

Kevin S. Madden SITING OF A HAZARDOUS WASTE FACILITY IN NORTH CAROLINA. (Under the direction of Dr. Leo E. Zonn) Department of Geography and Planning, November 1991.

Federal laws regarding proper hazardous waste disposal have begun to place pressure on states to provide adequate treatment facilities. The purpose of this thesis is to examine the siting process of North Carolina's proposed hazardous waste facility. The Umstead Farm Site in Granville County was selected by the State-appointed Hazardous Waste Management Commission to host the facility. However, approval of this site was not granted by the North Carolina Council of State, and because of this, no site has yet been selected to host the facility.

Public opposition played a crucial role throughout the siting process. The public opposition's methods and tactics were examined in detail. Public hearings, state documents, newspaper accounts, personal letters and interviews provided the information for researching the siting process and examining public opposition.

North Carolina was ineffective in convincing its residents that the facility was needed. One of the key reasons for this was that Federal and State consensus on interstate commerce laws were not reached. Individual states currently are unable to prevent unwanted wastes from entering their state. Source reduction and consumer modification can help alleviate the pressing problems associated with hazardous waste. It will however, ultimately take cooperation among the government, industry and the public to reach workable solutions.

**SITING OF A HAZARDOUS WASTE FACILITY
IN NORTH CAROLINA**

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by

Kevin S. Madden

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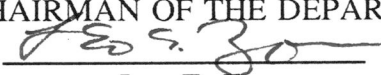
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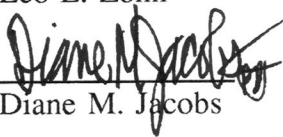
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CHAPTER 1

SITING OF A HAZARDOUS WASTE FACILITY IN NORTH CAROLINA

An intense siting controversy has unfolded in North Carolina as a result of the state proposing to construct a hazardous waste treatment facility within its borders. Despite considerable public opposition, the North Carolina Hazardous Waste Management Commission announced a preferred site for the facility near Butner, in Granville County. However, because the preferred site was owned by the state, it became necessary for the North Carolina Council of State to transfer the land from the Department of Agriculture to the North Carolina Hazardous Waste Management Commission. The land transfer was denied by a vote of seven to two.

The implications of these events are widespread. On January 1, 1991, North Carolina was expelled from a regional agreement with South Carolina, Alabama, Tennessee and Kentucky because it failed to meet a construction application deadline by December 31, 1990 (Raleigh N&O 8 January 1991). North Carolina is and has been dependent on other states for treating its surplus hazardous waste. Of the hazardous wastes exported from North Carolina in 1988, 51% went to South Carolina, 13% went to Alabama, and 25 other states disposed of the remainder (Raleigh N&O 18 December 1990). Because North Carolina has refused to take responsibility for treating its share of hazardous waste, resentment is increasing in other states.

South Carolina's Governor attempted to ban North Carolina from shipping its waste to his state. A federal judge overruled the Governor, claiming it would "violate

interstate commerce law" (Greensboro News & Record 23 December 1990). This judgement will likely be appealed. Additionally, South Carolina's Governor wrote a letter to the Bush Administration asking it to remove proposed federal funds that would be used for cleaning up the 22 existing hazardous waste sites in North Carolina (Raleigh N&O 8 January 1991).

Opponents of North Carolina's plan to construct a hazardous waste facility are concerned that if such a facility is built, other states will become dependent on North Carolina for waste disposal. Such a situation provokes fears that North Carolina will become the new "dumping ground" of the South. Based on South Carolina's experience, such fears may be justified, at least until federal and state governments can reach a consensus.

Just what constitutes "hazardous waste" may cause some confusion. Hazardous waste, as defined by the Resource Conservation and Recovery Act (RCRA), is not radioactive waste, medical waste, or solid wastes. Hazardous waste is a by-product of everyday items. When a hazardous substance "has outlived its useful economic life" it becomes a hazardous waste (Greenberg and Anderson 1984). Items such as varnishes, plastic by-products, lacquers, dyes, solvents, motor oil, batteries, pesticides, white paper, bleaches, paint removers, disinfectants, toilet bowl cleaners, make-up and pharmaceuticals are examples of products that create hazardous waste (NC HWMC, Everyday Hazards; Greenberg and Anderson 1984). These wastes can explode, corrode, poison or burn if not properly managed.

Approximately one percent of total wastes produced in the United States is classified as hazardous waste (Waste Age 1977). More specifically, hazardous waste is defined in the RCRA as: "garbage, refuse, or sludge or any other waste material" that meets these criteria ...

Because of its quantity, concentration, or physical, chemical, or infectious characteristics, (it) may cause or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health and the environment when improperly treated, stored, transported, or disposed of, or otherwise managed (U.S. EPA 1986).

The Environmental Protection Agency (U.S. EPA) estimates that 250 million tons of such wastes are generated annually in the United States (U.S. EPA 1986), which equates to approximately 2,000 pounds per person. Boraiko (1985) states that this annual output could fill the New Orleans Superdome nearly 1,500 times.

There are obvious short term economic incentives for improperly disposing of hazardous waste (Forbes 2 Dec 1985). However, many case studies recount environmental and health problems associated with improper disposal (Epstein et al. 1982; Fraley 1990; Jackson 1990; Lennett 1980; Brown 1980). Love Canal, which was declared a national emergency in 1978, has been the most publicized disaster associated with hazardous waste. It was termed "our country's baptism into the problem of toxic chemical wastes" (Weinberg 1983). From 1947 to 1952, over 43 million pounds of chemical wastes were dumped into Love Canal by Hooker Chemical

Company (Epstein et al. 1982). Abnormally high rates of birth defects, miscarriages, crib deaths, skin rashes, bronchitis, liver and kidney problems were reported to occur in the area (Harthill 1984).

The original costs of proper disposal of hazardous waste are only a fraction of the cleanup costs incurred years later. The EPA estimates that actual costs to clean up sites are approximately \$2,000 per ton vs \$90 per ton to dispose of waste properly (Piasecki 1984). According to the Conservation Foundation, proper management of the hazardous waste at Love Canal would have cost (in 1979 dollars) \$9 million (Anderson and Greenberg 1982), whereas the clean up and evacuation of 239 households cost \$125 million. In addition to these costs, approximately \$2.3 billion in law suits were filed (NY Times 1980; Segal and Kamlet 1980).

Other communities have also suffered from toxic waste disposal. For example, there are "at least a hundred dioxin-contaminated communities in Missouri" (Zeigler et al. 1983). Dioxin is one of the most deadliest poisons known to humans- "one drop in 10,000 gallons is considered a dangerous concentration" (Time 14 Oct 1985). The town of Times Beach, Missouri was so contaminated with dioxin that the EPA bought the entire town in 1983 for \$33 million and relocated 2,200 residents (Boraiko 1985). In some ways, residents from Times Beach may be better off than those near Swartz Creek, Michigan. A resident living near there expressed their dilemma, "We're prisoners... we can't sell our homes, we're afraid to drink from our wells, and out-of-town friends shy from visits" (Boraiko 1985).

There is a legacy of improperly disposed hazardous waste to be considered. According to EPA estimates, there are some 32,000 to 50,000 hazardous waste dumps located in the United States, with 1,000 to 2,000 of them posing possible health and environmental threats (Anderson and Greenberg 1982). Without proper treatment, these wastes can collect in the food chain and migrate into soil, groundwater, land and air. Groundwater contamination is particularly disturbing because half the population in the United States depends on groundwater for drinking purposes (Lennett 1980; Brewster 1987). Groundwater may remain contaminated for "hundreds or thousands of years, if not for geologic time" (Burmaster and Harris 1982).

For a problem of such magnitude, individuals commonly want to select one agency or a sector of the economic system to blame. Typically, "irresponsible industry" and "laissez-faire government" are isolated as the main causes for the hazardous waste problem in the United States. Industry is ultimately responsible, although consumers play an important role in creating the demand for products that produce hazardous wastes. Greenberg and Anderson (1984) point out that "industry, the public, and the government are tied together by the product-oriented economy of the American consumer".

Steps Government Has Taken

Addressing proper waste disposal began at the federal level in 1965 with the Solid Waste Disposal Act. In 1976, the EPA was designated to administer the

(RCRA) Resource Conservation and Recovery Act (Brewster 1987). The RCRA was established in 1976 to define "hazardous waste" and to formulate a "cradle to grave" monitoring system which helps oversee proper disposal (U.S. EPA 1986). Follow-up revisions were made to RCRA in 1980, 1984 and 1986 (U.S. EPA 1986; Heiman 1990). The RCRA was criticized, however, for neglecting existing hazardous waste sites (Greenberg and Anderson 1984).

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) was established in 1980 to deal with abandoned waste sites (U.S. EPA 1986). Superfund was appropriated \$1.6 billion to address such sites. In theory, Superfund will supply the states with 90% of the funding necessary to clean up existing hazardous waste sites. Implementation of these regulations has required each individual state to assume responsibility for the hazardous waste it generates and expects to generate for the next 20 years (Heiman 1990).

The EPA's approach to controlling hazardous waste is to promote source reduction when possible. Ideally this will be accomplished by improving the quality and durability of goods that create hazardous waste as a by-product (U.S. EPA 1980a). However, it is nearly impossible to eliminate all hazardous waste, so the EPA priorities after reduction include: 1) separation and concentration; 2) waste exchange; 3) energy and material recovery; 4) incineration and/or treatment; 5) storage and/or disposal (U.S. EPA 1977b; 1980a). Treating waste in this way will minimize environmental damage and help insure protection of public health (U.S. EPA 1986).

Following these guidelines will inevitably involve closing outdated treatment facilities and constructing new, modern ones. The responsibility for siting new facilities will largely become an issue for the states because the EPA recognizes the hazardous waste situation as a regional problem rather than a national one (Greenberg and Anderson 1984).

Although the federal government has increased its awareness of problems associated with hazardous waste, there remain some disconcerting oversights. Of the approximate 250 million tons of hazardous waste that are generated annually in the United States, only about 40 million tons of this waste are subject to federal controls (Piasecki 1984, ix). The tracking system is good in theory, but enforcement of it is easily circumvented (Forbes 2 Dec 1985). The Superfund policy is severely inadequate and poorly managed. Of the original \$1.6 billion allotted to the fund, less than 20% was actually spent on cleaning up waste sites (Time 14 Oct. 1985). Only 27 of the 1,224 Superfund sites have been de-listed for having been cleaned (Newsweek 24 July 1989). As of 1989, Superfund contained \$8.5 billion (Newsweek 24 July 1989). However, the (GAO) General Accounting Office suggests \$39 billion will be needed for cleaning up abandoned sites while the Office of Technology Assessment (OTA, a research arm of Congress) claims over \$100 billion will be necessary (Forbes 2 Dec 1985).

Technology and Waste Disposal Practices

Technology for properly managing waste is available (Maugh 1979; Pojasek 1979; Environmental Science and Technology 1980). Economic and social pressures are the two main obstacles to properly treating hazardous wastes. The economic pressure becomes clear when one considers that disposal of hazardous waste in an unsecured landfill may be as low as \$5 per ton vs \$300 per ton for incineration (Maugh 1979).

High temperature incineration is potentially the most effective form of reduction for most types of hazardous waste (Epstein et al. 1982; NC HWMC, Intro to Incineration). Greenberg and Anderson (1984) indicated that "incineration could replace landfilling as the model technology". In 1982, the EPA estimated that 60% of hazardous waste could be incinerated vs the 6% that actually was so treated (Greenberg and Anderson 1984). Other common treatment methods include solidification, oxidation, dechlorinization (U.S. EPA 1986), neutralization, separation processes, secure landfilling, precipitation and (Rensselaer Polytechnic Institute 1979), deep well injection, starved air pyrolysis, physical, and chemical treatment (Josephson 1981). Additionally, naturally occurring bacteria can decrease some organic chemical waste (Environmental Science and Technology 1979; U.S. EPA 1986). Some enterprising industries have discovered that they can use other establishments' wastes, so in some areas clearinghouses have been established which allow industries to trade and re-use wastes (Maugh 1979; Crossland 1977). A large number of management

strategies is needed because no one treatment process will effectively treat every type of waste.

Approximately 80% of hazardous waste is managed by using secure landfilling, which is the least expensive disposal method for managing hazardous waste (Josephson 1981). Landfills cost \$5 million or more to establish, whereas high-temperature incinerators may cost \$30 million (Forbes 2 Dec 1985). Unfortunately, landfills present a great threat to groundwater (Epstein 1982; Josephson 1981; Brewster 1987). A study conducted by the EPA discovered that 90% of the landfills in the eastern portion of the United States have leaked toxic substances into groundwater (Brewster 1987). Greenberg and Anderson (1984) refer to landfilling as a "hidden subsidy to the consumers of products which will be paid by future generations and by people who live near landfills". John Lynch (of ERT Inc.) suggested that because of this threat, landfilling should be used only as a last resort (Josephson 1981).

Reduction of wastes is a feasible alternative that needs incentives and attention. The Office of Technology Assessment (OTA) estimates that with existing technology, 50% of industrial wastes could be eliminated within the next five years (Rachel's Hazardous Waste News #142 1989). However, waste management has become a profitable industry which is now "grossing \$80 billion per year, so proposals to reduce wastes are not well-received among their ranks" (Rachel's Hazardous Waste News #142 1989).

Problem and Purpose

The debate over North Carolina's hazardous waste facility has provoked strong criticism of the state politicians and siting officials. Questions such as: "Why was North Carolina selected to host such a facility?" and "Why was the site in Granville County singled out?" have arisen. The purpose of this paper is 1) to determine how and why the Umstead Farm site was selected and 2) to evaluate the role of public opposition in the siting process. It is proposed that the most suitable site for the facility was not selected because intense public opposition overruled the Hazardous Waste Management Commission's (HWMC's) decisions.

The attempts made to site a hazardous waste facility in North Carolina involve some fundamental geographic considerations. Selecting the exact location involves evaluating a large number of physical and cultural variables. The state appointed Hazardous Waste Management Commission (HWMC) was responsible for studying these variables and establishing criteria in order to find an appropriate site. A review of the criteria, criteria justification, news releases, documents prepared by the HWMC, interviews with state and public officials and commission meeting minutes will provide data for examining the siting process, and explain how the Umstead Farm site was selected as a preferred site.

Siting a hazardous waste facility could be a relatively straightforward process if opposition groups did not develop. However, several opposition groups evolved in North Carolina as the HWMC began considering possible sites for the facility. The

opposition groups played a vital role in the overall siting procedure. Residents have to be convinced that the facility is needed in order to be supportive of it. They have to believe that in some way it will be beneficial to them and/or the state, otherwise opposition groups will continue to frustrate siting attempts.

Several important questions about the opposition groups will be addressed in this thesis. How and why do opposition groups develop? It is proposed that a core of individuals increase the community's perceived fears and create opposition groups. This core often distributes information in the form of public meetings, pamphlets and flyers. In turn the information often alarms residents to take action and the momentum builds.

Centaur Associates (1979) conducted an extensive study on the role of public opposition concerning hazardous waste facilities. It points out some of the more common approaches used to prevent facilities from being built. Some examples include questioning the need for the facility, poor site characteristics, flawed siting process, health safety and environmental concerns, and land/property devaluation (Centaur Assoc. 1979).

Collette (1987) has devised a model for individuals to channel their energy and talents into when they join an opposition group. The model proposes that they join one of six sectors. They include: 1) executive; 2) research; 3) publicity; 4) fund raising; 5) allies; 6) action and protests (Collette 1987 p.7). The model provides a

framework for organizing members into specific groups so that they can capitalize on their individual strengths and increase their effectiveness.

The opposition may attract individuals for a variety of reasons, yet the common goal is to stop the facility from being built. This thesis will discuss the issues, methods and tactics employed by the opposition in Granville County, North Carolina to hinder the siting of the proposed facility. Their arguments will be discussed in detail. The opposition groups submitted written reports and volunteered information at commission meetings concerning the reasons for their opposition. These reports, news articles, and commission meeting minutes will provide the data for determining the role of opposition in the siting process. Personal communication with opposition group members will provide additional information.

The Umstead Farm site was eventually rejected by the North Carolina Council of State. The members of this Council are the state's top ten elected public officials. Their position is determined by the public and are thereby called to represent the public. Private correspondence with the Council members will help to provide answers to some pressing questions, such as: 1) Why did they decide to reject the Umstead Farm site? 2) What factors led them to reject the Umstead Farm site? 3) What alternatives do they see for dealing with North Carolina's hazardous waste?

Past Siting Problems

In 1974, the EPA reported to Congress that "between 80 and 90% of all hazardous wastes are disposed of in an unsafe manner" (Anderson and Greenberg 1982). In fact, "no area of the United States is now safe from the harmful effects of past improper waste disposal practices" (Epstein et al. 1982). The urgency of treatment and disposal of hazardous waste cannot be overemphasized. It should be noted that appropriate methods of managing hazardous waste are interdependent with proper siting procedures. The ideal engineering technology may prove to be ineffective if locational factors and important criteria are ignored. For example, a perfectly designed landfill may prove to be useless if it is located near zones of seismic activity or wetland soils (Anderson and Greenberg 1982). Greenberg and Anderson (1984) stated that "waste site selection decisions often ignored simple planning criteria...". For example, Fred C. Hart Associates conducted a survey which found that "75% of landfill sites were located on major aquifers, flood plains, and wetlands" (Greenberg and Anderson 1984).

Throughout the United States, social factors are often found to be disproportionately weighed in siting "undesirable facilities". A study done for the California Waste Management Board attempted to find the "types of communities least likely to resist new waste sites". Their findings indicated that "rural communities that are conservative and Republican, have low average education and income levels and are populated largely by farmers or ranchers are less inclined to oppose new waste

sites" (Phillips 1989). Because rural communities have a low population density, it is assumed that political activity and organized opposition will be minimal (Greenberg and Anderson 1984). In New Jersey, "relatively poor communities are bearing a disproportionate share of the burden of inactive hazardous waste sites" (Greenberg and Anderson 1984). Most solid waste incinerators and landfill sites in Houston were found to be located in predominantly black neighborhoods (Bullard 1983). These studies suggest that siting noxious facilities follows the "path of least resistance" rather than strict siting criteria.

Another example which followed the "path of least resistance" occurred in North Carolina. During the summer of 1978, Polychlorinated biphenyl (PCB) contaminated soil was discovered in 14 counties along 210 miles of highways (Raleigh N&O 4 January 1980). The contaminated soil was collected and then shipped to a landfill site in Warren County, North Carolina. Choosing Warren County "appeared to be a classic example of dumping on the powerless" (Greenberg and Anderson 1984). In 1970, Warren County had no urban population, the highest percentage of blacks in North Carolina (approximately 60%), and the second highest proportion of family income under \$3,000 in the state (Greenberg and Anderson 1984).

A similar social phenomenon has occurred in areas near airports. Since commercial jet travel began in 1959, the value of houses adjacent to several major airports has tended to depreciate, primarily as a result of increased noise. "Airport ghettos" have evolved as lower income residents move into the surrounding

community (Goodman and Clary 1976). In addition, public pressure on airport officials has increasingly caused flight paths to shift towards poorer neighborhoods (Environmental Studies Board... 1971).

The "path of least resistance" may temporarily appease industry and siting officials. However, using this method may be a poor alternative because it not only exploits the lower socioeconomic classes, but may also compromise important health and environmental criteria. Additionally, adequate sites may be ignored simply because of strong opposition in a particular area.

The fear of noxious facilities will continue to grow as long as they are poorly run, and as long as inadequate sites are selected. Non-biased decision making is needed in the siting process in order to provide for ecologically sound facilities. Shortsighted decisions to site noxious facilities will continue to discourage communities from accepting new ones, because future facilities will be measured to a great extent by how safe present and past ones perform.

Related Research

The siting process of a hazardous waste facility attracts the interest of many disciplines; chemistry, engineering, geology, biology, political science, environmental health, psychology and several others. Their knowledge and expertise is undoubtedly needed. It is, however, geography which ties these disciplines together so that the exact location can be selected. Geography serves as the interdisciplinary bridge

between these physical and social sciences. It is geography which supplies the tools, techniques and skills for siting such a facility.

Siting hazardous waste facilities involves the use of some of the most recent advances in the field of geography. The development of Geographic Information Systems (GIS) has allowed for rapid manipulation of data, overlaying of specific siting criteria and careful locational analysis. The modern tools used in the siting process are based on a combination of long standing geographic traditions.

One of the oldest traditions in geography is the spatial tradition (Pattison 1964). Kates (1987) points out that since the 1960s the "spatial tradition came to dominate the field". Spatial studies are the central concern for many geographers, with the focus being on "why is anything where it is?" (Kates 1987). Geography is an inquisitive discipline which insists on understanding locational factors and how location effects humans.

In addition to the spatial tradition, Pattison (1964) discussed the man-land and earth science traditions. A combination of these two traditions allowed the human environment tradition to develop (Kates 1987). Kates (1987) points out the significance of this field of study:

The human environment tradition still poses great, enduring, intellectual, and scientific challenges, some of which are inexorably linked with the very survival of humankind.

The field of hazard studies evolved from this tradition (Kates 1987). Researchers of hazards attempt to aid in one of the "great enduring themes of scholarship-the relationships of people and their physical environments" (Mitchell 1989, p.411).

Since World War II emphasis on hazards research has grown tremendously (Mitchell 1989, p.413). Previously, hazards were viewed as "Acts of God", or events beyond human control (Mitchell 1989, p. 415). This idea has largely been altered by the notion that "hazards are dynamic interactive phenomena that involve people as contributors and modifiers, as well as victims" (Mitchell 1989, p. 415). Hazards research permits a greater understanding of "our place in the world" (Palm 1986). In addition, such research can be useful for evaluating and establishing public policy and governmental decisions (Palm 1986).

Originally hazard studies focused on natural hazards; for example, earthquakes, landslides, hurricanes, tornadoes, floods etc. Gilbert White and Robert Kates served as leaders in the field of natural hazards research (Mitchell 1989, p. 410). Mitchell claims that "hazards research is one of the most intellectually challenging and socially relevant branches of modern geography" (Mitchell 1989, p. 411).

In the 1970s a branch of hazard studies evolved which began to focus on another type of hazard, human-made or technological hazards (Mitchell 1989, p. 412). Technological hazards may include a number of modern technologies which may put human life at risk. The list of technologies is extensive but some examples include; nuclear facilities, automobiles, airplanes, noxious treatment facilities, pesticides and

many more human-made technologies. Human perceptions of these hazards involve another subfield of geography called environmental perception (Saarinen 1969).

Studies involving human perception of their environment allow for insightful information in regard to siting hazardous waste facilities. Perceptions may often be inconsistent with scientific evidence, yet the convictions of these perceptions become an important variable to consider. It becomes apparent that siting such facilities involves more than scientific analysis, but also an in depth understanding of behaviorism. In fact "the development of hazard studies closely parallels the advances in analytical behavioral geography" (Aitken et al. 1989 p. 223). Understanding human protests and the factors that create them is critical to the siting process.

