportunity to make its views known on the development of a comprehensive hazardous waste disposal program." With consistent encouragement from its chairman, and in the time available for its work, the Commission attempted to meet the Governor's charge to involve the public.

In Section IV of the report, the Commission recommends that the public be involved in all future hazardous waste decisions. This is necessary, the Commission believes, if trust and confidence, a prerequisite for public support for decisions, is to be established.

The Commission did an admirable job in setting an example for those who carry out its recommendations in all areas but one. Before making its final recommendation for a Management Corporation, the Governor's Commission failed to set forth for public review and comment a number of alternative institutions including advantages and disadvantages of each, and ways to overcome disadvantages. Only in this systematic way can the legal, fiscal, political, environmental, geographical and implementable aspects of various alternatives be debated and a public consensus be forged.

This judgment that the recommendation for the Management Corporation was premature is not meant to challenge the personal preferences of fellow Commission members. Rather it is meant to state that a full disclosure and public discussion of alternatives for the all important management institution was needed before a selection was made if the final choice is to have public support and if the management institution is to have a reservoir of public trust and confidence when it begins its work. In making its choice now the Commission missed an opportunity to put into practice its own recommendations for public participation.

So long as artificial time constraints (four months in this case) and limited staff resources come into conflict with meaningful public participation, and the choice is made to force the public to give way, the public cannot be expected to support the decision, nor to have trust and confidence in those who made it.

In addition, not all public values were represented in the decisions by the Commission. The State Legislative members of the Commission failed to participate except in essentially ceremonial activities. This was a disappointment because the legislators represent views and values which eventually must be factored into the hazardous waste management equation. By not attending the Commission meetings, the legislators have unwittingly prolonged the debate and ultimately postponed a solution to New Jersey's hazardous waste treatment and disposal problem.

2. ASSURING PROFESSIONALISM

The standards set by the Commission for professionalism in the enforcement program and in the proposed Management Corporation are inconsistent.

The Commission found the DEP enforcement efforts "ineffective". The Department's enforcement efforts "have suffered from a chronic shortage of investigative staff, laboratory capacity, and attorney time," the Commission concluded. The resulting bad experiences by the public is judged by the Commission to be a major cause of opposition by the public to new facilities.

The Commission's solution to the problem of ineffective enforcement, which is acknowledged "will poison the climate" for new facilities, was to tell the Legislature and executive branch to "take special care ... to make sure that budgets provide for adequate staffing and support services." In particular, the Commission asked that the State Civil Service structure and practices be examined to be sure that the necessary qualified personnel can be attracted and retained.

The Commission recognized that its proposed Management Corporation must also "provide for competitive salary ranges to entice the qualified professionals needed ..." In this case, the Commission made the judgment that such needs could not be met either within the present Civil Service structure or as a result of any recommendations it might make to the Legislature or executive branch, but recommended instead that the Management Corporation "operate outside the State Civil Service structure."

The Commission concluded that enforcement and management required top flight people, but in effect, judged that the state's Civil Service structure is good enough for enforcement but not for management.

To be consistent, the Commission should have recommended one of the following courses of action to meet both management and enforcement needs:

- a) reform the state Civil Service structure and improve the present DEP management practices;
- b) place the Management Corporation together with the DEP hazardous wastes related functions outside the state Civil Service structure.

The first course of action would appear to be the most reasonable option.

Diane T. Graves

Conservation Chairman
Sierra Club - New Jersey Chapter

APPENDIX E

PUBLIC PARTICIPATION IN THE DEP/DRBC
HAZARDOUS WASTE DISPOSAL STUDY

Public participation is an essential part of the overall solution to the hazardous waste disposal problem. DEP and DRBC are totally committed to intensive public participation in this study. The public will be involved in significant program decisions, suggesting alternative courses of action and evaluating their implications; issues will be presented at an early stage so they can be resolved and timely decisions can be made.

DEP and DRBC will share the responsibility of providing a full time individual for the duration of this contract (approximately 6 to 8 months) to establish and run an effective public participation program. This individual will ensure that all interested and involved citizens and public interest groups have every opportunity to participate in this study.

