

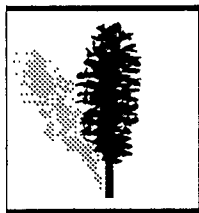
Hurt not the earth, neither  
the sea, nor the trees.

Revelation 7:3

## Hazardous and Radioactive Wastes: A High Anxiety Problem

by Dee Reid

*Hazardous and radioactive wastes are among the most difficult materials we must deal with in a modern society. For one thing, there's so much of the three principal kinds of these wastes—two billion pounds of hazardous waste and 83,000 cubic feet of low-level radioactive waste produced each year in North Carolina, plus 700 tons of highly-radioactive waste stored temporarily at the state's nuclear plants. State commissions are searching for a **hazardous waste** treatment facility site and a **low-level radioactive** waste site, while federal officials have considered North Carolina and other states for an eastern U.S. repository for **high-level radioactive** wastes. North Carolina will be home to at least two. But both technical problems and public opposition to treatment and storage facilities force state and local policymakers to make exhaustive searches for sites and to consider a broad range of options for dealing with these potentially harmful wastes. Why does North Carolina have so many kinds of wastes? How can the state dispose of them to protect its citizens and the environment without undercutting the state's economy and its attractiveness to its people and to new businesses?*



**O**n a warm summer evening in 1978, an unmarked tanker truck on a clandestine mission began dumping a load of hazardous chemicals along 210 miles of local roadways in piedmont North Carolina. Until

that incident, the words "hazardous waste" had not been a part of the Tar Heel vocabulary. But all that changed forever when thousands of gallons of oil mixed with an industrial material called PCB—polychlorinated biphenyl, linked to cancer in laboratory animals—gushed onto the right-of-way, contaminating the soil and threatening the groundwater in 14 counties.

It became an environmental nightmare both for state officials trying to clean up the mess and place it in a secure repository and for a wary public that wasn't even sure what a hazardous waste was—or how dangerous it might be. Since the summer of 1978, hazardous wastes have been a subject of frequent headlines as the state grapples with the problems of safely handling its hazardous wastes as well as its radioactive refuse.

After years of public debate over where and how to get rid of the waste, hundreds of thousands of cubic yards of PCB-tainted soil were scraped up from the sides of North Carolina roads, hauled away, and deposited in 1982 in a specially designated landfill in Warren County. The construction and filling of that landfill came only after heated and bitter opposition from residents of Warren County, one of the poorest counties—financially and politically—in the state. Despite concerted protests, the state proceeded with its plans to bury the waste in a remote area of the county.

Some citizens might have thought that would be the end of all the talk about hazardous wastes, but they were wrong. Burial of the PCBs did nothing to solve the problem of what to do about the billions of pounds of other types of hazardous and radioactive waste that are produced, stored, or transported in North Carolina every year.

Nearly a decade after the PCB incident, the state still has no central facility for treating and disposing of its most dangerous waste. It's a problem that refuses to go away. Consider the following:

■ During 1986 alone, North Carolina business and industry generated more than 2 billion pounds of hazardous wastes—industrial by-products that can pose a serious threat to human health and the environment if treated improperly.<sup>1</sup> They include everything from drycleaning fluid to printer's ink to in-

dustrial dyes and agricultural pesticides.

■ There are more than 700 inactive hazardous waste sites statewide.<sup>2</sup> Some of them are primitive storage sites or lagoons that threaten groundwater. Federal law implies that if North Carolina does not have a comprehensive hazardous waste treatment facility in operation by 1989, the state could lose its federal funds for cleaning up the worst of these "orphan dumps," as environmentalists call them.<sup>3</sup>

■ Nuclear power plants, research labs, fuel production facilities, and hospitals produce about 100,000 cubic feet of low-level radioactive waste each year in North Carolina, enough to fill a 100-foot silo.<sup>4</sup> Even the experts debate what levels of radioactivity are harmful to public health and the environment. But these experts do agree that even low-level radioactive waste must be disposed of carefully since it remains *potentially* dangerous for decades. Most of North Carolina's low-level radioactive waste is shipped to a South Carolina landfill that is scheduled to shut down in 1992, while some of it is shipped to two other states—Nevada and Washington.

■ And two of North Carolina's three nuclear power plants now store about 700 tons of high-level radioactive waste.<sup>5</sup> This high-level radioactive waste—which can cause cancer and birth defects—can remain dangerous for many years if not stored properly. The federal government has designated Nevada as the site for one repository. North Carolina was once on the list for potential sites in the eastern U.S. but is no longer.

The primary obstacle to establishing adequate treatment facilities for hazardous and radioactive waste in North Carolina has been citizen opposition to locating the facilities in their counties. Public officials, many of them convinced that the public is acting on misinformation or misunderstanding, call it the NIMBY (Not In My Back Yard) Syndrome.

"The biggest problem is the lack of understanding," says Linda Little, executive director of the Governor's Waste Management Board, the state board charged with planning and administering a safe system of hazardous and radioactive waste disposal.<sup>6</sup> "It's hard to understand why people oppose a facility that would take something that is hazardous and make it into something that is less hazardous or not hazardous," says Little.

But environmentalists argue that citizen concerns are well-founded. "The public might be more

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willing to accept a hazardous waste treatment facility if they read in the newspapers about polluters being fined, and they saw that everything was being done by industry to treat waste on-site," says William Holman, lobbyist for the N.C. Chapter of the Sierra Club and the Conservation Council of North Carolina. "Instead they see the state bending over backwards to help some polluter. They see an abandoned dump sitting there and not being paid attention to."

So after a decade of grappling with the hazardous waste disposal problem, citizens and state officials have reached an impasse. As a result, state government has begun trying to exercise its statutory authority to site and construct treatment facilities. The Hazardous Waste Treatment Commission<sup>7</sup>—an appointed body—is searching for a large disposal site for North Carolina's first comprehensive *hazardous (chemical) waste treatment facility*. Meanwhile the *Low-Level Radioactive Waste Management Authority*<sup>8</sup> has been given the job of selecting a regional site for a repository for the Southeast by 1990. And the federal government is looking for one or two national *high-level radioactive waste* repositories, and for a time considered sites in North Carolina. Three different kinds of sites for three kinds of potentially dangerous wastes—two of them, and possibly all three—located in North Carolina.