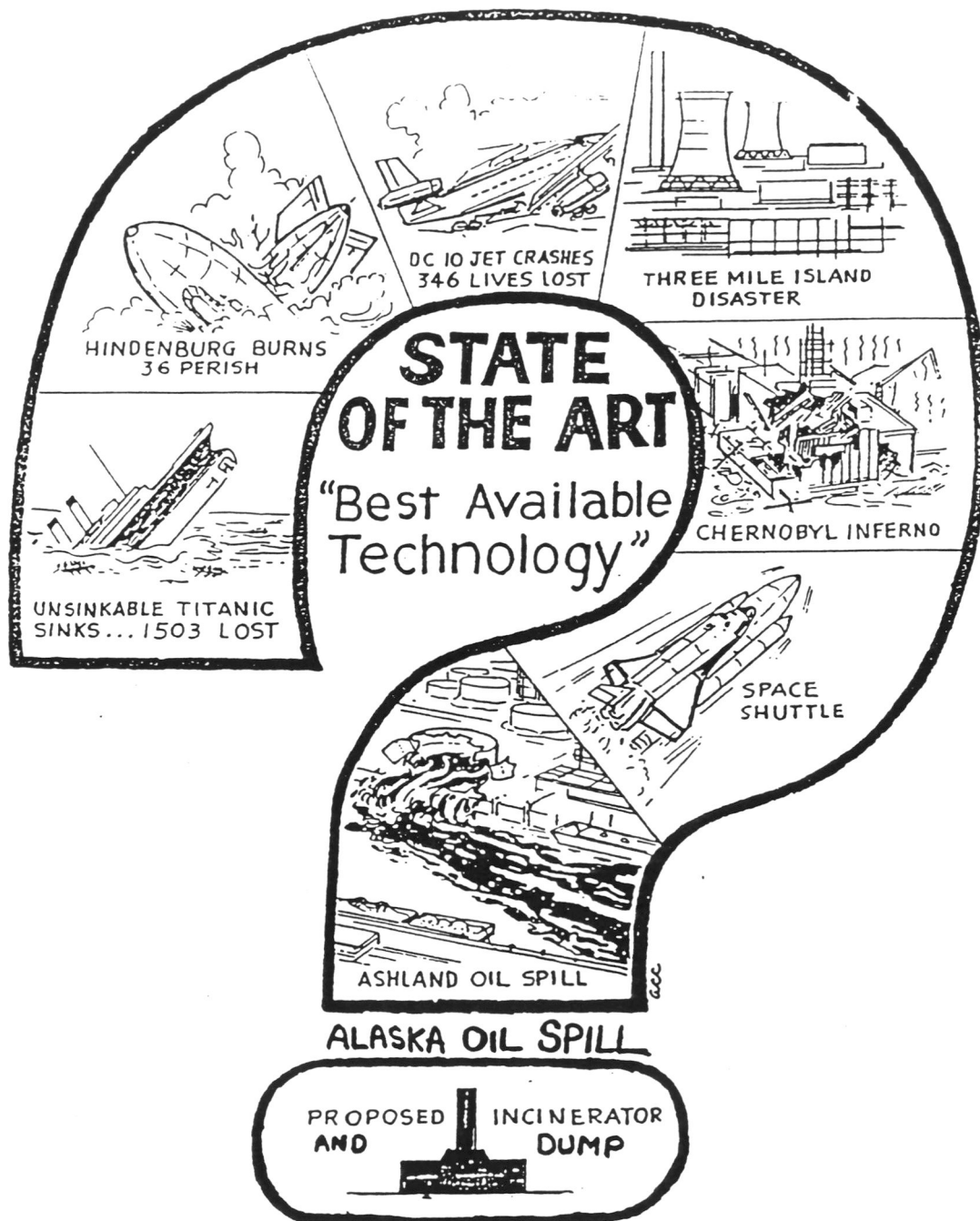
Previously, siting hazardous waste facilities was not a concern of anyone because the potential dangers of hazardous chemicals were not fully understood. Until 1976 there were no regulations concerning hazardous wastes, so such wastes were disposed of without proper precautions or specialized facilities. Since the hazards of some of the wastes are becoming better understood, the need for proper facilities is becoming more apparent.

"Mutual distrust" exists between generators and overseers of hazardous waste; "nowhere is the credibility gap wider than where there are hazardous waste facilities or where sites have been proposed" (Greenberg and Anderson 1984). Hazardous waste is the result of the technology-dependent society that has evolved in America. A growing dependence on various technologies has created new dangers referred to as

technological hazards. Though these hazards are not supposed to occur, they have occurred and will continue to do so, largely because they are subject to human error and circumstances beyond human control (see figure 1; Baum, Fleming, Davidson 1983). These hazards may therefore impose uncertain risks. Rather than eliminating uncertain or questionable technologies, new ones are created in order to theoretically reduce risks (Zeigler et al. 1983).

Various types of technologies have been evaluated in terms of benefits and costs (Starr 1969; Fischhoff, Slovic, Lichtenstein 1978a; Burton, Kates, White 1978; La Porte and Metlay 1975). Zeigler, Johnson, and Brunn (1983) explored different types of technological hazards, perceptions of them and how to safely co-exist with them. Hohenemser, Kates, and Slovic (1983) explored public concerns with various technological hazards and methods of prioritizing the management of hazards. Cuthbertson and Nigg (1987) discussed the difference between natural and technological hazards, and how communities respond to, and are affected by them. Preston, Taylor, Hodge (1983) discussed adjustments people make in response to natural and technological hazards. Fischhoff, Hohenemser, Kasperson and Kates (1978) and Slovic, Fischhoff and Lichtenstein (1979) compared perceived risks vs actual risks of various types of technologies. Reissland and Harries (1979) compared risks of different occupations.

Strategies for managing hazardous waste and for siting facilities have been discussed by geographers, planners and others with environmental interests (Anderson



WILL THIS BE MORE OF THE SAME ?

and Greenberg 1982; Heiman 1990; O'Hare et al. 1983; Rosenthal 1976; Wood 1984; Fawcett 1984; Fraley 1990; Greenberg and Anderson 1984; Pojaseck 1979; Josephson 1981; Maugh 1979; Environmental Science and Technology 1980; Morell and Magorian 1982; Modig 1989; Huggins and LaGrega 1991; Tolba 1990; Wilson and Balkau 1990; Robinson 1990). Parallel siting suggestions and comments have been discussed about nuclear facilities (Solomon and Shelley 1988; Zeigler et al. 1983; Jakimo and Bupp 1978; Sharaf 1978; Carter 1987; Brown 1987; Hohenemser, Kaspersen and Kates 1977; Pasqualetti and Pijawka 1984; Kemp 1990; Lemons and Brown 1990; Kunreuther et al. 1990). Siting of solid waste facilities and their implications have been discussed (Bullard 1983; Coulter and Kung 1990; Haley 1990; Alidi and Al-Faraj 1990). Ocean dumping considerations have been addressed by Duedall (1990); Kitsos and Bondareff (1990).

Waste treatment facilities can be viewed as human-made technological hazards. Such facilities tend to be seen by the public as benefiting only a small number of people, such as politicians or those with vested interests in a company (Cuthbertson and Nigg 1987; Heiman 1990). Frustration and acts of desperation can occur when the public feels powerless and victimized in the siting of a facility. Studies indicate that the public is "willing to accept risks from voluntary activities (e.g. skiing) roughly 1,000 times greater than it would tolerate from involuntary activities (e.g. food preservatives) that provide the same level of benefit" (Starr 1969; Fischhoff et al. 1978a). Additionally, there is ambiguity among scientists and authorities as to how

safe such facilities are (Cuthbertson and Nigg 1987; Heiman 1990; Sharaf 1978).

Such disagreements among scientists often produce confusion and distrust among the public. Eugene Crumpler, of the EPA, claimed that "a broad range of hazardous wastes-especially organics-can be destroyed with existing incinerator technology", while other hazardous waste management scientists and engineers claim that "high temperature incineration is in its technological infancy" (Josephson 1981).

Technological disasters such as those at Chernobyl, Three Mile Island and the Union Carbide plant in Bhopal weaken credibility and suggest to the public that no matter how much technology is applied, accidents can and still do occur (Coffin and Hunt 1986; Fraley 1990). A technological hazard may develop gradually, thereby imposing unknown beginnings and ends (Zeigler et al. 1983). Health damage may take many years to manifest itself. For example, asbestos has a latency period of 20-30 years (Cuthbertson and Nigg 1987). Such damage occurs without individual awareness until the harmful effects are noticed. An example of such uncertainties is described below:

... the devastation is seldom certain or clear or quick.
Broken chromosomes are unseen: carcinogens can be
slow and sneaky. People wait for years to find out if
they or their children are victims. The fears, the
uncertainties and the conjectures have a corrosive quality
that becomes inextricably mingled with the toxic realities
(Time 14 Oct 1985).

Deeply rooted fears can be provoked from exposure to toxic chemicals. According to psychiatrist Robert Lifton, one of the most primal human fears involves the threat of

invisible poison by irradiation (Sharaf 1978). Similar concerns are associated with toxic chemicals, and are described by consumer activist Ralph Nadar as a form of "silent violence" (Jackson 1990). Two-time administrator of the EPA William Ruckelshaus claims "toxic waste is no harder to control than air or water pollution", but "toxic waste frightens people more because we're less certain about the dangers it poses-risks we likely can't eliminate, only reduce" (Boraiko 1985).

Victims of technological hazards often do not receive the benefit of a therapeutic community because these hazards involve chronic rather than catastrophic damage (Cuthbertson and Nigg 1987). Publicity surrounds a catastrophic event, and community outpouring serves as a support system which aids with therapeutic recovery. Chronic damage is less publicized and suffers more from a non-therapeutic community (Cuthbertson and Nigg 1987).

"How safe is safe enough?" is an important research question that concerns whether a certain technology is needed or even desirable (Fischhoff et al. 1978a). Starr (1969) found that "the statistical risk of death from disease appears to be a psychological yardstick for establishing the level of acceptability of other risks".

There are some additional technical questions as to the accuracy of animal testing in reference to human extrapolation. Testing chemical substances on laboratory animals is commonly conducted over a short period of time, and assuming that findings can be projected to humans is widely being challenged (Cuthbertson and Nigg

1987; Greenberg and Anderson 1984; Fischhoff, et al. 1978b). Keeping up with the large number of chemicals available is an ongoing problem for scientists.

Of the more than 48,000 chemicals listed by the EPA, next to nothing is currently known about the toxic effects of almost 38,000. Fewer than 1,000 have been tested for acute effects, and only about 500 for their cancer-causing, reproductive or mutagenic effects (Langone 1989).

In the wake of this technological explosion, where unanswered questions abound, it may be prudent to err on the side of safety, proceeding cautiously rather than continuing to involve the public with uncertain risks.

Siting Hazardous Waste Facilities

Scientists, siting officials, and industrial representatives have "little credibility when it comes to siting hazardous waste facilities" (Greenberg and Anderson 1984). The local communities may feel that they have everything to lose and nothing to gain. Facilities are becoming notorious for imposing serious localized disruptions while offering regionally diffuse benefits (Greenberg and Anderson 1984). The public sees risks as "involuntary and not likely to be related to employment" (Greenberg and Anderson 1984). In addition to the communities' increased concern for health and safety, there is also inconvenience from heavy traffic, construction equipment, and environmental and aesthetic disruption (O'Hare et al. 1983).

Some adverse consequences from hazardous waste facilities ought to be expected, but the degree of danger and actual risk will be determined largely by the

nature of the actual site selected. It is conceivable that safe places can be found to treat hazardous wastes (Anderson and Greenberg 1982; 1984), but the establishment of, and adherence to, valid criteria will help insure that the best sites can be selected where risks are minimized.

Public perception of hazardous waste facilities plays a commanding role in the ultimate siting process, so it is worthy of examination. Most people would agree that proper management of hazardous waste is desirable, yet citizen opposition is a common problem when officials attempt to site hazardous waste facilities (Maugh 1979; O'Hare et al. 1983; Heiman 1990) or nuclear waste facilities (Gervers 1987; Jakimo and Bupp 1978; Sharaf 1978; Hohenemser et al. 1977). Citizens throughout the United States are forming opposition groups and crippling new siting efforts. A national survey reported by the New York State Legislative Commission on Toxic Substances and Hazardous Wastes found that in the United States, from 1980 to 1987, 81 applications for new facilities were submitted, with only 6 of these resulting in new operating facilities (Heiman 1990). Coffin and Hunt (1986) stated:

Most of the proposed facilities that failed to come to fruition were technically feasible and incorporated advanced environmental safety features. They were aborted not because of engineering and safety considerations, or even because of regulatory agency intervention. Instead, they died of public opposition.

Concerned citizens prefer that hazardous waste facilities not be located near them, or "in their backyard". The NIMBY (Not In My Backyard) syndrome is

discussed by Fraley (1990) as a common problem encountered when siting officials attempt to site a new facility. Unfortunately for planners, "almost everyplace is someone's backyard" (Zeigler et al. 1983). Davis (1991) pointed out another term that has recently been used to deter siting noxious facilities-"NOPE" (Not On Planet Earth). Previous improper methods of disposal have "left a deep psychological imprint of mistrust in the minds of the public that threatens to undermine efficacious management programs" (Greenberg and Anderson 1984). Such opposition to siting facilities hinders plans for proper disposal which may ultimately provide protection for communities. It appears that modern waste treatment facilities which could protect the public "are no more welcome in our communities than dumps" (Boraiko 1985). A distorted perception of risk and distrust in government officials are perhaps the major deterrents siting officials encounter (Fraley 1990).

Keeping risks in perspective is a difficult challenge, because public perception may differ significantly from that of experts and professionals (Burton et al. 1978; O'Hare et al. 1983; Slovic, Fischhoff and Lichtenstein 1979). Scientists and engineers think facts ought to "be as persuasive to others as they are to themselves" (Coffin and Hunt 1986). Public fears are often found to be irrational and do not necessarily correspond with actual risks. Emotional ties to homeland and previous experience with a hazard may largely determine individual perceptions of the risk involved (Sims and Bauman 1983). Individuals do not always take appropriate actions to reduce their chance of being harmed. Personality, values, attitudes, and social ideologies tend to

be important considerations in determining responses to hazards (Sims and Baumann 1983).

There may be inconsistencies in the public's perception of hazards. For example, the money spent to protect one life in the nuclear industry far outweighs what is spent to protect one life in the fossil fuel industry (Fischhoff et al. 1978b). The risks associated with nuclear power are "nothing compared to a coal-fired plant" (Cohen 1981), yet there are many people opposed to the use of nuclear power. One could compare the risk of nuclear power to a technological hazard that is widely used and accepted- the automobile. Approximately 50,000 people die annually in automobile accidents, and few people advocate eliminating the automobile (Zeigler et al. 1983). People are willing to spend ten times as much money to save a known life than they are for a "statistical life" (Zeigler et al. 1983; Reissland and Harries 1979).

An increase in consumer awareness and re-evaluation of technology dependence may provide some solutions to the public vs siting authorities dilemma. In Societal Benefits versus Technological Risk, Starr (1969) attempted to determine what price society is willing to pay relative to the technology desired. Ultimately, a consumer revolution may be in order if such controversies are to be avoided in the future. Meanwhile, the past and current problems of improper waste disposal need attention. Reduction of wastes may involve foregoing benefits until technology can "catch up" (Fischhoff et al. 1978b). Until industry and government become more credible, Greenberg and Anderson (1984) believe "hazardous waste management will

occur almost exclusively on industrial properties, on oceangoing ships, and on a few sites that are controlled by federal and state governments and are not near settlements."

One last consideration involves the idea that external factors may change the present safety of a facility. For example, seismic activity, political changes, war, or new scientific developments may decrease the safety of a specific location for such a facility, so past information may not be an entirely accurate measure of present suitability for siting a facility (Fischhoff et al. 1978b).

CHAPTER 2

THE NORTH CAROLINA CASE

North Carolina has over nine hundred inactive waste sites being evaluated for a National Priority Superfund List (NC-HWMC, Report to Council of State 1990). There are presently 22 sites in North Carolina on the list. According to federal law, North Carolina had until October 17, 1989 to assure that it had the capacity to manage properly its hazardous waste for the next 20 years or that it had arrangements with other states to do so (Intergovernmental Committee 1989, 26). If North Carolina did not comply with these requirements, it would risk losing federal Superfund monies that would assist in detoxifying its abandoned waste sites (Intergovernmental Committee 1989, 3). This would be a significant loss because Superfund will supply 90% of the funds necessary for cleaning up abandoned waste sites if the requirements are met (NC-HWMC, Report to Council of State 1990). The total expected cost for the state's clean-up is \$260 million (NC-HWMC, Report to Council of State 1990).

North Carolina's preferred method of waste treatment is to promote source reduction, waste minimization and waste exchange (NC-HWMC, About Everyday Haz., 4). In fact, North Carolina's waste reduction program has been recognized as a national model (Intergovernmental Committee 1989, 6). Although waste reduction is the ideal solution to dealing with hazardous waste, it is unrealistic to assume that all waste will be eliminated. Ongoing research has increased the number of chemicals added to the RCRA definition of hazardous wastes, which in turn increases the total

volume of hazardous waste that needs to be treated (NC-HWMC, What is Haz. Waste). In addition, North Carolina needs to have the capacity to treat accidental spills and to clean-up old waste sites. It is estimated that between 25-40% more capacity will be needed for the latter task (GWMB 1989, 11). Addressing these concerns indicates that North Carolina will need to construct and operate new facilities and/or secure arrangements with other states. This will involve reversing the state's direction in terms of hazardous waste management, because off-site capacity for treating hazardous waste in North Carolina has decreased rather than increased since 1984 (GWMB 1989, 8).

Equity Issue

In 1987, North Carolina generated 1.4 million tons of hazardous waste (NC-HWMC, Haz. Waste in NC). Most of that waste (94.28%) was treated on site by the industries that generated it (GWMB 1989, 8). Of the waste shipped off-site, 88,000 tons went to other states (NC HWMC, 10 Q&A). South Carolina and Alabama received the largest amount with 51,000 tons and 3,500 tons respectively (NC HWMC, 10 Q&A). Currently, South Carolina and Alabama manage approximately 62-64% of North Carolina's exported hazardous waste (Intergovernmental Committee 1989, 7; NC-HWMC Q&A..., 4).

Presently, North Carolina has no commercial incineration, no secure landfills in operation, no metals or energy recovery and limited solvent recovery (Little 1990, 2;

GWMB 1989, 5). This means that North Carolina has no place to dispose of hazardous waste from accidental spills or abandoned waste sites (GWMB 1989, 1). Clearly, North Carolina's siting officials feel there is an equity problem. This regional inequity has appeared to produce resentment from other states, because it allows North Carolina to have the industries and corresponding jobs, while South Carolina manages the bulk of North Carolina's exported wastes (GWMB 1989, 28). If North Carolina finds the waste too dangerous to handle, one wonders how ethical it is to ship it elsewhere for treatment (NC-HWMC, Q&A About Everyday Haz., 5).

North Carolina's Approach

North Carolina's policy makers realized that the state's role in hazardous waste management needed to be altered, not only for a good neighbor policy, but also to comply with the Superfund regulations.

The General Assembly of North Carolina hereby finds that the safe management of hazardous waste, and particularly the timely establishment of adequate facilities for the treatment and disposal of hazardous waste, is one of the most urgent problems facing North Carolina (Gen. Assembly of NC 1989, 1).

To comply with this need, a new state law (Senate Bill 324) was ratified on May 30, 1989. This Senate Bill provides detailed information about the role of the Governor, the General Assembly, and the newly created Hazardous Waste Management Commission.

Originally, the Hazardous Waste Treatment Commission (HWTC) was established in 1984 and was in charge of dealing with North Carolina's hazardous waste problem. The HWTC attempted to site and design a new hazardous waste facility. It reviewed 517 sites and eventually selected a site in Lee County in May of 1988 (NC-HWMC, A Brief History..., 1). The following month the "Commission was placed on a site selection moratorium by the General Assembly" (NC-HWMC, A Brief History..., 1). In order to progress with the hazardous waste situation the General Assembly passed Senate Bill 324, which changed the name of the Hazardous Waste Treatment Commission (HWTC) to the Hazardous Waste Management Commission (HWMC) and refocused its work (NC-HWMC, A Brief History..., 1). The HWMC held its organizational meeting July 14, 1989.

The nine commission members represent different geographic locations within North Carolina. In addition, they are employed in a variety of occupations (see table 1). This diversity allows for different perspectives and viewpoints to be considered throughout the siting process (NC-HWMC, A Brief History... ; NC-HWMC, What is the HWMC). For example, Dorthy Kilpatrick is a small business owner who lives in the western part of North Carolina and Henry Von Oesen is an engineer who lives in Eastern part of the state (NC HWMC, What is the HWMC?). Over half of the members on the HWMC have had some direct experience with attempting to site a hazardous waste facility, because five of the members were previously on the HWTC (NC WARN, Background Info. on Darrel Hinnant).

Hazardous Waste Management Commission Members (Table 1)

Member	Occupation	City address
Dr. Alvis Turner (Chairman) *	Professor, Environmental Sciences, UNC-Chapel Hill	Chapel Hill, NC
Lloyde Hise, Jr. (Vice- Chairman) *	Attorney	Spruce Pine, NC
Dr. Trenton Davis	Dean, School of Industry and Technology, ECU	Greenville, NC
Dorothy Kilpatrick *	Small business owner	Hendersonville, NC
Truman Koehler *	Vice-President, Sandoz Corporation	Charlotte, NC
Mary H. Odom	Retired educator and former State Legislator	Wagram, NC
Dr. Lonnie Sharpe, Jr.	Professor, School of Engineering, NC A&T State Univ.	Greensboro, NC
Dr. William Shingleton	Director Emeritus, Duke Comprehensive Cancer Center	Durham, NC
Henry von Oesen *	Professional engineer	Wilmington, NC

* Denotes previous members of the HWTC.

Source: NC HWMC, What is the HWMC?; NC-WARN.

The HWMC was assigned the responsibility of evaluating what facilities if any would be needed in North Carolina. If they found that new treatment facilities were needed, then the Commission would be in charge of siting, constructing and operating the new treatment facilities (NC-HWMC, Q&A...; NC-HWMC, A Brief History..., 2). The HWMC agrees that primary treatment should be to reduce, reuse, and recycle when possible (NC-HWMC, Treatment Methods). However, in spite of these efforts the HWMC decided that a hazardous waste incinerator would be needed (Intergovernmental Committee 1989, 25). It recommended that a rotary kiln incinerator be built ("pending the development of more advanced incinerator technology") and that the incinerator not process more than 40,000 tons of waste per year (Intergovernmental Committee 1989, 11-12).

North Carolina's Interstate Agreement

State assessments found that North Carolina currently has a shortage of hazardous waste management facilities "its only chance to comply with Superfund is through an interstate agreement with states which have excess capacity in one or more areas of waste management" (Intergovernmental Committee 1989, 1). The Governor, General Assembly and HWMC all agreed that a regional approach was the most logical way to satisfy the Superfund requirements. The General Assembly stated, "waste treatment and disposal facilities in North Carolina and every state is neither environmentally nor economically sound" (Intergovernmental Committee 1989, 9).

The regional agreement would benefit all those in the agreement because presently no state in the southeast region has sufficient capacity to "go it alone" for the next 20 years (Intergovernmental Committee 1989, 5). This agreement insures that North Carolina would have a "state of the art" facility to handle its hazardous waste, while also having access to a variety of other treatment methods in the agreement states (Intergovernmental Committee 1989, 1).

The EPA has encouraged regional agreements as a preferred method of properly treating waste because it avoids unnecessary duplication and establishes a regionally comprehensive treatment facility (NC-HWMC, Q&A About Everyday Haz.; Intergovernmental Committee 1989, 28). Such agreements are being initiated nationwide (NC-HWMC, Interstate Mgmt).