At five key points in the study, public information meetings will be held to ensure public involvement before important decisions are made. The points in the study and approximate time frames for these meetings are listed below:

1. Site screening criteria (Levels I & II) - February 1980
2. Institutional recommendations - May 1980
- *3. Identification of Broad Areas - June 1980
- *4. Siting Criteria (Level III) - June 1980

*3 and 4 may be held concurrently

In addition, DRBC has established a Joint Advisory Committee consisting of individuals from industry, state, federal and local government and six public interest groups. These people will assist in the public participation program for DRBC's portion of the study. DEP will be expanding this concept and establishing a committee that will represent state-wide interests.

d. Operating Parameters and ManagementAPPENDIX F1. Technical ControlsIncineration

Thermal destruction is dependent on combustion temperature and residence time in the incinerator combustion chamber. The incinerator should be designed to provide worst-case thermal decomposition requirements. Combustion chamber temperatures of 1800-2400°F and residence times of several seconds are required for destruction of chlorinated wastes. Suggested combinations of residence time and temperature are listed in the attached State of Alabama air permit issued to a waste incineration facility which had received guidance from the U.S.EPA.

The incinerator should be backed by a scrubbing device for washing of off-gas. Scrubber design and operating conditions must consider the materials being incinerated, i.e., if an acidic off-gas is produced, the scrubbing liquid should be alkaline.

The scrubber emission after passage through a particulate disengaging device should exit via a tall stack. Stack design should consider dispersion to minimize ground level (or building height) concentrations.

Secure Landfill

Assuming adequate geology (as identified in EPA regulations), operating control should address the placement and location of wastes in the landfill. Potentially reactive wastes should be segregated from each other in different cells or sections of the facility. Additionally, a daily cover requirement should be imposed to minimize exposure of wastes to rainfall. Cover and material used to pack around containers (drums) should be clay.

Bulk sludges or liquids may require stabilization before placement in the landfill. A maximum moisture (water) criteria should be used in waste acceptance criteria for bulk materials.

Recordkeeping

Recordkeeping program above and beyond NJDEP manifest requirements should include control of the quantity of incoming wastes and daily visual inspections of operating equipment.

Analytical Facilities

Complete laboratory facilities should be available for waste stream analysis, quality control and hazard assessment. Each waste stream should be analyzed prior to disposal by GC-MS for key parameters. The lab should be staffed with qualified chemists and technicians. Analytical results should be coordinated with a coding system on the waste containers.

Personnel Training

Key management or supervisory positions should be filled by people with a formal education, preferably an engineering degree. Normal training for hourly workers should include spill response and containment instruction, in addition to a complete understanding of the processes and materials with which they are working.

Safety Precautions

Strategically located eyewash facilities and safety showers should be provided. Fire precautions should include chemical fire extinguishers and firewater supply system. Personal protective equipment should be worn as required. Smoking should be permitted only in designated areas.

Security Precautions

The facility should be totally fenced with 24-hour guard coverage

Storage Facilities

All storage tanks should be diked, curbed or some other form of secondary containment provided. Drum storage area should be an impervious surfaced area with diking or curbing to contain 10% of the total volume of liquids in the drums.

Transfer Facilities

Loading and unloading areas should be paved and drain to collection sumps.

Materials Compatibility

Three aspects are involved: compatibility of the contents with the materials of construction of the container, compatibility of different chemicals combined in, for example, a landfill or a container, and compatibility of the container with its environment. The program should establish procedures to assure that all aspects of materials compatibility are adequately covered in the design and operation of all equipment handling toxic and hazardous wastes.

Housekeeping

All holding/storage areas should be kept clean and orderly. Drum inventory control system should be used that includes the marking of containers per analytical testing activities.

Preventive Maintenance

Program should cover the routine repair and replacement of worn-out equipment parts, the lubrication of equipment, and the overall surveillance to assure that equipment and instrumentation systems are functioning properly. Program will eliminate potential causes of accidents and minimize equipment downtime and failure.

Visual Inspections

Program should include routine touring or patrolling of disposal facility to detect equipment failure or spills/leaks at storage facilities, transfer pipelines and loading and unloading areas.

3. Residuals

Waste generated from the disposal operations are leachate from the landfill activity, ash and scrubber water residual from incineration. Management of these streams should be consistent with NPDES permits and solid waste disposal permits.

4. Industrial Hygiene Program

A medical program should be set up that consists of a comprehensive preplacement (baseline) medical exam including a good medical and work history giving special attention to nervous system and liver disorder (liver function tests as appropriate).

