NORTH CAROLINA

SOLID WASTE MANAGEMENT

ANNUAL REPORT

JULY 1,1992 - JUNE 30,1993

State of North Carolina
James B. Hunt,Jr.,Governor

Department of Environment, Health, and Natural Resources
Jonathan B.Howes,Secretary

TABLE OF CONTENTS

APPENDICES:

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The management of solid waste is a major issue facing North Carolina and the rest of the nation. The North Carolina General Assembly adopted SB (Senate Bill) 111, an "Act to Improve the Management of Solid Waste," in 1989 and later amended it. The act sets goals and policies, establishes new programs, bans certain materials from landfills, and mandates planning and reporting requirements.

The U.S. Environmental Protection Agency (EPA) also addressed the solid waste issue through its "Subtitle D regulations," which are part of the Resource Conservation and Recovery Act (RCRA).
These new federal regulations require environmental protection standards for municipal solid waste landfills (those that receive residential solid waste). The rules established siting, design, operation, closure and post closure criteria for municipal solid waste landfills. Financial assurance requirements also are detailed. North Carolina completed its own set of municipal solid waste landfill facility rules and received "Approved State" status from EPA on October 7, 1993.

This report meets the reporting requirements of G.S. 130A-309 which requires the state to prepare a Solid Waste Management Annual Report on the status of solid waste management in North Carolina. Data for this report come from sanitary landfill and incinerator reports completed by local governments and private municipal solid waste facilities for the period July 1, 1992 to June 30, 1993 and submitted to the state during December 1993. Data for recycling and other waste management activities come from the Solid Waste Management Annual Reports submitted by North Carolina's 100 counties and 520 municipalities. Other data and information are based on on-going agency program activities in the Solid Waste Section, Division of Solid Waste Management or the Office of Waste Reduction. Data as recent as April 1994 are included.

The following statements include some key findings of this report:

In FY 1992-93, North Carolina's municipal disposal facilities consisted of 107 public landfills, six private landfills, two scrap tire monofills and three incinerators which received 6,794,219 tons (74 percent) of the reported total of 9,240,462 tons of solid waste disposed in facilities located in North Carolina.

The disposal rate for North Carolina citizens was 1.01 ton per person per year (per capita) during FY 1992-93.

Sixty local governments consisting of 33 counties and 46 municipalities (representing 12 percent of the 620 potential local governments) indicated that they had an operating source reduction program in FY 1992-93.

There were 575 documented local government recycling programs (up 19 percent from the previous year), which reported recycling 616,369 tons of materials from July 1, 1992 to June 30, 1993 for an increase of 43 percent over FY 1991-92.

Seventy-seven counties (77 percent of all counties) and 277 municipalities (53 percent of all municipalities) reported having in-house recycling programs.

More than one-third of all North Carolina municipalities (189) offered curbside collection programs to their residents in FY 1992-93, which represents a dramatic 59 percent increase over FY 1991-92.

As of FY 1992-93, at least 17 counties and four municipalites passed ordinances restricting disposal of one or more materials. Additionally, only 10 local governments indicated they passed source reduction ordinances, policies or resolutions - representing .02 percent of the potential local governments.

In FY 1992-93, seven local governments hosted nine household hazardous waste (HHW) collection days.

Of North Carolina's special wastes (lead-acid batteries, scrap tires, white goods, used oil, and medical waste), scrap tires continue to be an especially difficult problem. North Carolina generated approximately 6.8 million scrap tires or 1.0 per capita in FY 1992-93. Approximately 29 percent of the scrap tires generated in North Carolina were diverted from landfills disposal in FY 1992-93, compared to only 15 percent for the previous fiscal year.

In FY 1992-93, eight solid waste incinerators were permitted to operate in North Carolina. Six of these are privately-owned facilities - four medical waste incinerators and two industrial waste incinerators. The remaining two facilities are MSW incinerators owned by local governments.

During FY 1992-93, there were six lined municipal solid waste landfills in operation, managing 12.5 percent of the state's residential and commercial waste stream. As of April 1994, there are 17 lined landfills operating in North Carolina and it is estimated that 20 lined facilities will receive approximately 40 percent of the state's municipal solid waste total for FY 1994-95.

Communities with relatively small waste quantities are turning to publicly owned regional or privately owned landfills as methods to provide cost-effective disposal services.

As of April 1994, more than 90 percent of North Carolina's unlined landfills have shown evidence of some degradation of ground water quality in their detection monitoring wells.

The Field Operations Branch of the Solid Waste Section employs 12 waste management specialists, six environmental technicians, two environmental engineers and two supervisors to provide enforcement and compliance with the state's "Solid Waste Management Rules."

As of late April 1994, there are 66 MSW landfills, 31 industrial waste landfills, 150 land clearing and inert debris landfills, eight incinerators, 14 yard waste composting facilities, 11 mixed waste processing facilities, 35 transfer facilities, and 94 scrap tire collection sites permitted in North Carolina. Additionally, 225 septage sites are inspected quarterly and 351 septage haulers are inspected semiannually by waste management specialists.

Approximately 200 facilities are evaluated each year to assure compliance with the "Standards for Special Tax Treatment." These standards allow a business that purchases or constructs facilities or equipment used exclusively for recycling or resource recovery, special consideration regarding real and personal property tax, corporate state income tax, or franchise tax on domestic and foreign corporations.

The Septage Management Branch of the Solid Waste Section handles the proper disposal of septage, sewage solids, liquids, sludges of human or domestic origin removed from septic tanks, and material pumped from grease traps. The Septage Branch is currently responsible for permitting and monitoring 351 septage firms and 225 septage disposal sites statewide.

Since the yard waste facility regulations became effective in February 1991, more than 50 facilities have been permitted or have notified the Solid Waste Section of their operation. Approximately 331,823 tons of yard waste were managed by local governments statewide in FY 1992-93.

During FY 1992-93, a total of 64 local governments (nine counties = 9 percent, and 55 municipalities = 11 percent) operated compost programs.

The Office of Waste Reduction administers the Solid Waste Management Trust Fund. Twenty-eight new grants were awarded in FY 1992-93 to help North Carolina reach its goal of a 40 percent reduction in the amount of solid waste disposed by the year 2001. For the first time, private sector funds were solicited and added to the trust fund to help increase available funding.

The data presented in this report represents the state's third annual assessment of North Carolina's solid waste practices. It allows counties and municipalities to compare their progress as well as motivates them to further examine and improve their solid waste management programs.

NORTH CAROLINA SOLID WASTE DISPOSAL

RECOMMENDATIONS

The following recommendations are proposed to advance the development of waste reduction programs and to help achieve state waste management goals and policies during this transition time.

The state should consider funding to supplement costs of local governments for developing and initiating comprehensive solid waste management plans.

The state should consider statewide landfill disposal bans of additional materials that have markets and opportunities for recycling.

The state should expedite development of regulations affecting local solid waste management plans and should provide technical assistance in developing a comprehensive waste management system.

The state should consider using source reduction programs for materials that can be eliminated from the waste stream.

The state should expand specific recycling and reuse programs for particular sectors of the community.

The state should consider a statewide disposal fee as an incentive to reduce the amount of material disposed and to subsidize comprehensive local government's solid waste management efforts.

The state should expand efforts to review the benefits of implementing additional programs affecting material currently being disposed in landfills.

The state should encourage more market development efforts to improve demand and financial incentives for recycling of materials.

The state, local governments, institutions and private enterprise should significantly increase efforts in source reduction, reuse, recycling and purchase of recycled material.

Better communication and increased planning activities by both state and local governments are critical to maximize resources and avoid duplication. Roles and responsibilities should be clearly defined and increased state and local funding should be provided for solid waste enforcement and education.

Innovative programs must be developed to halt any advantage of illegal disposal over approved practices.

CHAPTER ONE

SOLID WASTE DISPOSAL

State Progress Toward Waste Reduction Goal

In 1989, the General Assembly passed the "Act to Improve the Management of Solid Waste" (Senate Bill 111). This legislation established goals and policies, a waste management hierarchy, required planning and reporting, instituted landfill bans on certain materials and established new solid waste management programs. The act as amended in 1991 (House Bill 1109) set a goal for the state to achieve a 25 percent reduction of municipal solid waste (MSW) by June 30, 1993 and a 40 percent reduction by June 30, 2001.

North Carolina did not achieve the 25 percent solid waste reduction goal by the 1993 deadline. The amount of solid waste disposed in landfills and incinerators decreased only 6.4 percent. If the 25 percent goal had been achieved in FY 1992-93, approximately 1,500,000 tons of solid waste would have been diverted from the waste stream. Instead of the 6,890,819 tons that were disposed, the total would have been approximately 5,400,000 tons.

However, for the third consecutive year the state recorded a decrease in the amount of solid waste landfilled on a per capita basis. Much of the decrease can be attributed to recent changes in methods used to manage solid waste. These include: an increase in the number of landfills using tipping fees as well as an increase in fees charged; the separation of land clearing and inert debris (LCID) from disposal with general solid waste; the enactment of disposal bans on certain materials; the growing number of communities with source reduction and recycling programs; and an expansion of recycling efforts by business and industry.

Waste reduction is measured by comparing the base year disposal tonnage (FY 1991-92) to disposal tonnage in the current year. The base year amount was determined by adding the total amount of municipal solid waste disposed in landfills and incinerators to the amount of the waste managed through recycling, composting and mulching efforts of local governments.

These combined tonnage figures for FY 1991-92 were used to determine the base year numbers. Thus, 197,287 tons of recycled material and 237,250 tons of composted and mulched material were added to the 6,822,890 tons of solid waste disposed that year. This sum was divided by the population of North Carolina to determine the per capita managed rate of 1.08 tons for FY 1991-92. In FY 1992-93, the per capita disposal rate decreased to 1.01 tons or slightly more than one ton per person - a decrease of 6.4 percent. (Refer to TABLE 1-1 for a statewide summary of North Carolina MSW disposal.)

Solid waste management plans of local governments will indicate how comprehensive programs will help achieve the long range goal. The Solid Waste Section has begun development of the regulations to support the local planning effort.

These calculations show slow, but steady, progress toward the state's municipal solid waste reduction goal. The industrial waste managed by the 27 industrial landfill facilities was not included in the state's goal for waste reduction, nor in individual county calculations. State regulations for local solid waste management planning will determine how waste reduction goals will be addressed for industrial facilities.

TABLE 1-1: Statewide Summary of MSW Disposal

Population	Population	MSW Tons Disposed	MSW Tons Disposed	MSW Tons Disposed	MSW Tons Managed	Base Year Per Capita	Disposal Rate	% Waste Reduction	Progress Toward Goal
FY91-92	FY92-93	FY90-91	FY91-92	FY91-92	FY92-93	FY91-92	FY92-93	FY92-93	FY92-93
6,739,959	6,836,977	7,161,455	6,822,890	7,257,428	6,890,819	1.08	1.01	6.40%	25.60%

County Progress Toward Waste Reduction Goal

Although the total state waste reduction was 6.4 percent, many counties achieved much greater MSW reductions. Several counties made significant progress during the past year toward helping the state achieve the municipal solid waste reduction goal.