After Governor Martin met with representatives from the agreement states (South Carolina, Alabama, Tennessee and Kentucky) to determine North Carolina's contribution, it was decided that North Carolina would fulfill its role in the interstate agreement by building the following:

- 1) a 50,000 tons per year rotary kiln incinerator, and treatment unit which is capable of combusting liquid and solid wastes and treating contaminated soils.
- 2) a 15,000 tons per year solvent distillation and recovery unit capable of treating and recycling hazardous solvents.
- 3) a 10,000 tons per year residuals management unit which is capable of disposing of incinerator ash and solvent distillation (NC House of Rep. 1989).

The excess treatment capacity that Governor Martin agreed to (compared with the HWMC's recommendation for a 40,000 tons per year incinerator) not only made the actual siting procedure more complex, but also left a discrepancy for the opposition.

Incineration Issues

Incineration was perhaps the most controversial issue throughout the siting process. An in-depth review of the technicalities concerning incineration is beyond the scope of this paper; however, a brief discussion about incineration is important because of the controversial impact of the proposed unit. For more detailed information concerning incineration issues see U.S. EPA document Hazardous Waste Incineration: Questions and Answers (1988).

The EPA believes that incineration is the best technology available for the treatment of certain types of wastes, (U.S. EPA 1988, 13) and that it "can occur in a manner that is protective of human health and the environment" (U.S. EPA 1990, 8/10). For many years incineration has been used in the United States and Europe to manage hazardous waste (U.S. EPA 1988, 1). As of 1987, more than 200 hazardous waste incinerators were in operation in the United States (U.S. EPA 1988, 13). There are currently five non-commercial hazardous waste incinerators operating in North Carolina (see table 2). The largest one is operated by Burroughs Wellcome in

Greenville, North Carolina and has an annual capacity of 4,750 tons per year (Intergovernmental Committee 1989, 36).

Existing Hazardous Waste Incinerators in N.C.

Table 2

Incinerator Operator	Location	Capacity in tons/yr
Burroughs Wellcome	Research Triangle Park	1
Burroughs Wellcome	Greenville	4,750 (four units)
National Institute of Environmental Health Sciences	Research Triangle Park	655
Singer	Lenoir	3,500
General Electric	Wilmington	4,300

Source: Intergovernmental Committee 1989

The incineration process detoxifies and destroys organics, reduces the overall volume of waste and converts wastes to solids by vaporizing liquids (NC-HWMC, About Incin.). The primary advantage of incineration is that it can permanently destroy most of the toxic qualities of the hazardous waste (NC-HWMC, About Incin.). A 100% efficient incinerator is not possible, although a well designed incinerator can destroy all but a fraction of the organic waste (U.S. EPA 1988, 7). For example,

the EPA requires a destruction and removal efficiency (DRE) of principle organic hydrocarbon compounds (POHC's) of 99.99%; rotary kilns have demonstrated that

they can achieve 99.9999% and 99.99999% DRE indicating that they are 100 to 1000 times cleaner burning than EPA requirements (Intergovernmental Committee, 31, 32).

A DRE of 99.99% means that one molecule is released into the air for every 10,000 entering the incinerator (U.S. EPA 1988, 14). It should be noted that incineration does not reduce the actual volume of the waste by 99.99%, but it reduces hazardous elements by 99.99% (NC-HWMC, Q&A About Everyday Haz., 5). Depending on the type of waste the volume reduced may range from 25% to 100%; for example, soils may be reduced 25% while liquid waste may be reduced 100% (NC HWMC, Q&A About Everyday Haz., 5).

Incineration Process

There are four basic steps involved in the incineration process: 1) wastes are placed into the incinerator; 2) burning takes place in order to destroy organics; 3) ash is cooled and collected; and 4) gases are cooled, cleaned and released (U.S. EPA 1988, 4). The temperature, turbulence and amount of time wastes are in the incinerator are the three critical factors that determine how efficient the incinerator operates (U.S. EPA 1988, 7).

The EPA has recommended rotary kiln incinerators as the "best technology for solids incineration" (Intergovernmental Committee 1989, 9). This type of incinerator allows for the complete mixing of waste which contributes to thorough burning,

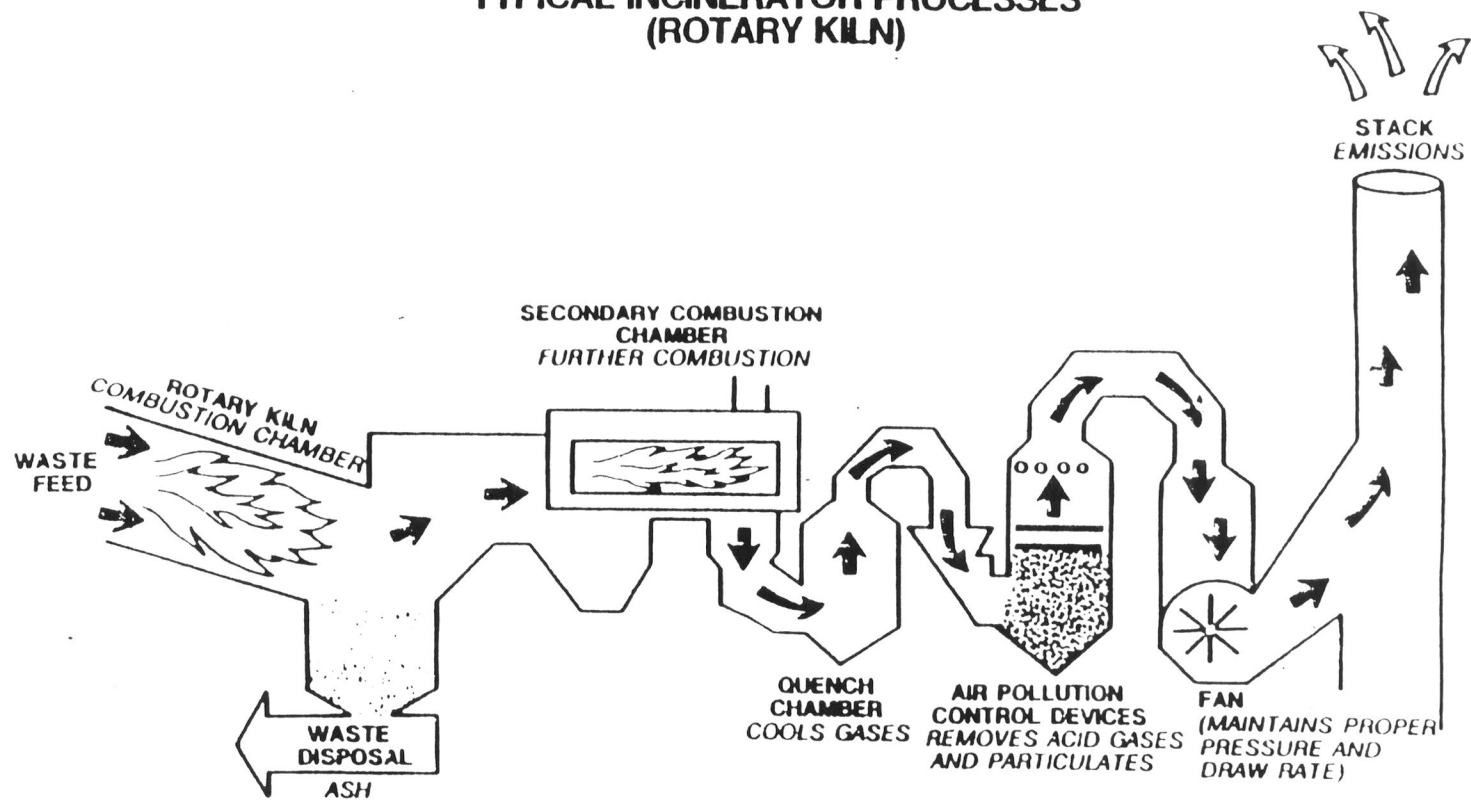
coupled with high efficiency and downtime for maintenance (Intergovernmental Committee 1989, 30). The incinerator is designed so that there is a cylindrical shell, called the afterburner, which allows any organic matter that is not destroyed in the kiln or primary combustion chamber to undergo secondary combustion (U.S. EPA 1988, 9). The next step involves cooling the gases in a quench chamber, followed by pollution control devices. These devices include a baghouse filtration, electrostatic precipitators and venturi scrubbers (U.S. EPA 1988, 10). A fan then draws emissions to the stack where they are released into the atmosphere (see figure 2).

North Carolina's proposed incinerator "will bring together the most advanced technologies available for incineration and pollution control" (NC-HWMC, Q&A About Everyday Haz., 5). The incoming waste would be screened for metals and those wastes with high concentrations of metals would not be permitted in the incinerator (NC-HWMC Q&A..., 5). Radioactive wastes and PCB's would also be prohibited from the facility because they are not regulated under the legal definition of hazardous waste (U.S. EPA 1988, 2). Dioxins would not be permitted either. Although dioxins can be created during the combustion process, they are destroyed at temperatures over 1800 degrees Fahrenheit (NC-HWMC, Q&A..., 5). North Carolina's proposed incinerator would burn wastes for one to two seconds at 2,000 degrees Fahrenheit (NC-HWMC, Q&A..., 4).

The emissions from the incinerator will be observed and must comply with EPA regulations, Federal Clean Air Acts and Federal RCRA requirements for

TYPICAL INCINERATOR PROCESSES (ROTARY KILN)

FIGURE 2



SOURCE: U.S. EPA 1988 HAZARDOUS WASTE INCINERATION Q&A

disposing of hazardous waste. Emissions must also pass strict standards established by North Carolina's Environmental Management Commission, some of which are more stringent than certain sections of the Federal Clean Air Act (NC-HWMC, Q&A..., 5). A new law passed by the 1990 General Assembly requires 24 hour on-site inspectors to be at the facility in order to further insure it operates safely (NC-HWMC, About Everyday Haz., 2). The incinerator control system would be engineered in such a way that if operating conditions vary and do not meet permissible ranges, then the waste feed is stopped and the incinerator shuts down (U.S. EPA 1988, 30).

An incinerator properly run is odorless and smokeless. A white cloud may be visible occasionally, but this is mostly a result of water vapor being emitted (U.S. EPA 1988, 22). Large power plants may have similar emissions in much greater quantities. For example, a large coal burning power plant may emit 1,000 times more than an incinerator (NC-HWMC, Did You Know...). In fact "the automobiles in North Carolina produce in one day over 40 times the emissions that this incinerator will produce in one year" (NC-HWMC, Did You Know).

The proposed hazardous waste facility must be approved by approximately 15 programs in order to qualify for the required permits (NC-HWMC, Q&A..., 1). Applicants for a new facility must receive a Part B permit which is extremely extensive and may take several years to prepare (U.S. EPA 1988, 17,18). As a condition of the Part B permit application, a closure plan must be submitted which insures that enough money has been secured to close the facility properly when the

appropriate time comes (U.S. EPA 1988, 39). Lastly, the state Hazardous Waste Management Commission claims that incineration offers needed technology to the region and that it will not burden North Carolina taxpayers nor will it require their subsidization (Intergovernmental Committee 1989, 28,29).

Other Proposed Units of the Facility

The ash landfill and solvent recovery were additional units that were planned, although they were not recommended by the HWMC. They were included in the proposal when Governor Martin joined the interstate agreement with the four neighboring states (Davis 2 February 1991). The incinerator was commonly the focus of discussion and controversy, however a brief discussion of the landfill and solvent recovery may be useful.

The proposed landfill would have double liners with a leak detection system. The liners would be made of dense, high grade, thick plastics which would minimize leaks or tears (NC-HWMC, Q&A about Everyday Haz., 5). Any ash that is found to be unstablized would be encapsulated in a cement mixture to prevent movement or leakage within the landfill (NC-HWMC, Pollution Control). As an extra precaution, modern monitoring systems would be installed to detect migration or leakage (NC-HWMC, Q&A..., 6). If the ash has no remaining hazardous components it could be used for several different purposes, such as road building (NC-HWMC, About Incin.).

Solvent distillation is a treatment method that allows wastes to be reused and permits solvents to be returned to the marketplace. The basic process involves separating liquid wastes by exposing them to different boiling points. Solvent based liquid wastes such as used paint thinners, furniture strippers, and dry cleaning solvents are exposed to incremental heating which allows the different components to be vaporized and then recovered. The vapors may be re-boiled a number of times before the process is complete (NC-HWMC, Treatment Methods). This aspect of the facility may be more agreeable to industry and environmentalist alike because it allows for recycling and re-using wastes.

Siting the Facility

The HWMC's next duty was to find an appropriate site for the proposed \$70 million facility. The siting process proved to be a long and difficult task for the Commission. It began by seeking volunteer counties to host the facility. However, no counties volunteered for the facility (NC-HWMC, A Brief History..., 1).

The Commission developed siting criteria in order to select the best possible site for the facility. It was required to hold one public hearing for each set of criteria it adopted (NC-HWMC, Site Selection Rules). Throughout this process the Commission "sought input from citizens across the state, industry, environmental leaders and waste management professionals" (NC HWMC, Site Selection Rules). For the first set of criteria, four public hearings were held from November 16 to December

6, 1989. They were held in Charlotte, Morganton, Elon College and Raleigh. A total of 59 citizens attended these meetings (NC-HWMC, Site Selection Process 1990). For the second set of criteria four hearings were held from January 3 to January 10, 1990. They were in Rocky Mount, Rockingham, Winston Salem, and Dallas with a total of 446 citizens in attendance (NC-HWMC, Site Selection Process 1990). For the third set of criteria four more hearings were held from March 20 to March 27, 1990. They were held in Reidsville, Research Triangle Park, Smithfield, and Asheboro, and 530 citizens attended (NC-HWMC, Site Selection Process 1990). The meetings for establishing siting criteria were held in a variety of locations to allow for comments and suggestions statewide. The announcements for these meetings were made through news releases, advertisements on radio, television and newspapers (Davis 14 February 1991). Several recommendations from these meetings were incorporated into the criteria, for example, suggestions concerning proximity to epicenters and clay content in soils (Davis 14 February 1991).

The low number of residents attending these initial hearings is important to consider when it comes to analyzing the role of public opposition in the siting process. The hearings were meant for public input and permitted North Carolina residents to take part in a crucial stage of the siting process. Having such low numbers of residents attending these initial hearings indicates that there was a certain level of apathy that existed until communities felt directly threatened. Residents apparently

were not as concerned about the facility until they were jeopardized with having it in their "backyard".

The criteria used in the siting process is an integral part of this thesis. The criteria provided a framework on which the Commission could base its decisions (see tables 3, 4, 5). It should be noted that some of the criteria developed by the HWMC are more stringent than federal and state requirements.

The Commission originally screened state owned land but found that none of the land parcels survived the screening process. The criteria was then applied to the remainder of the state using a screening process which began eliminating different portions of North Carolina. The first set of criteria concerning, inland lakes, wetlands, floodplains, hurricane storm surge area, PCB landfill buffer, areas more than 60 miles to interstate highway, and areas within .25 miles of a fault and/or an institution eliminated approximately 29% of the state (see figure 3). The second set of criteria, involving weak geologic formations, areas within 10 miles of the Blue Ridge Parkway, areas within five miles of the North Carolina border, municipalities, and soils that flood in over 10% of the area eliminated approximately 26% of the state (see figure 4). The third set of criteria concerning clay content of soil, proximity to interstate or four lane highway, two miles within surface water intake areas, slope and drainage considerations excluded 34% of the state (see figure 5; NC-HWMC 1990, 2). After all the criteria were combined, 89% of the state was eliminated, leaving 11% for further consideration (see figure 6). The remaining 11% was divided into 2,851 land

Site Location Exclusions (Table 3)

Feature or Area Excluded	As Identified By	Criteria Justification
Inland Lake		Floodplain considerations
Bog, Pocosin, Marsh, Swamp	Duke University Wetlands Center	Wetland sites are prohibited
Hurricane storm surge or inundation area	U.S. Army Corps of Engineers, 1987	Floodplain considerations
Within 25 miles of PCB landfill		State permitting requirements
Greater than 60 miles from an Interstate Highway		Minimizes travel distance between site and highway
Within 0.25 miles of a fault displaced during Holocene *	As defined by 10 NCAC 10F .0032 (c)	State permitting requirements
Within 0.25 miles of epicenter of seismic event greater than 3 *	As measured by Modified Mercalli Intensity Scale of 1931	State permitting requirements
Upon a 100 year floodplain *		It is permissible, however extra permitting would be required
Upon wetlands		In accordance with Section 404 of Clean Water Act
Within 0.25 miles of jails, prisons, hospitals, schools, nurseries, day care centers, nursing homes which exist prior to 9/25/89		State permitting requirement

* denotes criteria more stringent than federal and state rules

Source: North Carolina Administrative Code 8/90

Site Location Exclusions

Table 4

Area Excluded	As Identified By	Justification
State and National Parks, and Forests including wilderness areas, State Nature and Historic Preserves as of 9/25/89	Secretary of the Dept. of Environment, Health and Natural Resources	Article XIV, Sec. 5 of NC Constitution
Existing and proposed wildlife refuges, preserves or management areas as of 9/25/89	Wildlife Resources Commission	
Existing and proposed Historic places and sites listed prior to 9/25/89	North Carolina Historical Commission	As listed in the National Register of Historic Places
State owned historical and archaeological sites		
Registered natural landmarks and National Historic Landmarks as of 9/25/89	Secretary of the Interior	

Source: North Carolina Administrative Code 8/90

Site Location Criteria

Table 5

Criteria	Identified by	Justification
The following geological formations shall be excluded: Castle Hayne, Shady Dolomite, Murphy Marble, Andrews Formation, Nottely Quartzite	Geologic Map of North Carolina (Dept. of Environmental Health and Natural Resources 1985)	State requirements concerning weak or unstable geologic structures
Areas within 10 miles of the Blue Ridge Parkway shall be excluded		State requirements in regards to aesthetic value and slope considerations
Areas within 5 miles of the state boundary shall be excluded		To insure neighboring states of NC's equitable responsibility
Areas within a municipality as of 11/7/89 shall be excluded, except for areas zoned for industrial use	1988 DOT maps which contain 1987 data or 1990 pre-census maps whichever is the most current and complete	Noise, aesthetics and transportation considerations
Areas with population density greater than 500 people per square mile	U.S. Census Bureau based on 1980 data	Planning concerns regarding residential disruption
General soil types that flood in over 10% of the area shall be excluded	U.S. Dept. of Agriculture General Soils Association Data	State requirements concerning areas prone to flooding
Site shall be at least 75 acres in size and should encompass all units of the facility *		Traffic patterns, safety and maneuverability within the plant

A 1,000 foot buffer shall be installed between the facility and nearest property boundary *		To reduce perceived and/or real risks associated with the facility
An area with a soil association type with a slope greater than 15% for more than 70% of the area shall not be considered	U.S. Dept of Agriculture General Soils Association data	State requirements concerning slope, hydrological, and geologic factors
An area shall be excluded that is within 0.25 mile of a groundwater well used two years before 1/25/90 or 1000 ft of its zone of influence whichever is greater		State requirements concerning safety and environmental factors regarding drinking water supplies
Areas within drainage of a Class I or II Reservoir shall be excluded	10 NCAC 10D.0702(6) and (7)	State requirements concerning environmental and public health regarding surface water
Areas within the watershed for Class WS-I, WS-II and SA waters shall be excluded	15A NCAC 2B .0200	State requirements concerning proximity to water supply watersheds
Some drainage areas classified as WS-III or within two miles of stream segments classified as WS-III shall be excluded	Division of Environmental Management of the Dept. of Environment, Health, and Natural Resources	To insure protection of water supplies
Areas within two miles of surface water intake that provide water for human and animal use as of 1/25/1990 shall be excluded unless it is downstream from intake or does not drain from a point upstream for intake		To maintain adequate buffers between the facility site and drinking water supplies

Areas within drainage area of headwaters or within two miles of a stream below headwater areas that are being considered for Outstanding Resource Waters or High Quality Waters shall be excluded	As described by 15A NCAC 2B .0216; and 15A NCAC 2B .0201	State requirements concerning environmental and public health factors; also to help insure high quality water by removing non-point source discharge
The main truck entrance of the facility shall be no more than 15 miles to an Interstate Highway or a 4 lane highway that connects to an Interstate highway		In order to have reasonable access to the facility as well as the Interstate highways; also to help insure safe transportation
An area within 200 ft. horizontally of a floodplain designated as a 100 year or 500 year floodplain shall be excluded **	Maps from the U.S. Dept. of Housing and Urban Development or Federal Emergency Management Agency	To comply with state administrative code 10 NCAC 10F .0032(q)(4)(v)
An area must have at least 50% of the soils with a clay content of 35% **	Soil Conservation Service of the U.S. Dept. of Agriculture	Soil composition and permeability considerations

*Denotes criteria which was subsequently changed

**Denotes criteria for landfill requirements only

Source: N.C. Hazardous Waste Management Commission 8/90

NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT COMMISSION

Areas Excluded by First Statewide Screening
January 1990

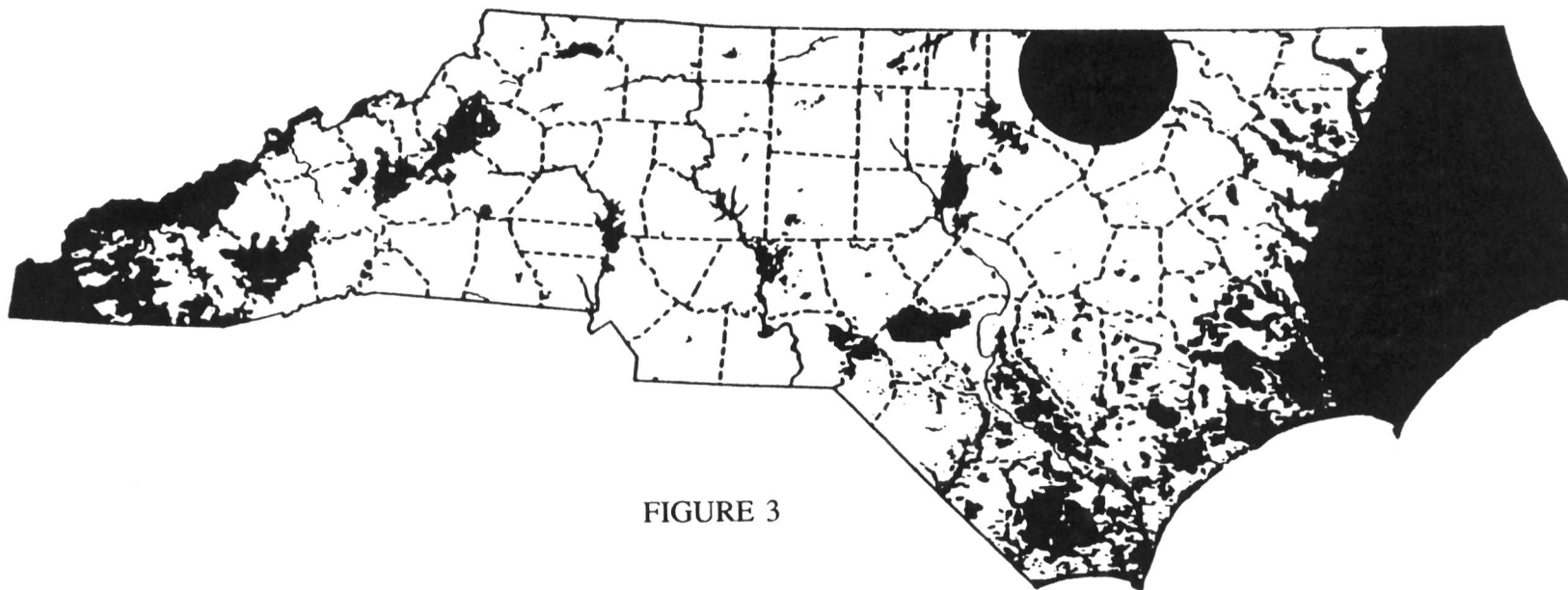


FIGURE 3

SOURCE: N.C. CENTER FOR GEOGRAPHIC INFORMATION & ANALYSIS
N.C. DEPT. OF ENV., HEALTH, & NATURAL RESOURCES

NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT COMMISSION
Areas Excluded by Second Statewide Screening
March 1990