How did we arrive at this juncture? Where do we go from here?

## A Major Hazardous Chemical Waste Producer

**B**y any measure, North Carolina produces and handles an enormous quantity of hazardous waste each year, more than 2 billion pounds or about 325 pounds for every man, woman, and child in the state, although that sum has been going down steadily since 1983 (see Tables 2 and 3, pp. 85 and 86, for more). The state's 1986 waste totals include about 75 million pounds shipped here from out of state to be treated at state-permitted, commercial treatment plants, and 130 million pounds that are shipped to 27

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"Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you and the storms their energy, while cares will drop off like autumn leaves. As age comes on, one source of enjoyment after another is closed, but Nature's sources never fail."

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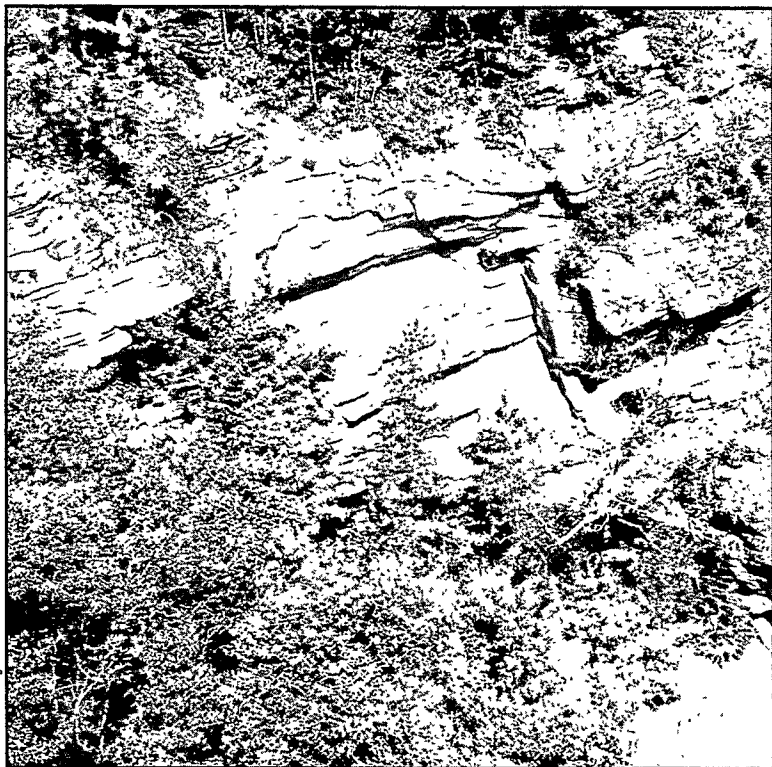
—John Muir from "Wilderness Essays"

other states for treatment.<sup>9</sup> The waste is produced by industrial plants, research facilities, and hospitals.

"Both hazardous wastes and radioactive wastes are necessary by-products of today's technology, a by-product that stems from our quality of life," says Russell B. Starkey Jr., manager of nuclear safety and environmental services at Carolina Power & Light Company in Raleigh. "Every state in the country has hospitals producing waste by-products. Every state has research facilities producing hazardous wastes. Every state has hospitals producing low-level radioactive wastes. But the benefits, on balance, far outweigh the disadvantages."

The majority of the state's hazardous waste (63 percent, or about 1.26 billion pounds) is produced at one facility, Sandoz Chemicals Corp.'s textile dye facility in Mecklenburg County. Most of Sandoz Chemicals' hazardous waste (99.9 percent) is actually wastewater, classed as hazardous only because of its acid content. The wastewater is treated and neutralized at the plant. That process destroys nearly 63 percent of all the hazardous waste produced in North Carolina. Sandoz has spent more than \$10 million on environmental improvements in recent years, and has reduced its own hazardous waste by 75 percent since 1981.

In fact, about 90 percent of North Carolina's hazardous waste is treated right where it is produced.



toxic waste is any poison that can be harmful to health, such as chemicals like pesticides and herbicides or heavy metals. Exposure to unsafe levels of any hazardous material—waste or otherwise—can result in a variety of health problems ranging from coughing and sneezing to cancer and birth defects. Some of these hazards exist in the home and the workplace—paint remover fumes, gasoline, fingernail polish remover, and the like. The list of hazardous waste materials runs from arsenic to the residue from printer's ink, such as used in this magazine, to spent pickle liquor—not from the state's eastern pickle producers, but a material used to clean metals.

The regulatory definition of hazardous waste does *not* refer to radioactive wastes, a

distinction not widely understood, state officials say. While radioactive wastes can be highly hazardous or toxic, federal and state laws have established separate definitions for hazardous wastes and for radioactive wastes. See Table 1, p. 84, for more.

Still, 22 million pounds are transported to small local facilities and another 130 million pounds are shipped out of state each year.<sup>10</sup> These figures do not take into account the number of companies that produce less than 220 pounds of hazardous waste each month. Those companies are not required to report their hazardous waste production to state authorities. Nor do the statistics measure the amount of waste that individual households contribute to the problem. Every year, a typical community of 20,000 uses about 100,000 pounds of home products that result in hazardous waste (hair spray, cleaning fluid, glue, nail polish, and the like). That same community will also use 1,000 pounds of pesticides and 3,000 gallons of automotive and paint products.<sup>11</sup> As soon as any of those products are discarded, they become hazardous wastes. State and industry officials say this is a major problem, yet these wastes are largely unregulated.