Each employee should be provided with a locker for his street clothes. For entry into the disposal area, he will remove his street clothes and place them in the locker. He would then don clean, disposable work clothes, i.e., coveralls, headcover, gloves and boots and enter the workplace. Upon exit from the work area, he would remove all protective clothing and place in a receptacle for disposal. He would then shower and exit into the locker room to dress in his street clothes. Adequate protective clothing should be issued each worker so that he can have a clean issue daily. Smoking and eating should be prohibited in the work area. Hands and face should be washed before smoking or eating in properly designated clean areas or lunchrooms.

Respirators should be worn whenever equipment is to be opened or other potential exposure situations exist. Half-face respirators (NIOSH-approved for dusts and fumes) should be adequate for dust levels up to 1.0 mg/m^3 , full-face NIOSH respirators for dust levels up to 10 mg/m^3 and self-contained breathing units for higher levels should be utilized.

STRATEGY SECTIONPart (e) - Operating Facility Monitoring(1) Environmental Criteria for Monitoring

Attached is a four page outline of a proposed monitoring program for operating chemical waste disposal facilities. This outline sets forth the environmental and operational controls felt necessary to realistically minimize the environmental hazards potentially posed by such operations.

The outlined program separately addresses the following elements for both landfills and incinerators.

● Pollution Types

Air
Surface Water
Ground Water
Noise
Odor .

● Pollution Sources

Significant potential sources of the individual pollution types are listed.

● Establishment of Baselines

Recommendations are given for establishing suitable pre-operating baseline levels for each pollution type against which possible subsequent pollution can be objectively measured.

● Routine Environmental Monitoring

As appropriate and feasible, routine environmental monitoring requirements for the various potential sources of pollution are suggested.

● Routine Operating Controls

Routine operating controls to reduce the duration and extent of possible pollution from the various potential sources are suggested.

● Agency Surveillance

Specific proposals are made regarding the nature and frequency of primary agency environmental surveillance by N.J.D.E.P. with EPA Region II overview.

Part (e) - Operating Facility Monitoring

<u>Pollution Type</u>	<u>Disposal Facility</u>	<u>Pollution Source</u>	<u>Baseline</u>	<u>Routine Envir. Monitoring</u>	<u>Routine Operating Controls</u>	<u>Agency Surveillance</u>
Air	Landfill	(1) Fugitive dust from unpaved internal roads and working face of landfill	(1) Upwind & downwind (of prevailing wind) 24 hr. samples taken 5ft. above ground at site perimeter over 30 day period. Days with full or partial snow cover or frozen ground conditions not to be counted. Record rainfall times and wind directions & force hourly. Record rainfall total daily.	(1) Upwind & downwind 24hr. samples at baseline locations monthly. Record data as in baseline procedure.	(1) Daily tour of site perimeter by facility supervision during operating hours. Tour log to be maintained.	(1) Quarterly by N.J.D.E.P.--review monthly monitoring data and compare to baseline --review daily tour log.--tour site perimeter during operating hours. (1) Annually by EPA II same as by NJDEP quarterly.
		(2) Fugitive emissions of carbon dioxide, methane, and possibly other gases from decomposition of buried organic material.	(2) None	(2) None	(2) None	(2) None
		(3) Secondary emissions from any treatment or neutralization facilities operated in conjunction with landfill.	(3) None	(3) None	(3) Control and continuously record reaction temperatures and temperatures of coolant in vapor condensers (if so equipped).	(3) Quarterly by N.J.D.E.P. --Review logs
	Incinerator	(1) Stack Emissions	(1) Establish average and maximum ambient air levels for particulates, SO ₂ , CO, NO _x , Hydrocarbons and total halogens at a suitable location downwind of proposed site.	(1) Check monthly 24hr. sample from ambient air sampling station for same parameters as baseline samples. (Monthly sample must be taken while incinerator is in operation).	(1) Continuously monitor combustion chamber temp. (1) Monitor O ₂ , CO ₂ , and CO in stack for at least 1 hour during each operating day. (1) Monitor organic halides for at least one hour. Each time liquids containing 12 or more of such materials are burned or if burned regularly at least 1 hour per week.	(1) Quarterly by N.J.D.E.P. --review monthly ambient air sampling data --review combustion chamber temp. logs --review stack sampling records --monitor combustion chamber temp. and stack O ₂ level (1) Annually by EPA II --Monitor O ₂ , CO ₂ and CO in stack
		(2) Emissions from storage tanks or lagoons operated in conjunction with incinerator.	(2) Included in baseline data for ambient air pollution levels.	(2) Included in monthly 24hr. ambient air sample.	(2) Weekly physical check of any air pollution control devices installed. Inspection to be logged.	(2) Quarterly by N.J.D.E.P. --Review weekly inspection log --Inspect randomly selected devices