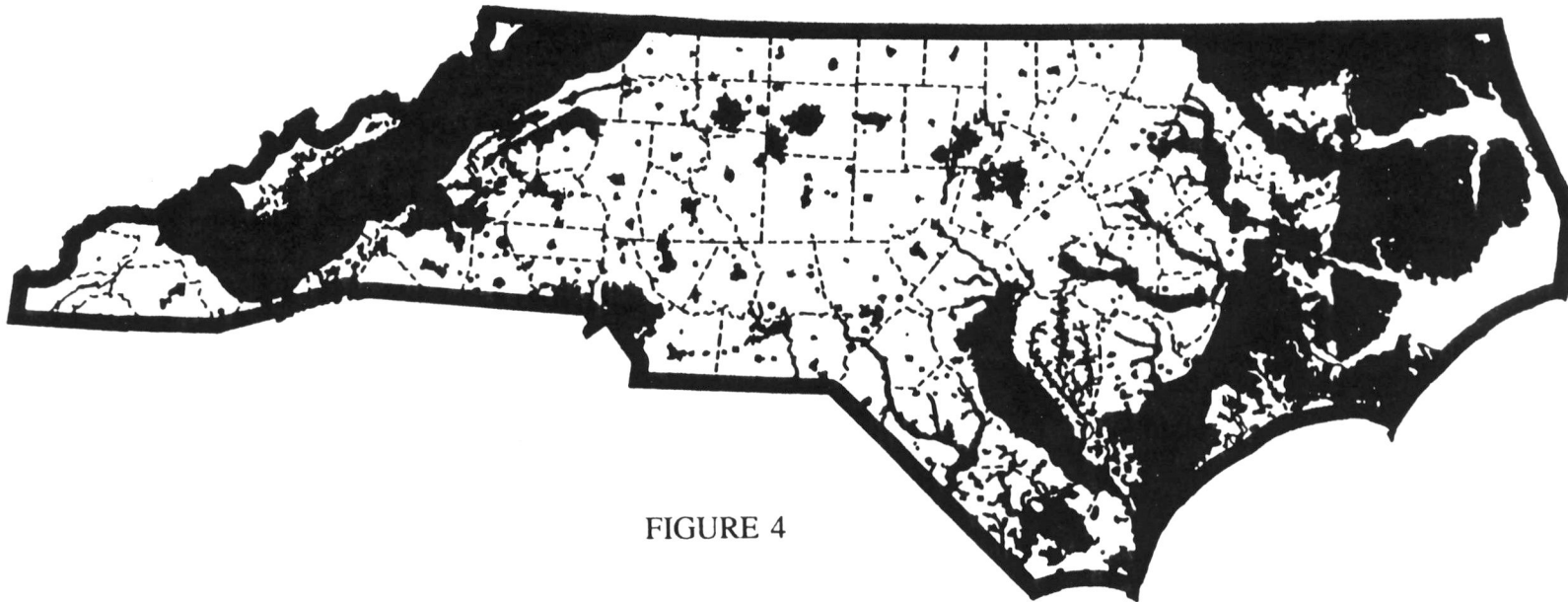


FIGURE 4

SOURCE: N.C. CENTER FOR GEOGRAPHIC INFORMATION & ANALYSIS
N.C. DEPT. OF ENV., HEALTH, & NATURAL RESOURCES

NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT COMMISSION

Areas Excluded by Third Statewide Screening

April 1990

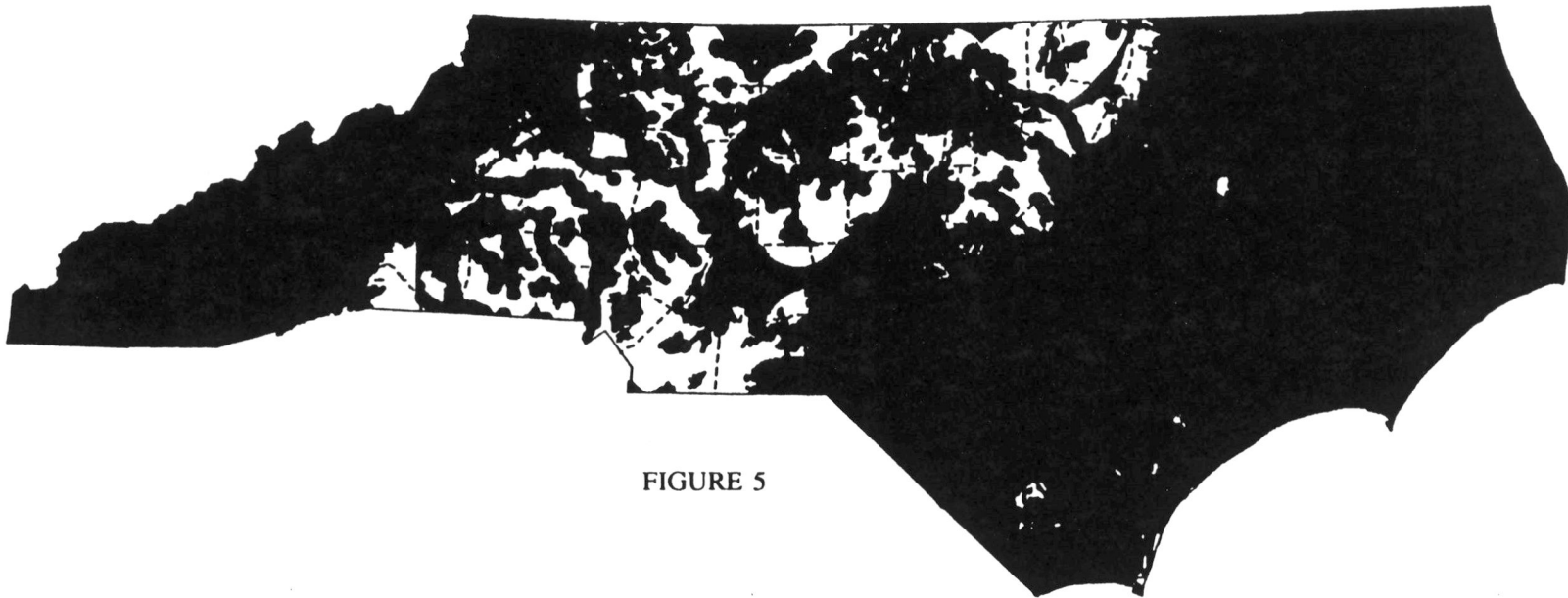


FIGURE 5

SOURCE: N.C. CENTER FOR GEOGRAPHIC INFORMATION & ANALYSIS
N.C. DEPT. OF ENV., HEALTH, & NATURAL RESOURCES

NORTH CAROLINA HAZARDOUS WASTE MANAGEMENT COMMISSION

Areas Excluded by First, Second & Third Statewide Screening

April 1990

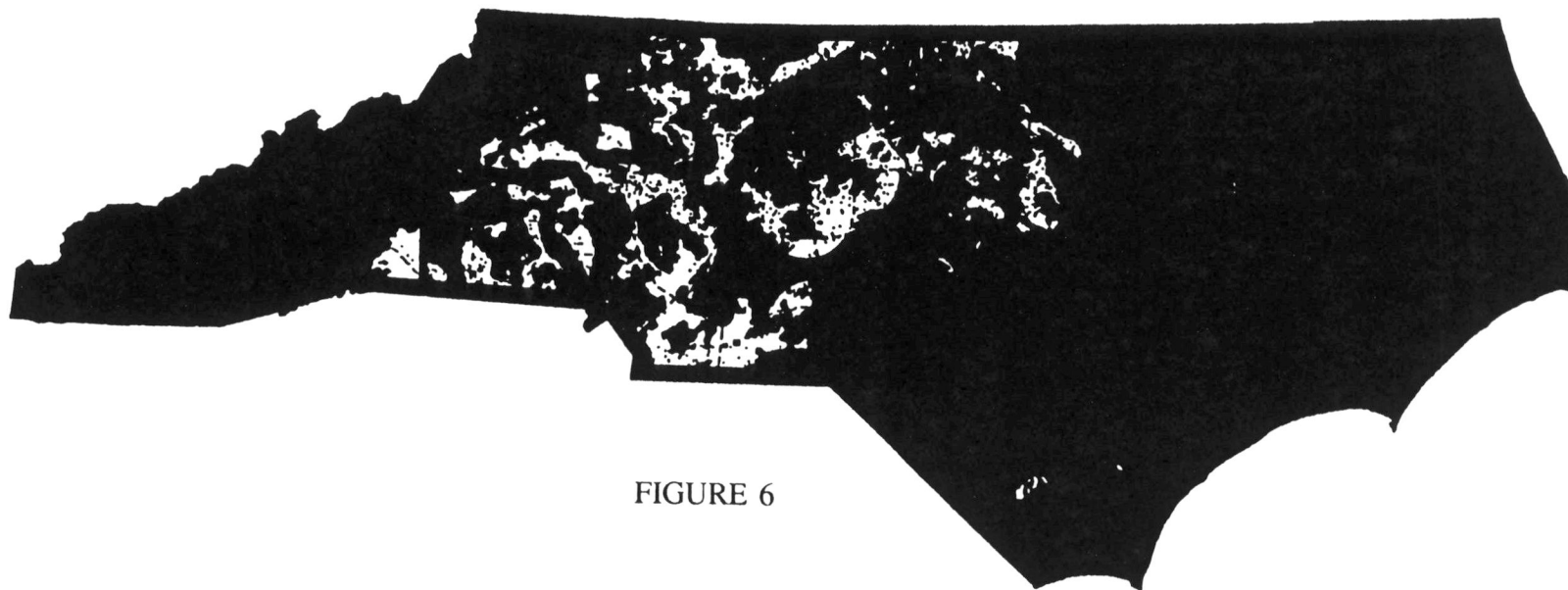


FIGURE 6

SOURCE: N.C. CENTER FOR GEOGRAPHIC INFORMATION & ANALYSIS
N.C. DEPT. OF ENV., HEALTH, & NATURAL RESOURCES

parcels using roads, streams and previously excluded land as the basis for forming boundaries (see table 6). Twenty-six counties had parcels that were being considered at this point (NC-HWMC, Site Selection Process 1990).

In order to be considered further a land parcel had to be 350 acres or larger. Emphasis was then given to locations that were within a 75 mile radius of hazardous waste generation points, a 45 mile radius of meteorological stations and a 15 mile zone along interstate highways (NC-HWMC, Site Selection Process 1990). This process eliminated 1,345 parcels leaving 1,506 still under consideration. The next step involved an analysis of the configuration of the parcels to allow for the HWMC's required 1,000 foot buffer around the facility. This analysis eliminated 1,083 parcels, which left 423 to be considered (NC- HWMC, Site Selection Process 1990). These parcels were then examined to see which ones had on-site streams. There were 188 of these and they were then considered a low priority (NC- HWMC, Site Selection Process 1990). The remaining 235 parcels were further examined for the physical geographic characteristics. This included soil and rock quality, depth to groundwater and bedrock, presence of dikes and/or faults. This analysis removed 152 parcels leaving 83 under consideration (NC- HWMC, Site Selection Process 1990).

Detailed maps were studied to gather more information concerning location of floodplains, access to interstates and proximity to institutions. This analysis put 65 parcels in low priority, leaving 18 high priority parcels (see figure 7). The remaining parcels were then evaluated visually by the commissions review contractor (PEI

**FLOW CHART OF PARCELS
UNDER CONSIDERATION FOR SITE SELECTION**

Table 6

2,851 Parcels From Remaining 11% of the State
(meeting 350-acre minimum requirements)

1,345 Parcels Removed

(outside the 75-mile center from hazardous waste shipped off-site for treatment, the 45 mile radius around meteorological stations and a 15-mile radius around Interstates)

1,506 Parcels Removed

1,083 Parcels Removed

(did not meet proper buffer requirements)

423 Parcels Remaining

188 Parcels Removed

(on-site streams; placed at lower priority)

235 Parcels Remaining

152 Parcels Removed

(did not meet State geological standards)

83 Parcels Remaining

18 Parcels

(potentially acceptable-
High Priority)

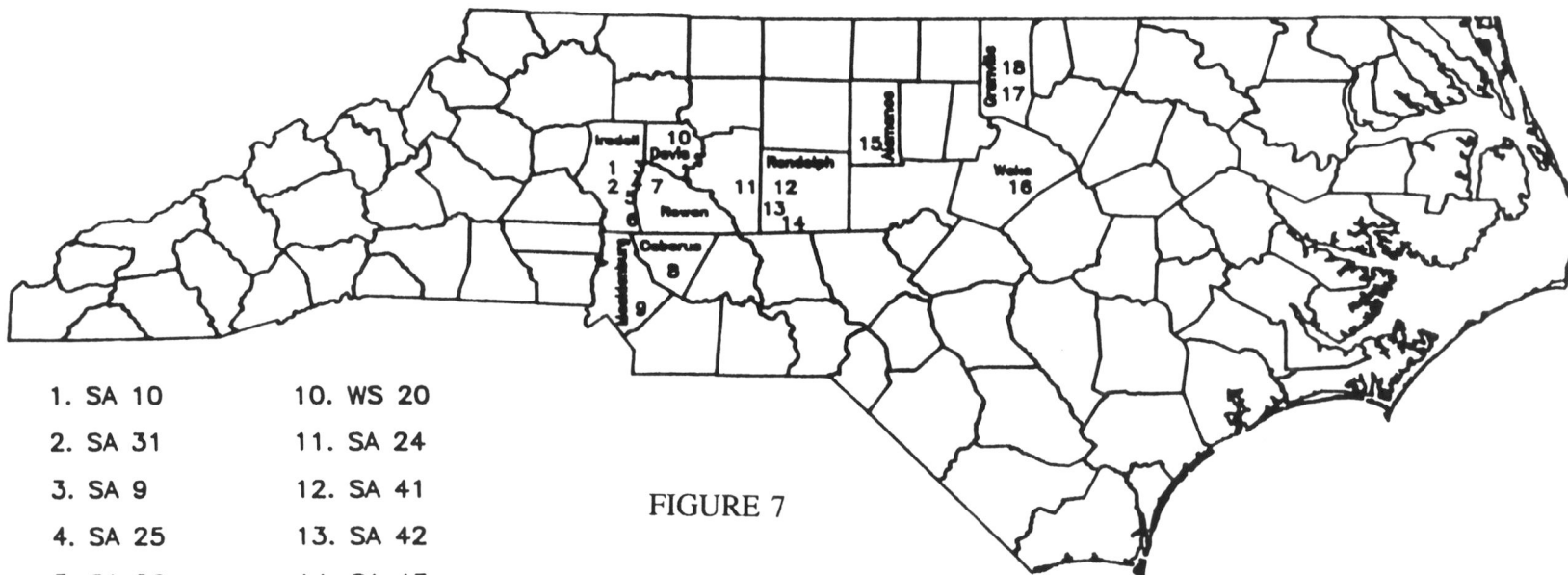
65 Parcels

(potentially acceptable-
Low Priority)

Source: NC- HWMC Site Selection Process, 1990

NORTH CAROLINA

List of 18 Potential Hazardous Waste Sites



- | | |
|------------|------------|
| 1. SA 10 | 10. WS 20 |
| 2. SA 31 | 11. SA 24 |
| 3. SA 9 | 12. SA 41 |
| 4. SA 25 | 13. SA 42 |
| 5. SA 26 | 14. SA 43 |
| 6. SA 30 | 15. CH 6 |
| 7. SA 23 | 16. RAI 33 |
| 8. CHAR 31 | 17. HEND 9 |
| 9. CHAR 31 | 18. HEND 8 |

FIGURE 7

Source: North Carolina HWMC

Kevin Madden

Associates of Durham). Local information was gathered concerning land owners, institutions, surface water and other criteria established by the HWMC (NC- HWMC, Site Selection Process 1990).

The parcels under consideration were examined to include: factors that may effect air quality; geologic considerations; amount of landowners; available property; water protection; aesthetic concerns; agriculture considerations; Department of Transportation easements; prevailing wind direction; proximity to low-level waste facility; distance to wildlife preserves (NC- HWMC, Site Selection Process).

On May 1, 1990 the two preferred sites were selected--one in Granville County known as HEND-8 and one on the Iredell/Rowan county border known as SA-9 (NC- HWMC, Q&A About Everyday Haz., 14). Both of these sites were owned by private landholders. The HWMC attempted to evaluate these private parcels on-site but they were denied access to these sites (NC-HWMC, Report to Council of State 1990).

As specific land parcels were being considered to host the hazardous waste facility the public opposition became an integral part of the overall siting selection. It was proposed in this thesis that because of public opposition the best sites in North Carolina were not chosen. The state screening process led the HWMC to select two sites SA-9 and HEND-8. As their technical analysis revealed these sites were the most suitable, yet these sites were dismissed from consideration because of the intensity of public opposition. It was only after these two sites were dismissed that state owned land was re-evaluated.

There were 246 state owned land parcels that were over 75 acres to be re-evaluated. Preference was given to parcels that were at least 350 acres in size, and were within three miles of an interstate or four-lane highway (NC- HWMC, Report to Council of State 1990); Summary of HWMC Search). Twenty-eight parcels were further analyzed concerning floodplains, stream drainage, soil quality, road access and off-site institutions (NC- HWMC, Report to Council of State 1990). Close inspection of these state owned parcels revealed that the Umstead Farm site was suitable for further inspection. It had originally been eliminated because of (.0203 NCAC #12) criteria concerning surface water intake (Howell 28 March 1991) and questionable geology (Raleigh N&O 18 September 1990). The original screening of state owned land eliminated surface water intake areas within a two mile radius. However, closer inspection of this site showed that a large portion of this land parcel was located downstream from the intake area, thereby allowing the site to meet these criteria as well as all other criteria established by the Commission (NC HWMC meeting 4 December 1990; Howell 28 March 1991). The HWMC decided that the,

Umstead Farm Unit met all statutory requirements, regulatory requirements, and Commission rules for the establishment of a hazardous waste incinerator and solvent distillation and recovery unit (NC-HWMC, Report to Council of State 1990).

The Umstead Farm site was announced as the preferred site on December 4, 1990 (see figure 8). However, it should be noted that the landfill was not approved for this site at this time. The technical criteria for a below ground landfill were not met as of

UMSTEAD FARM SITE

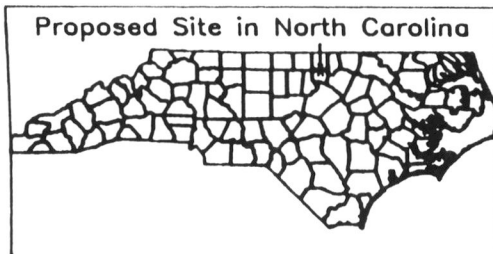
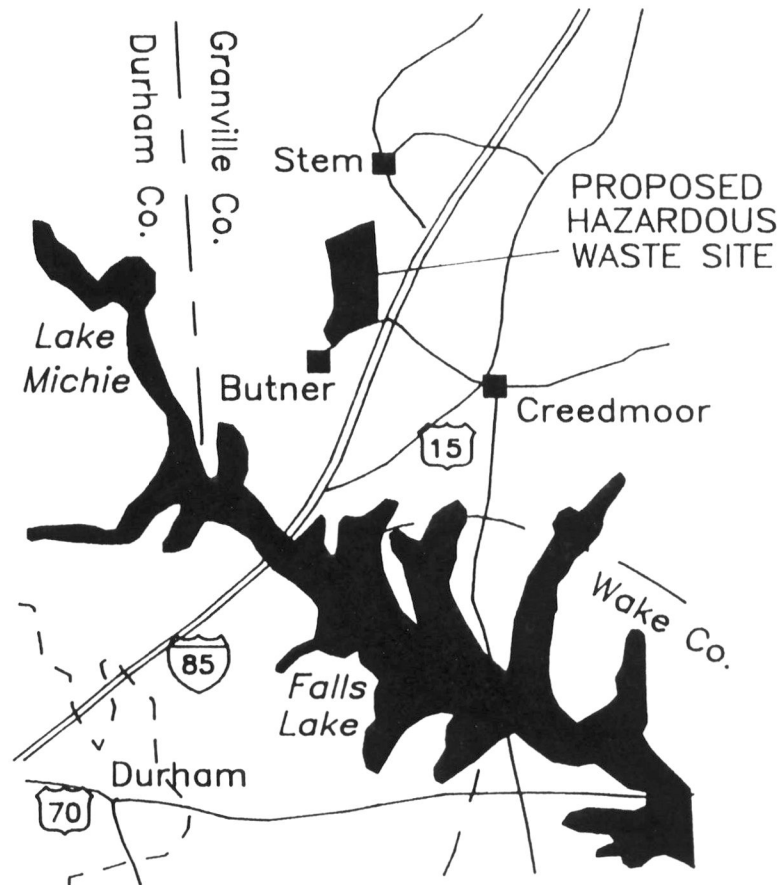


FIGURE 8

KEVIN MADDEN

Source: Greensboro News & Record 12/5/90



December 4, 1990. The HWMC intended to continue to evaluate the site to decide if an above-ground landfill would be feasible. If not, the search for a landfill site as close as possible to the Umstead Farm site would begin.

CHAPTER 3

THE ROLE OF PUBLIC OPPOSITION IN NORTH CAROLINA

Siting hazardous waste facilities has become increasingly difficult, largely because of the growing public knowledge that their construction can often be prevented. Past disasters associated with hazardous waste have created negative perceptions towards such facilities. These perceptions are largely responsible for impairing the siting of other facilities. The public often is unable or unwilling to distinguish between proper management approaches and past nightmares associated with toxic hazards (Centaur Associates p.22). In addition, there is increased incentive to prevent facilities from opening because past experience has shown that closing a facility is much more difficult than preventing one from opening (Centaur Associates p.25). A study conducted by Centaur Associates explores 21 case studies regarding public opposition in siting hazardous waste facilities. The purpose of the study was to help gain a better understanding of the factors that increase public opposition and what actions may be taken to reduce the opposition (Centaur Associates 1979 p.1). A surprising amount of organization and creativity has been employed to help opposition groups develop successful campaigns. For example, some groups have drawn from anti-Vietnam War experiences. Their methods, tactics and creativity may stem from the fact that the people involved in the opposition often are from diverse backgrounds:

grandmothers and U.S. Congressmen, factory workers and university scientists, those who never graduated from high school and those with doctorates in ecology and

physical sciences. What unites these people is their concern and opposition to facilities in their community (Centaur Associates 1979 p.III).