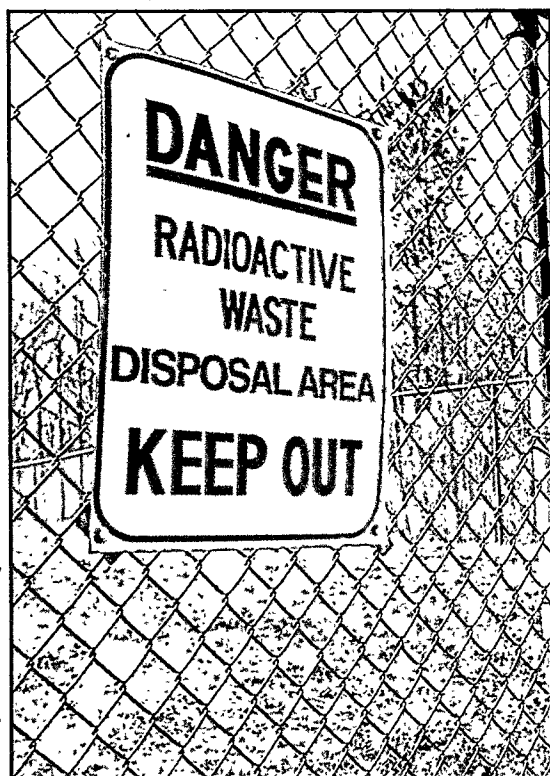
Years ago, the common way to get rid of hazardous waste was to bury it in the ground. But Love Canal—where the leakage of chemical wastes in an unmarked New York dump was linked to birth deformities—and citizen opposition to landfills changed their minds. Thanks to federal and state legislation, North Carolina officials have been urging business and industry to prevent, recycle, detoxify, and reduce their hazardous wastes. Landfills are now considered the option of last resort—suitable only for wastes that have been treated to the maximum extent possible.

What are hazardous wastes? By definition, hazardous wastes are substances that fall into one of four categories: ignitable, corrosive, reactive, or toxic. Ignitable waste is highly flammable, such as gasoline, paint thinner, or nail polish remover. Corrosive substances, such as alkaline cleaner or battery acid, can eat through human tissue. Reactive products, such as cyanide or chlorine, can cause an explosion or produce fumes when mixed with air or water. And

State officials also once hoped the job of treating and disposing of most of our hazardous wastes could be borne by the private sector. While many industries did treat and dispose of their wastes properly and voluntarily, others did not. In 1983, the state launched an innovative program to encourage industries to take steps to prevent pollution and thereby reduce hazardous waste. The "Pollution Prevention Pays" program caught on, and case studies of 55 North Carolina industries have shown they are saving more than \$12 million a year in operating and

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*Inactive radioactive waste disposal site in Duke Forest.*

disposal costs by reducing, recycling, or preventing wastes before they become pollutants.<sup>12</sup> Instead of waiting to deal with such wastes after they've been produced, the program aims at first preventing waste production, and recycling into usable material the by-products that are produced. The program has become popular with industry not only because it helps solve industrial waste problems, but also because savings show up on corporate income statements.

The program is now being used by the U.S. Environmental Protection Agency as a model for other states. Roger N. Schechter, director of the program, is on loan to the EPA to run the national program. Says Schechter, "North Carolina is recognized as the leading state in the nation in implementing a multi-media waste reduction program"—aimed at reducing pollution in air, in water, and in hazardous wastes.

"We've come a long way," says Holman, the environmental lobbyist. "The debate has shifted from disposal of hazardous waste to prevention and treatment."

Despite the success of the Pollution Prevention

Pays program and the steady reduction in the volume of hazardous waste generated annually, North Carolina's hazardous waste problem has not disappeared. Industries continue to generate two billion pounds of waste annually as a by-product of the manufacturing process. And private sector efforts to provide commercial treatment facilities have largely failed. For example, consider the fate of two commercial hazardous waste incinerators that have been located in the state: One, in Mitchell County, voluntarily closed down in 1986 following citizen complaints about the operation. The other, a county-owned incinerator in Caldwell County, has drawn the state's attention following allegations that employees suffered health problems because of exposure to hazardous chemicals at the plant. In November 1987, the county Board of Commissioners voted to seek a new operator for the plant, the state's only commercially operated chemical waste incinerator, but later decided to shut it down.<sup>13</sup>

The most recent attempt to locate a major treatment facility in North Carolina was made by GSX Services, Inc. The company has been trying to establish a major hazardous waste treatment facility that could discharge up to 500 million gallons of treated wastewater daily in rural Scotland County. The plant would treat wastes from North Carolina and six other states. Citizens opposing the plant fear it would pollute the adjacent Lumber River and drinking water supplies, and lower property values.

Local opposition to the proposed GSX plant was so strong that the 1987 General Assembly enacted special legislation that may effectively halt the company's plans.<sup>14</sup> Sponsored by Sen. J. Richard Conder (D-Richmond), the bill requires all commercial hazardous waste treatment facilities that discharge upstream from drinking water supplies to dilute the discharge wastewater by a factor of at least 1000 gallons of water for every gallon of treated waste. If that requirement holds up against legal challenges, GSX will have to find another site or sharply curtail its plans, because the proposed site near Laurinburg would not be able to maintain the 1000:1 dilution ratio the law requires.

The anti-GSX legislation was opposed by both Gov. James G. Martin and several of the General Assembly's leading environmentalists. One of the criticisms of the GSX legislation was that it might lead the EPA to remove the state's authority to run its own hazardous waste treatment programs. Sure enough, the EPA threatened in the fall to revoke that authority, and Gov. Jim Martin briefly toyed with the idea of calling a special legislative session to

amend the law. But when legislative leaders balked, Martin dropped that idea and said he would rely on Attorney General Lacy Thornburg's advice that if the EPA took action to revoke the state's regulatory authority, the law would automatically be repealed because of a special proviso in the anti-GSX law. That may have the effect of reviving the GSX facility plans.

Under a federally imposed guideline, North Carolina is to have an adequate waste treatment facility in place by 1989—a deadline that may be impossible to meet. The body charged with choosing a facility site is the Hazardous Waste Treatment Commission, a panel of nine members appointed by the governor, lieutenant governor and speaker of the House.

The Commission's goal was to find by October 1, 1987 a suitable site for a facility that will treat up to 90 million pounds of hazardous waste annually, but it was unable to do so, and now aims to pick a site by June 1988. Plans call for establishment of hazardous waste incinerators and a treatment plant at one location. Under state law, a hazardous waste landfill cannot be established until the treatment plant is in place, and even then the landfill must be at least 25 miles from the treatment facility.