Alamance County, with a reduction of 22 percent and Craven County with a reduction of 21 percent, used aggressive recycling and other waste reduction programs. Yancey County, with 39 percent and Mitchell County with 27 percent reduction, have strong industrial programs. Transylvania County, with a reduction of 46 percent, has a strong recycling program and eliminated land clearing debris from the Transylvania County MSWLF. However, much of their progress may be due to artificially high estimates in FY 1991-92. Even though scales to weigh were required by law, many county landfills lacked scales in the base year, resulting in operators' overestimates of tons disposed.

As indicated above, not all the progress reported is the result of identifiable programs, but is due to high estimates of waste managed in FY 1991-92. Consequently, the more accurate FY 1992-93 information indicates a MSW disposal decrease. This is probably one of the major factors in the decreases reported by Alleghany, Avery, Jones, Montgomery, Rutherford, Moore, and Warren counties. Initiation of tipping fees in Montgomery and Rutherford counties may have contributed to their decrease in waste managed.

North Carolina solid waste law provides for the establishment of an earlier baseline year if a local government makes an official request to the state. Following submission of earlier dates, nine counties received approval for an alternative base year for managing solid waste. These nine counties are specifically detailed in a separate part of Appendix B and are designated with an asterisk.

The counties with alternative base years generally received additional credit in their progress toward achieving the state's goal. Several of these counties initiated early recycling programs, tipping fees, bans on cardboard or other programs to reduce waste. Alamance, Buncombe,

Catawba and Craven counties banned cardboard from their landfills. Alamance and Catawba counties also have extensive curbside recycling. Craven County has a "bag and tag" system where the disposal fee is based on volume. Durham, Forsyth and Wake counties have extensive curbside recycling programs and Wake County just initiated a ban on cardboard disposal at landfills.

Although the state's goal was to reduce solid waste disposed, 32 of 100 counties actually increased solid waste disposed. Where estimates were low, such as in Yadkin, Cherokee, Rockingham and Wilkes counties, the actual high scale-measured totals for the following year are misleading.

Another factor contributing to low MSW reduction reports was industrial sector expansion. In counties like Anson and Granville, new industries increased the amount of solid waste disposed. Haywood County's waste increased because Champion International, Inc. extensively renovated its physical facilities.

Other counties experienced one-time events that significantly increased their solid waste totals during FY 1992-93. Several counties, including Swain, landfilled waste from the "Blizzard of '93," which destroyed buildings and trees. Additionally, a furniture factory in Swain County was demolished. Hertford County had an increase in construction and residential waste as a result of land clearing and construction for the states's new juvenile home. Greene County had to estimate their FY 1991-92 tonnage totals because a computer virus destroyed their data. See Appendix C for county progress reports.

Municipal Solid Waste Disposal

Disposing of municipal solid waste in the "county landfill" was still the principal disposal method for solid waste in North Carolina in FY 1992-93. All but seven of the counties in the state had public sanitary landfills receiving MSW. These 107 public municipal solid waste landfills received nearly 86 percent of the 6,794,219 tons of MSW disposed in North Carolina. Six private landfills accepted this type of waste, while three incinerators (two are waste-to-energy facilities) and two scrap tire monofills managed the remaining municipal waste.

Under N.C. law, MSW includes waste generated from households, businesses, and commercial and industrial activities. Appendix A lists 107 public landfills, six private landfills, three MSW incinerators, two scrap tire monofills and 27 industrial landfills that completed and submitted Solid Waste Management Annual Report Forms to the state for the FY 1992-93 reporting period.

TABLE 1-2: Facility Solid Waste Disposal

No. of Facilities	Facility Type	Total Tons Received
107	PUBLIC LANDFILLS	5,845,440
6	PRIVATE LANDFILLS	811,174
2	SCRAP TIRE MONOFILLS	22,698
3	INCINERATORS*	114,907
118	TOTAL MSW DISPOSED	6,794,219
	OUT-OF-STATE DISPOSAL**	96,600
27	INDUSTRIAL LANDFILLS	2,349,643
145	FACILITIES REPORTED FY1992-93	9,240,462

*Adjusted downward by 50,586 tons of ash landfilled to avoid double counting of material disposed.
**Estimated

The seven counties without a MSW landfill were Camden, Chowan, Gates, Hyde, Mecklenburg, Mitchell, and Tyrrell. They used regional landfills located in other counties. Currently, facilities that take waste from more than one county are located in Dare, Cabarrus, Pamlico, Sampson, Montgomery, Beaufort, Forsyth, Harnett, Pasquotank, Perquimans, Washington, Scotland, and Yancey counties. Due in part to new regulations governing MSWLFs, many counties are closing their landfills and transferring waste to regional facilities. It is estimated that by the end of FY 1993-94, at least 40 counties will not have a MSW landfill. However, local governments retain the right to provide disposal service through the operation of transfer stations and contracts for disposal of waste previously disposed at the local government landfill.

In addition to the 6,794,219 tons of MSW disposed in landfills, 2,349,643 tons of industrial waste were disposed in 27 private industrial landfills serving specific industrial operations. Waste managed at these industrial landfills includes ash, asbestos and other process waste.

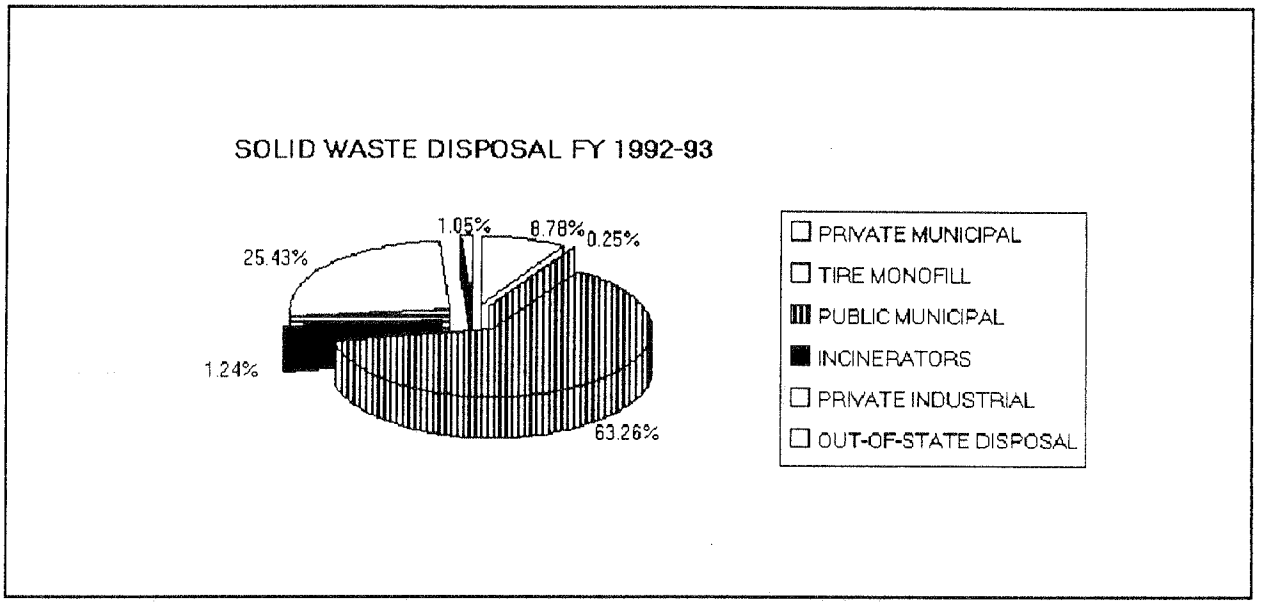
There are two scrap tire monofills, Central Carolina Recycling in Harnett County and US Tire Disposal in Cabarrus County. They disposed of 22,698 tons of scrap tires.

For the FY 1992-93 reporting period, North Carolina had three MSW incineration facilities: Northeast Waste-To-Energy in Mecklenburg County; New Hanover County Incinerator; and Town of Wrightsville Beach Incinerator, also in New Hanover County. These incinerators received 114,907 tons of waste and generated 50,586 tons of ash for FY 1992-93. Wrightsville Beach Incinerator stopped receiving waste in April 1993.

Large scale movement of waste out of North Carolina into neighboring states started in FY 1992-93. In the future, increased waste movement into and out of North Carolina will be a significant part of the solid waste management picture in the State. An estimated 87,300 tons

of waste from Mecklenburg County and an estimated 9,600 tons from Buncombe County were disposed in South Carolina. Relatively small amounts of waste from other western and southern counties also may have been sent to South Carolina.

FIGURE 1-1: Solid Waste Disposal FY 1992-93



The volume of municipal solid waste received by sanitary landfills ranged from a low of 402 tons per year to 493,963 tons per year. Of the 118 MSW facilities, 74 received less than the state average of 205 tons per day (based on 280 days/year), and 46 of those facilities received less than 100 tons per day. In FY 1992-93, 40 percent of the facilities receiving MSW received less waste than disposed in FY 1991-92.

Unlined Landfills

In FY 1992-93, a majority of the permitted sanitary landfills were unlined facilities where leachate has the potential to contaminate groundwater. More than 90 percent of the unlined landfills have shown evidence of some on-site degradation of ground water quality in the detection monitoring wells close to the waste boundaries within the landfill permitted areas.

Lined Landfills

Six sanitary landfill facilities operational in FY 1992-93, were equipped with liners and leachate collection systems to protect groundwater. This is the same number of lined facilities that

existed in FY 1991-92. The six lined landfills are Piedmont Landfill & Recycling Center in Forsyth County, New Hanover Secure Landfill, Charlotte Motor Speedway Landfill in Cabarrus County, Rowan County Landfill, Transylvania County Landfill, and Macon County Landfill.

Piedmont Landfill received waste from 40 counties in North Carolina, while Charlotte Motor Speedway Landfill received waste from two counties. All other lined landfill facilities received waste solely from the county in which they are located. Lined MSWLFs received a total of 845,752 tons of waste or 12.5 percent of the state's total during FY 1992-93.