There are many factors which give rise to public opposition, including: poor public relations about a proposed facility; credibility of facility operators and regulators; publicity given to past hazardous waste issues; public attitudes towards managing hazardous waste problems; the history and environmental compliance record of the facility operators; and political sophistication of the population being considered to host the facility (Centaur Associates 1979 p.9,10).

Opponents of a facility are confronted with a difficult challenge once a specific site has been selected. The proponents have the scientific background and technological know-how to select a site. The opponents may or may not have much scientific background, but it is likely that they will not have the background knowledge to deal directly with such issues. In order to be effective in delaying or dismissing the site from consideration they must supply factual, logical and technological reasons why the facility should not be located in their community. They must conduct their own studies, collect their own data and present it to siting officials in a rational logical report or presentation. They must explain why their community is not suitable to host a facility, and often this must be carried out quickly. In addition, raising the financial resources to conduct their research can present difficulties for the opposition (GCSDRC 1990).

The Centaur Associates study (1979) discusses some of the more common issues raised by the opposition throughout the siting process: 1) the actual necessity of the facility; 2) inadequate site characteristics; 3) flawed siting process; 4) credibility of facility operators; 5) possible transportation problems; 6) the types and quantities of wastes to be disposed of; 7) the source of the wastes (which often come from out of state, raising an equity issue); 8) perceived image of community as a "dumping ground"; 9) ramifications and/or effects from facility, including devaluation of property, health risks, environmental concerns; 10) economic issues, including the fact that few jobs will be generated for the local community (Centaur Associates 1979).

The tactics used by opponents include the presentation of facts, civil disobedience and even threats of death and violence. The most common approaches however, include presenting information at public hearings, instigating lawsuits and hiring experts to refute siting officials claims (Centaur Associates 1979 p.14). Most lawsuits are found to be unfruitful from a monetary standpoint, but they are quite effective as a delaying tactic (Centaur Associates 1979).

Will Collette, in How to Deal with a Proposed Facility, discusses tactics that may be quite useful for beginning opposition groups. It is about "the process you use to stop bad things from happening to your community" (Collette 1987 p.1). It provides practical information about how to organize effectively so that one can utilize the residents' skills most efficiently. In addition, it is suggested that a petition drive be used, not only to alert citizens and politicians, but also to be used as a mailing list

and for recruitment of individuals (Collete 1987). The success of community opposition will be determined largely on its ability to organize quickly, instill a positive winning attitude in the residents and have high visibility by using the media effectively (Cowdery et al. 1990 p.5).

The fight, says Collete, will be won or lost in a "court of public opinion", and media provides this "court" (Collette 1987 p.17). The media covers action, scandal, controversy and personalities. Suggestions are made for doing things "that are different, lively, colorful, and--for electronic media both visual and somewhat noisy" (Collette 1987 p.17). Writing letters to the editor of local newspapers which inform residents of proposed facilities and describe what has occurred in other communities is suggested as well. Also, cultivating a local reporter may be useful for aiding in investigative research.

Issues that may be important to raise include: determining who will pay for deteriorating roads due to increased truck traffic and who will hire and train emergency staff; pointing out that not many jobs will be created and that industries will not be attracted to the area as a result of the new facility (Collette 1987 p.28). Being creative with local laws can also hamper and even eliminate a site from consideration. A recent proposed facility near Morris, Oklahoma was stopped because a law was passed which stated that a hazardous waste facility could not be located within eight miles of a city (Dillsaver 26 June 1991). Opposition groups research previous examples in other states that have had to deal with hazardous waste issues,

some of which lend credence to residents fears. A GAO (Government Accounting Office) study has confirmed, however, that hazardous waste facilities are "more frequently sited in minority communities" (Cowdery et al. 1990 p.14). In fact, three out of four facilities in the EPA Region IV (southeastern U.S.) "are located in predominantly Afro-American communities" (Cowdery et al. 1990 p.14). Collette (Director of Citizens Clearinghouse on Hazardous Waste) claims that "the toxic waste issue is fast becoming the top social justice issue in North America" (Carothers 1987 p.13). On a national scale this problem can be observed as well. Elmore (1990a) points out that presently, there are 13 southern states that manage 66% of the nation's hazardous waste (Elmore 1990a).

Hugh Kaufman (Assistant Director of the Hazardous Waste Control Division of EPA) helps opposition groups by providing them with information from other communities experiences. In a letter to the editor he was quoted as saying "It will be pretty difficult 20 years down the line, when major problems start to ensue, for the government to then go back to the generators and get them to pay for the remedial action" (Glover in Northhampton News 27 February 1991). Kaufman also claims that technical criteria like geology, hydrogeology are not what facilities are sited by, but that they are "sited where they can be sited" based on politics (Butner-Creedmoor News 7 June 1990). Kaufman continues this approach by saying:

you have less sophistication about politics or you are more rural, so you don't have the numbers nationally to really pack a wallop. The stuff that goes on in South

Carolina couldn't go on in New York or New Jersey.
 There are too many people in New York and New Jersey,
 and there are too many sophisticated people in the ways
 of politics (Butner-Creedmoor News 7 June 1990).

Such comments tend to provoke citizens to take action and by spreading this type of information through newspapers, flyers and word of mouth opposition groups can increase their growth and effectiveness.

Another popular method of activating residents into taking action involves providing information about other cities or areas that have hosted similar facilities. In Eldorado, Arkansas an analysis was done regarding the waste consumed at that facility: .6% came from El Dorado city, 1.4% from the state of Arkansas, and 98% from other states and foreign countries (GCSDRC 1990). Sanjour (from the Office of Solid Waste and Emergency Response, U.S. EPA) pointed out that the GSX facility in Sumter County South Carolina has not attracted any industrial growth. It has been a net cost to the community due to the heavy truck traffic and declining land values" (Colston in Northhampton News 27 February 1991). The Rollins Incinerator in Alsen, Louisiana receives most of its waste from out of state and the community's population is 95% black (Colston in Northhampton News 27 February 1991).

The city of Emelle, Alabama has been the site of a stirring controversy and, in fact, has been the subject of Greenpeace's documentary "Rush to Burn". The city has a 2,400 acre hazardous waste landfill, which is the nation's largest (Carothers 1987 p.12). The son-in-law of former Governor George Wallace bought the land and was

said to have "obtained the relevant permits with surprising ease and immediately sold it to Chem Waste at a profit, over the lifetime of the deal, estimated at \$15 - \$30 million" (Carothers 1987 p.12). It was at the time the "first and only hazardous waste disposal permit in Alabama" (Kiker 1988 p.1). This landfill receives almost 600,000 tons of waste a year from 45 states and 10 foreign countries (Kiker 1988 p.1; Cowdery et al. 1990 p.14). Seven industries and a number of small businesses left the area, causing the unemployment rate to rise from 5.8% in 1978 to 21.1% in 1986 (Kiker 1988 p.1; Collette 1987 p.35). Approximately 2,500 people lost their jobs (Elmore Interview 4-20-91). In addition a disproportionate number of brain tumors were reported in the area (Smith in Montgomery Herald 21 March 1991). Such statistics are not comforting to other areas in which a new hazardous waste facility is being planned. One woman from Sumter County, Alabama warned future citizens that:

It is much easier to stop a proposed facility before it opens than after the land has been contaminated. Don't let what has happened to us happen to you (Kiker 1988 p.2).

Generally, opponents focus on risks and fears while proponents emphasize the technology and regulatory compliance. Each approach is "often not understood by the other" (Centaur Associates 1979 p.IV). It is not likely that the opposition will be convinced that the hazards of a facility are slight (Centaur Associates 1979 p.24).

North Carolina's Situation

North Carolina is no exception to this national trend. In fact, it has been involved in one of the most vehement battles in the United States this year (1990). Opposition grew quickly as different counties were being considered to host the proposed hazardous waste facility. The residents promptly organized groups and were then able to inform and disseminate information to the public. In May of 1990 the HWMC selected two private land parcels which were referred to as HEND-8 and SA-9. After a bitter five month struggle and numerous lawsuits against the HWMC, the sites were dropped from the priority lists (see table 7). The opposition caused Dr. Alvis Turner (Chairman of the HWMC) to admit, "I don't think its possible to use private property in this state, without an enormous amount of public opposition or even violence- unless of course, a volunteer comes forward, and volunteers are few and far between" (Raleigh N&O 9 January 1991).

NC WARN

The NC WARN (North Carolina Waste Awareness and Reduction Network) is perhaps North Carolina's most important organization in terms of understanding how public opposition groups in the state form. NC WARN was established in the Fall of 1988 in response to the Hazardous Waste Treatment Commission's (HWTC's) attempt to site a facility in Lee County, North Carolina.

Important Dates In North Carolina's Siting Process

Table 7

1984	HWTC (Hazardous Waste Treatment Commission) was established to deal with NC's hazardous waste problem.
May 1988	Lee County placed under close consideration.
June 1988	HWTC placed on a site selection moratorium.
May 1989	Senate Bill 324 ratified by NC General Assembly, which created the HWMC.
July 14, 1989	HWMC held its organizational meeting.
Fall 1989	Governor James Martin began negotiations with four states (SC, AL, TN, KY) for regional agreement.
December 1989	General Assembly voted to join interstate agreement with four other states.
February 1990	The State asked for volunteer counties to host the hazardous waste facility.
May 1990	Two privately owned sites were announced as possible sites, SA-9 and HEND-8.
September 1990	Pending lawsuits by the opposition are consolidated.
October 1990	Private land is dropped from consideration and state owned land is re-evaluated. The Umstead Farm site is announced as a "suitable site" by the HWMC.

December 4, 1990	The Umstead Farm site is announced as a "preferred site".
December 13, 1990	The North Carolina Council of State vote rejects Umstead Farm site.
December 21, 1990	A ten day temporary ruling forbids South Carolina from preventing North Carolina from sending its hazardous waste to S.C.
December 31, 1990	License filing deadline for North Carolina to remain in the interstate agreement with the four other states.
January 1991	North Carolina is dropped from the four state regional agreement.
January 1991	Permanent ruling against South Carolina- North Carolina can continue to ship wastes to S.C.
1992	Projected operational date.

Residents of Lee County discovered that state officials had been studying Lee County in detail "behind closed doors" in order to find a suitable site for a hazardous waste facility (Elmore Interview 20 April 1991). Billie Elmore, coordinator of NC WARN, referred to the tactic as a "big brother" approach. When the residents of Lee county did find out, the opposition grew rapidly, largely because the Lee County residents had not been included in the decision making process (Elmore Interview 20 April 1991). The work of Lee County residents paid off because they were able to dissuade the state officials from siting the facility in their county. The county was dismissed from consideration on June 26, 1988 when HB 2368 passed both branches of the General Assembly. The bill said "no commercial hazardous waste facility could be sited in any county that did not volunteer for it" (Elmore 1990 p.1). With the information and experience residents gained, NC WARN was formed. They put together what is called "The Box", which contains a variety of information concerning hazardous waste issues (see table 8). NC WARN then assisted six other North Carolina counties (Jones, Edgecombe, Hertford, Montgomery, Anson, and Rutherford) whose local officials "attempted to volunteer them for the incinerator" (Elmore 1991a; Elmore 1990 p.3). Elmore stated that "The strategy was so effective that the average grassroots fight in each of these counties lasted less than six weeks (Cowdery et al. 1990 p.35).

NC WARN now serves as a coalition organization for other groups and communities who are concerned with their "backyard" becoming the next site for the

The Box

Table 8

Video Tapes

Poisoned by Progress- Geraldo
 Carolina Assignment- WRAL
 Who's Killing Calvert City, Ky- Frontline
 Emelle 2,000
 There's a Better Way- Dale Earnhardt
 Public Hearing in Rockingham- NC HWMC
 Town Meeting on Hazardous Waste- WTVD

Audio Tape

Five part series on CSI- Hazardous Waste Incinerator

Papers

Victim County Residents Letter from NC WARN
 Rachel HWN #180- Commercial Hazardous Waste Landfills
 Letters to the Editor from:
 Hardell Smith; Karen Kirsch; Linda Campbell
 Understanding Different Kinds of Waste- LCCC
 County of Granville Letter
 News Release on Caldwell Systems- Independent investigation
 Clean Water Fund "NC Hazardous Waste Plan: Burn & Bury
 NC WARN Membership Information
 Communications Speech- Billie Elmore
 Hazardous Waste in North Carolina- UNC School of Public Health
 Rachel's HWN #213
 REAP- Patricia Link Letter to Lt. Governor
 "Don't Build Incinerator, Gardner says- The Salisbury Post
 Test Your Hazardous Waste I.Q.- REAP
 Waste Not #88 Fairy Tale Incinerator a Costly Reality
 Hazardous Waste Shipped Into NC from other states (list)
 News Release- NC WARN calls for Governor to Rescind Certification of Need
 Analysis of the Regional Agreement States CAPS- NC WARN
 Wasteland, USA Cartoon
 South Could Become Nation's Waste Dump- Sanford Herald News Day Kiker Letter

Gitback Smokestack- Incinerator Song
 NC Hazardous Waste Mathematics
 Poisons: Now you see'em, now you don't- Business Week article
 Is Breathing Hazardous to your Health- News Week article
 NC's Hazardous Waste Management Plan: Give Industry What It Wants and Stick it to the Citizens
 Special Meeting, Board of Granville County Commissions, 11-13-90
 How to Deal with a Proposed Facility- CCHW
 Regional Hazardous Waste Policy- Between the Lines- Bredl
 NC Official Incinerator Policy- News & Observer
 Editorial Cartoons
 Focus-Hazardous Materials Control Research Institute Newsletter
 A Positive Response to the Question of What to do about Hazardous Waste in NC- NC WARN
 Hazardous Waste Incinerators- Greenpeace Action
 Three JAWS Newsletters
 What the Governor Knew- Independent
 Wanted Poster for Governor Martin
 Martin & Hussein Poster
 The Revolving Door- NC WARN
 Hugh Kaufman article: Incinerator Plan will Bankrupt State by 21st Century
 Twenty Eight (28) News Articles about ThermalKem- The Herald, Rock Hill, SC

Incineration Information from Environet-

San Francisco, CA

Activists Oppose Chem Waste Incinerator Plan
 Track Record of the Haz Waste Incineration Industry
 Lead-Its dangers from Incineration
 Reproductive Toxicity Review for Toxic Metals
 Quotes on Hazardous Waste Incineration
 Hazardous Waste Incinerators- A Greenpeace Fact Sheet
 "Burning Issue: Plants that Incinerate Poisonous Waste Run Into a Host of Problems"- Wall Street Journal Article
 "Waste Incineration Linked to Cancer"

hazardous waste facility. The organization's motto is "North Carolina is My Backyard", and it will do "anything within the law to help what Elmore calls a 'victim community'" (Elmore 1990 p.2). NC WARN's "overwhelming purpose is to assist any threatened community" (Elmore 1990 p.2). It will do this by furnishing "as much information and assistance as we possibly can to each and every community and county in the state" (Elmore 1991a).

Presently, there are 50 groups in the NC WARN coalition (see table 9). Elmore recommends that a community being considered to host a facility form a steering committee of concerned citizens to organize their opposition. This committee can send representatives to Sanford, North Carolina (NC WARN headquarters) to meet with Ms. Elmore. Her office contains a library of articles, news clippings, government documents and a wide variety of information relating to the different aspects of hazardous waste issues. Elmore can then recommend different strategies to employ and discuss what is effective and what is not. She can orient groups, provide fact sheets, explain how to get others involved, and how to motivate people to respond in an effective manner. She recommends pushing hard in the beginning in order to motivate people as soon as possible (Elmore Interview 30 April 1991).

When the group representatives come, the first step is to find out what their concerns are and to clear up misconceptions about risks (Elmore Interview 30 April 1991). For example, one group confused hazardous waste with low level radioactive wastes. In the beginning they made signs with the slogans "Hell No We Won't

**Partial List of
Opposition Groups in North Carolina**

Table 9

	Caldwell County Concerned Citizens for a Clean Environment
CATS	Citizens Against Toxic Sites
CCHW	Citizens Concerned About Hazardous Waste (Johnston County)
CCRADS	Central Carolina Residents Against Dump Sites
CCHC	Concerned Citizens of Harnett County
DEAL	Davie Environmental Awareness League
FREE	Forsyth Residents for Environmental Education
GROW	Granville County Residents Opposed to Waste
GNAT	Granville Non-violent Action Team
I CARE	Wake & Chatham Counties
JAWS	Johnstonians Against Waste Sites
N-CAP	Northhampton Citizens Against Pollution
PACE	People in Action for a Clean Environment
POOH	Prisoners Of Our Homes (Mecklenburg County)
RCET	Randolph Citizens Environmental Taskforce
REAP	Rowan Environmental Action Partners
RICCE	Rowan-Iredell County Citizens for the Environment
SCAT	Sensible Concerns About Toxics
SCOTCH	Stanly County Opposed to Toxic Chemical Hazards
CAP	Surry County Citizens Against Pollution
VPE	Voters Protecting the Environment (Wake County)

Source: NC WARN (North Carolina Waste Awareness and Reduction Network)

Glow". Elmore says "We try to dispel any of those misconceptions right off the bat so they don't get perpetuated".

The group is then supplied with factual information with appropriate references to allow the steering committee to become knowledgeable. NC WARN supplies them with samples of what other groups have done, as well as with fact sheets, flyers, and letters from people in other communities that have had problems with waste facilities. Armed with this information they can then accurately inform other members of their community. Elmore advises not to use scare tactics based on misinformation: "Your credibility is number one" (Elmore Interview 30 April 1991).

NC WARN receives information from a variety of sources. The organization has access to Greenpeace's database (Environet) in San Francisco, RACHEL (Remote Access Chemical Hazards Electronic Library) in Washington, D.C., OTA (Office of Technology Assessment), GWMB (Governors Waste Management Board) and Waste Tech News (the waste industry's newspaper; Elmore 30 April 1991; Elmore 1990 p.5). NC WARN also scrutinizes the information EPA produces. One particular branch of the EPA the Science Advisory Board, is especially helpful because it has been critical of some things the EPA has done. The information they produce can be valuable information to opponents because they can actually quote the EPA, and later use the critical comments against them. The State of North Carolina has also made some costly mistakes in terms of producing critical public comments. Elmore said, "A lot

of our best information has come from the state and we use it against them. ... this has been one of our major tactics."

Elmore advises not to make enemies with the media. The media needs the opposition groups and the groups need the media. The media brings the signs of protests into people's living rooms (see figures 9, 10, 11). Elmore points out that "you can protest from now until doomsday but if there is no media attention then you're doing it only for the occasional car that (is) going to pass by." Newspapers also serve an important role by means of editorials, printing letters to the editor and creating satirical political cartoons about the siting process (see figures 12, 13, 14). In addition to remaining friendly with the media, Elmore cautions that you should rarely make enemies of politicians, "only if you absolutely have to."

Another instruction Elmore suggests is to begin a ribbon campaign. Residents are encouraged to put ribbons on car antennas, mailboxes, and signs in yards. Ribbons on mailboxes and signs in yards and along roadways serve to increase community awareness (see figures 15, 16, 17, 18). Some businesses advertise their opposition as well (see figures 19, 20). In addition, the outward display of opposition allows politicians who may be driving in the area to see that this is an issue citizens are seriously concerned about. It's important for politicians to know this for policy implementation and re-election campaigns.

Elmore encourages the groups to start planning public meetings and is available to come speak at the meetings. Usually she will try to speak at the first and/or second

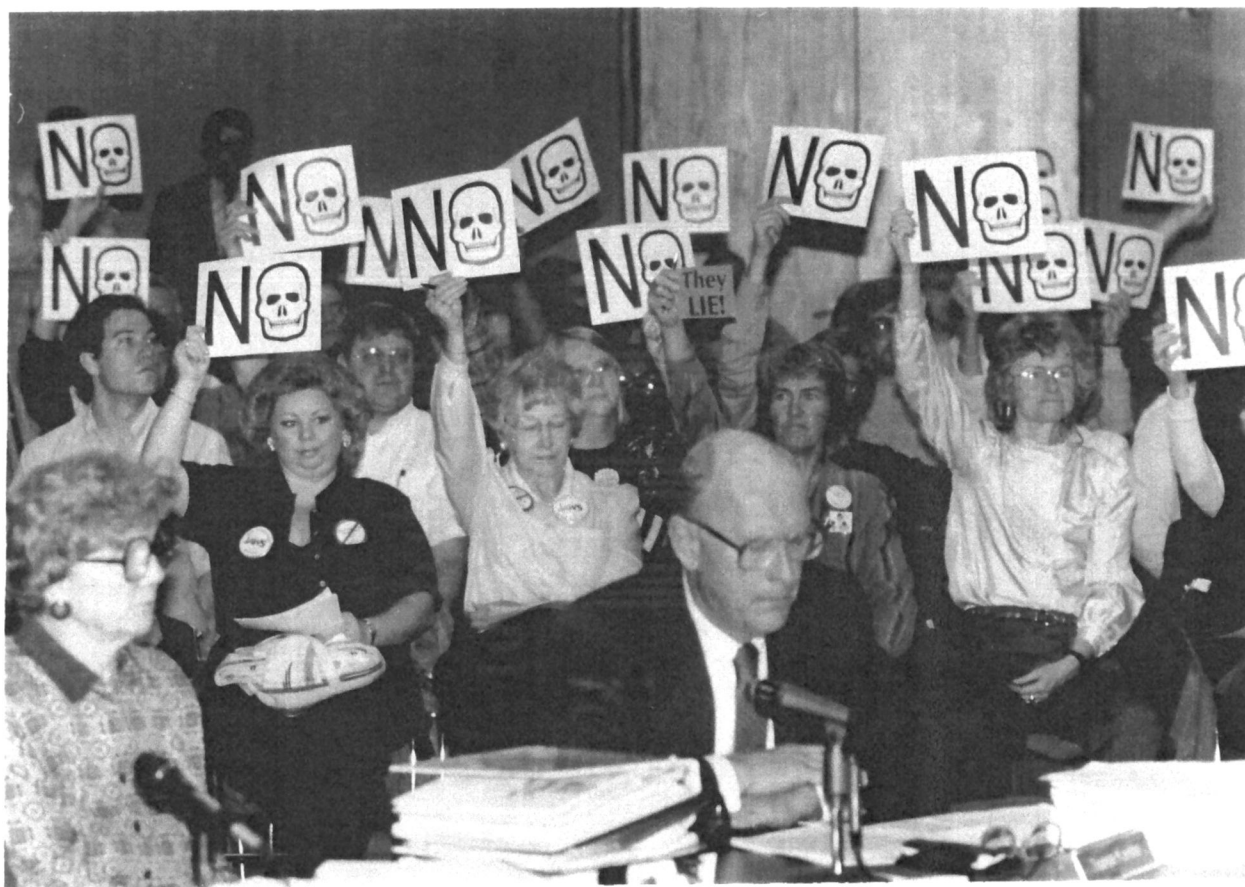


Figure 9. Opponents at a Hazardous Waste Management Commission meeting in Raleigh 12-4-90. Photo by: Robert Thomason; Raleigh N&O.



Figure 10. Opponents let their opinions be known by placing signs in their yards.



Figure 11. Opponents make it clear how they feel.