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<u>Pollution Type</u>	<u>Disposal Facility</u>	<u>Pollution Source</u>	<u>Baselining</u>	<u>Routine Envir. Monitoring</u>	<u>Routine Operating Controls</u>	<u>Agency Surveillance</u>
Surface Water	Landfill	(1) Discharge of collected and treated leachate.	(1) Three 24hr composite samples of surface water at downstream point analyzed for all parameters listed in proposed (6/14/79) NPDES application forms. To be repeated seasonally if possible.	(1) Of discharge as required by NPDES permit issued to facility.	(1) As required by NPDES permit issued to facility.	(1) Semi-annual by NJDEP -sample & analyze Discharge for compliance with NPDES permit Discharge limitations
		(2) Storm water runoff	(2) None	(2) Of discharge as required by NPDES permit issued to facility.	(2) As required by NPDES permit issued to facility.	(2) Semi-annual by NJDEP -Physical inspection to assure there are no non-registered discharge points.
		(3) Discharge of collected rain water from diked areas around storage tanks - (if any)	(3) None	(3) Analysis of accumulated water (prior to discharge) for NPDES permit parameters of outfall to be used <u>plus</u> material(s) in tank or tanks inside diked area.	(3) Dike area drainage valves or sump pumps to be locked closed. Written permission of supervisor required to discharge.	(3) Quarterly by NJDEP -Review records of any discharge from diked areas.
		(4) Spills of hazardous liquids (if handled) or oil.	(4) None	(4) Discharge sampling required by NPDES permit.	(4) BMP/SPCC programs if required by NPDES permit or oil spill regulations.	(4) Semi-annual by NJDEP -Review BMP/SPCC programs if they are required of facility. Bi-Annual by EPA II-as above by NJDEP
	Incinerator	(1) Discharge of waste scrubbing liquids, equipment washwaters, boiler blow-down (if heat recovery system), etc.	(1) Three 24hr. composite samples of surface water at downstream point analyzed for the parameters listed in proposed (6/14/79) NPDES application form. To be repeated seasonally if possible.	(1) Of discharge as required by NPDES permit issued to facility.	(1) As required by NPDES permit issued to facility.	(1) Semi-annual by NJDEP -Sample and Analyze Discharge for compliance with NPDES permit Discharge limitations.
		(2) Storm water runoff	(2) None	(2) Of discharge as required by NPDES permit issued to facility.	(2) As required by NPDES permit issued to facility.	(2) Semi-annual by NJDEP -Physical inspection to assure there are no non-registered discharge points
		(3) Discharge of collected rain water from diked areas around storage tanks.	(3) None	(3) Analysis of accumulated water prior to discharge for NPDES permit parameters of outfall to be used <u>plus</u> material(s) in tank or tanks inside diked area.	(3) Dike area drainage valves or sump pumps to be locked closed. Written permission of supervisor required to discharge.	(3) Quarterly by NJDEP -Review records of any discharges from diked areas
		(4) Spills of oil or hazardous liquids.	(4) None	(4) Discharge sampling required by NPDES permit.	(4) BMP/SPCC programs if required by NPDES permit or oil spill regulations.	(4) Semi-annual by NJDEP -Review BMP/SPCC programs if they are required of facility. Bi-annual by EPA II -As above by NJDEP

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Pollution Type

Disposal Facility

Pollution Source

Baseline

Routine
Monitoring

Routine
Operating Controls

Agency
Surveillance

Ground Water

Landfill

(1) Permeation or leakage through leachate barriers.

(1) Establish site geology down to mean annual water table.

(1) Monthly samples from monitoring wells to be analyzed for pH, spec. cond., COD and chlorinated organics.

(1) Maintain daily records of leachate collected and rainfall. Continuously check for unexplained drop in leachate volume.

(1) Quarterly by N.J.D.E.P. -Review records

(2) Annually by N.J.D.E.P. -Sample monitoring wells for pH, spec. cond., COD and chlorinated organics

(1) Establish depth of water table, direction and rate of ground water flow considering present and projected withdrawals.