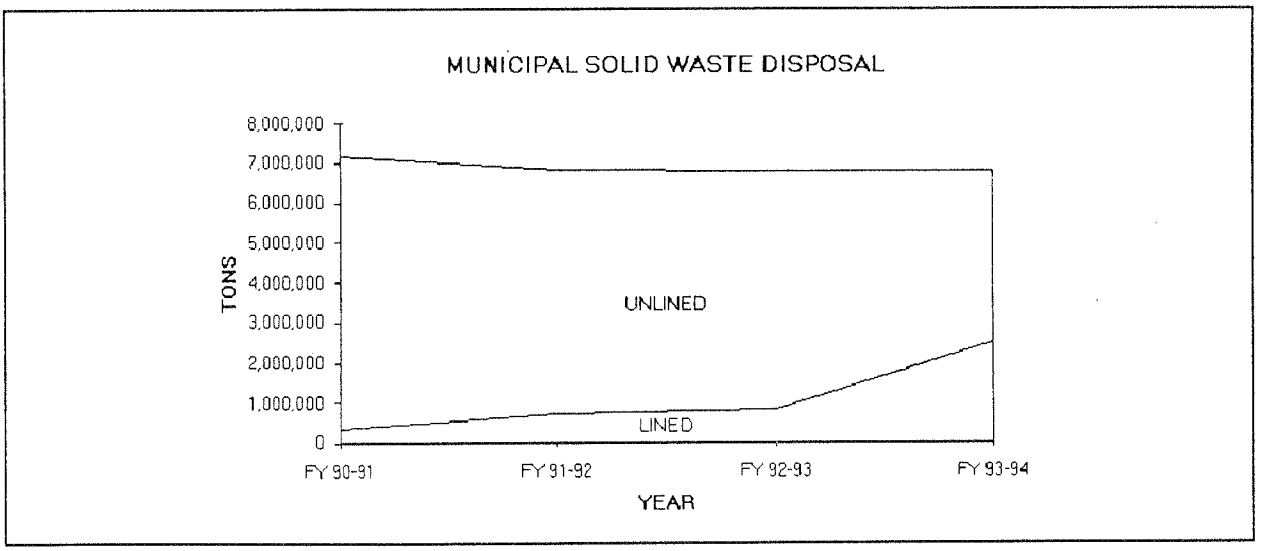
In FY 1993-94, an additional 11 lined landfills began receiving waste bringing the total number of lined facilities to 17. These 11 new landfills are City of High Point Landfill, Wilkes County Landfill, Madison County Landfill, Haywood County Landfill, Coastal Regional Solid Waste Management Authority Interim Landfill in Craven County, Ashe County Landfill, Iredell County Landfill, Lincoln County Landfill, Alamance County Landfill, Sampson County Regional Landfill, and East Carolina Environment Regional Landfill in Bertie County.

Three additional lined facilities, Davidson County Landfill, Orange County Landfill, and North Wake County Landfill, are under construction and expected to be operational within calendar year 1994.

It is estimated that these 20 lined facilities will receive approximately 40 percent of the state's municipal solid waste total for FY 1994-95. This is a 27.5 percent increase over FY 1991-92. All MSW must be disposed in lined landfills by January 1, 1998.

The state is on the way toward achieving the goal established in the State Solid Waste Plan of ensuring "that adequate capacity of environmentally protective solid waste disposal facilities exist to meet the needs of the people of North Carolina." The movement away from unlined landfills to the newer lined facilities is a significant accomplishment for protection of public health and the environment.

FIGURE 1-2: Muncipal Solid Waste Disposal



Disposal Rates

Each landfill and incineration facility reported the quantity of waste received by the county of origin. This data provided the basis for a per capita disposal rate, that was established by dividing the total waste disposed by the county's estimated population. The per capita disposal rate expressed as tons per year provides a basis for comparative analysis of waste disposed and measuring progress toward the state's waste reduction goal. (Refer to Appendix B for waste per capita data for all North Carolina counties. Appendix B does not include the waste disposed in the 27 industrial landfills.)

The three counties with the highest per capita disposal rate were Dare (2.16), Haywood (1.77) and Wilson (1.82). Dare County has a significant tourism industry that generates large amounts of seasonal waste. Haywood County disposed of large amounts of construction and demolition waste due to a Champion International, Inc. remodeling project. Wilson County did not have tipping fees during the reporting period.

Fifteen counties as shown in TABLE 1-3, generated slightly more than 51 percent of North Carolina's municipal solid waste. (Tonnages in TABLE 1-3 do not include the 27 industrial landfills.)

TABLE 1-3: Solid Waste Disposal by County FY 1992-93

County	Total Tonnage	Population July,1991	Waste Per Capita Disposal	% of Total (Cumulative)
MECKLENBURG	617,277	536,403	1.15	8.97
WAKE	542,427	459,544	1.18	16.85
GUILFORD	452,645	354,477	1.28	23.43
FORSYTH	286,079	269,678	1.06	27.59
CUMBERLAND	218,486	283,405	0.77	30.76
DURHAM	195,038	187,911	1.04	33.60
GASTON	163,093	176,874	0.92	35.97
ONSLOW	154,526	144,004	1.07	38.21
NEW HANOVER	151,076	127,928	1.18	40.41
BUNCOMBE	143,463	180,265	0.85	42.63
CATAWBA	136,463	121,418	1.12	44.61
ORANGE	125,767	99,674	1.26	46.44
IREDELL	124,813	96,865	1.29	48.25
DAVIDSON	122,371	132,259	0.93	50.03
WILSON	121,443	66,868	1.82	51.79

Tipping Fees

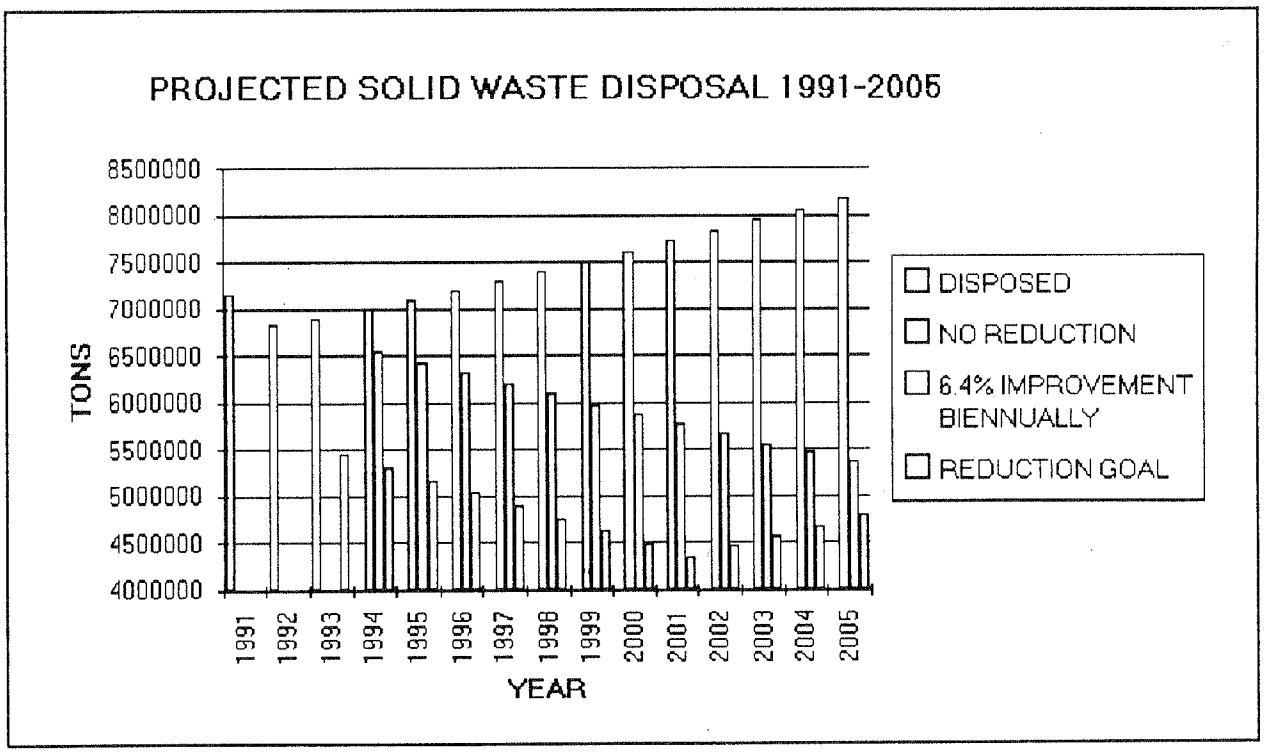
Eighty-four MSWLF facilities reported receiving some fee for solid waste disposal. Most sanitary landfills charged by the ton for accepting solid waste, although four facilities charged by the cubic yard. For purposes of comparison, cubic yard fees were converted to a per ton fee using 600 pounds per cubic yard as a conversion factor. When more than one disposal fee was listed by a facility, the charge for a commercial waste hauler was used in the calculations. (Appendix A lists facilities and their tipping fees.)

Tipping fees in FY 1992-93 ranged from $60 per ton in New Hanover County to $3.40 per ton in Wilkes County. The average North Carolina tipping fee per ton is $18.52, while the weighted average is $21.88 (due to more waste being disposed in facilities with tipping fees). Twenty-three landfills did not charge a tipping fee to dispose of municipal solid waste. Of the 23 that had no tipping fee, 16 will stop receiving waste by April 9, 1994.

Trends in MSW Reduction

After three years of reporting, trends in waste reduction are beginning to emerge from the information gathered from the Solid Waste Management Annual Report Forms submitted by local governments. The following projected trend graph (FIGURE 1-3) presents three scenarios for North Carolina's future solid waste management.

FIGURE 1-3: Projected Solid Waste Disposal 1991-2005



The first three columns represent municipal solid waste disposal from 1991 through 1993.

The tallest set of columns represents the annual MSW disposed given projected population increases through the year 2005. If no waste reduction efforts are made, and waste disposed remains constant at roughly one ton per person, North Carolina will have to manage a growing volume of waste through landfill and incineration facilities.

The middle set of columns represents waste disposal if North Carolinians achieve a 6.4 percent reduction in solid waste every two years. By 1999, North Carolina would reach its 25 percent waste reduction goal and be on its way to achieving a 40 percent reduction by the year 2010. Under present policies and strategies, much effort will be necessary to achieve substantial, long term waste reduction.

The final scenario (shortest set of columns) illustrates the state's waste reduction goal of 25 percent reduction in MSW disposed per person by 1993, and a 40 percent reduction in MSW disposed per person by 2001. The graph shows that even with a 40 percent reduction, the amount of waste managed will continue to grow after 2002 due to population growth, although at a lower rate.

If the state continues to dispose of waste in 2001 at the 1993 per capita rate, approximately $169,033,590 ($21.88 X 7,725,484 tons) will be spent if tipping fees remain unchanged (a highly unlikely assumption). This is approximately $74,000,000 more than would be spent if the state reaches its waste reduction goal and disposes of only 4,354,456 tons. If disposal costs reach $35.00 per ton, the additional cost of disposing the 3.4 million tons of waste over the goal would be $119,000,000 each year.

The savings in landfill costs are not necessarily savings, but represent costs that are redirected from landfilling to other forms of waste management such as composting or recycling. Additionally, the cost per ton of landfilling waste may go up significantly at smaller landfills as fewer tons are landfilled since the costs associated with landfills are so sensitive to size and economies of scale.

CHAPTER TWO

SOURCE REDUCTION

The 1989 Solid Waste Management Act and subsequent modification are the foundation for waste reduction in North Carolina. Waste reduction at the source or source reduction is the first priority in managing solid waste as established in the hierarchy of preferred management methods for solid waste and should play an integral role in comprehensive solid waste management planning.