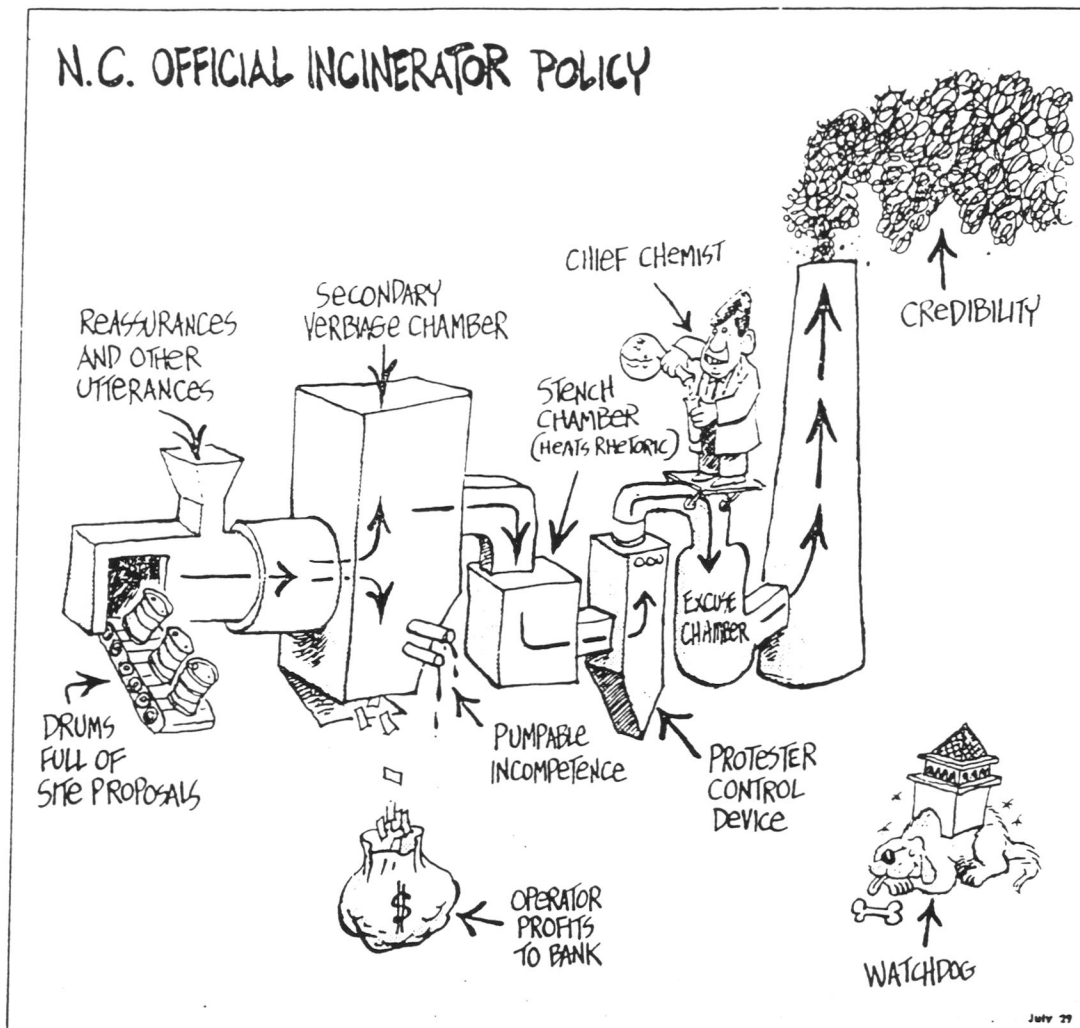


FIGURE 12

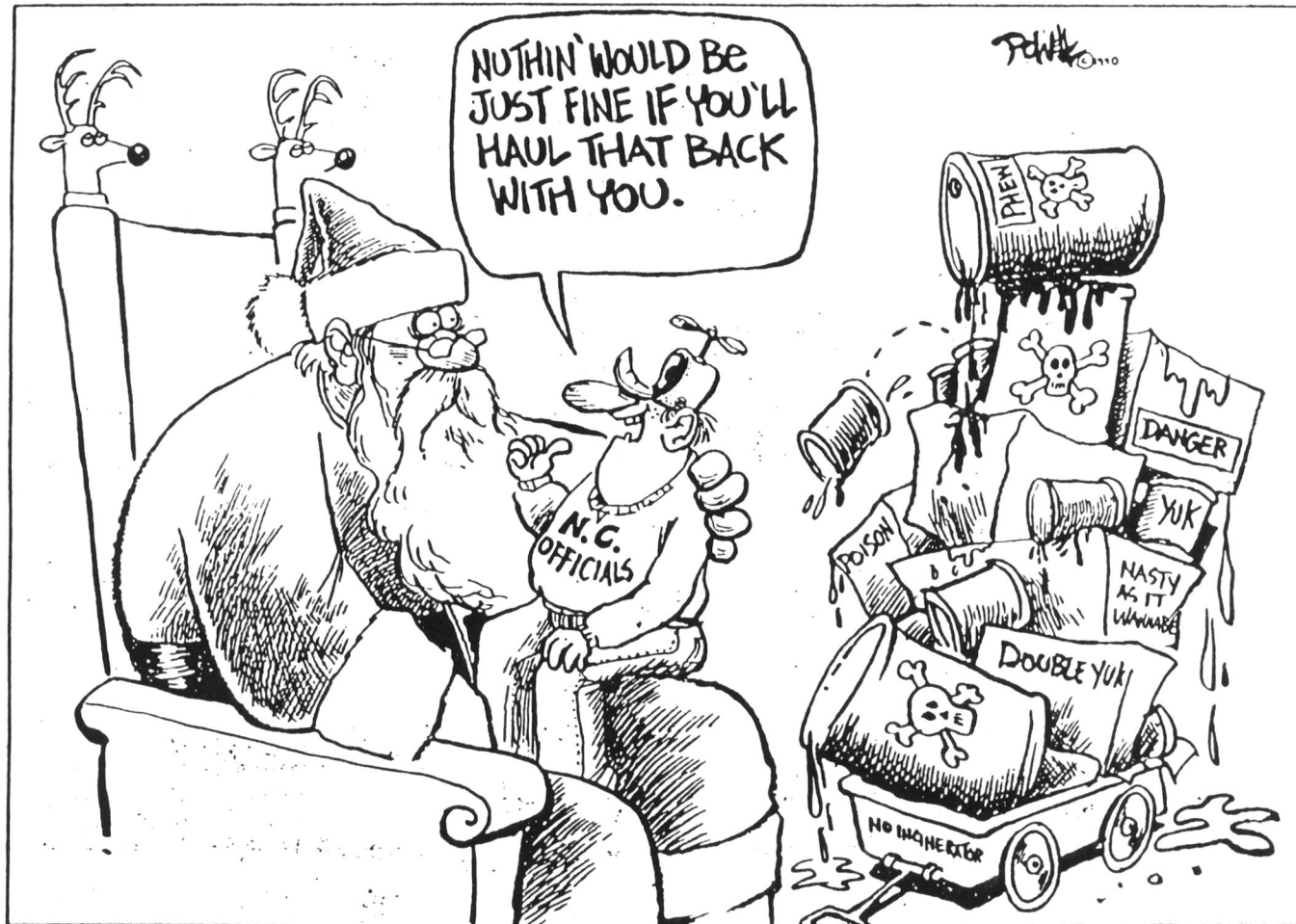
SOURCE: RALEIGH NEWS & OBSERVER 12/30/90

FIGURE 13



SOURCE: BUTNER-CREEDMOOR NEWS 11/15/90

FIGURE 14



SOURCE: RALEIGH NEWS & OBSERVER 12/21/90

LEE COUNTY SKY
CAROLINA BLUE
OR
HAZARDOUS WASTE GREY
YOU DECIDE !
STOP THE

HAZARDOUS WASTE INCINERATOR
TIE AN ORANGE (OR YELLOW) RIBBON
AROUND YOUR MAILBOX OR FRONT YARD TREE
AND LEAVE IT **NOW !** UNTIL WE WIN !



Figure 16. A sign of the times in Granville County.



Figure 17. A sign urging citizens to get involved. Also, note the green ribbon.



Figure 18. Green ribbons in Granville County emphasized residents opposition.



Figure 19. Even commercial establishments put signs up emphasizing how they felt.

**Future
Incinerator
Fashion**



**Smash Apathy! Get Involved Now!
Your Life and Breath Depends On It!!**

Je' Nita's

Distinctive Ladies' Apparel

**Dutch Village Shopping Center
I-85 at Exit Hwy. 56, Behind Wendy's
Creedmoor 528-0096
Hours: Mon.-Sat. 10 A.M. to 6 P.M.**



FIGURE 20

SOURCE: BUTNER-CREEDMOOR NEWS 11/15/90

meetings in order to provide accurate information and allow the steering committee to become more knowledgeable. In order for the groups to have other speakers and gain additional information, NC WARN furnishes the groups with the names of some national figures like Paul Connett (Chemistry Professor at St. Lawrence Univ.) and Hugh Kaufman (Assistant Director of the Hazardous Waste control Division of U.S. EPA). They have much experience and can provide insightful information to the national hazardous waste situation, and also tend to side with the opposition groups.

NC WARN's role is crucial to understanding how other opposition groups in North Carolina have formed and gathered momentum. The organization does what individual communities could not do, by offering immediate information and education. It permits access to information that otherwise would take local opposition groups weeks or months to gather. NC WARN is a non-profit volunteer organization that has just recently received grants in order to hire some paid staff. However, Elmore insists on working on a volunteer basis. With her guidance the organization has been quite successful. Elmore says NC WARN has "assisted in getting Caldwell Systems shut down and Carolina Solite to stop burning hazardous waste at their plant in Stanley County. We have been directly involved or assisted in 13 different fights against the siting of a hazardous waste incinerator, a commercial medical waste incinerator and ash landfill" (Elmore 1990 p.6).

Overcapacity Issue

One of the core questions about the facility planned for North Carolina is "Is it really necessary?" NC WARN has detailed North Carolina's Capacity Assurance Plan (CAP) as well as the other four agreement states' (SC, TN, AL, KY; NC WARN 1990) Capacity Assurance Plans. Its analysis indicates that if the proposed facilities are built in the agreement states that a large overcapacity will be the result (Cowdery et al. 1990 p.28), and industry will have little incentive to reduce wastes generated. It is estimated that in 1995 North Carolina will need to incinerate 15,679 tons of hazardous waste, yet a 50,000 ton incinerator is planned (Raleigh N&O 14 January 1991). The five states that were in the regional agreement have estimated that 215,780 tons will be needed to be incinerated in 1995; however, the planned capacity is 375,519 tons, which is 1.75 times more than it would produce (Raleigh N&O 14 January 1991). With the interstate commerce laws in effect, this excess capacity could be opened for other states in the nation to use, raising residents fears about North Carolina becoming a "dumping ground" (see figure 21). Elmore points out that "what currently exists is more than sufficient for the needs of these five states over the next 20 years" (Elmore 1990a p.2).

NC WARN points out 1989 figures that indicate that North Carolina was actually a net importer of hazardous waste. The breakdown of the hazardous waste movement follows: 51,000 tons were shipped off site and 12,500 tons of that were treated at the 12 existing facilities in North Carolina; the remaining 43,500 tons were

FIGURE 21

SOURCE: N.C. WARN



©1989 Lynn Austin

shipped out of state. However, 46,000 tons came into North Carolina from other states, which leaves a 2,500 ton excess that was imported to North Carolina (Elmore 1991c p.2).

Marge Howell of the HWMC and Bill Pitchford (the Solid Waste Management) confirmed that in 1989 North Carolina was a net importer of hazardous waste (Howell 11 June 1991; Pitchford 11 June 1991). They both pointed out that in 1989, however, there were not many inactive hazardous waste sites cleaned up. Howell claims that NC WARN is looking at the short term and is not necessarily looking at the long term problem.

Dr. Linda Little of the GWMB (Governors Waste Management Board) did not acknowledge that NC WARN's figures were wrong, she said "If all the incinerator capacity planned, including ours, is built and operational including additional capacity in Tennessee and Kentucky that would mean there is a surplus" (Raleigh N&O 14 January 1991). However, the planned capacity needs to account for economic growth and clean-up of old waste sites (Little 1990 p.1). Dr. Little also points out that other agreement states are having problems siting their facilities and that the EPA is in the process of adding new chemicals to the hazardous waste list which will increase the overall volume of hazardous waste generated. While the latter issue raised by Dr. Little is a legitimate concern, one wonders what advantage there may be to joining a regional agreement with other states who are also having problems siting waste facilities.

John Pike of the GCSDRC pointed out that in 1989 the state industries produced approximately 4,500 tons of hazardous waste that required incineration. This was disputed by Darrell Hinnant, (Executive Director of the HWMC) who said that it was higher than that. Later confirmation by Stephen T. Reid (spokesman for the Solid Waste Management Division) said that "John Pike is probably right on the money" (Raleigh N&O 26 January 1991). Such contradictory messages from state officials weaken their credibility and confuse the entire issue. One may wonder if the state officials intentionally misrepresented the figures, or if they were simply ignorant of the exact figures. Neither option breeds much faith in the state officials or the policy makers responsible for siting this new facility.

Granville County

The primary focus of the remainder of this chapter will be on Granville County residents, because they were under consideration for one of the privately owned sites (HEND8) as well as the state owned Umstead Farm site. The Granville County opposition may have waged the most intensive campaign because of that fact (see figures 22, 23). It was also the site that came the closest to being selected because the HWMC actually selected it as the "preferred site" for the facility. The Umstead Farm site was originally discarded because of geological concerns as well as watershed considerations (Raleigh N&O 18 September 1990). However, because the Umstead Farm parcel is quite large, (4,855 acres) a portion of the site, 1,089, acres was found



Figure 22. Note the green ribbon on the welcome sign. The ribbon signifies residents' opposition to the hazardous waste facility.



Figure 23. GROW (Granville Residents Opposed to Waste) was one major force of opposition in the county.

to fulfill the technical criteria established by the HWMC (Raleigh N&O 3 October 1990; HWMC meeting 4 December 1990).

A Granville County Site Designation Review Committee (GCSDRC) was established in order to allow the local residents to contribute to the siting process. The GCSDRC supplied the Hazardous Waste Management Commission (HWMC) with an in depth report declaring why the Umstead Farm site was an inadequate location for the facility. An analysis of this report supplied much of the data for answering the research question concerning what factors the opposition chose to focus on.

There are a number of issues presented in this report, with some being general issues and others being site specific concerns. This section will begin with the general policy issues that would and could be raised for any site in North Carolina, and then focus on the scientific problems associated specifically with the Umstead Farm site.

General Issues

The Granville County opposition claims that the state and Dr. Turner (Chairman of HWMC) have underestimated the potential hazards and risks of the proposed facility. This attitude represents a break in the credibility gap between public officials and the public. One resident claimed "They have not picked us on technical merit. They want to be near the northeastern U.S. to handle their waste" (Tunstall in Raleigh N&O 14 November 1990). The Granville County Board of

Commissioners claimed that the HWMC was "set upon a predetermined course" and that the members were "unwilling to consider meaningful and intelligent responses" to the Umstead Farm proposal (Raleigh N&O 15 November 1990). A large part of the reason for this mistrust may stem from North Carolina's poor track record when it comes to monitoring hazardous waste facilities. The Caldwell Systems International waste facility (CSI) in Lenoir, North Carolina stirred a controversy and weakened the State's credibility.

The CSI plant operated from 1977 to 1987, and after much debate the facility eventually closed. The incinerator's purpose was to burn wastes from nearby furniture factories. However, wastes came from as far away as California and Japan (Raleigh N&O 11 November 1990). Dozens of residents that lived near CSI had been diagnosed with nervous disorders and respiratory problems (Raleigh N&O 11 November 1990) that maybe related to the CSI facility. A nearby resident (Mr. Haas) claimed, "he saw incinerator workers dump wastewater into a creek that ran into his cow pastures and fields, despite warnings from regulators". Another resident's (Mrs. Miller) porch became black from the incinerator soot (Raleigh N&O 11 November 1990). The burden of proof was placed upon the local residents and they were finally able to pressure the county commissioners into closing CSI. Even the EPA reported that "North Carolina did a poor job monitoring and responding to the public cries on health effects caused by the Caldwell Incinerator." The EPA announced in December of 1990 that it plans to include the CSI incinerator site to the Nation's Superfund list

(Greensboro N&R 30 December 19). Although the laws have changed since CSI originally opened and the facility was not required to have a Part B permit before it began operating, it serves as a "close to home case" of potential problems associated with hazardous waste incinerators (Northhampton News 13 March 1991).

Tactics of the Granville County Opposition

Lawsuits have slowed the siting process of the proposed facility considerably. As of November 15, 1990 twenty-three lawsuits were filed in Granville County (The Butner-Creedmoor News 15 November 1990). The opposition also successfully postponed a public hearing and closed the site off to state testing by obtaining court orders (Raleigh N&O 16 November 1990; Raleigh N&O 17 November 1990). The state became so entangled with lawsuits that the Attorney General's office claimed that "the courts and the judicial system are purposefully being abused for the sole purpose of disrupting the siting process" (Raleigh N&O 28 September 1990).

At one public hearing a protester brought out a life-size effigy of Governor Martin hanging from a noose, which he hung from the gym's basketball hoop (Raleigh N&O 21 September 1990). In a letter to the editor of the Raleigh N&O, Glenda Whitefield (opponent of the facility) referred to the Martin effigy:

Somehow the sense of satisfaction that superb creation gave me lingers. For it said for so many of us what words could never express. It gave concreteness to our frustrations and tears and anger. I only hope he hears.

And I hope he learns a little something (Whitefield in Raleigh N&O 2 October 1990).

Governor Martin received a barrage of insults (see figures 24, 25). Some other slogans that refer to the governor include "Butcher of Butner", "Can Toxic Jim" and "Jim Martin, One Stack Mind" in addition protesters referred to the proposed incinerator site as "Martin's Death Camp" (Raleigh N&O 5 February 1991; Raleigh N&O 23 October 1990).

The HWMC members have also been subjected to some unpleasant situations. At one panel hearing a 14 year old boy threw coffee grounds and garbage at some of the commission members (Raleigh N&O 21 September 1990). Later, one opponent commented that "this meeting's kinda boring, we had fun the last time when we threw trash" (Raleigh N&O 24 September 1990). A minister told some members "that they should be excommunicated from their churches because they were working against God's will" (Raleigh N&O 1 October 1990).

One opponent from Oxford, North Carolina claimed that "what we read in history books about Hitler is happening to us, our government has betrayed us. Most of us are not violent people, just scared" (Raleigh N&O 1 October 1990). However, the HWMC have been called Nazis and "scum of the earth", and have even received death threats (Raleigh N&O 1 October 1990; Greensboro N&R 6 March 1991). A meeting was canceled in August of 1990 due to "various threats of violence" (Raleigh N&O 21 September 1990). Executive Director Darrell Hinnant's house in Kannapolis,

WANTED

FOR ENDANGERING THE PEOPLE AND THE STATE OF NORTH CAROLINA

JAMES G. MARTIN

GOVERNOR, STATE OF NORTH CAROLINA

DESCRIPTION

EYES: Blinded to the facts
EARS: Deaf to the calls of the citizens
HEIGHT: Shrinking under pressure from polluters
and those wishing to turn NC into a
dumping ground
REMARKS: Uncomfortable around citizens and
angry at those wishing to protect public
health and preserve the environment
LAST SEEN: Assaulting the intelligence of North
Carolinians by railroading an unneeded
and unwanted hazardous waste
incinerator into the heart of NC



CAUTION: *This man is a danger to the people of North Carolina*

JIM MARTIN IS WANTED FOR THE RECKLESS ENDANGERMENT OF NORTH CAROLINA'S ENVIRONMENT AND PEOPLE

Some of the specific acts by Governor Martin against the people of NC include

- Entering into a regional agreement to build a hazardous waste incinerator and landfill in NC to handle toxic waste from 5 states. This agreement allows waste from all over this country and foreign countries to be shipped and burned here.
- Overestimating the capacity needed to handle toxic waste in NC and proposing to build an incinerator several times larger than needed, especially when burning poisonous waste has yet to be proven safe.
- Budgeting \$10 million on the siting process and less than one-half million dollars per year on Pollution Prevention Pays Program in NC.
- Contracting with a foreign-owned company operating for profit to build and run the hazardous waste incinerator and landfill. This contractor's parent company has an abysmal history of environmental mismanagement. Leading European media organizations have linked the parent company and other of its subsidiaries to the illegal export of nuclear materials and technology to Saddam Hussein in Iraq.

IF YOU SEE THIS MAN, DO NOT TRY TO COMPREHEND ALONE, CONTACT:

RAIN

SOURCE: Republicans Against the Incinerator

PO Box 172, Barium Springs, NC 28010

FIGURE 24

WHAT DO
SADDAM HUSSEIN AND GOV. JIM MARTIN
HAVE IN COMMON?



THEY LIKE TO DO BUSINESS WITH THE SAME FAMILY OF COMPANIES

NuKEM GmbH, a German corporation, has been linked with supplying Iraq's Saddam Hussein with technology and materials to build nuclear weapons. These weapons could be used against American troops now in the Middle East.

NuKEM has an American subsidiary named ThermalKEM. It is the company chosen by Governor Jim Martin to build and operate a large hazardous waste incinerator and landfill in North Carolina.

ThermalKEM's record at its incinerator in Rock Hill, South Carolina boasts a host of citizen complaints of explosions, noxious fumes, and unfiltered dumping of burned toxic waste into the air. When the South Carolina Department of Health and Environmental Control and the US Environmental Protection Agency cited ThermalKEM for 17 violations just this year, ThermalKEM's response was to sue -- the Governor of South Carolina, the South Carolina Legislature, SC Department of Health and Environmental Control and a citizen's group.

Is this the kind of company we want operating in North Carolina -- a company with strong links to our enemy Saddam Hussein? We don't think so. If you agree, call Governor Martin toll-free at 1-800-662-7952 or write

SOURCE: REPUBLICANS AGAINST THE INCINERATOR
PO Box 172, Barium Springs, NC 28010

North Carolina was threatened with fire bombing (Greensboro N&R 17 March 1991).

Dr. Trenton Davis said after a public hearing September 20, 1990 in Oxford,

I walked out of the Granville Courthouse and realized we were going to be escorted out by state troopers, one at each side, one behind and one in front, and I knew what running the gantlet was like. People were shouting and shaking their fists at me (Raleigh N&O 1 October 1990).

Dr. Davis said he has attempted to answer each letter he receives but, he said that he is not quite sure how to respond to a letter that begins with "'You are disgusting' and it goes downhill from there" (Raleigh N&O 1 October 1990). Truman Koehler stated that he had a letter on his desk "telling me I'm the scum of the earth" (Raleigh N&O 1 October 1990).

These extreme reactions may allay some personal feelings of the individuals, but it is unlikely that it will do much for their cause. They in fact may weaken their credibility and public support. They may "hurt their cause as much as their targets" (Raleigh N&O 23 October 1990). The reversal of attention to the hazardous waste problem continues to frustrate public officials. Linda Little commented about this reversing trend:

In the 1960's, when I entered this field, the perception of risk was much less than the actual risk, (many wastes simply poured down sinks). We went from a situation where perception went from being less than the actual risk to the other extreme. What we need to remember is, wastes, if they're properly handled, are not hazardous. The key is handle them properly (Raleigh N&O 5 February 1991).