(1) Yearly samples from monitoring wells to be analyzed for primary drinking water parameters and priority pollutants.

(1) Install at least three monitoring wells. At least one up-gradient and at least two down-gradient of site. Sample several times and analyze for pH, specific conductance, primary drinking water parameters and priority pollutants.

(2) Losses from leaks in leachate collection and treatment system.

(2) Included in (1) above

(2) Included in (1) above.

(2) Run monthly material balance on leachate collection and treatment system.

(2) Quarterly by N.J.D.E.P. -Review records

Incinerator

(1) Seepage losses from storage tanks on lagoons.

(1) Identical to (1) above Except install only two monitoring wells, one up-gradient and one down-gradient of facility operating and storage areas.

(1) Semi-annual samples from monitoring wells to be analyzed for pH, spec. cond., COD and chlorinated organics.

(1) Bi-annual samples from monitoring wells to be analyzed for primary drinking water parameters and priority pollutants.

(1) Monthly visual inspection of tanks, lagoons, and diked area (to be logged)

(1) Quarterly by N.J.D.E.P. -Review inspection log.

(1) Bi-annually by N.J.D.E.P. -Sample monitoring wells for pH, spec. cond., COD and chlorinated organics

(2) Chronic minor spillage of hazardous liquids (e.g. during unloading).

(2) Included in (1) above

(2) Included in (1) above

(2) Monthly visual inspection of liquid transfer facilities. (To be logged). Logging of sump clean-outs.

(2) Quarterly by N.J.D.E.P. -Review inspection log and sump cleanout log.

<u>Pollution Type</u>	<u>Disposal Facility</u>	<u>Pollution Source</u>	<u>Baseline</u>	<u>Routine Envir. Monitoring</u>	<u>Routine Operating Controls</u>	<u>Agency Surveillance</u>
Noise	Landfill	(1) Operation of trucks, bulldozers, and other heavy equipment.	(1) 24hr. continuously recorded sound levels for all seven days of the week measured at the property line point of the proposed site closest to other occupied buildings.	(1) Monthly 5 minute fence-line sampling at random times during operating periods. (To be logged).	(1) As may be required by OSHA regulations.	(1) Quarterly by N.J.D.E.P. -Review noise monitoring logs. (1) Annually by N.J.D.E.P. -Make 3 different 5 minute measurements at fence line points during operating periods.
	Incinerator	(1) Operation and maintenance of unit and necessary facilities.	(1) As above	(1) As above	(1) As above	(1) As above
Odor	Landfill	(1) Possible from certain types of waste before they are covered.	(1) Note any odors detected at property line while gathering fugitive dust baseline data.	(1) Note any odors detected while performing routine fugitive dust monitoring (monthly).	(1) None	(1) Quarterly by N.J.D.E.P. -Review logs & monitoring records -Tour site perimeter during operating hours (fugitive dust tour)
	Incinerator	(1) Possible from holding tanks or lagoons, or incinerator stack gases.	(1) Note any odors detected at downwind monitoring station while baseline ambient air levels are being established.	(1) Note any odors detected at downwind monitoring station while performing monthly ambient air sampling.	(1) None	(1) Quarterly by N.J.D.E.P. -Review monitoring records.

STRATEGIES FOR IDENTIFYING,
ESTIMATING THE HAZARDOUS POTENTIAL AND
HANDLING OF TERMINATED (ORPHAN) WASTE DISPOSAL FACILITIES

INTRODUCTION

This strategy starts with the assumption that every landfill or dump, active or inactive, municipal or private, permitted or otherwise, regardless of the types of waste it is alleged to have or be receiving, has the potential for becoming a trouble spot some time in the future. This assumption is made because: (1) only recently has attention been given to the segregation of hazardous wastes from relatively harmless trash, (2) concepts of "hazardous wastes" and the appropriate handling thereof have changed over time, (3) enforcement of even the most adequate guidelines has not always been 100% effective, (4) many existing owners may not be able to implement needed corrective actions.

This strategy is divided into the following steps:

- (1) Identify and locate waste disposal facilities.
- (2) Estimate potential hazard and establish priority for control.
- (3) Recommendations for handling terminated (orphan) waste disposal facilities.

The first step of this strategy will be to locate and identify landfills. The paper lists seven categories of landfills. Each listing is followed by notes on available sources of information and techniques to be applied for listing, locating and determining the hazardous potential of sites which fall into that category.