Currently, recycling and disposal programs dominate the attention and resources of local governments. Source reduction and other management options such as composting are largely neglected. However, source reduction is an effective tool for local governments to reduce solid waste disposal. National estimates indicate that source reduction programs can achieve from 5 to 10 percent reduction of the total waste stream. The City of Greensboro conducted a pilot study among 1,000 households that resulted in 23 percent reduction of waste solely through source reduction efforts. After one year, household garbage weight dropped by an average of 10.64 pounds per week per household participating in the pilot study. Using these per household reduction rates, disposal of 276 tons of solid waste was avoided because this waste was not generated, collected, processed, managed, recycled, or disposed by the city.

What is Source Reduction?

It is defined as avoiding the creation of waste by reducing the amount or toxicity of waste before it is generated. It is a premeditated activity that eliminates waste or increases the intensity of use or promotes reuse. Source reduction decreases the quantity of materials that must be collected, processed, or disposed by landfilling, incineration, municipal composting, or recycling. For example, backyard composting is a source reduction method, but municipal composting is not. With a municipal composting or mulching program, a local government or its agent must collect and process materials. With backyard composting, residents manage organic wastes at their home and avoid contributing yard and kitchen wastes to the wastestream. Source reduction can also reduce toxicity of waste. A household hazardous waste (HHW) collection day is not source reduction. For example, using less toxic or non-toxic ingredients such as baking soda and vinegar for cleaning is source reduction rather than purchasing and using household cleaners.

Examples of specific **residential** source reduction activities:

- Substituting cedar chips for moth balls;
- Purchasing toothpaste without the outer box;
- Buying laundry detergent in a 10-pound box rather than a 2-pound box;
- Using a cloth handkerchief or cloth kitchen rag instead of disposable paper towels or tissues; and
- Using razors with replaceable heads rather than disposable razors.

Examples of specific **commercial** source reduction activities:

- Sending faxes without cover sheets;
- Buying reusable plastic pallets or repairing wooden pallets;
- Reducing the number of over-runs a newspaper prints;
- Providing bulk dispensers for milk or condiments in company cafeteria; and

•Using packing material from in-coming packages to send with out-going packages.

In reviewing of the FY 1992-93 local government Solid Waste Management Annual Reports, it is evident that considerable confusion exists about source reduction. Many local governments incorrectly indicated that they had source reduction programs in place, but described curbside or drop-off recycling programs in their explanation. Recycling programs manage materials after they have been discarded by consumers and does not constitute source reduction. Source reduction **prevents** management of discards by:

- Promoting better inventory control;
- Promoting better purchasing decisions that reduce discards such as buying more durable goods, re-manufactured goods, or reusable goods;
- Promoting purchase of less toxic materials; and
- Promoting increased bulk purchases to reduce packaging that is discarded.

Other examples of source reduction include:

* Redesigning products or packaging so that less material is used.
  Example - concentrated products or thinner packaging.

* Making voluntary or mandatory human behavioral changes in the use of materials.
  Example - circulating only one copy of a memo or sending it via electronic mail rather than printing and distributing multiple copies.

* Substituting durable or reusable items for disposable items.
  Example - replacing disposable coffee cups with reusable ceramic mugs and returning laser cartridges for reuse.

I. Programs Reported by Local Government

Source reduction methods employed by local governments may include those that are implemented in-house, those that are directed at the public, or both.

A. In-House Programs

In-house programs may use various methods to reduce waste generated in a local government office. Examples include printing or photocopying written materials on both sides of the page and using the reverse side of single-sided printed materials for scratch paper or draft printing. Some local governments have cited duplexing, ceramic mugs, refillable laser toner cartridges, and single-sided printed paper for scratch pads as examples of their source reduction efforts. For example, Pittsboro reuses computer lead sheets for memos, buys chemicals for its wastewater treatment plant in bulk, and has packages delivered by freight instead of by express carriers to reduce packaging waste.

State agencies have begun to examine source reduction as a tool to reduce disposal of solid waste. Executive Order #8 signed by Governor Hunt on April 22, 1993, and Senate Bills 90 and 572 passed in the 1993 General Assembly charge state agencies to incorporate source reduction in their management practices. Executive Order #8 requires state agencies to review their operations and determine where waste can be reduced. Agencies must avoid unnecessary printing or photocopying of printed material, require two-sided copying on all documents when feasible and practicable, discourage the use of disposable products where reusable products are

available and economically viable for use, acquire durable items, and acquire items that have minimal packaging.

Senate Bill 90 requires that bid procedures and specifications for state purchasing encourage the purchase or use of reusable, refillable, repairable, more durable, and less toxic supplies and products. This includes the purchase of remanufactured toner cartridges for laser printers to the extent practicable.

Senate Bill 572 requires that in lieu of distributing reports in mass, state agencies must notify persons to whom they are required to report and other approprate persons, that a report has been published, its subject and title, and the locations, including state libraries at which the report is available. Opportunities for local governments to start similar programs exist and are encouraged.

B. External Programs

External programs may include promoting and educating households or businesses, such as offices, retail stores, or local industries, about source reduction of waste. Local governments may sponsor workshops or promote waste exchanges or pallet exchanges among businesses. Orange County sells backyard compost bins and provides training to residents, distributes the "Junk Mail Terminator" kit telling residents how to reduce the amount of third class mail they receive, and provides waste audits to businesses. Bladen County sponsors a fourth grade program that teaches students to reuse products rather than to generate trash.

Backyard composting. The Office of Waste Reduction, through a grant from the Solid Waste Management Trust Fund to the N.C. Cooperative Extension Service, helped establish backyard composting demonstration sites in thirty-three counties. Two additional counties have established backyard composting demonstration sites as well. Locations for the sites vary from a local Chamber of Commerce to a centralized municipal compost facility and to a science museum. In addition to backyard composting demonstration sites, New Hanover and Orange counties sponsor backyard compost workshops and distribute backyard compost bins to residents. New Hanover is constructing bins from discarded wooden pallets. The following counties listed in TABLE 2-1 have backyard composting demonstration sites:

TABLE 2-1. North Carolina Counties with Backyard Compost Demonstration Sites

Alamance	Edgecombe	Pamlico
Alexander	Forsyth	Pasquotank
Anson	Franklin	Polk
Bladen	Guilford	Randolph
Burke	Harnett	Rockingham
Catawba	Henderson	Union
Columbus	Macon	Wake
Craven	Martin	Watauga
Cumberland	McDowell	Wayne
Davie	Mecklenburg	Wilson
Dare	New Hanover	Yancey
Durham	Orange	

Grasscycling. Grasscycling is a source reduction program that encourages backyard composting of lawn clipping rather than bagging them for local government collection. In Guilford County, the County, Greensboro Beautiful, Inc., and the N.C. Cooperative Extension Service established a Grasscycling Lawn Care Plan to promote proper watering, fertilizing and mowing of lawns as well as leaving clippings on the ground after mowing. A "Grasscycling" brochure was developed and distributed to the public. A survey found that from the 100 participants, approximately 825,000 pounds of yard trimmings over a six month period (spring/summer) were diverted from the landfill or municipal compost facility. This diversion of materials saved the cities of Greensboro and High Point about $7,500. The town of Zebulon will not pick up grass clippings from households. Information is provided on how to manage grass clippings at home and saves money.

Special Events. A program in Durham County promoted a "garbage free" Festival for the Eno, an annual public event celebrating July 4th. The use of reusable dishware, source reduction, and proper recycling were encouraged. Food scraps were collected and composted. This program incorporated three solid waste management strategies - source reduction, recycling, and composting.

Enviroshopping. Chatham County Recycling and the Chatham County Cooperative Extension Service are using the Florida *Enviroshopping* module to train volunteers to staff a display booth in the local grocery stores to talk to customers about their purchasing decisions and waste issues. The display booth uses pictures and text to explain the five R's outlined in the *Enviroshopping* program: reduce, reuse, recycle, reject, respond. All three grocery stores in Pittsboro - Byrd's, Food Lion, and Lowe's - have agreed to let the Chatham County Recycling Office place the display booth in their stores to educate consumers about the effect their purchasing decisions have on the waste stream.

Source Reduction Programs. Local governments may also adopt policies that require solid waste plans before a building permit may be issued. For example, the Orange Regional Recycling Program assisted Breadman's Restaurant in their source reduction efforts in conjunction with the Town of Chapel Hill's solid waste management plan. This plan requires developers to submit a solid waste management plan for any new commercial or multifamily facility including management of construction waste, evaluation of the use of recycled materials in construction, and a operations plan for solid waste reduction. Some of the source reduction activities Breadman's Restaurant undertook were:

* Almost all the broken brick and other rubble from demolition, five loads, was claimed by a passer-by for building a road on his property.

* Large rocks from the western landscaping design were claimed by a local citizen for erosion control in a gully on his property.

* Used restaurant equipment was picked up by Equipment Brokerage, a used equipment supply firm, when new equipment was delivered.

* Carpeting, lighting fixtures, and commodes were taken for reuse and resale by Building Supply Recycling Center.

* All old tables and booths were refinished with a water-based coating and reused at the new facility.

* Exterior doors were removed and reused. Old brick from the interior walls of a Western Sizzlin' was used in construction of interior partitions and decorative features.

* Fiberglass insulation above the ceiling was taken down, stored on site, and reused when the new ceiling was constructed.

* Breakfast is no longer served with side jelly packets and extra napkins. Instead, jelly packet and napkin dispensers are placed at each table. This reduced jelly use by 40 percent and napkin use by 20 percent.

II. Data Reported by Local Governments

The form for the Annual Report for July 1992-June 1993 asked each local government whether it had a source reduction program and to describe the program if it answered "yes." In addition, the report form asked what audience the source reduction program was targeted - in-house, the public, or both. Finally, the report asked each local government whether it had passed any source reduction ordinance, goal, or other official action, and to provide a copy of the action if it answered "yes."

Seventy-nine local governments - 33 counties, 46 municipalities - indicated they had some type of source reduction program. This is an increase of 32 percent over the 60 programs reported in 1991-92. Thirty-three programs were reported in 1990-91. However, this only represents 12 percent of the 620 potential local government source reduction programs.

Thirty-six of these local governments reported that they only targeted their source reduction program in-house. An additional 11 targeted their source reduction programs only to the public. Finally, thirty-two programs attempt to educate both types of audiences with their source reduction messages.

Ten local governments indicated that they passed source reduction ordinances, policies, or resolutions, an increase of two over the FY 1991-92. These are Camden, Craven, Davie, Orange, and Transylvania counties and the cities of Wallace, Carrboro, Chapel Hill, Laurinburg, Raleigh. Some local governments which reported having a source reduction policy in the past are not included in FY 1992-93 due to incorrect reporting or data entry.