Non-violent methods of protest were employed as well. Sixteen protesters were arrested one day for blocking a drilling rig that was to be used to test soil and rock material. A spokesman for the protesters said "they would continue to seek arrest each day the drilling continues" (Raleigh N&O 21 September 1990b). One protester commented that he was "proud to say I was one of the first group to be arrested on September 19. We have been to meetings every night and have been at the designated sites every day, hoping to have accomplished something" (McKellar in Raleigh N&O 29 September 1990). The opposition was so frustrating to the HWMC that at one point in time they considered using helicopters and possibly a C-140 transport plane to take crews and equipment over the protesters (Greensboro N&R 17 March 1991). The non-violent methods present a passive form of resistance, and are far more acceptable than any violent methods of protest.

Another tactic involved accusing two of the HWMC members (Truman Koehler and Dr. Alvis Turner) of having a conflict of interest. However, the ethics panel "found no actual or potential conflicts of interest" (Raleigh N&O 6 October 1990).

The opposition accused the HWMC of changing the rules by altering the siting criteria, which in fact, is true. Darrell Hinnant asked the legislature's Environmental Review Commission to ban the no-wetlands requirement for the incinerator's buffer zone. Hinnant said, "Wetlands are too common in North Carolina to be able to find a qualified site that would not have some in its buffer zone" (Raleigh N&O 26 January 1991). The HWMC voted three to two to change the wetlands criteria, which would

permit the buffer zone to contain wetlands (Raleigh N&O 6 March 1991). The size of the required buffer zone was also changed from 1,000 feet to 200 feet (JAWS newsletter 1990). The changes, however, did comply with state and federal regulations (HWMC meeting 4 December 1990).

The GCSDRC also attacked ThermalKem, the company designated to run the facility. They researched the company's history and its affiliates, and claim that ThermalKem has a poor track record. Opponents are quick to report several violations the company had on a recent inspection. The Clean Water Fund of North Carolina points out a recent EPA report that claims that ThermalKem in Rock Hill, South Carolina exceeded its permit standard for burning arsenic and chromium, "for three hours on January 16, 1990 employees stoked the incinerator with arsenic compound at a rate of up to 145 pounds per hour (the permit allows less than one pound per hour"; Clean Water Fund of NC- NC Haz. W. Plan p.8). Another issue involves ThermalKem's lawsuit against South Carolina. The company wants to expand and the state is trying to stop them from doing so. There is some additional resentment towards the facility because it would be able to earn profits while the state taxpayers assume the responsibility for cleaning up accidental spills, explosions, etc.

Transportation of the hazardous wastes has been a focal concern for the residents. They claim that from 1986 - 1989 there were 4,927 accidents on North Carolina highways involving hazardous materials. Additionally, in the past there were problems with identifying the hazardous chemicals during an accident. There would

be approximately 17 trucks a day entering the facility and some concern was expressed about the increased risk of an accident in the area.

Site Specific Concerns

A wide variety of site specific issues were raised during the review of the Umstead Farm site. The site was not suitable according to the GCSDRC for a variety of reasons. These will be examined and summarized in this section.

The Umstead Farm site originally was part of a larger unit of land that was taken from citizens by the Federal government during World War II. In April of 1942 the land was purchased from the residents so that the area could be used as a military training site. After the war it became "surplus land" and Senator John Umstead secured it for state use (HWMC meeting 8 November 1990). Dr. Harvey Spurr points out that the "state land is citizens' land, its not state government land to do with as they please" (HWMC meeting 8 November 1990).

The Umstead Farm is currently being used by North Carolina State University for an agricultural research center. There are approximately 230 cows that are used for milk and meat research (see figure 26). In addition, some 70 scientists study a variety of crops, including cotton, tobacco, peaches, corn, peanuts, grapes, and other vegetables (Raleigh N&O 18 September 1990).



Figure 26. The Umstead Farm site contains approximately 230 cows which are used for agricultural research.



Figure 27. The John Umstead Hospital houses approximately 650 residents with psychological disorders. Its proximity to the proposed site was a major concern raised by many opponents.



Figure 28. The Murdoch Center is home to some 750 mentally ill. Its proximity to the Umstead Farm site caused a bitter controversy.

One of the key issues raised by the opposition was the proximity of the two state owned hospitals near the site. The John Umstead Hospital provides psychiatric services for approximately 650 patients and the Murdoch center has 750 mentally retarded patients (see figures 27, 28,; Raleigh N&O 9 November 1990). Dr. John Bagget (Executive Director of the NC Alliance for the Mentally ill) points out that the idea of placing the hazardous waste facility near patients at John Umstead Hospital increases fear and paranoia among patients which exacerbates treatment (HWMC meeting 8 November 1990). George Cheek of the GCSDRC pointed out that some of the patients at Murdoch center are very fragile, and occasionally even experienced care givers can break patients' bones in the process of moving them (HWMC meeting 8 November 1990).

These hospitals, in addition to the C.A. Dillon School for Juvenile Offenders, North Carolina Alcohol and Drug Rehabilitation Center, and the Whitaker School for emotionally handicapped children are all state owned properties within two miles (see figure 29) of the Umstead Farm Unit (Raleigh N&O 19 October 1990). In addition, there is a Federal Prison approximately four miles from the site (Howell Interview, 27 September 1991). In the event of a major accident, evacuating these institutions would be a very lengthy and disruptive event. Some 300 doctors, nurses and other health professionals claim it would be unethical to build the facility near the hospitals and prisons (Raleigh N&O 30 November 1990). A survey of the John Umstead Hospital employees found that over half of the 760 employees that responded would

INSTITUTIONS NEAR UMSTEAD FARM SITE

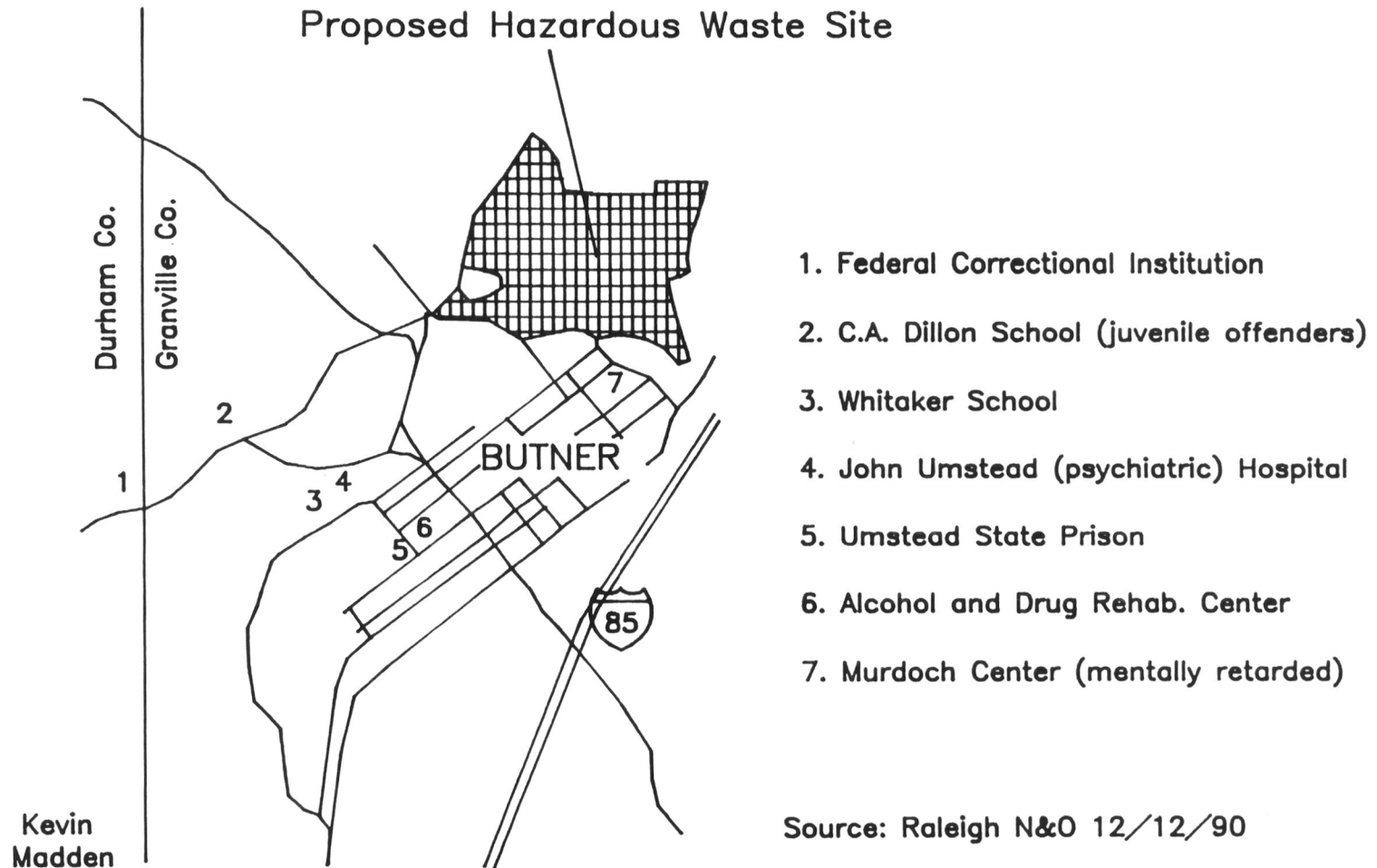


FIGURE 29

quit their jobs if the incinerator was located at the site near Butner (Raleigh N&O 30 November 1990).

In a letter to the editor, Stephen Ashby discredits the policy makers by pointing out their basic responsibilities: "Public policy has an obligation to be 'people sensitive' first and not be driven by perceived paths of least resistance, with disabled adults and children representing the source of 'least resistance'" (Ashby in Raleigh N&O 10 November 1990).

Addressing chemical exposures and risks from emissions, the GCSDRC points out recent studies in the Journal of Science (31 August 1990) which documents gross errors in rodent and mice exposure studies. The EPA

claims that 50% of all hazardous waste incinerator emissions are of the hexavalent type or the most carcinogenic of all emissions, EPA further claims that the technology is not available to accurately measure for example chromium metal emissions or composite mixed gases metal emissions (GCSDRC 1990).

Matt Petrovick of the GCSDRC questioned the HWMC's ability to assure residents that the emissions would be accurately monitored and measured. He challenged the HWMC to explain how they will "prevent the generation of hexavalent carcinogens from coming out of that stack", because he claims that the federal government doesn't even have the technology to accurately measure the emissions (HWMC meeting 11-8-90). In addition, Mr. Petrovick points out a GAO report claiming that out of 4,615

landfills in the United States 1,711 are leaking. He requested an explanation as to how the HWMC could prevent the proposed landfill from leaking as well.

The risk of contaminating water resources was a concern of the GCSDRC, which noted that several reservoirs were in close proximity to the proposed site. Lake Butner, which supplies water for Butner, is 0.7 miles from the site; Creedmoor Lake provides water for the town of Creedmoor and is 2.0 miles from the site; Falls of the Nuese Lake provides water for Raleigh and is 1.5 miles away; Lake Michie and Little River Reservoir provide water for Durham and they are 4.0 miles and 7.0 miles, away respectively. Dr. Richard Taylor claims that "water supplies for at least 300,000 people could be threatened" (HWMC meeting 8 November 1990). The site is also in close proximity to 3 creeks which flow into the Tar River, which supplies cities in eastern North Carolina with drinking water.

There are approximately 1,194 acres of wetlands on the Umstead Farm site (HWMC meeting 8 November 1990). Engineering a hazardous waste facility around these wetlands would be problematic, as is noted by the HWMC rule changes regarding the wetland buffer zone. Also, delineating wetlands can be problematical in the sense of what criteria to use, as well as the question "how large or small an area has to be to be considered a wetland".

The geologic analysis indicates the site contains diabase dikes and the area is underlain by a sill at several points. The GCSDRC points out that "no study has been

completed on the effects of diabase sills and dikes on the movement of groundwater" (GCSDRC 1990).

The unusual geology of the Umstead Farm site encourages the area to be botanically unusual. There is a volcanic layer which produces a "somewhat alkaline soil that encourages the growth of plants more typically found on the prairies in the midwest" (Raleigh N&O 5 October 1990). There are three plant species on the site which have "federal status of being candidates for the federal list of endangered and threatened species." They include the Smooth Coneflower (the site contains over 35% of known world population), Serpentine Aster and Prairie Birdsfoot- trefoil. The Coneflower is used in "over 200 pharmaceutical preparations" in Germany and the only known colonies are in Virginia, Georgia and North and South Carolina (Raleigh N&O 5 October 1990). There are an additional nine plant species of state concern on this site. There are three main concerns from a botanical viewpoint: 1) soil disturbance; 2) acid gas effect on plant stems and leaves; 3) change in surface runoff due to the modification of soil, which in turn may affect the Ph level in the soil. Harry LeGrand, a biologist with the North Carolina Natural Heritage Program, stated, "It's about the worst place they could put a site in the Piedmont from our standpoint" (Raleigh N&O 5 October 1990).

The GCSDRC points out that the site may threaten endangered species, most notably migratory birds. It serves as a migratory range for four to six species of rare birds. The following birds were listed in their report: Bald Eagle, Peregrine Falcon,

Coopers Hawk, and Black Vulture. There is concern for these birds because of the possibility of contamination of predatory food supply through bioaccumulation of toxins, negative impact from emissions on reproductive supply, pollution of surface water, and alteration of normal behavior due to increased traffic.

Ms. Rexanne Newman stated that the Carolina Fatmucket (a type of mussel) is a probable inhabitant of the Umstead Farm site. This is a rare species with which the North Carolina Wildlife Resources Commission is involved in extensive research. Ms. Newman points out:

The HWMC continues to remind us of our moral responsibility to take care of our own waste. I remind them of their moral responsibility to first protect the living things with whom we share this planet (HWMC meeting 8 November 1990).

Historical and archeological evidence of Indian artifacts and graves were found on the Umstead Farm site. Reid Tunstall presented information about monolithic tools (which date back to 8,000 B.C) that were quarried in the area. Ancient chisels, hammer stones, scrappers, and knives are some of the tools found in the area.

It was suggested that there was an error in the HWMC's calculation of the 75 mile centroid for hazardous waste which is generated and shipped in the state (GCSDRC 1990). Bill McGovern, of the GCSDRC, suggested that the state made consistent errors in calculating this centroid, and that if it were properly calculated Granville County would be eliminated. He claimed that a one year calculation of the

centroid is not an accurate measure and that it needs to be averaged over a several year period (HWMC meeting 8 November 1990).

Under a category termed "sensitive receptors", the chronic fear of spills and accidents that would affect nearby residents as well as patients at the two hospitals was discussed. Opponents claimed that there were unknown risks from emissions which may lead to lung diseases, cancer, and Parkinsons Disease (Jones in Butner-Creedmoor News 15 November 1990). In addition, real estate devaluation could be a problem for the local residents if they choose to sell their property. The report also lists approximately 15 recent technological accidents for those who believe technology is the answer to technologically generated problems.

Alternatives

When it comes to offering alternatives, a contradictory type of logic is used, according to Collette (1987 p.30) "On the one hand, they (the siting officials) make you believe that you (the opposition) are totally unqualified to judge the merits of their proposal. On the other hand, you are expected to come up with a better alternative". However, the opponents were resourceful at finding potential alternatives for dealing with North Carolina's hazardous waste. Lynn Phillips (manager of Heritage Environmental Services) claims that North Carolina is capable of handling most of the waste shipped off site, but much of the waste is shipped to South Carolina because it is one of the least expensive alternatives (NC WARN- A Positive Response).

Elmore (NC WARN) claims that there are "at least 50 alternatives to incineration, beginning with source reduction" (Elmore 1991c). The GCSDRC report makes a plea for source reduction, recycling and implementation of cleaner air standards. Some experts claim that hazardous waste production could be reduced by 75% (Raleigh N&O 12 November 1990). Roger Schechter (former director of N.C.'s Pollution Prevention Pays) estimated that off-site reduction could reach "a minimum of 30% in two years" (NC WARN- A Positive Response, p.1). Some environmentalists claim that the money spent on a facility would be better used by helping industry reduce wastes and seek alternative methods of reduction. Joel Hirschorn (Senior Associate at U.S. OTA) pointed out that in 1986 there was approximately \$16 billion spent for environmental protection by all levels of government, but only about \$4 million of that was dedicated to source reduction (Carothers 1987 p.13). Greenpeace claims that

hazardous waste is not a fact of life, it is a product of poor planning and inefficiency. Source reduction is the answer to the hazardous waste problem, not more high risk, expensive treatment and disposal (Greenpeace Action- Haz. Waste Incinerators p.4).

It can be in industries' long term interests to practice reduction methods (Raleigh N&O 12 November 1990). For example, Cape Industries in Wilmington, North Carolina reduced 90% of its hazardous waste generation by using a reclamation system; Liggett-Myers Tobacco Company in Durham, North Carolina cut its hazardous wastes by 95% by recycling solvents (Raleigh N&O 12 November 1990).

Some opponents and environmentalists want the HWMC abolished and the state to cease its direct involvement. William E. Holeman (spokesman for the Sierra Club and Conservation Council of N.C.) claims that siting such a facility should be "a market decision instead of a political decision" (Raleigh N&O 28 January 1991).

Elmore was asked at a recent meeting what the HWMC could have done differently in order for them to have been successful. She replied, "Nothing, we have no intention of letting them site any facility in North Carolina until there is significant waste reduction first."

NC WARN is in the process of writing a reduction plan to offer to the state. The goal is to have as close to zero toxic use and contamination as possible. She said that "We want North Carolina to be a model for this nation and we're not going to settle for anything less." Her response to the frequently used phrase that "its got to go somewhere" is that it doesn't have to be produced at all or that it can at least be treated on-site. For example, she claims that the small dry cleaning business that doesn't have waste capacity can switch to a water base cleaner. She recommends that the state helps research technology for alternate reduction methods and dismantle the HWMC.

Officials in South Carolina admit that "they made a serious mistake in oversizing their facilities, thereby attracting hazardous waste from 33 states and several foreign countries" (103 p.2). An excellent example set forth by the state of Oregon illustrates how states can combat the interstate commerce laws and the equity

problem. Oregon invites industries to dump as much hazardous waste in their state as they desire, provided they pay the \$250,000 per ton dumping fee" (Collette 1987 p.32). Perhaps other states could adopt similar rules.

The Granville County opposition did not convince the HWMC that their issues were valid enough to prevent the HWMC from selecting the state owned Umstead Farm as a preferred site for a hazardous waste facility. The HWMC found that all the information presented by Granville County did not violate their technical criteria, state or federal laws. For example, while there may be a large concentration of hospitals and institutions near the Umstead farm site, they were all outside of the .25 mile buffer zone that the site criteria required. Another example involved the existence of Indian artifacts. Although there were Indian artifacts on the site, it was not disqualified because it was not a registered state or federal landmark, historic or archeological site. On December 4, 1990 the HWMC announced the Umstead Farm as a preferred site.

The controversy did, however, arouse much publicity statewide, and groups effectively informed the public. The media followed the siting process closely, exposing controversial issues. This publicity may have had some impact on the next step of the siting process, which involved the top 10 elected officials of North Carolina, the Council of State members. The law in North Carolina requires that land transfers involving state-owned land be approved by these officials. The Council of State members were in charge of passing the land transfer from the Department of

Agriculture to the control of the HWMC. Seven out of ten voted against this land transfer. This vote removed the Umstead Farm Site from consideration and stalled the entire siting process. The reasons for their refusal to transfer the land will be explored in the following chapter.

CHAPTER 4

THE COUNCIL OF STATE'S POSITION

The Hazardous Waste Management Commission spent approximately \$3.5 million and 16 months searching for a site to host North Carolina's proposed hazardous waste facility. The HWMC's expertise involve dealing with hazardous waste issues and the siting process. It studied a large number of sites throughout North Carolina and applied technical criteria to the potential sites (see tables 3, 4, 5). It found that the Umstead Farm site met the established criteria and that it was suitable for hosting the proposed facility. This was announced on December 4, 1990. However, the siting process stalled dramatically as a result of the Council of State's refusal to pass the land transfer to the HWMC on December 13, 1990. The negative vote disrupted the entire siting process that the Governor, the HWMC and the legislature had established.

The Role of the Council of State

The Council of State consists of the top 10 elected officials in the state. They include the Governor, Lieutenant Governor and are responsible for other state departments (see table 10). The factors that led these state officials to reject the Umstead Farm site will be the focus of this chapter. Data for this assessment included letters written by the author to the seven Council of State members who voted against the land transfer of the Umstead Farm site (see appendix A). Five of the members

COUNCIL OF STATE MEMBERS

Table 10

Vote For/Against Umstead Farm Site

Harlan Boyles State Treasurer	Against	*
John Brooks Commissioner of Labor	Against	*
Rufus Edmisten Secretary of State	Against	
Bob Ethridge Superintendent of Public Instruction	Against	
James Gardner Lieutenant Governor	For	
James Graham Commissioner of Agriculture	Against	
James Long Commissioner of Insurance	Abstained	
James Martin Governor	For	

Edward Renfrow
State Auditor

Against

Lacy Thornburg
Attorney General

Against

* Denotes members that did not respond to information requested.

actually responded (see table 10). Determination of the factors they based their decisions on will be of importance to future siting attempts. They were also asked about what alternatives they saw for dealing with North Carolina's hazardous waste. Their responses to the letters and news reports provided the information for this chapter (see table 11).

The Commissioner of Agriculture, James A. Graham, is responsible for managing the Umstead Farm site because of a 1989 state law which appropriated the site to the Department of Agriculture. Mr. Graham pointed out that according to the law the site was to be managed for "research, teaching and demonstration in agriculture, forestry and aquaculture" (Raleigh N&O 6 December 1990). He also said he met with Darrell Hinnant (executive director of HWMC) at least three times and had members of his staff follow the HWMC proceedings. The reasons he cited for not passing the Umstead Farm site include: 1) proximity to the Murdoch Center: "The patients would not know what a fire alarm is, much less what to do if an evacuation became necessary"; and 2) proximity to the town of Butner. Mr. Graham claimed that:

the siting criteria was and is too strict. Access to a four-lane highway is too restrictive. Also, a suitable location could be engineered cutting the site off from any watershed supply, but the siting criteria will not allow for an engineered site.

It is interesting to note that Mr. Graham believes the siting criteria is too strict, because many opponents have argued that it is not strict enough.

REASONS STATED FOR NEGATIVE VOTE OF UMSTEAD FARM

Table 11

	Graham	Edmisten	Renfrow	Thornburg	Etheridge
Hospital Concerns	*	*	*	*	*
Violation of Original Purpose	*				
Interstate Commerce Concerns			*		
Proximity to Butner/Pop. Concentration	*		*		
Watershed Considerations				*	
Flawed Siting Process					*
Supports some type of Facility in NC	*	*	*	*	*

Mr. Graham claims that a hazardous waste facility is necessary and that incineration is a preferable method: "all credible research shows that this is one of the safer ways to deal with the problem if the incinerator operates correctly". He also advocates a private siting venture "without state government sponsorship".

The Secretary of State, Rufus Edmisten, said in reference to siting the proposed facility, "We ought to go back and redo it, get people together on this, quit yelling at each other, and get it done" (Raleigh N&O 14 December 1990). Mr. Edmisten claimed that he was "not opposed to having such a facility in North Carolina". He pointed out that the state has a responsibility to its citizens as well as to neighboring states, and that North Carolina needs to accept that responsibility. However, Mr. Edmisten said that he felt that the

Umstead Farm site in Granville County was simply not suitable for siting the hazardous waste facility. I was not convinced that its location near the Butner hospital and prisons, in the middle of some of our state's richest farmland, and in such proximity to particularly heavily populated segments of our state made this a wise choice.