Plans call for a hazardous waste facility with a series of liquid treatment tanks and a pair of incinerators. The liquid treatment facility would process liquids that are acidic, corrosive, or contain metal. The process would involve adding liquids that could neutralize the acids and corrosives and precipitate (cause particles to settle) the dissolved metals. The incinerators would burn solvents and other flammable liquids such as waste jet fuel and cleaning substances at a temperature of about 2,200 degrees Fahrenheit, a temperature that will reduce the chemicals to steam and carbon dioxide. Ashes from the furnaces would be solidified, sealed in a drum, and then buried in a hazardous waste landfill.

As one might expect, the site selection process met with strong public opposition, although in the early stages there was relatively little public comment. The commission first elicited from county officials statewide a list of more than 500 sites in 51 counties that might be suitable for the state's first comprehensive hazardous waste treatment facility. The commission then scheduled regional public meetings in each county where sites were under serious consideration. Gradually, more and more citizens began to turn out for the meetings, and in September 1987, public meetings were packed with citizens and local officials overwhelmingly opposed



Carolina Power and Light Company

*Low-level radioactive waste being packed for shipment at CP&L's Brunswick Plant.*

to the commission's plans. The tone, state officials say, became tense in October when the commission narrowed its choices to sites in Rowan and Davidson counties—the latter a last-minute candidate—and in November the Hazardous Waste Treatment Commission reversed itself and began the process anew.

One dramatic indication of the public's opposition to construction of such a facility came on October 25, 1987, when the Hazardous Waste Treatment Commission held a public meeting at Lexington High School to hear from citizens. Local residents filled the school's gymnasium, spilled over into the school cafeteria, then filled the 6,000-seat football stadium, and sprawled over a grassy bank to listen to opponents via loudspeaker. In all, police estimated, more than 15,000 residents—a tenth of the county's population—turned out to express their opposition.

Why the commission failed to pick a site by the original deadline has been the subject of some debate. (See sidebar on page 89 for more). Commission members point the finger at politicians and a lack of public education about the real versus the perceived risk of such facilities, while others say the state's businesses were not sufficiently supportive of

**Table 1. A Guide to Hazardous and Radioactive Materials**

Type of Material	Definition	Source
<b>A. Hazardous Materials and Wastes</b>	Often used erroneously to refer to both hazardous and nuclear wastes, this term applies to the following four broad categories of chemical wastes:	
1. Ignitables	Highly flammable materials including such items as gasoline, paint thinner, nail polish remover and motor oil	Petroleum processors and dealers Paint products manufacturers Chemical companies Furniture companies
2. Corrosives	Corrosive substances such as battery acid or alkaline cleaners, which can eat the skin or dissolve tissue	Battery manufacturers Chemical companies Microelectronics companies
3. Reactives	Chemicals such as cyanide or chlorine, which can cause an explosion or harmful fumes when mixed with air or water	Chemical companies Munitions manufacturers
4. Toxics	Poisonous materials, such as pesticides or herbicides, or other forms of chemicals harmful to animal or plant life	Chemical companies Lawn products manufacturers Electronics insulators Dry cleaners
<b>B. Radioactive Materials and Wastes</b>	These materials, which certainly can be dangerous, are not referred to as "hazardous" wastes. And although radiation can be "toxic," radioactive wastes generally are regarded as a different kind of potentially harmful waste:	
1. Low-Level Nuclear Wastes	Moderately radioactive trash from nuclear power plants, hospitals, and research institutions, such as papers, uniforms, filters, and other disposal items. Individual states are responsible for the disposal of these items, which can be stored in a low-level waste repository, or incinerated in low-level radioactive waste incinerators	Nuclear power plants Hospitals Medical clinics Research organizations
2. High-Level Nuclear Wastes	Highly radioactive wastes, constituting a much greater threat to life than low-level nuclear wastes, left over from spent nuclear power plant fuel or nuclear-powered military vessels. The federal government is responsible for disposing of high-level wastes.	Nuclear power plants Military vessels Arms plants

Source: N.C. Center for Public Policy Research

the commission's efforts. Still others say there was not enough public participation earlier in the process, and that the state must mount a massive education plan and offer incentives to counties to alleviate some of their objections to being chosen for a site. Governor's Waste Management Board Director Linda Little says she encouraged the Hazardous Waste Treatment Commission to undertake more of an education effort, and says she has repeatedly sought more appropriations from the General Assembly to finance such efforts. "The Board has made an effort on public education, but I'd be the first to say that we haven't been able to get enough resources to do the job that we need to be doing," says Little.

Through the fall, the Commission was still seeking a location for the facility, and opponents were threatening court action to forestall creation of the facility. Meanwhile, North Carolina still has no comprehensive hazardous waste treatment center, and it may take years before it does. Most of the public opposition to the facility was based on where it might be located, and relatively few of the objections were based on what technology would be involved, notes Professor Richard Andrews of the Institute for Environmental Studies at UNC-Chapel Hill. "There are lots of questions [besides where to put them] that ought to be acknowledged on hazardous waste treatment plants," says Andrews.

Two notable pieces of legislation have been

adopted in recent years to deal with the problems of hazardous materials and inactive hazardous waste sites. In 1985, the General Assembly adopted the Hazardous Chemicals Right-to-Know Act, which enables any citizen to find out what sort of chemical materials or wastes are used by a particular industrial plant.<sup>15</sup> The law also requires businesses to notify the local fire chief if they have more than 55 gallons or 500 pounds of a hazardous material on the premises.

And the 1987 General Assembly adopted an Inactive Hazardous Waste Sites Cleanup Act—some call it the Orphan Dumps Act—to clean up inactive and sometimes abandoned sites. The same bill set up a Carolina Clean Drinking Water Fund—a state-level Superfund—to clean up abandoned sites and to protect drinking water.<sup>16</sup> This bill, sought since 1983 by environmentalists, requires the responsible parties to clean up their abandoned hazardous waste sites. Federal funds help clean up the worst sites in the country, but only nine of the more than 700 abandoned sites in North Carolina qualify for the federal "Superfund" expenditures. The N.C. legislation requires state officials to identify, inventory, and set priorities for cleaning up the abandoned sites. Owners of those properties are given an incentive to voluntarily clean up these sites; those who volunteer can limit their liability to \$3 million for the cost of cleaning up such sites.