TABLE 2-2: Summary of NC Local Government Source Reduction Programs/Policies

Program	County		City		Total	
	FY 1991-92	FY 1992-93	FY 1991-92	FY 1992-93	FY 1991-92	FY 1992-93
Public Only	10	**8**	13	**3**	23	**11**
In-House	9	**12**	17	**24**	26	**36**
Both	4	**13**	7	**19**	11	**32**
Totals	23	**33**	37	**46**	60	**79**
Policy	**County**		**City**		**Total**	
	FY 1991-92	FY 1992-93	FY 1991-92	FY 1992-93	FY 1991-92	FY 1992-93
Policy	3	**5**	7	**5**	10	**10**

Source reduction policies may be targeted to in-house departments or agencies or to the public. Policies vary and include efforts such as Craven County's volume-based garbage collection system; Orange County's inclusion of source reduction as part of the county commissioners' solid waste goals, the Landfill Owners Group solid waste goals, and the Orange County solid waste committee goals; and Transylvania County's mandate to county departments and agencies to reduce disposables, purchase more durable products, and decrease product consumption.

As noted earlier, there is considerable confusion about source reduction. In addition to incorrectly reporting recycling programs as source reduction, some local governments failed to report that they had a source reduction program. For instance, some local governments listed as having backyard composting demonstration sites in TABLE 2-1 did not report having source reduction programs in place and are not represented in TABLE 2-2.

Conclusion

Although source reduction is the preferred solid waste management method identified in North Carolina's solid waste management legislation, it clearly is neglected by most local governments. There also is confusion about source reduction. Recycling programs are often incorrectly reported as source reduction programs while some source reduction programs go unreported by local governments.

Source reduction, which prevents the generation of waste, is hard to measure. Unlike recycling and disposal programs that manage tons of solid waste collected, source reduction that prevents the generation of waste does not require facilities to be built or materials to be collected, marketed, or sold. It is a less tangible activity. This difficulty however, should not prevent implementation of a source reduction program. Local governments can do much more to promote source reduction that will lead to reduced disposal needs and costs and help achieve the state's solid waste reduction goals.

CHAPTER THREE

RECYCLING

North Carolina solid waste management law contains numerous, wide-ranging provisions designed to reduce solid waste. State statutes specify:

- A hierarchy of approved strategies for solid waste management.
- Waste reduction goals of 25 percent by June 30, 1993, and 40 percent by June 30, 2001.
- Bans on the disposal of certain wastes in sanitary landfills, including yard waste, tires, used motor oil, white goods, lead-acid batteries, antifreeze, aluminum cans, and steel cans (banned from incinerators only).
- A requirement that all designated local governments establish a recycling program effective July 1, 1991.
- A requirement that all counties, either individually or in cooperation with other counties, annually report to the state on the status of their solid waste management programs.
- A requirement that all local governments participate in the development and implementation of a comprehensive solid waste plan for their local government area.

Progress toward the waste reduction goals of the state depend primarily on the efforts of local governments, who report yearly on their solid waste management activities. Waste reduction efforts by private businesses and industries, although extensive and very important, are not accounted for by any formal reports to state government. This chapter focuses on the activities of local governments as a way of assessing progress made statewide in reducing solid waste.

The Local Government Solid Waste Management Annual Reports include descriptions of source reduction and recycling programs, educational efforts, the amount of waste sent to solid waste management facilities, the amount and type of materials recycled, and other aspects of local solid waste management. In addition to summarizing local government activities statewide, the information in the annual reports provides a foundation for the state's recycling market development and technical assistance efforts.

Recycling program information from the annual reports covering FY 1992-93 is presented in this chapter. Data from FY 1993-94 will be available in late 1994.

Summary of Recycling Data from the FY 1992-93 Local Government Waste Management Annual Reports

A. Total tons collected for recycling in FY 1992-93.

FY 1992-93 saw a substantial increase in the amount of materials collected for recycling, composting, and mulching in local government programs for waste management. Many of the

statewide disposal bans were in effect in FY 1992-93, including bans on white goods, tires, lead-acid batteries, used motor oil, and yard waste (effective January 1, 1993), which accounts in part for the increased diversion of materials from disposal.

Total tonnage and tonnages for each major material type increased in FY 1992-93. The overall total for materials recycled by local governments in FY 1992-93 was 616,369 tons. Specific amounts by major material type are reported in TABLE 3-1.

TABLE 3-1: Total Tonnage Recycled By Major Material Type

Material	FY 1990-91 Tons	FY 1991-92 Tons	FY 1992-93 Tons	Percentage change: FY 1991-92 to 92-93
Paper	99,488	98,729	151,676	54%
Glass	16,816	25,997	32,611	25%
Metals	18,736	34,148	44,302	30%
Plastics	2,878	6,128	9,264	51%
Organics	105,871	267,428	378,516	42%
TOTAL	243,789	432,430	616,369	43%

Note: The large numbers for organics includes leaf and yard waste collection programs, as well as pallet and wood recycling by counties and municipalities. Some local governments reported organics numbers in cubic yards, which were converted into tonnages for this table using a ratio of 400 lbs/cubic yard. Metals includes aluminum and steel cans, as well as white goods.

A more detailed examination reveals that local governments increased their collection of most specific types of recyclable materials, and that the number of recycling programs collecting the materials have also increased generally over the past three years (see TABLE 3-2). The decline for brown glass and increase for green glass may be due in part to flaws in the FY 1991-92 data.

TABLE 3-2: SPECIFIC MATERIAL TONNAGES AND FREQUENCY OF COLLECTION

Material	1990-91 Tons	1991-92 Tons	1992-93 Tons	Number of programs collecting material		
				1990-91	1991-92	1992-93
Newspaper	53,104.90	70,866.14	85,727.53	280	346	412
Cardboard	36,677.40	14,257.06	27,679.33	164	204	250
Office Paper	NA	1,869.96	13,499.73	NA	109	140
Other paper	710.30	761.78	8,475.9	93	45	53
Mixed paper	NA	10,974.68	15,004.4	NA	110	96
Magazines	NA	NA	1,289.33	NA	NA	86
Clear Glass	8,520.82	12,176.19	18,580.02	294	359	420
Green Glass	4,021.98	4,279.95	6,419.28	281	345	409
Brown Glass	4,274.35	8,261.06	7,611.56	283	349	407
Aluminum	1,639.36	2,601.92	4,484.13	286	379	441
Steel Cans	425.52	1,597.61	3,179.4	131	180	255
#1 plastic	1,766.71	2,660.16	4,856.69	196	278	349
#2 plastic	911.77	2,989.50	3,500.85	168	272	328
#3 plastic	18.57	76.29	10.28	26	32	33
#4 plastic	37.70	148.86	180.2	20	27	32
#5 plastic	71.71	34.23	185.99	13	27	24
#6 plastic	19.3	166.50	194.34	18	26	25

In addition to the listed materials in TABLE 3-2, local governments report collecting 21,918 lead- acid batteries and 356,771 gallons of used motor oil in FY 1992-93.

TABLE 3-3 shows how the materials listed above were collected for recycling:

TABLE 3-3: Amount of Recyclables per Collection Method

Material	Curbside	Drop-off	Buy-Back	Other
Glass	17,770.64	13,007.59	374.80	1,457.83
Plastic	4,414.87	3,528.01	279.83	1,041.46
Metal	4,323.60	6,964.81	253.23	3,991.22
Paper	53,688.62	56,236.66	3,726.87	38,024.07
Wood	81.75	36,418.02	0.00	10,193.01
Other	660.90	7,128.34	0.00	1,673.51
TOTAL	80,940.37	123,337.43	4,634.73	56,381.10

Note: This TABLE does not include tonnages for yard waste, white goods, nor the 4,272.23 tons of commingled recyclables (not broken down by material category or collection method) reported by local governments.

B. Total Number of Recycling Programs

The increase in tonnage collected over the past three fiscal years is due in part to the rise in the number of local recycling programs. The number of programs reported for FY 1992-93 was 575, up 19 percent from the previous year.

Local governments have started one or more of five types of collection programs: curbside, drop-off, buy-back, reuse/reconditioning, and miscellaneous "other" programs. In addition, a number of local governments have in-house recycling programs (which are not included in the tables in this Chapter). Seventy-seven counties (77 percent of all counties) and 277 municipalities (53 percent of all municipalities) reported having in-house programs.

Many local governments employ multiple collection methods to target the various generators of recyclable materials in their communities. TABLES 3-4 and 3-5 show the number of each type of program North Carolina cities and counties have put in place and the changes over the past three fiscal years.

TABLE 3-4: Number Of Programs Reported By Type For Municipalties

Program Type	FY 1990-91	FY 1991-92	FY 1992-93	Percentage Change FY 1991-92 to 1992-93
Curbside Recycling	88	119	189	59%
Drop-off Recycling	126	132	137	4%
Reuse/ Reconditioning	26	18	16	-7%
Buy-back Recycling	4	3	2	-33%
"Other" Recycling	23	37	37	0%
TOTAL	267	309	381	23%

As TABLE 3-4 shows, more than one-third of all North Carolina municipalities (189) offered curbside programs to their residents in FY 1992-93, which represents a dramatic 59 percent increase more than FY 1991-92. The growth in drop-off programs has been slower, with only slightly more than a quarter of all towns offering drop-off service. Dramatic increases in curbside service and a higher level of recycling service may account for the slower growth in drop-off. The number of reuse/reconditioning and buy-back programs continue to decline.

TABLE 3-5: Number Of Programs Reprted By Type For Counties

Program Type	FY 1990-91	FY 1991-92	FY 1992-93	Percentage change
Curbside Recycling	7	7	10	43%
Drop-off Recycling	73	85	98	15%
Reuse/ Reconditioning	29	26	32	19%
Buy-back Recycling	14	11	12	9%
"Other" Recycling	22	45	42	-7%
TOTAL	145	174	194	11%

TABLE 3-5 shows that citizens in all but two North Carolina counties had access to drop-off recycling service in FY 1992-93, and citizens in 10 counties had access to curbside recycling service (although Burke County's was a pilot curbside program only). Percentage change was calculated as the difference between FY 1991-92 and FY 1992-93.

Curbside pick-up is the highest level of residential recycling service and provides a good barometer for assessing the status of residential recovery efforts. TABLE 3-6 below shows by population category the municipalities that did or did not offer curbside service in FY 1992-93:

TABLE 3-6: Municipal Curbside Programs By Population Category

Population	Curbside offered	Curbside not offered
Under 250	8 (12%)	58 (88%)
250 to 1,000	48 (29%)	119 (71%)
1,000 to 5,000	80 (41%)	116 (59%)
5,000 to 10,000	19 (53%)	17 (47%)
10,000 to 25,000	17 (55%)	14 (45%)
25,000 to 50,000	8 (89%)	1 (11%)
over 50,000	9 (64%)	5 (36%)
Total	189 (36%)	330 (64%)

With curbside service available in 189 municipalities and 10 counties, the total North Carolina population with access to curbside service in FY 1992-93 was 2,689,293 (more than one-third of the state's population). However, the total number of North Carolinians who actively participate in such programs is lower. Local governments were asked in the FY 1992-93 annual report form to estimate participation rates for their various programs (see TABLE 3-7 below). Applying the estimated overall average 59.86 percent participation rate for curbside programs to the number of citizens with access to curbside reveals that 1,609,810 citizens (less than one quarter of the state's population) actually participated in curbside recycling in FY 1992-93.