He contends that there are areas that would be better suited for the facility and that there are "communities willing to accept the facility".

The State Auditor, Edward Renfrow, expressed a number of reservations concerning the Umstead Farm site. Mr. Renfrow is not opposed to the state constructing a hazardous waste facility, claiming that the state has a responsibility to its citizens regarding proper disposal of the hazardous waste generated within the state

(Greensboro News & Record 27 December 1990). However, he claimed, "I am not willing to take some action today that would place North Carolina in a bad situation for the next 20 years". He referred to the eleventh Circuit Court of Appeals ruling regarding Alabama's attempt to prevent out-of-state waste from coming into it. The interstate commerce laws do not respect statutory boundaries, meaning that individual states cannot prevent wastes from coming into their states. This issue was compounded further by the recent decision by the United States Supreme Court which upheld this judgment (Raleigh N&O 11 June 1991). Mr. Renfrow said he would support a regional compact. A compact is different from an "agreement" because it requires Congressional approval to limit waste management to the states that joined the compact.

Another interesting issue that Mr. Renfrow discussed was the rule prohibiting a hazardous waste facility within a municipality. The town of Butner is unique because of the fact that it is run by the state, so technically it is not considered a municipality. He points out that because of this fact, the residents of Butner may be unfairly exposed. He also expressed concern about the patients at the nearby hospitals and about evacuation issues: "I could not with good faith expose these citizens- who are society's least capable of fending for themselves- to a situation that could be so chaotic and unmanageable" (Greensboro N&R 27 December 1990). He said that because of the concentrations of federal and state institutions in the Butner area, it is not "practical to add more stress to the community".

Mr. Renfrow claimed that focusing solely on state-owned land was a severe limitation, and that it "tied the commission's (HWMC) hands, because there was not enough state-owned property eligible for consideration for the commission to make the best decision" (Greensboro N&R 27 December 1990). He recommends that the 1991 General Assembly re-evaluate the issue of private versus state-owned land. Lastly, he claims that the Council of State vote was "the only responsible action we could have taken, given the significant number of unresolved questions and unique circumstances".

The Attorney General, Lacy Thornburg, raised several important issues concerning the Umstead Farm site. He believes that North Carolina needs an incinerator and supports siting one whether it be on private or state-owned land. However, he does believe that the size of the incinerator should be scaled down. He said he would support finding a site for the incinerator and that he "will do everything to assist in that effort" (Thornburg 18 December 1990). However, Mr. Thornburg claims that Umstead Farm "was a lousy site". The reasons for his disapproval of the site include: 1) proximity to Murdoch Center, with emergency and evacuation concerns: "this factor alone would have been enough upon which to base my vote"; 2) the area serves as watersheds for four different municipalities; and 3) the HWMC had approved the Umstead Farm site for only two components of the hazardous waste facility, meaning that a second siting process would be necessary to site the ash landfill.

Mr. Thornburg wrote a letter to the editor of the Winston Salem Journal, in which he defended his vote against the Umstead Farm site. He claimed that the HWMC changed its rules in order to select Butner as a preferred site, and that it "was done because 1,400 handicapped children have no political clout, most of whom are unable to vote". He continued:

If you are really concerned about responsibility, then place the blame where it properly belongs. Don't choose the Council of State because they didn't roll over and rubber-stamp the last but desperate attempt to place the incinerator 'somewhere'.

Mr. Thornburg mentions that in March of 1990 the HWMC listed 83 potential sites in the state and that the Umstead Farm site was not one of them. The next month that list had been narrowed down to 18 sites and did not include the Umstead Farm site either. In fact, it wasn't until October 2, 1990 that the Umstead Farm site was listed as a potential site for the facility.

Mr. Thornburg suggests spending more money on reduction and less money on disposal and treatment methods. He claims, "it would be far better and ultimately less expensive to subsidize industry to help reduce waste instead of putting all the state's money in disposal". He notes that North Carolina is 49th in the country in the amount of money spent per capita on environmental needs, and that there is room for significant improvement. He further proposes offering tax credits to industries that are successful at reducing waste generation.

In the meantime, Mr. Thornburg said he would be willing to go to court to allow North Carolina to continue shipping its hazardous waste to South Carolina and other states that were threatening to prevent this practice. He said, "I personally don't believe that we in North Carolina should be bullied or threatened or fold to a bully effort" (Raleigh N&O 14 December 1990).

The Superintendent of Public Instruction, Bob Ethridge, pointed out two basic reasons for his negative vote. He said that

the proximity of the site to institutions for the mentally and physically disabled and the process by which this site was chosen were the major reasons why I was unconvinced that this location was appropriate for such a facility.

He also advises source reduction and/or construction of new facilities for handling North Carolina's waste in the future.

Five Council of State members responded to the letters sent. Follow up letters were sent to three members (see appendix B), and telephone communication was attempted; however, Mr. John Brooks (Commissioner of Labor) and Mr. Harlan Boyles (State Treasurer) did not reply. Some information about their opinions was gained from news accounts.

Commissioner Brooks said that Butner had absorbed its share of state and federal institutions and should not be required to sacrifice any more of its economic growth. He points out that

While I think the incinerator can be operated safely, I recognize nevertheless it would further depress land values. It would be very unfortunate, very imprudent, to now further burden it (Butner) with that facility (Raleigh N&O 27 November 1990).

Mr. Brooks also objected to having a four-lane highway near the facility; this is, however, contrary to the siting criteria. In fact, emphasis was given to sites closest to four-lane highways. In addition, Mr. Brooks said that hosting the facility on state-owned land was not a criterion as far as he was concerned (Raleigh N&O 27 November 1990).

Before the actual vote Mr. Boyles said he would "likely support" Mr. Graham, Commissioner of Agriculture. Mr. Ethridge followed this reasoning as well saying, "I certainly respect the Commissioner's (Mr. Graham) judgement and always have, and will certainly listen to his advice on matters affecting his agency" (Raleigh N&O 27 November 1990). Mr. Long did not vote on the land transfer but, he did say that "basically, my position is going to be that I concur with the position of the agriculture commissioner" (Raleigh N&O 27 November 1990).

Proponents View

The Governor and Lieutenant Governor were the only two members who voted to pass the land transfer to the control of the HWMC. Governor Martin was frustrated by the Council of State vote because he had originally arranged the interstate agreement with the other states. The negative vote caused North Carolina to miss its

licensing deadline, and by failing to do so North Carolina was unable to fulfill its agreement with the other four states. Governor Martin claimed that

If we can ever get North Carolina's leadership to agree on the need for a hazardous waste treatment facility, then I believe we will be able to hold up our end of the bargain (Raleigh N&O 8 January 1991).

The negative vote by the Council of State caused some to claim that it was a political vote. Clearly, much of the siting process is laden with policy and political issues.

Mr. Graham said that he had been getting 12 to 15 calls each day, and that he had received over 800 letters about the issue (Raleigh N&O 8 December 1990). Mr.

Edmisten said he had received comments 50 to one against the land transfer (Raleigh N&O 8 December 1990). Governor Martin accused the Council of State of putting political issues ahead of serving the state properly:

I feel like they (Council of State) didn't serve the state of North Carolina very well. I think they put political considerations ahead of the needs of the state. They feel its popular to defend everybody from the consequences of modern life, and that's just not going to work anymore (Raleigh N&O 15 December 1990).

The vote made the HWMC aware that selecting a site on state- owned land would be difficult because of the Council of State's power to refuse the land transfer. As a result of this problem the HWMC sought to revoke the Council of State's power to do so. Dr. Turner (chairman of the HWMC) said he didn't think it would be possible to site a facility on state-owned land while the Council of State still had the authority to veto the land transfer. He claimed, "Unless they deal with (the Council of

State) I don't think it would be possible to site a facility in this state" (Raleigh N&O 9 January 1991).

The veto by the Council of State was frustrating for the HWMC, who had spent nearly one and one-half years looking for a suitable site. Although some important issues were addressed by the Council of State, one may wonder how prudent it is to allow elected government officials who are unfamiliar with hazardous waste issues to serve such a pivotal role in the siting process. For example, the Superintendent of Public Instruction, State Treasurer, and Commissioner of Labor are not likely to be well versed in hazardous waste issues. In fact, Mr. Boyles, Mr. Ethridge, and Mr. Long indicated that they were going to vote against the site because Mr. Graham (Commissioner of Agriculture) was going to vote that way. Land transfers between state departments are commonly passed by the Council of State members; however, perhaps their role in this siting process should be re-examined because this apparently is an area beyond their expertise.

The North Carolinians opposed to having a hazardous waste facility in their state may take little comfort in the Council of State vote. All the members that responded do believe some type of facility is needed and several stated private land would be acceptable to them to host the facility. This fact should alert North Carolinians that the hazardous waste issues in the state will still have to be confronted.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Awareness of problems associated with hazardous waste are relatively recent. It was only 15 years ago that specific steps were taken to develop proper hazardous waste management policies. These steps brought about significant challenges for the states. The focus of this thesis is on North Carolina's attempt to site a particular hazardous waste facility. Siting hazardous waste facilities is a growing problem, not just in North Carolina but nationwide. Obviously, the generation of hazardous waste is not unique to North Carolina, nor are the attempts at siting facilities. The role of public opposition is an integral part of the siting process, the issues that the opposition focused on are summarized in this thesis. By attempting to understand these issues it is hoped that one may gain a better understanding of the statewide problem, as well as a broader national perspective. A review of literature points out conflicting reports concerning the safety of technological hazards. Opposition groups often get caught up in the "dueling experts" dilemma which increases the cyclic debate over safety concerns. Perceptions of technological hazards vary widely, largely because technology is creating hazards faster than humans can understand and adjust to them. New technologies and products are rapidly being introduced to industry and the public. The consequent by-products of these wastes may need time to be studied in depth before actual risks can be calculated. Even when real risks are known people often dismiss the findings for reasons not entirely understood.

There are lessons to be learned from North Carolina's attempt to site a hazardous waste facility. Perhaps the most important issue that needs to be re-examined is the interstate agreement with the four neighboring states. Wastes coming into North Carolina would not be limited to the five states in the regional agreement because of interstate commerce laws. This raised fears about North Carolina becoming a national dumping ground. To further compound this problem the United States Supreme Court recently upheld federal rulings which concerned the interstate commerce laws. With this ruling it is clear that regional agreements are of little value, because waste can be transported across state boundaries regardless of whether the state wants it or not. The state essentially has no control over what comes into its own territory.

The judgement concerning interstate commerce law contradicts the Superfund Amendments and creates little incentive for states to build facilities that will allow them to manage the hazardous waste they generate. This was pointed out by South Carolina Governor Campbell who has had to deal directly with this issue:

If the EPA does not aggressively enforce (the Superfund law), the practical effect will be to allow non compliant states to continue to thwart federal requirements while states that are in compliance will continue to bear the burden of managing their hazardous wastes (Greensboro N&R 8 January 1991).

Clearly, this issue need to be resolved in order to provide a more equitable approach to managing hazardous waste.

There are some options to limiting the amount of waste that is imported into the state. Compacts can be made which would prevent the waste from coming in; however, these require Congressional approval. North Carolina's Governor Martin pointed out that compacts would solve the "problem of the fear that other states would dump on us, like we've been dumping on them" (Raleigh N&O 4 February 1991). Also, Oregon's example offers a viable solution, because it allows waste to come into the state provided a \$250,000 per/ton dumping fee is paid (Collette 1987).

Public Opposition

The opposition turned out to be a formidable barrier to the siting process. It was suggested that the opposition focused largely on emotional issues and did not utilize scientific techniques. To a certain extent emotional issues were used. However, substantial factual information was brought out by the opposition. This information coincides with the model concerning public opposition presented by Centaur Associates. The opposition in Granville County used 10 of the more common tactics that were studied and presented by Centaur Associates from previous opposition groups throughout the United States. NC WARN served as the impetus for the formation of much of the opposition. The power and knowledge base of NC WARN is impressive and effective. Larry Hodge, Vice President of JAWS, said that they got off to a much faster start because of NC WARN. They were able to organize quickly and efficiently, largely because of the information and advice from NC WARN.

Measuring the degree of effectiveness of the opposition groups is not easily done. The HWMC selected a preferred site even though there was much opposition. However, it was the Council of State members who vetoed the Umstead Farm site. The Council of State members were asked what factors led them to vote against the Umstead Farm site, but to measure quantitatively the impact of opposition on their decision presents a difficult problem. However, the issues that they based their decision on were examined, and one can see that they were largely similar to the issues on which the opposition focused, most notably the proximity to sensitive state hospitals and the nearby population concentration.

Government Considerations

Individual citizens are not faced with the daily problems of what to do with hazardous waste. Certainly not every citizen is or wants to be an expert on all the issues involved in siting a hazardous waste facility. Elected officials are in the position to make major policy decisions so that individual residents do not have to do so on a daily basis. This system allows experts to study soils, water resources, and other siting considerations while others carry on with their own work, in their own fields of interests.

A major problem with the siting process arose because the state officials did a poor job of convincing the public that the facility was needed. North Carolina officials led the public to believe that large amounts of hazardous waste were being

generated in the state and that much of it was being sent out of state. Emphasis was placed on this equity problem and how North Carolina needed to share its burden of managing hazardous waste. However, the information not made readily available was how much waste was imported to North Carolina. In 1989 North Carolina imported more waste than it exported. Unfortunately, these figures were not widely circulated and the public was skeptical of the necessity of the facility. This skepticism may have been a cause of much of the opposition, which ultimately is believed to have caused North Carolina's failure to site a facility. In order to gain support, the people have to be convinced that the facility is necessary and that they will in some way benefit from having the facility.

Governor Martin's haste to have a facility built and to join the regional agreement caused him to agree to more capacity than was needed. The HWMC only recommended a 40,000 tons per year incinerator, but Governor Martin agreed to add 10,000 tons per year to the incinerator capacity, an ash landfill and a solvent recovery unit. The HWMC also made some errors that were costly to their cause. The flip-flopping between state-owned land and private land did little to support their credibility. The fact that the Umstead Farm site was eliminated by the HWMC early in the siting process was a serious error. They were put into the position of explaining to the public why this site was at one point in time inadequate. By further scrutinizing state-owned land the first time, their credibility could have been helped to a large degree.

Gaining public support would most certainly facilitate the siting process. This may sound like an unreachable goal, especially regarding the vehement opposition that North Carolina officials encountered. However, it is believed that the siting process would have encountered less opposition if the size of the facility was scaled down to an appropriate size to manage only North Carolina's waste. In addition, a clear and accurate accounting of the amount of hazardous waste generated in the state needed to be made available.

When considering a community to host a facility, it is important to take into account what the hosting community has to gain. Hosting such a facility involves a long list of inconveniences, from increased traffic to uncertain health risks. A particular county may be selected to absorb the rest of the state's wastes because of its geographic fate. To alleviate these inconveniences it is essential that the host community be adequately compensated. A fair compensation is important so that communities don't feel they are being unfairly used.

The most important, largest investment people normally make in their lifetime are their homes. It is also an investment that usually increases in value. However, the stigma of having a noxious facility nearby often creates a serious problem with devaluation in property. This is certainly an unfair burden to place on any community. If it is determined that a facility is indeed necessary, then the state needs to share the burden and have the taxpayers contribute to the residents whose property

values have declined. Determining how many people that includes depends upon how many people are affected by the devaluation.

Northhampton County

The siting of a hazardous waste facility has a cyclic pattern to it. A speculative site is named or county officials may volunteer to host the facility, word leaks out and residents begin the opposition process.

The latest place under consideration is Northhampton County. County officials there have volunteered their county for hosting the hazardous waste facility. Once again a controversy has evolved. The county has lost one-fifth of its population over the past 30 years (Winston-Salem Journal 21 December 1990). Proponents think it would bring jobs and enhance the economy. In addition, ThermalKem has stated that it will provide Northhampton County with 6.5% of its gross profits which would accumulate to approximately \$3.5 million per year (The Virginia Pilot/ The Ledger Star 24 February 1991). However, there has been considerable opposition since these developments occurred. A petition signed by 1,848 county members opposed to hosting the facility has been presented to the County officials (Raleigh N&O 8 January 1991).

North Carolina is in a unfruitful cycle involving the Governor, the legislators, the HWMC, and the public. A recent editorial pointed out the reality of North Carolina's hazardous waste issues:

Behind the newsclips and headlines about protests, real problems remain, and the necessity of dealing somehow with the toxic and hazardous junk Tar Heel society produces is about as real as they come (Raleigh N&O 12 December 1990).

The problems are not likely to be resolved until a consensus is reached among the ruling and opposing bodies. This will involve an accurate assessment of what exactly is needed, as well as significant steps toward source reduction. The North Carolina Office of Waste Reduction estimated that there will be a 36% reduction in hazardous waste volume by 2009 (Greensboro N&R 26 December 1990).

There are several issues in which the legislators are in rough agreement: 1) waste reduction should be emphasized; 2) Congressional action should be taken to prevent other states from abusing North Carolina's facilities; and 3) a closer monitoring of hazardous waste plants should be implemented (Raleigh N&O 28 January 1991). What they cannot seem to agree on is how and when to begin searching for an adequate site for the facility. Representative DeVane (Hoke County and co-chair of Environmental Review Commission) suggested three options for solving the problem: 1) dismiss the Council of State's authority for land transfers of state property; 2) have the general assembly select a site; 3) Assign the Council of State to find an appropriate site for the facility (Raleigh N&O 28 January 1991).

Suggestions for Future Study

Suggestions for future study may involve gathering information from North Carolina residents as to what would be an acceptable treatment facility for hazardous waste. Having the support of the state's residents would be a useful step in the siting process. This may be facilitated by finding out exactly what type of facility would be needed for the state and by examining the amount of waste generated in the state. In addition, it may be useful to research possible approaches to limiting the amount of wastes that are permitted to enter the state, so that once a facility is opened it is not a destination spot for wastes throughout the nation.

Philosophical Overtones

Residents can advocate reduction, recycling and theoretical approaches to dealing with hazardous waste, but until those are put into practice the problems concerning proper hazardous waste disposal will continue to increase. Unless reduction methods are emphasized, some waste facilities will be necessary and siting them will continue to be an issue. Individuals may wonder why they have to absorb the burden of having a facility in their community. In order to fully understand the pressing need for new facilities it becomes necessary to examine deeply imbedded theories of consumerism in the United States.

The infrastructure for hazardous waste generation is in place so that it continues to be generated. It is to a large extent characterized by a "credit card"

society which thrives on the concept "buy now--pay later". Re-adjusting attitudes and values to reduce the amount of hazardous waste produced will require more than lip service to source reduction and recycling. It will require consumer modification that emphasizes buying products which create less hazardous waste. Responsible consumerism needs to be implemented in order to reward environmentally conscious companies. In addition, support should be given to politicians concerned with environmental issues.

To a large extent, the reason North Carolina had such a controversial siting process is because of the residents' political apathy. North Carolinians were not concerned about the hazardous waste facility until individual counties were selected to host the facility. This is exemplified by the small number of residents that attended the original meetings which established the siting criteria. For example, representatives from Granville County did not go to these initial meetings and suggest that the distance from hospitals and prisons be changed from .25 miles to an acceptable distance from the hospitals. Perhaps residents heard about the plans to build a facility but never suspected that it would be in their community. As long as it was located in some distant county they could afford to be apathetic about the issue.

There were different stages of the siting process during which it would have been more appropriate for the citizens to protest. By waiting until their communities were threatened, many of their issues were discredited. In addition, some of their

tactics were threatening and damaging. Among other insults they threatened commission members with violence and had a mock hanging of the governor.

Residents of Granville County focused on a number of reasons as to why the Umstead Farm site was not suitable for the facility. One wonders, however, how many people are really concerned about the rare smooth coneflower. It is believed that the majority of people protesting are not seriously concerned about the plant but are merely using it as an excuse not to put the facility in their community. Also, a large presentation concerning Indian artifacts was given at one of the HWMC meetings and was included in the GCSDRC report. One wonders how many residents are concerned about preserving the Indian heritage of the region. If this is a serious priority it is curious that it was not so established beforehand. There were no museums or memorials already set in place. This sudden outpouring of concern for endangered species and Indian artifacts are examples of issues that were raised for the simple purpose of preventing an unwanted facility in the community. Contrary to its appearance of concern, it is the result of years of apathy. Perhaps the lesson to be learned is not how to site future facilities or prevent them from being built in the future, but to become more aware of history, the environment, the underprivileged, and the representatives elected to government.

It is hoped that individuals may begin to take this increased environmental and social awareness and integrate it into their daily lives. It may in effect bring communities closer together. In Granville County, the residents all had a common

cause because they had a common enemy. There may be some bonding that has occurred as a result of working together against the state. Such experiences may bring about "the type of community organization and self sufficiency that sustained humans in another era- before people felt that they were to be taken care of, before government assumed its paternal role" (Carothers 1987 p.14). Perhaps petty grievances with neighbors will have been resolved and they may realize that you can "beat city hall". It is hoped that individuals may now realize they do have power, and that government policy and practices can be changed once apathy is dispelled and individuals take an active role in changing policies. After all, if such powerful groups can be organized so quickly, one wonders why they aren't organized for some of these other core problems.

Certainly the burdens associated with hazardous waste problems will not be solved entirely by the public. It will take cooperation among the three principal parties responsible for its current problem. No sector can achieve it alone; government, industry and the public will have to take their responsible role. If this challenge is met and the United States can establish efficient methods of dealing with hazardous waste then it will benefit itself by protecting its citizens and it will help the developing world by establishing models for proper treatment.

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APPENDIX A

Kevin Madden
Rt. 1 Box 275
Grimesland, NC 27837

April 8, 1991

Attorney General
Lacy H. Thornburg
Dept. of Justice
Second Floor Justice Bldg.
2 E. Morgan St.
Raleigh, NC 27837

Dear Mr. Thornburg:

I am a graduate student in geography at East Carolina University. I am currently gathering information relating to my thesis topic, which deals with the siting process of the proposed hazardous waste facility for North Carolina. I am writing to you because your role in the North Carolina Council of State serves an important function in the siting process. I have formulated three questions to ask you, and I would greatly appreciate your cooperation in answering them.

1) Why did you vote against passing the land transfer of the Umstead Farm in Granville County to the control of the Hazardous Waste Management Commission?

2) What specific factors led you to vote against this land transfer?

3) What alternatives do you see for North Carolina to deal with its hazardous waste now and in the future?

I sincerely thank you for your time in helping me gather this important information.

Sincerely,

Kevin Madden

APPENDIX B

Kevin Madden
Geography Department
East Carolina University
Greenville, NC 27858

May 28, 1991

Bob Ethridge
Superintendent of Public Instruction
Dept. of Public Instruction
116 W. Edenton St.
Raleigh, NC 27603-1712

Dear Mr. Boyles:

I sent you a letter approximately six weeks ago requesting information concerning your vote on the siting of the hazardous waste facility. I have received no reply from you and would appreciate your attention to the following questions.

I am a graduate student in geography at East Carolina University. I am currently gathering information relating to my thesis topic, which deals with the siting process of the proposed hazardous waste facility for North Carolina. I am writing to you because your role in the North Carolina Council of State serves an important function in the siting process. I have formulated three questions to ask you, and I would greatly appreciate your cooperation in answering them.

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