IDENTIFICATION AND LOCATION OF WASTE DISPOSAL FACILITIES

A. Public or Commercial Landfills

1. Currently operating landfills.

Solid Waste Facility Directory, 6/29/79, N.J. DEP Solid Waste Administration. This computer printout lists the name and location of facilities by county, mailing address, telephone number, type of operation, wastes it is authorized to receive and remarks as to its status, i.e., operating, terminated, not yet open, etc.

The Hazardous Waste Facility Report, N.J. DEP, is developed from the manifest system and can provide additional and more detailed data on the types and quantities of wastes being received by operating facilities. These lists will provide a basis to determine recently terminated facilities and those which may be abandoned in the future.

2. Landfills terminated between 1968 and the present.

Solid Waste Facility Directory, 6/29/79, indicates under "Remarks" recently terminated facilities.

The earliest Inventory of N.J. Landfills is a longhand document dated 1968. This is in the possession of Mr. Charles Gingrich, Principal Environmental Specialist, N.J. DEP, Solid Waste Administration.

Cross-checking this document with the 1979 Solid Waste Facility Directory should produce a list of facilities terminated since 1968.

Additional listings and locations may be obtained from a Geodetic Survey Map with an overlay indicating all known operating and terminated landfills in New Jersey. This was compiled by SWA staff about 1975. Mr. Gingrich is also in possession of this map.

3. Landfills terminated prior to 1968.

County and municipal Health Offices may still have records dating from the period when waste disposal facilities were their responsibility. If such records no longer exist, the memories of older staff members may provide some information on the existence and location of long discontinued facilities. The N.J. State Department of Health publishes a List of Boards of Health in the state.

4. Unregistered, unrecorded or illegal landfills, currently active or discontinued.

Obviously, none of the information sources previously listed will be useful in locating this type of facility. Two types of investigation, however, may be helpful.

An aerial survey employing specialized photographic techniques may turn up some clues from anomalies in vegetation, natural land contours, etc.

A public information campaign in the media could invite the public to supply information on this type of facility, particularly the long abandoned ones. The memories of long time residents of an area may be the only sources of information on this subject.

B. Landfills owned by the waste generating industry.

1. Currently operating industrial landfills.

N.J. DEP, SWA Industrial Waste Survey should provide data on waste types, quantities, disposal method and location of disposal facility.

2. Discontinued landfills on a currently functioning plant site.

Data on this category of facility could be generated only by a follow-up questionnaire as a continuation of the Industrial Waste Survey or the public information campaign suggested in A4, above.

3. Discontinued landfill on abandoned plant site.

Data on this category of facility could probably be generated only by the public information campaign suggested above.

C. In-Building Storage of Hazardous Materials.

The problem of locating stores of potentially hazardous materials housed in abandoned or otherwise unused buildings is even more difficult than identifying terminated land disposal sites, since it is unlikely that any such storage facilities were ever registered or recorded.

The only approach to locating such facilities lies in enlisting the aid of the public as previously described.

Having located such a facility, however, the process of assessing its hazards and establishing a priority for dealing with it is much simpler. The magnitude of the problem is visible, measurable and its components are available for analysis and identification.

ESTIMATING POTENTIAL HAZARDS AND ESTABLISHING PRIORITIES FOR DEALING WITH TERMINATED WASTE DISPOSAL SITES

It is assumed that any terminated disposal site which currently offers visible or olfactory evidence to suggest that it may contain hazardous materials would have first priority in any program dealing with terminated waste disposal facilities.

For estimating the potential hazards and establishing priorities for dealing with sites with no current obvious symptoms of problems, the following strategy can be applied.

For Categories A2, A3, B2 and B3, the possibility exists that company records of waste types may still be available. If not, company personnel could be located and interviewed for whatever knowledge they may have on the types of wastes handled and the location of various waste types within the facility. Long time residents of the area could be also interviewed for their recollections of past incidents involving fires, smells, ground or surface water degradation, anomalies in vegetation, types of vehicles seen entering the facility, etc.

If the sum of the information from these sources suggests that the facility may have been used for the disposal of hazardous materials, even though currently there is no visible evidence of this, a physical investigation of the site may be justified. Such a physical investigation could involve surface water sampling, ground water testing (existing local wells), drilling wells for ground water sampling, core borings, etc.

For Category A4, all of the foregoing could be applied except a search of records and interviewing company personnel.