TABLE 3-7: AVERAGE ESTIMATED PERCENTAGE OF POPULATION PARTICIPATING IN LOCAL GOVERNMENT RECYCLING PROGRAMS

Program type	County	Municipal
Curbside	55.82%	60.36%
Drop-off	30.16%	28.28%

Miscellaneous Items of Interest

A. Local Government Material Bans

A number of local governments are using local ordinances to support their waste reduction efforts. As of FY 1992-93, at least 17 counties and four municipalities had passed ordinances restricting the disposal of one or more materials. The restrictions are generally enforced by fines, penalties, or surcharges on disposal fees (often 2-3 times the current fee).

The most commonly targeted material for restriction is corrugated cardboard. Alamance and Wayne counties have restricted a wide range of residential and commercial recyclables. Davidson County, home of many furniture manufacturers, has restricted wood waste from disposal.

A complete listing of local government material disposal restrictions is available from the Office of Waste Reduction, (919) 571-4100.

B. Solid Waste Management Staffing

Local governments continue to devote staff to recycling and waste reduction efforts. In FY 1992-93, 63 counties and 98 municipalities had a designated "recycling coordinator." As in previous years, many recycling programs were administered by persons responsible for other governmental duties. Many local governments relied on solid waste managers, solid waste directors, public works directors, and assistant town or county managers to administer recycling as well as other solid waste programs. Eighty-four counties and 161 municipalities reported having someone in the position of "solid waste manager or similar position." More local attention is being focused on illegal dumping, with 35 counties and 44 municipalities now having "solid waste enforcement officers."

CHAPTER FOUR

SPECIAL WASTES

Special wastes are defined in GS 130A-294 as "solid wastes that can require special handling and management, including white goods, whole tires, used oil, lead-acid batteries, and medical wastes." Information was collected from the Solid Waste Management Annual Report forms on lead-acid batteries, white goods (refrigerators, washers, stoves, etc.), used oil and tires for FY 1992-93.

In addition to special handling requirements, these wastes may also be banned from landfilling or have other requirements associated with disposal. Many of these banned materials have been or can be recycled. Reduced demand periods have been experienced within the recycling market, but generally successful recycling programs exist for most of these materials.

Lead-acid batteries have been collected and recycled for their lead content for many years. Current state law requires retailers offering batteries for sale to accept old batteries in return. Lead-acid battery manufacturers have supported this action resulting in a high recovery percentage of used batteries through the retail recovery process. Local governments reported receiving 21,918 batteries in FY 1992-93 (TABLE 4-1).

TABLE 4-1: Special Waste Volumes FY's 1990-91, 1991-92, and 1992-93.

Material	FY 1990-91	FY 1991-92	FY 1992-93
Lead-Acid Batteries(#)	3,338	16,312	21,918
White Goods (Tons)	47,354	25,749	28,769
Used Oil (Gallons)	147,816	262,559	356,771

White Goods have been recovered for years through existing scrap yard dealers and metal recoverers. Enactment of air quality regulations requiring recovery of freon gas has presented some difficulty and added cost in recycling of some white goods. Freon gas is being recovered by working with contractors, local metal recyclers, and thorough local government programs.

Legislation passed in 1993 imposed an advance disposal tax on sale of white goods, starting January 1, 1994. The tax is $10 for white goods that contain freon and $5 for those without freon. Revenues will be distributed to counties for white goods management and freon removal. Special disposal fees for white goods are prohibited.

In FY 1992-93, 28,769 tons of white goods were collected by local governments. A significant number of white goods are also transported by retailers and individuals directly to metal dealers.

Used oil has been recovered and used as fuel and a fuel supplement for many years, and there are processors in the state who collect and market used oil as a fuel. The bulk of used oil

recovered and used for fuel comes from service stations and fleet operations, such as bus and trucking companies and other operations with large numbers of motor vehicles.

Collection of used oil from the "do-it-yourselfers" or individuals who change their own oil has been difficult. In FY 1992-93, local governments collected 356,771 gallons of used oil. In addition, a limited number of private facilities offered collection services to the public. An estimated 60 percent of the approximately 21,000,000 gallons of oil sold for light trucks and automobiles in North Carolina are sold to "do-it-yourselfers" (DIY). Even though some DIYs' used oil is taken to private facilities and some is non-recoverable (burned or leaked), it is evident that the 356,771 gallons collected at publicly used oil facilities is far short of the estimated millions of gallons that could be collected from those who change their own oil.

Medical Waste: North Carolina had three commercial medical waste incinerators in operation in 1992-93 that treated mostly out-of-state waste shipped from hospital and medical clinics. The total statewide permitted capacity was 14,300 pounds per operational hour for all three incinerators. Recovery Corporation of America treated 14,684 tons of medical waste, which was 50 percent of the total (TABLE 4-2).

TABLE 4-2. Tonnage of Medical Waste Incinerated by Three Commercial Incinerators in FY 1992-93.

TONS

Incinerator	North Carolina	Out-of-State	Total
WMI*	1,500	5,099	6,599
RCA	5,271	9,413	14,684
BFI	4,250	3,717	7,968
Total (Tons)	11,021	18,229	29,251

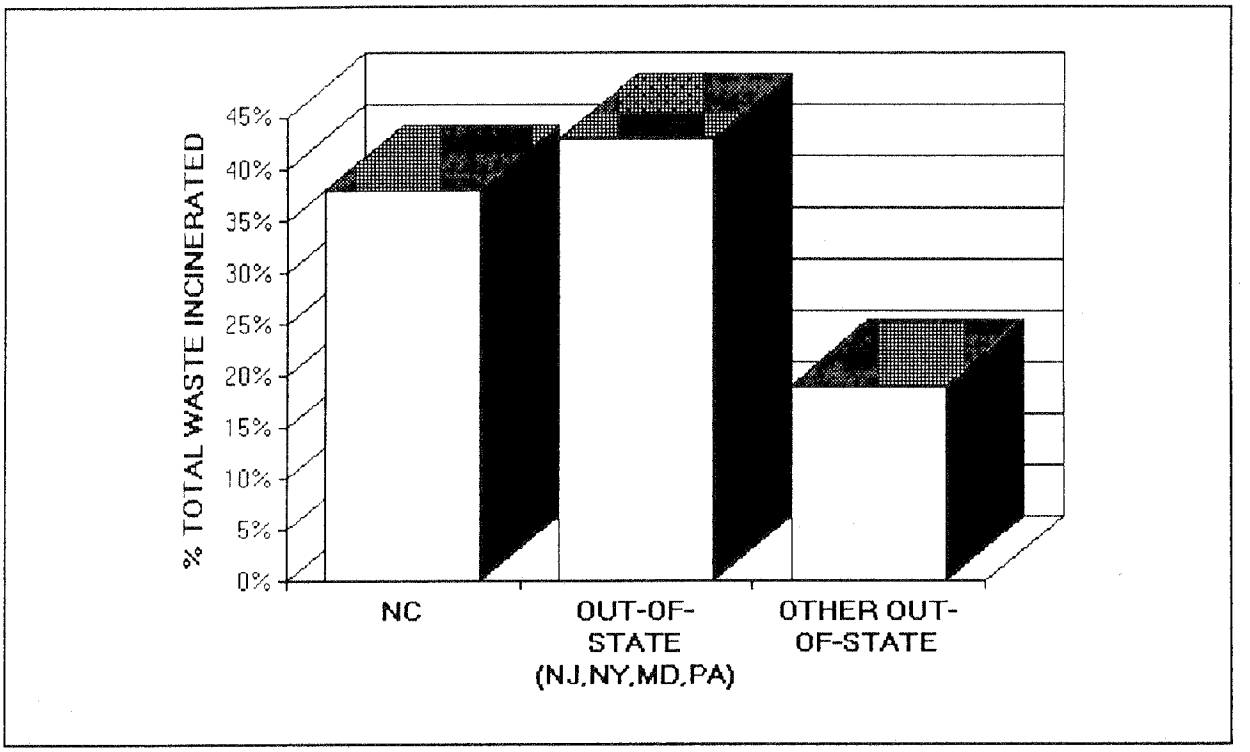
*** WMI - Waste Management Industries, Huntersville, NC**
RCA - Recovery Corporation of America, Matthews, NC
BFI - Browning Ferris Industries, Haw River, NC

Many North Carolina hospitals own and operate medical waste incinerators and treat waste generated on site. These hospitals are not required to have a solid waste permit or to submit an Annual Solid Waste Management Report.

The North Carolina Medical Waste Management Rules designate incineration as an acceptable treatment for regulated medical waste (bulk blood, microbiological waste, and pathological waste), which is a small portion of the total medical waste stream. The waste that is typically incinerated is mostly nonregulated medical waste such as used gloves, tubing, drapes, sharps, bloody gauze and dressings.

Sixty-two percent (18,229 tons) of the 29,251 tons of medical waste incinerated in North Carolina originated out-of-state (FIGURE 4-1), primarily from New York, New Jersey, Maryland, and Pennsylvania.

FIGURE 4-1: Origin of Medical Waste Incinerated by Three Commercial Facilities



Forsyth Hospital in Winston-Salem uses a microwave treatment unit to treat medical waste generated on site. This unit has been used to treat approximately 500 tons per year since 1990. SafeWaste, Inc. (Huntersville, NC) provides treatment of hospital medical waste using a mobile microwave treatment unit. The company treats medical waste on site at Memorial Mission Hospital and St. Joseph's Hospital in Asheville, Presbyterian Hospital in Charlotte, and Valdese Hospital in Valdese.

Tires present complex disposal problems and create unique hazards to the environment and public health. The presence of illegal tire dumps around the state has resulted in the introduction and potential establishment of an exotic mosquito, the Asian Tiger Mosquito (Aedes albopictus). Researchers at N.C. State University found the mosquito in 29 of 38 sites sampled in 1993.