—continued on page 88

**Table 2. Trends in Hazardous Waste Management**

	1981	1982	1983	1984	1985	1986	Change from 1985 to 1986	
							Number	Percent
** Number of Generators	806	618	618	610	700	655	-45	-6.4
Number of Treaters, Storers, or Disposers	323	157	111	89	77	78	+1	+1.3
* Total Generation in billions of pounds	1.8	6.2	7.3	5.8	2.6	2.0	.6	-20.58
Shipped to other states (in millions of pounds)	113.5	77.0	113.9	134.9	141.2	130.7	-10.5	-7.4
Shipped from out-of-state to N.C. (in millions of pounds)	3.3	15.8	27.2	57.4	82.0	75.4	-6.6	-8.1

\* It is difficult to compare waste generation from year to year because wastewater reporting and the definition for hazardous waste have changed some from year to year. These figures also do not include waste from 1,864 small generators.

\*\* These figures are as of Dec. 31, 1986.

Source: Governor's Waste Management Board



**Table 3. Amount of Hazardous Waste by County (1986)**

<b>County</b>	<b>Number of Generators</b>	<b>Amount of Waste Generated in Pounds</b>	<b>Number of Treaters, Storers, or Disposers</b>	<b>Amount of Waste Handled* in Pounds</b>
Alamance	6	406,078	-	40,965
Alexander	2	109,481	-	8,058
Anson	2	40,909	-	200
Ashe	1	30,450	-	917
Beaufort	6	286,480	-	6,655
Bladen	2	5,034,762	2	205,802
Brunswick	5	402,380	2	147,839
Buncombe	21	3,838,986	3	1,666,028
Burke	13	3,004,999	-	79,432
Cabarrus	9	4,215,736	3	24,200
Caldwell	23	3,221,647	3	22,871,461
Carteret	1	49,178	-	49
Catawba	32	23,286,523	1	20,164,241
Chatham	1	521,455	1	30,295
Cherokee	4	211,587	1	16,412
Chowan	2	40,645	1	1,320
Cleveland	7	622,123	-	73,352
Columbus	4	257,435	1	108,173
Craven	7	3,048,880	1	569,438
Cumberland	10	2,527,586	1	350,383
Dare	1	39,350	-	39,350
Davidson	30	2,603,253	2	577,347
Davie	4	500,585	1	13,130
Duplin	1	82,000	-	40,000
Durham	19	114,820,774	3	113,189,982
Edgecombe	5	324,125	-	16,212
Forsyth	28	29,524,291	3	35,777,040
Franklin	1	116,706	-	715
Gaston	19	44,499,012	5	37,128,480
Graham	1	197,720	-	18,160
Granville	5	1,487,370	-	96,096
Guilford	59	9,375,592	6	10,381,229
Halifax	4	59,250	-	4,740
Harnett	2	602,831	-	12,519
Haywood	1	112,293	-	9,190
Henderson	7	785,092	-	49,755
Hertford	1	800,640	-	273,510
Hoke	1	530,001	-	58,800
Iredell	12	29,917,166	1	27,898,765
Jackson	1	106,963	-	7,315
Johnston	13	6,633,052	1	5,553,890
Lee	9	208,051,324	2	202,178,053
Lenoir	5	342,344	2	59,986

**Table 3. Amount of Hazardous Waste by County (1986), *continued***

County	Number of Generators	Amount of Waste Generated in Pounds	Number of Treaters, Storers, or Disposers	Amount of Waste Handled* in Pounds
Lincoln	1	103,916	-	13,674
McDowell	4	143,3168	-	7,108
Martin	3	42,780	-	243,102
Mecklenburg	88	1,293,133,851	8	1,280,224,671
Mitchell	2	271,292	1	2,852,555
Montgomery	1	5,264	-	320
Moore	1	3,502,810	-	2,759,540
Nash	11	668,551	1	307,331
New Hanover	15	5,257,345	1	2,557,905
Northampton	2	-	-	-
Onslow	4	220,147	1	41,238
Orange	2	282,921	-	15,817
Pasquotank	2	114,496	1	1,223,209
Pender	1	190	-	54
Person	3	294,607	-	22,322
Pitt	8	5,169,315	1	3,090,388
Randolph	8	3,000,006	-	20,553
Richmond	2	42,068	-	1,275
Robeson	6	253,877	1	597,037
Rockingham	6	6,420,257	1	9,644,968
Rowan	8	1,456,319	1	257,275
Rutherford	8	7,384,683	-	174,042
Sampson	3	1,026,956	-	2,200
Scotland	5	363,088	-	22,900
Stanly	4	21,332,450	1	83,247,029
Stokes	1	129,000	-	2,450
Surry	4	170,538,146	-	240,820,461
Swain	1	311,150	-	-
Transylvania	3	185,964	1	73,190
Union	9	4,193,117	-	83,044
Wake	30	11,908,278	10	6,384,193
Watauga	1	38,800	-	1,750
Wayne	7	317,572	1	3,050
Wilkes	6	408,150	-	3,050
Wilson	5	181,449	-	4,041
Yadkin	2	38,975	1	2,400
Yancey	1	180,587	-	20,600
<b>Total*</b>	<b>655 **</b>	<b>2,041,590,599</b>	<b>78 **</b>	<b>2,114,510,785</b>

\* Includes Treatment, Disposal and Storage by Treaters, Storers, and Disposers (TSD's) as of Dec. 31, 1986; and 90-day Storage by Non-TSD's as of Dec. 31, 1986.

\*\* Number of facilities in the North Carolina Hazardous Waste System as of Dec. 31, 1986.

Note: Not every county produces measurable hazardous waste.

Source: Solid Waste Management Section, N.C. Department of Human Resources

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"This we know.  
 The earth does not belong  
 to man; man belongs  
 to the earth ...  
 All things are connected,  
 like the blood which  
 unites one family ...  
 Man did not weave the web  
 of life; he is merely a strand  
 in it. Whatever he does  
 to the web, he does  
 to himself."