The hazardous potential for Category C can only be determined by chemical analysis by qualified personnel.

Once the hazardous potential for any site has been established, the control measures must be undertaken. Included are removal to an approved location for treatment, detoxification, stabilization, incineration and for ultimate disposal. Means of carrying out such measures are discussed below.

RECOMMENDATIONS FOR HANDLING TERMINATED WASTE DISPOSAL FACILITIES

The endangerment of the public by the improper disposal of hazardous wastes has only recently been recognized. As yet, no firm precedent has been established for an automatic response to this kind of threat when discovered. A building or forest fire poses a highly visible and dramatic threat to life and property and society's response to this kind of threat is well established. Trained personnel at once combat the threat at public expense. Only after the threat has been contained are questions of responsibility dealt with. Yet a suppurating landfill or abandoned storages of hazardous wastes can pose a threat to life and property of more far reaching proportions over a period of time than a general alarm fire.

While the prospect of the taxpayer paying for someone's ecological blunder, shortcut or irresponsibility is not attractive, neither is the imminent or ongoing degradation of the environment while time-consuming investigations and litigation attempt to assign responsibility for the situation to a particular party. Such an assignment of responsibility is likely to be readily achieved only for currently operating or recently discontinued facilities. The longer a facility has been out of operation, the more tangled the issue of responsibility is likely to be. Even if and when responsibility can be assigned, there is no assurance that the responsible party will be financially capable of coping with the problem. The State should be prepared to take both physical and legal action promptly, at the minimum ultimate cost to the tax payer, when environmental degradation occurs or is deemed imminent.

Therefore, it is recommended that the State enact legislation to provide for:

1. The creation and funding of an appropriately trained and equipped force authorized to deal on an emergency basis with active or threatened environmental degradation resulting from the disposal of hazardous materials.
2. A fund, designed to work in conjunction with any Federal program which may be enacted, from which contracts may be let to deal with less urgent situations or those too massive for the State force to deal with efficiently.
3. A clearer definition of liability and responsibility in cases where there is degradation of the environment as a result of the disposal of hazardous material. The law should address such questions as:
 - a. Can the disposer be held responsible for environmental degradation resulting from his actions even though he was in compliance with all relevant laws and regulations existing at the time of disposal?
 - b. Does responsibility for what is in the ground go with the ownership of the ground? Under what conditions?

Having defined responsibility, the law should provide for the reimbursement, as far as possible, of the State by the responsible party for costs incurred through the use of State personnel or private contractors. Reimbursement costs should include the costs of investigation and litigation associated with the fixing of responsibility as well as those related to the physical cleanup of the site.

APPENDIX G(2)

4. Orphaned Sites

Former waste disposal sites which have been abandoned may present serious hazards as well as formidable problems in implementing corrections.

Key points of an action plan addressing these sites are given below:

A. Inventory

Several sources of information can be tapped to develop a listing of orphaned sites:

1. Existing local and state files from health and environmental agencies.
2. Industry data - requested through the development of a questionnaire, similar to the approach used earlier this year by the Congress.
3. General Public - an open solicitation of information from the public with appropriate protection of confidentiality to protect the individual. Although there are probably reasonable objections, a "bounty system" might

4. Orphaned Sites (continued)

A. Inventory (continued)

be attempted as a final resort, providing a reward for identification of sites which were previously undocumented.

B. Risk Assessment

Having identified a number of sites, a risk assessment should be made, resulting in a prioritization of sites to be subjected to more intense investigation. This can be accomplished through an evaluation of existing data for each site in several areas.

1. Severity of existing groundwater contamination.
2. Degree of hazard, toxicity, etc., associated with known wastes. (Explosion vs. toxicity vs. inconvenience)
3. Degree of hazard, toxicity, etc., associated with suspected wastes.
4. Amount of waste.
5. Method of disposal.
6. Geology.

C. Comprehensive Review

Once the top priority sites have been determined, they should be systematically subjected to comprehensive hydrogeological surveys. These should be specifically designed to determine, (1) the direction and rate of flow of groundwater; (2) the types and levels of contamination encountered and projected; (3) impact on drinking water and surface water resources and (4) alternatives for correction/mitigation.