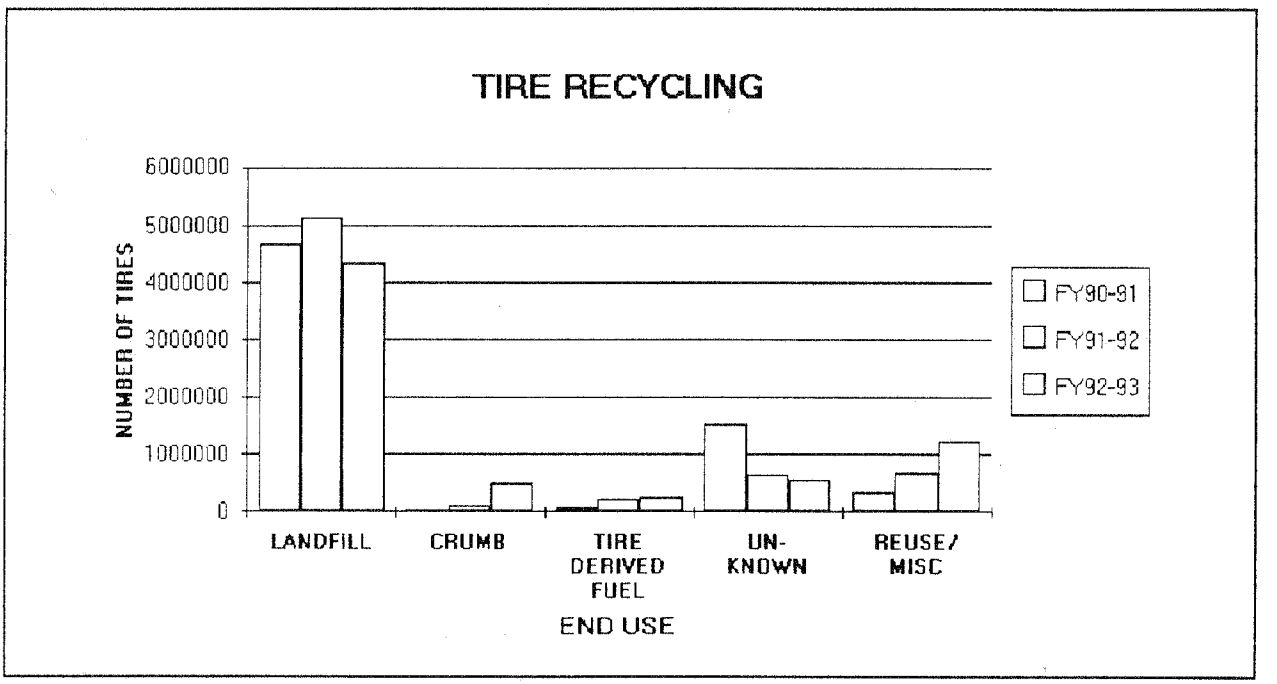
The scrap tire disposal tax was increased in October 1993 from 1 percent to 2 percent to provide additional funding to county programs and for cleanup of nuisance tire sites. Counties are prohibited from charging a disposal fee for tires certified as generated in North Carolina. It is anticipated that removal of landfill disposal fees will result in less illegal dumping of tires.

North Carolina generated approximately 6.8 million scrap tires or 1.0 per capita in FY 1992 - 93. The counties reported managing 5,329,340 tires, which was 78 percent of the total.

Approximately 1,962,500 scrap tires or 29 percent of the scrap tires generated in North Carolina were diverted from landfills for various uses in FY 1992-93 (FIGURE 4-2). This was a large increase over the previous year when only 15 percent of the tires were diverted from disposal.

For a more detailed presentation of the status of North Carolina's scrap tire management, please request from the Solid Waste Section a copy of the Scrap Tire Management Report dated May 15, 1994.

FIGURE 4-2: End Use of Disposed Scrap Tires Over a Three-Year Period



Household Hazardous Waste (HHW) programs have been tracked by the Solid Waste Section since July 1991. Temporary and permanent HHW identification numbers, which are used for tracking HHW collection, treatment, disposal, and recycling in the state, are issued by the Solid Waste Section. In FY 1992-93, there were nine household hazardous waste collection days in the state. The seven hosting communities were Greensboro, Durham, Raleigh, Winston-Salem, Buncombe Co. (Asheville), Caswell Co. (Yanceyville), and Rockingham Co. (Reidsville). For more information on individual programs or upcoming events, contact the communities listed above.

The items most frequently collected and either recycled or re-used from collection days were used motor oil, latex paint, lead-acid batteries, propane tanks and cylinders, resins and flammable liquids for fuels blending, oil-based paints, and aerosol cans. Several communities have started the permitting process to establish permanent sites.

CHAPTER FIVE

WATER QUALITY MONITORING OF SOLID WASTE FACILITIES

The Solid Waste Management Rules, 15A NCAC 13B Section .0600, require water quality monitoring at solid waste management facilities. Rules .1630 through .1637 address ground-water monitoring at Municipal Solid Waste Landfill Facilities (MSWLFs). The purpose of these water quality monitoring rules is:

1) To monitor the effect of the disposal unit on the ground and surface water quality in the area in order to protect the public health and the environment; and

2) To monitor the effectiveness of the design, construction, and operation of the landfill or other solid waste management unit.

All permitted sanitary landfills in North Carolina have been required since 1989 to monitor ground water quality. Ground water monitoring is presently being conducted at closed sanitary landfills, open sanitary landfills, industrial landfills, municipal solid waste landfills, and several illegal open dump sites. Recent changes in the Solid Waste Management Rules require ground water monitoring at construction and demolition landfills. The Solid Waste Section has more than 1,000 monitoring wells for which water quality monitoring is required. As new facilities are permitted and as water quality assessments and investigations are increased at sites found to have contamination, the number of wells for which the Solid Waste Section is responsible will continue to increase.

Although unlined MSWLF units are being phased out of operation, the majority of currently permitted landfills and virtually all of the closed landfill units are unlined. Leachate generated at these unlined landfills has affected ground water quality in the immediate vicinity of the disposal areas. More than 90 percent of the unlined landfills have shown evidence of some degradation of ground water quality in the detection monitoring wells located close to the waste boundaries within the landfill permitted areas.

Since most of these landfill facilities are located in relatively remote areas near ground water discharge features, there does not appear to be any threat to public health from these facilities. There has been no significant degradation of surface water quality off site in the streams serving as discharge features. The detection monitoring systems are designed to provide an early warning of ground water contamination so that any water quality problems can be assessed and corrected before there is any threat to public health.

Water quality investigations and assessments will be necessary at nearly all of the unlined landfill facilities to determine the nature and extent of contamination and to assess the potential risk to public health and the environment. This will allow a proper evaluation of corrective action and remediation strategies for these facilities.

As of April 1994, water quality assessments or ground water investigations are being conducted at a number of landfill sites. Formal water quality assessments are being conducted with approval of the Solid Waste Section under administrative consent agreements at the following facilities: the Catawba County Newton Landfill, the High Point Riverdale Road Landfill, the Charlotte York Road Landfill, the Ashe County Landfill, the Watauga County Landfill, the Buncombe County Landfill, the Northampton County Landfill, and the Lexington Landfill. The Solid Waste Section is currently negotiating administrative consent agreements with Champion International - Canton, ReUse Technologies, the town of Kernersville, Duplin County, Pitt County, Hertford County, and Franklin County.

Formal assessments are also being conducted by other state or federal agencies at several landfill facilities. Preliminary ground water investigations have also been required by the Solid Waste Section at a number of landfills, where the section has requested more frequent sampling and/or sampling for additional chemical constituents.

Changes in the N.C. Solid Waste Management Rules as a result of the EPA RCRA 40 CFR Part 258 Solid Waste Disposal Facility Criteria (Subtitle D) have recently become effective, resulting in significant changes in the ground water monitoring program for municipal solid waste landfill units. These include increased sampling frequency, routine detection monitoring for the more extensive Appendix I constituent list including volatile organic analysis, statistical analysis of water quality data, and an automatic increase to Phase II monitoring for the Appendix II constituent list if significant increases are reported in the routine detection monitoring. The new rules for MSWLF units also include more formalized procedures for ground water assessments and corrective action, and at least 30 years of post-closure monitoring as required under 40 CFR Part 258.

CHAPTER SIX

SOLID WASTE ENFORCEMENT AND COMPLIANCE

The Solid Waste Section currently employs 12 waste management specialists, six environmental technicians, two environmental engineers and two environmental supervisors and one Field Operations Branch supervisor to administer the state's solid waste compliance and enforcement program in North Carolina. This group is divided into eastern and western field operation units and comprises the Field Operations Branch of the Solid Waste Section.

Historically, the group has monitored permitted facilities to assure compliance with construction and operational requirements within the "Solid Waste Management Rules." Currently, there are 66 MSW (municipal solid waste) landfills, 31 industrial waste landfills, 150 land clearing and inert waste landfills, eight incinerators, 14 yard waste composting facilities, 11 mixed waste processing facilities, 35 transfer facilities, 94 scrap tire collection sites, 225 septage sites and 351 septage firms.

The group also evaluates approximately 225 facilities each year to assure compliance with the "Standards for Special Tax Treatment," which allow tax credits and property tax exemptions to encourage solid waste resource recovery and recycling.

Since the passage of Senate Bill (S.B.) 111 in 1989, House Bill (H.B.) 1109 in 1991, S.B. 1159 in 1992, and S.B. 1003 in 1993, major changes have taken place throughout the state in solid waste management. Likewise, the state's solid waste regulatory program is directly affected. Illegal dumping is a rapidly growing problem within North Carolina due to increased tipping fees and stressed resources for local and state enforcement.

When local governments develop enterprise funds and other finance plans to fund solid waste management, enforcement generally is not considered. Only 35 percent of the state's counties have "solid waste enforcement officers" designated to deal with solid waste dumping. Most local agencies, e.g., health, planning and zoning, law enforcement, etc., have higher priorities with other mandated programs.

The responsibility for prevention, investigation, apprehension of offenders and cleanup is divided between the state (Solid Waste Section) and local governments. The state assumes responsibility for dump sites that do not have permits and are operated for economic gain. Local governments, through health departments and solid waste enforcement officers, should address illegal dumping that occurs without the permission or control of the landowner. Consequently, the section's field staff is called upon more and more to deal with illegal dumping, regardless of who is officially responsible.

Currently, 40 percent of field operations staff time is spent investigating an average of 90 incidents per month regarding complaints and illegal dumping. Dumping of tires, land clearing debris, construction and demolition wastes (including asbestos), waste oil, medical waste, household garbage, and commercial and industrial wastes comprise the range of materials illegally managed. Sites investigated range from large for-profit illegal dumps to small

unmanaged sites. Three-quarters of these incidents are settled each month, with a range of enforcement actions dependent upon the severity of the violation.

Six years ago, field operations staff spent 60 percent of their time evaluating and routinely visiting permitted sites. Now staff spend only 40 percent of their time monitoring permitted facilities because of the demands of complaint and open dump investigations. The Section has reduced numbers of official evaluations from four to two times per year on landfills and incinerators and once on all other facilities. This was done to compensate for the demands of complaint and open dump investigations. Currently, an average of 50 permitted sites are evaluated monthly.

The section's enforcement program has seen steady increases in compliance actions since 1988. Violations at permitted and non-permitted facilities are resolved based upon degree of regulatory deviation and the extent of potential harm to public health and the environment. "Warning Letters," "Notices of Violation" (NOVs), and "Compliance Orders" (COs), with or without administrative penalties, as well as other legal actions are used.

Implementing only parts of a solid waste program instead of a comprehensive program can have negative effects. Without enforcement provisions, there is direct increase in illegal disposal practices, as the cost per ton for disposal/recycling increases within the state.

Planning by both state and local governments is critical. Roles and responsibilities must be clear, and increased funding must be provided for solid waste enforcement and education. Innovative programs must be developed to halt any advantage of illegal disposal over approved practices.

The Field Operations Branch will increasingly play a greater role in an integrated solid waste management program in North Carolina. Specialization of field positions will concentrate efforts toward local government planning assistance, enforcement, and permitting. This branch is committed to protecting the citizens and environment of North Carolina by investigation and resolution of illegal solid waste disposal practices.