—Chief Seattle, 1854  
*Sequamish Tribe,  
 Washington Territory*

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## The Low-Level Radioactive Waste Question: Low Level, High Anxiety

Disposing of the state's low-level radioactive waste has been easier than managing its hazardous chemical waste. North Carolina generated 102,073 cubic feet of low-level radioactive waste in 1985 and 82,936 square feet in 1986,<sup>17</sup> clear evidence that efforts to reduce low-level waste are working. A majority of North Carolina's low-level waste (90.3 percent by volume, but 99.6 percent by radioactivity, according to state estimates) comes from three existing nuclear power facilities (in Wake, Brunswick and Mecklenburg counties) and the General Electric nuclear fuel manufacturing plant in Wilmington. The rest is produced by industrial, governmental, academic, and medical research facilities, and hospitals where radioactive materials are used for diagnosis and treatment.

This low-level waste isn't nearly as harmful as highly radioactive, spent nuclear fuel, but exposure to it could mean an increased risk of cancer and birth defects. Low-level wastes decrease in strength over a period of years, but must be disposed of carefully to minimize the risk of contamination.

So far, only one company has tried to locate a commercial low-level radioactive waste treatment facility in North Carolina. In 1984, U.S. Ecology, Inc. applied for the necessary state permits to build a low-level radioactive waste incinerator in Bladen County. More than 20 local government agencies and organizations within a 50-mile radius of Bladen County opposed the site, and two years later, the state Division of Environmental Management denied U.S. Ecology the required air quality permit, based on the company's lack of experience in incinerating low-level radioactive waste and its "history of non-compliance with environmental laws."<sup>18</sup>

A month later, the state Radiation Protection Section notified U.S. Ecology that it intended to deny the company's application for a radioactive material license on the basis that its other low-level radioactive waste facilities had not been operated properly and because of a lack of qualified personnel. The company eventually withdrew all of its permit applications.

North Carolina has been sending most of its low-level waste to a state-licensed facility in Barnwell, S.C., operated by ChemNuclear, Inc. The state of South Carolina plans to close the facility by 1992, despite ChemNuclear's objections, forcing officials in North Carolina and seven surrounding states to discuss and to create in 1983 the Southeast Interstate Low-Level Radioactive Waste Management Compact. That group, known as the Southeast Regional Compact for short, has agreed to take turns hosting a repository for the region's low-level waste.<sup>19</sup>

Because it is one of the region's largest producers of low-level waste, its location, and several other factors, North Carolina was selected to be the next site, a decision that aroused many environmentalists. During the 1987 General Assembly, some House members objected to that selection and proposed legislation withdrawing from the compact, but that move was derailed and North Carolina remains a member of the compact. Under conditions of the legislation setting up the state Low-Level Radioactive Waste Management Authority, North Carolina will dispose of up to 32 million cubic feet (current projections put the total at probably 12 million cubic feet) of the region's low-level radioactive waste for the next 20 years. One important concession to compact opponents was made, however.

If the other seven member states do not adopt an agreement to limit the possibility of their withdrawal from the Southeast Compact, North Carolina will withdraw.

Many environmentalists oppose the compact agreement, arguing that North Carolina would be better off managing its own waste forever than the entire region's waste for 20 years. "At its current rate [of waste generation] it would take North Carolina over 300 years to produce 32 million cubic feet

of low-level radioactive waste," says Marion Nichol, president of the Conservation Council of North Carolina.<sup>20</sup>

Moreover, says environmental lobbyist Holman, there are no guarantees that the other states will keep their end of the bargain and take their turn disposing of N.C. wastes. "We'd like to see the compact select the next host [state] now and have that state select a site as North Carolina selects its site, as a show of good faith," he says.

## *Hazardous Waste Issues: Balancing Real Fears With Real Facts*

by Truman L. Koehler Jr.

**N**orth Carolina's struggle to locate a site and begin construction of a hazardous waste treatment facility illustrates the gap between the rational and political sides of public policymaking. Our rational side led legislators to spend 15 years studying and choosing the most technologically sound solution to our hazardous waste problem. Our political side prevents us from moving with courage to deal effectively with public fear to implement the solution.

But the unfavorable political consequences of that rationality seem to be posing an insurmountable barrier to implementing the solution. If progress is to be made, if North Carolina is to clean up existing waste and prevent further build-up, it is critical that a distinction be recognized between the rational or technical solution and political issues. Those who deal with public policy, namely our politicians, must participate in the removal of the barrier. They, in turn, will need the substantial help of the Governor's Waste Management Board to understand and then explain the underlying problems and solutions to their constituents. Our citizens deserve to understand, for example, why their legislative representatives have chosen this solution and how they can balance real fears with real facts to truly guarantee the best possible quality of life.

Consider some of the facts behind the current policy on managing hazardous wastes. The N.C. General Assembly determined in 1973 that the re-

sponsibility for managing hazardous waste was too important to leave in the hands of private or local control. The Governor's Waste Management Board, set up in 1981, was authorized to preempt local decision-making and to guide state policies to encourage prevention, recycling, detoxification, and reduction of hazardous wastes.

After 10 years of study and lawmaking regarding handling of hazardous wastes, both the governor's office and the N.C. General Assembly agreed the state needed to go further and develop a statewide solution for treating waste. The resulting Hazardous Waste Study Commission, established in 1983, included three senators, three representatives, two environmentalists and two industry representatives. They spent 15 months studying the question of whether North Carolina needed a hazardous waste treatment facility. At its

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State officials and industries, however, argue that a central storage facility would be far easier to manage and oversee rather than on-site storage facilities. And they point out that numerous legal questions have been raised as to whether North Carolina could withdraw and prohibit other states from shipping and storing their low-level radioactive wastes here.

The 15-member Low-Level Radioactive Waste Management Authority has been appointed by the

governor, lieutenant governor and House speaker, and has begun the process for selecting the most suitable site for the regional repository. The law requires the authority to identify suitable areas by Dec. 1, 1988, to select two or three sites by Aug. 1, 1989 and to select the preferred location by Nov. 15, 1990. The facility is to be in operation by Dec. 31, 1992, and must comply with new strictures placed on low-level repositories by the 1987 legislature.<sup>21</sup> Those strictures include a ban on burial of low-level

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public meetings, the Commission heard from representatives of government, regulatory groups, academia, and from numerous professionals, chemists, experts, and engineers. At the end of those 15 months, the report concluded, "We need a facility."