D. Correction/Mitigation

Actions to alleviate a contamination hazard can be generally assigned to one of five categories or some combination thereof:

1. Diversion wells (or collection ditch) for withdrawal of contamination to the surface for proper disposal. This restricts the area of high contamination to the near vicinity of the well. In more severe cases, a series of diversion wells may be required.
2. Installation of leachate drainage collection system. This option is quite effective if site circumstances are favorable.

3. Sealing of waste in situ by covering with impermeable layer on the surface. This is particularly effective when the contamination is caused by infiltration of surface water down through the waste.
4. Excavation and proper disposal of waste. This is usually considered as a last resort due to high expense.
5. Provide alternate drinking water source and allow dilution and degradation. This can only be done when the area affected is small and the contamination is expected to shortlived.

The selection of a plan should be made by the State in conjunction with their hydrogeological consultant, preferably with input from a panel of industrial and health experts in this field.

E. Project Management

Having selected a method of correction/mitigation the problem arises of how to best implement the solution.

For simpler problems, the State might possibly consider performing corrective actions with available resources. In more complex cases, there will undoubtedly be a requirement for special expertise and equipment. Here the hydrogeological consultant should prepare specification for correction/mitigation subject to approval by the State, possibly with concurrence of the above mentioned panel. The specification package would then be bid on and a contract awarded. Contract oversight would be supplied by the State and the hydrogeological consultant, if so qualified.

F. Potential Losses and Class of Claimants From Abandoned Hazardous Waste Disposal Sites

POTENTIAL DAMAGES

1. Emergency Containment Actions
2. Emergency Public Health and Safety Actions - i.e., emergency drinking water supplies and medical services, evacuation, etc.
3. Personal Injury
4. Clean-Up and/or Removal
5. Injury to or Destruction of Real or Personal Property
6. Injury to or Destruction of Natural Resources
7. Economic Loss due to Personal Injury, or Loss of, or Use of Natural Resources

POTENTIAL CLAIMANTS

1. Private Citizens - should have the right to submit claims for:

POTENTIAL CLAIMANTS (continued)

- a) Personal Injury - limited to actual medical and rehabilitation costs.
- b) Injury to or Destruction of Personal Property - including loss of income derived from real or personal property for a reasonable period of time.
- c) Economic Loss due to Personal Injury; or Loss of, or Use of Natural Resources - i.e., loss of wages, loss of income due to damages to fish or wildlife (fishermen), etc.

While it is obvious that private citizens will be beneficiaries of emergency actions (1 and 2 above) they should not be permitted to submit claims for these damages. The same logic (governmental actions are the controlling force) applies to clean-up and/or removal and injury to or destruction of natural resources (4 and 6 above).

2. State or Local Governments - claims could be submitted for

- 1. Emergency Containment Actions
- 2. Emergency Public Health and Safety Actions
- 3. Clean-Up and/or Removal
- 4. Injury to or Destruction of Real or Personal Property
- 5. Injury to or Destruction of Natural Resources - limited to replacement costs where the government either owns or has jurisdiction over the natural resources
- 6. Economic Loss Due to Personal Injury; or Loss of, or Use of Natural Resources - this would include local property taxes, state sales taxes where it can be demonstrated that there was a direct relationship between the loss and the damage which occurred.

3. Federal Government

Claims should be limited to only those damages occurring to federal property or natural resources over which they have jurisdiction (5 and 6 above). No claim should be permitted for the other potential damages since it is assumed that actions taken on these abandoned hazardous waste disposal sites by the state or local officials was in response to the lack of appropriate action by the federal government.

4. Corporations

Corporations should have the same rights and privileges as private citizens.

NEW JERSEY DEP INVESTIGATIONS (continued)

G. Funding

Funding to cover the cost of response to an orphan site should be generated based on a tax or fee (a) assessed on all industrial waste requiring disposal in the State of New Jersey, or (b) a tax similar to a value-added tax on all goods manufactured within the State. The latter approach is probably preferred in that a tax on waste could foster illegal dumping whereas a general tax on all goods manufactured is somewhat hidden and sidesteps the problem.

Relative to any existing site, funding should be required of the operator to provide for perpetual monitoring and closure of the site. In this case, cost could be borne by the dischargers to the site.

It is believed that an effort should be made by the State Congressional delegation to increase the amount of money potentially available under the Administration's Superfund bill. At the present time, the funds available to a state are limited to approximately \$250,000. It is believed that federal funds for reclamation should not be less than \$5 million per site and that allowances should be made for additional funding if the severity of the problem merits it.