During the public hearings, a number of people suggested that the need for a hazardous waste treatment facility might be eliminated by the serious application of two other approaches:

- Prevention of the creation of hazardous waste—the Pollution Prevention Pays approach; and

- On-site treatment of the hazardous material necessarily remaining, even after the best efforts of the state's Pollution Prevention Pays program have been used.

Pollution Prevention Pays is, of course, a sensible and logical approach. But its greatest impact is on small producers, who may need both technical assistance and capital to make changes that reduce the amount of hazardous waste they generate.

No large company competing on a national or international scale can afford to let raw materials or production by-products leave the plant as waste. Therefore, most companies large enough to have technical experts who understand the processes and enough capital to install the necessary equipment already are using a broader version of Pollution Prevention Pays. It is called just plain "Cost Reduction." They've learned that minimizing waste makes sense both for the environment and the bottom line. That's part of the reason hazardous waste generation in our state

dropped 73 percent between 1983 and 1986.

Still, the small producer—who may need technological help to find the best approach to recycling material and financial help to implement the change—is benefiting from the Pollution Prevention Pays program. This is worthwhile but slow going, and cannot eliminate the total problem. In fact, the amount of hazardous waste that was shipped out of state for treatment between 1983 and 1986 increased more than 13 percent, even though the total amount generated dropped 73 percent.

It is true that remaining wastes can be treated at the plant sites where they are created. The ultimate process is incineration. But even if every producer of waste wished to build an incinerator, and if the state permitted the facilities, environmental engineers have pointed out that the units would not operate efficiently because the quantity of wastes produced at most plants would be too small. Also, monitoring all of the treatment units would be too complex to be cost-effective. However, those who recommend on-site treatment of waste are right about one thing: In the proper scale, the technology exists.

The Hazardous Waste Study Commission determined that Pollution Prevention Pays cannot do the required job and that multiple incinerators are not feasible. The Commission recommended a state-mandated plant to treat hazardous wastes. In 1984, the General Assembly accepted the recommendation and created the Hazardous Waste Treatment Commission to find a site. The first appointments to the commission were made in early 1985.

Although the General Assembly hoped that private enterprise would enter the venture at an early stage, it soon became obvious to all who

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waste in shallow, unlined trenches; a requirement for special barriers; and a requirement that a facility must be at least seven feet above the water table.

State agencies are examining a number of models for a low-level radioactive waste storage facility. The options include—but are not limited to—above-ground storage vaults, below-ground vaults, the use of modular concrete cannisters, and sophisticated caps, liners, and water-migration detection systems. “This is not going to be an inexpen-

sive undertaking,” warns Edgar Miller, former community relations coordinator of the Governor’s Waste Management Board. Cost estimates just for setting up the facility range from \$20 million to \$35 million; the cost for full operation and monitoring for 100 years could amount to as much as \$434 million, estimates the U.S. Department of Energy.

State officials contend the public’s concerns about radioactive wastes are often based on a lack of information. They say even the nation’s worst

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have followed environmental affairs in this state that this was not likely to be. Numerous companies have invested in the design of waste treatment plants, only to run into roadblocks in the permitting procedure.

The Hazardous Waste Treatment Commission saw early in its deliberations that it would have to carry the project forward through selecting a site and gaining the permit to construct and operate the facility. But this also meant that the state must pay for the engineering up to the point required by the permitting procedure. So, the Commission sensibly started to work on two issues—selecting a site and designing the plant.

Using the experience of our state regulatory people and the experience of other states—with discussions held at public meetings—a detailed set of selection criteria regarding size, location, and environmental quality standards was adopted by the Commission. In addition to setting criteria, the Commission approved design specifications to protect health, safety, and the quality of air, land, and water near the site. According to design specifications, the facility would employ the most advanced and cost-effective treatment and environmental controls. It would have less impact on the local environment than the average municipal wastewater treatment facility or solid waste incinerator. At full capacity, fewer than 10 trucks per day would drive to and from the site.

Unfortunately, the process has become stalled. The very tool which would provide a means for North Carolina citizens to take action to control our quality of life is the one tool many citizens seem to find unacceptable.



**Truman L. Koehler Jr.**

So, how should we proceed?

Political issues of public policy can override purely rational, technological considerations. But the public policy will be sensible only if those involved have a clear understanding of the problem and the proposed solution.

The Hazardous Waste Treatment Commission is charged with implementing public policy, not assessing or defining that policy. With respect to understanding the problem, it is the Governor’s Waste Management Board that has responsibility for education. With respect to identifying and implementing an effective solution, it is our elected officials who carry the responsibility to set public policy.

It is only with help and guidance from these two groups that the Hazardous Waste Treatment Commission can proceed with the site selection process. We now need to get on with the mission.

nuclear accident at the Three Mile Island nuclear plant did not result in the loss of life or even severe injuries.

Dayne Brown, chief of the state's Radiation Protection Section, which oversees the regulation of all radioactive materials, says the state has been cautious in establishing regulations for a treatment or storage site. The state tries to project what would happen in the worst such cases, and develop programs to deal with that. "These regulations are designed to guarantee that the objective—protecting the public—is met even with the failure of part of a system," says Brown. "Because we are interested in erring on the side of safety, we overestimate everything."

Carolina Power & Light's Starkey believes that the public has "a phobic reaction" when such terms as hazardous and radioactive wastes are mentioned, and that a comprehensive education campaign by the state's public schools, industries, and government agencies is needed to educate the public on exactly what the risks are. "Based on what I know of the technology [on handling dangerous wastes], I don't believe there is any cause for unreasoned concern," says Starkey. "We are talking about minimal to low risk, as long as we go about handling these wastes correctly and carefully."

## High-Level Waste: A Federal Task with State Implications

Gov. James G. Martin seemed to be stricken with the NIMBY Syndrome himself not long ago when North Carolina became one of seven states being seriously considered for a proposed federal high-level nuclear waste repository; this would be the final resting ground for much of the highly-radioactive, spent nuclear fuel generated in the eastern United States. The first such facility would be sited in the western United States.

In the spring of 1986, when areas in western and eastern North Carolina appeared on the U.S. Department of Energy's tentative shopping list for the second of two planned repository sites, Governor Martin flew to Washington to register the state's protest. He argued that the sites were geologically unsuitable or too close to densely populated areas. Ironically, these were the same arguments North Carolina citizens and local officials had used to fight plans by the N.C. Hazardous Waste Treatment Commission to locate the state's first comprehensive hazardous waste treatment facility. The Governor, a former college professor of chemistry, was willing to accept a hazardous waste treatment facility and a low-level radioactive waste repository in North Carolina, based on the evident need and the



Sandoz Chemicals Corporation

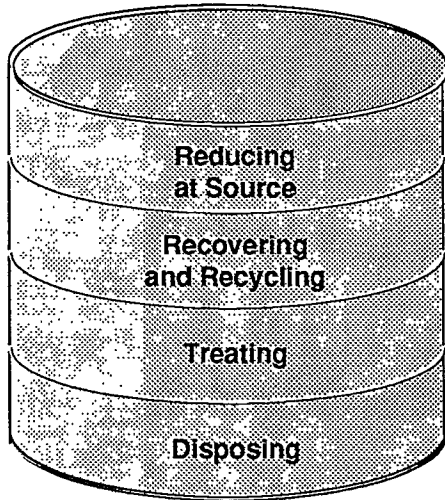
*Sandoz Chemicals Corporation effluent operators such as Carl Moore monitor and control the company's waste treatment facilities with the help of computer controlled equipment.*

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## Hierarchy of Waste Management Alternatives for Pollution Prevention Pays Program

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**Most Desirable**



**Least Desirable**

ability of the state to minimize risk. But he was not willing to accept a high-level site as well. A month later, U.S. Energy Secretary John Herrington indefinitely postponed the search for an eastern site, but in October 1987 the federal government resumed the hunt.

Congress changed the atmosphere enormously in December 1987 when it enacted legislation designating Nevada as the first host site for a high-level radioactive waste repository.<sup>22</sup> The legislation also halted the search for an eastern repository, which at least takes North Carolina out of the hunt for the foreseeable future. And the legislation also delayed plans for a Monitored Retrievable Storage (MRS) facility in eastern Tennessee, about 40 miles from the N.C. border. That temporary storage site would have meant an increase in the amount of nuclear waste shipped through North Carolina, most likely by truck on the heavily traveled I-85 and I-40 highway corridor. That route, often referred to as North Carolina's Main Street, would have been the primary corridor for high-level wastes because federal regulations declare a preference for interstate roads in the movement of these wastes<sup>23</sup> But if an MRS is constructed, a site in North Carolina is on the list—in Davie County.

So, for the time being, North Carolina is not likely to become the locus of treatment or storage facilities for all three types of dangerous wastes. But for many citizens, especially those who don't want wastes buried their backyards, figuratively or literally, the two other facilities—for hazardous wastes and for low-level radioactive wastes—will be quite enough. ☐☐

### FOOTNOTES

<sup>1</sup>*North Carolina Hazardous Waste (Generation, Storage, Treatment, Disposal), 1986 Annual Report*, Solid and Hazardous Waste Management Branch, Division of Health Services, Department of Human Resources, July 1987, p. 1.

<sup>2</sup>*Comprehensive Environmental Response and Compensation Liability Inventory System*, (otherwise known as the Superfund list), maintained by the U.S. Environmental Protection Agency pursuant to P.L. 96-510.

<sup>3</sup>P.L. 96-510, 94 Stat. 2767, 42 U.S.C. 9601 *et seq.*; and P.L. 99-499, 100 Stat. 1613.

<sup>4</sup>*North Carolina 1986 Low-Level Radioactive Waste Survey*, Radiation Protection Section, Division of Facility Services, Department of Human Resources, draft, November 1987, p. 1.

<sup>5</sup>Monte Basgall, "Deep pools at N.C. reactors shelter tons of nuclear waste," *The News and Observer of Raleigh*, May 11, 1987, p. A1.

<sup>6</sup>G.S. 143B-216.12 (authority for Governor's Waste Management Board).

<sup>7</sup>G.S. 143B-470.3 (authority for Hazardous Waste Treatment Commission).

<sup>8</sup>Chapter 850 (HB 35) of the 1987 Session Laws, now codified as G.S. 104G-5 (Low-Level Radioactive Waste Management Authority).

<sup>9</sup>*N.C. Hazardous Waste, 1986 Annual Report*, p. 9.

<sup>10</sup>*Ibid.*

<sup>11</sup>*Hazardous Household Products: A Guide to Safer Use and Disposal*, Triangle J Council of Governments, November 1985, p. 1.

<sup>12</sup>Tom Mather, "EPA enlists N.C. help in waste program," *The News and Observer of Raleigh*, Sept. 14, 1987, p. C1.

<sup>13</sup>Associated Press, "Caldwell board votes to keep incinerator," *The News and Observer of Raleigh*, Nov. 3, 1987, p. C3.

<sup>14</sup>Chapter 437 (SB 114) of the 1987 Session Laws, now codified as G.S. 130A-295.01.

<sup>15</sup>G.S. 95-18. See also Bill Finger, "N.C. Right-to-Know Law—New Information for the Public," *North Carolina Insight*, Vol. 9, No. 4, June 1987, p. 11.

<sup>16</sup>Chapter 574 (HB 134) of the 1987 Session Laws, now codified as G.S. 130A-310.

<sup>17</sup>*North Carolina 1986 Low-Level Radioactive Waste Survey*, p. 1.

<sup>18</sup>*1986 Annual Report, Governor's Waste Management Board*, p. 36.

<sup>19</sup>P.L. 96-573, federal Low-Level Radioactive Waste Policy Act; see also N.C. G.S. 104F, Southeast Interstate Low-Level Radioactive Waste Management Compact.

<sup>20</sup>Marion Nichol, "N.C. Should Manage Its Own Radioactive Waste," *N.C. Forum* news release, June 1987, p. 3.

<sup>21</sup>Chapter 633 (SB 48) of the 1987 Session Laws, now codified as G.S. 104E-5.

<sup>22</sup>P.L. 100-203.

<sup>23</sup>49 CFR 177.825b.