TABLE 6-1: Compliance Orders Issued for Period July 1, 1990 to March 31, 1994

N.C. Fiscal Year	Category Type	Violation	Penalty Totals
1990-91	17-Nonconformance	No Permit	$272,250.00
1990-91	1-Sanitary Landfill 5-Demolition Landfill	Operational Requirements	$ 35,700.00
1991-92	1-Sanitary Landfill	Operational Requirements	$ 3,000.00
1991-92	1-Sanitary Landfill	No Scales	$ 200.00 per day*
1991-92	6-Nonconformance	No Permit	$ 79,500.00
1992-93	4-Nonconformance	No Permit	$ 23,750.00
1992-93	3-Sanitary Landfill	Operational Requirements	$ 20,000.00
1992-93	1-Private Sanitary Landfill	No Scales	$ 2,000.00
1992-93	1-Demolition Landfill	Operational Requirements	$ 5,000.00
July 1 1993-March 31, 1994	12-Nonconformance	No Permit	$130,500.00
July 1, 1993-March 31, 1994	3-Permitted Landfill	Operational Requirements	$ 31,250.00
July 1, 1993-March 31, 1994	11-Nuisance Tire Sites	Nonconforming Scrap Tire	N/A
		TOTAL	**$602,950.00***

*Total does not include $200 per day contingent penalty since case disposition and final penalty have not been settled.

TABLE 6-2: Total Number of Compliance Actions FY 1989 to March 1994*

Field Operations Branch

NUMBER OF COMPLIANCE ACTIONS	
FY - 89	25 NOVs
	9 Compliance Orders
Total	34
FY - 90	59 NOVs
	1 Injunctive Action
	4 Compliance Orders
Total	64
FY - 91	113 NOVs
	21 Compliance Orders
Total	135
FY - 92	20 NOVs
	8 Compliance Orders
	1 Injunctive Action
Total	29
FY - 93	97 NOVs
	9 Compliance Orders
Total	106
FY - 94	192 NOVs
	26 Compliance Orders
Total	218

*FY 94 calculated reporting from July 1, 1993 to March 31, 1994.

CHAPTER SEVEN

SEPTAGE MANAGEMENT

In 1988, legislation was adopted that established a Septage Management Program effective January 1, 1989. The purpose of the program was to ensure the proper disposal of septage (sewage solids, liquids, sludges of human or domestic origin removed from septic tanks) and material pumped from grease traps.

Prior to 1989, each county regulated septage disposal based almost entirely on local regulations. Septage and septage haulers are now regulated statewide by one set of rules. Permitting of individuals to pump septage, permitting of septage disposal sites, and compliance with the rules are now handled by the Solid Waste Section's Septage Management Branch in Raleigh, NC.

The Septage Management Branch operates on a calendar year basis. All figures presented reflect totals for the period January through December 1993.

SEPTAGE FIRM PERMITTING STATUS

322	NUMBER OF FIRMS REQUIRED TO PAY ANNUAL FEE
313	NUMBER OF FIRMS PERMITTED IN 1993
34	NUMBER OF PORTABLE TOILET FIRMS PERMITTED IN 1993-(Fees not applicable)

In 1993, the Septage Management Branch issued Notice of Violations (NOV's) and Compliance Orders (CO's) for the following:

NOV's	CO's	
46	02	Site Management Problems
76	09	Non-Payment of 1993 Annual Fees
72	01	Firm Management Problems (failure to submit proper forms for permitting)
00	07	Discharging/Operating an Unpermitted Disposal Site

Septage is properly managed at permitted septage disposal sites mostly through land application and disposal at sewage treatment plants. Sixty-five Septage Disposal Site Permits were issued in 1993, making a total number of 221 disposal sites permitted in North Carolina as of December 31, 1993. Less than 10 of these are currently inactive. An additional eight sites are in various stages of the permitting process. Sixty-four counties have at least one disposal site, with the number of sites per county ranging up to 16. One site uses spray irrigation as part of the disposal process; the remaining are strictly land application sites. Lime stabilization to reduce pathogens is used on some of the sites and the remainder incorporate within 24 hours of application.

Ninety-one sewage treatment plants in North Carolina accept septage for treatment and disposal. However, many of these plants will not accept material pumped from restaurant grease traps.

Lack of treatment capacity and not wanting to deal with the material are the primary reasons sewage treatment plants do not accept septage. Ten counties (Avery, Clay, Dare, Greene, Hyde, Jones, Mitchell, New Hanover, Tyrrell, and Yancey) do not have a permitted disposal site or a sewage treatment plant that accepts septage.

Improperly managed septage disposal includes disposal at unpermitted sites and inadequate site management. Unpermitted sites range from those that actually would meet all the minimum requirements to be permitted to illegal use of roadside ditches. Inadequate site management usually involves failing to properly incorporate the septage within 24 hours of application, site overloading, and incomplete lime stabilization.

For the past year, the primary emphasis of the Septage Management Branch was to respond to complaints and permit new and deemed permitted sites. Most appropriate sites are now permitted or in the process of being permitted. This will allow emphasis to shift to certain rules and permit conditions which previously have not been rigidly enforced. A specific point within the rules that will be carefully examined is having the necessary information properly displayed on trucks and pumper rigs. Permit conditions that will be followed up include adherence to crop management plans, site loading, and adequate lime stabilization.

In 1993, the state legislature passed a law that expanded the definition of septage to include restaurant grease trap pumpings, certain sludges, septage from industrial sources, and portable toilet waste. These changes were made in response to U.S. EPA rules and North Carolina laws concerning the permitting authority of certain septic tank systems. The new legislation and U.S. EPA rule changes required a major amendment to the N.C. Septage Management Rules. The new rules should be in effect by October 1994.

CHAPTER EIGHT

COMPOSTING AND YARD WASTE

SOLID WASTE COMPOSTING

Composting elements of the municipal solid waste (MSW) stream is becoming a more commonly used waste reduction option for many local governments and private indusrtries in North Carolina. Rules governing MSW composting were put into effect on December 1, 1991. The rules describe the minimum criteria for siting, design, and operation of a compost facility, and establish standards for the classification and use of the compost end-product.

Interest in composting MSW has led to the establishment of eight pilot composting projects approved by the Solid Waste Section, and the submission of several additional proposals. MSW composting activities to date have focused on a variety of specific wastes, including tobacco dust, mixed paper, crab waste, vegetable wastes, burlap, boiler ash, restaurant wastes, and other selected MSW. At least two companies in North Carolina have started to process and compost a variety of industrial and other residual MSW.

YARD WASTE MANAGEMENT

Yard waste was banned from disposal in North Carolina MSW landfills beginning January 1, 1993. As a result, local governments in North Carolina, the primary managers of solid waste, have implemented management strategies to divert yard waste from landfill disposal. According to the Solid Waste Management Annual Report forms, local governments managed **331,823** tons of yard waste in FY 1992-93.

Many local governments, in addition to providing yard waste collection services, have established yard waste management facilities. These facilities process yard waste for mulch or compost, and must comply with the state's yard waste facility regulations, which became effective February 1, 1991. Among other things, the regulations established design and operational standards for the facilities, and required facilities that receive over 6000 cubic yards of material per quarter to operate under permit.

Yard waste facilities manage a variety of organic wastes, including leaves, grass, limbs and brush, stumps, pallets, and untreated wood waste. TABLE 8-1 below shows the types of local government yard waste facilities established in North Carolina in FY 1992-93:

TABLE 8-1: Yard Waste Facilities by Type and Local Government

Local Government	Composting Facilities	Mulching Facilities
County	9	37
Municipality	55	94
Total	64	131

Once yard waste is processed into mulch or compost by local government yard waste facilities, it is available for distribution to end-users such as landscapers, public works projects, or citizens. TABLE 8-2 below shows the distribution of mulch and compost from local government yard waste facilities in FY 1992-93:

TABLE 8-2: Distribution of Processed Yard Waste in FY 1992-93

DISTRIBUTION METHOD	PERCENTAGE
Given to individuals	38.82%
Given to professional end-users (e.g., nurseries)	5.65%
Sold	8.42%
Stockpiled on site	37.68%
Used by public agencies	9.53%
Total	100.00%

Finally, a number of local governments operate programs to deliver collected yard waste directly to end-users (by-passing any processing facility). The most common practice is to deliver leaves collected in the fall directly to farmers or gardeners. One hundred local governments provide this type of service.

CHAPTER NINE

STATE FUNDING FOR SOLID WASTE PROJECTS

This chapter details for FY 1992-93 the activities and expenditures of the Solid Waste Management Trust Fund. The trust fund was created by the passage of the Solid Waste Management Act of 1989 (SB 111) and is funded by a fee on the sale of new tires, a tax on virgin newsprint, and a tax on white goods. The purpose of the trust fund is to provide money for a wide range of solid waste management activities, including: technical assistance to local governments, businesses and others on solid waste issues; solid waste educational activities; research and demonstration projects; and recycling market development activities.

TABLE 9-1: Summary of Trust Fund Expenditures and Revenue - FY 1992-93

Fund Status	Total FY 1993
Beginning Balance	$ 723,686
Revenue	$ 416,874
Expenditures	$ 283,843
Ending Balance	$ 856,717
Encumbrances	$ 212,287
Uncommitted Funds	$ 644,430*

* $ 398,935 of this amount was committed to fund 28 Recycling Assistance Grant Projects selected through the 1993 grant cycle. The grant selection process was completed in June 1993 although the actual expenditures were not realized until the beginning of FY 1993-94.

It should be noted that the above figures are only an accounting of 10 percent of the total amount of funds generated through the sale of new tires plus a small amount generated from the newsprint tax. During this reporting period (FY 1992-93), 90 percent of the total amount of revenues from the tire sale fee was given back to the counties to pay for scrap tire disposal. The Department of Revenue administers this allocation with verification by the Solid Waste Section (SWS). During FY 1992-93, the Office of Waste Reduction (OWR) administered only the 10 percent that goes into the trust fund for research, education and local government assistance.

With the passage of the 1993 Scrap Tire Amendment Law (HB 83), the formula a for allocation of funds into the trust fund changed from a 1 percent fee on the sale of tires to

a 2 percent fee; however, only 5 percent instead of 10 percent of the revenues are now allocated to the trust fund. This provision became effective October 1, 1993. Additionally, with the passage the White Goods Disposal Tax Law (SB 60) an estimated $ 60,000 per quarter will be generated and added to the trust fund. This provision became effective January 1, 1994. However, as of May 1, 1994, actual revenue figures as a result of the new white goods law were unavailable.

TRUST FUND EXPENDITURES - FY 1992-93

As shown in the previous TABLE 9-1, in FY 1992-93, the Solid Waste Management Trust Fund received $416,874 in revenues, or an average of $104,218 per quarter. The Office of Waste Reduction expended $283,843 of the trust fund in the same period. While the ending balance for the fiscal year was $856,717, the office encumbered $212,287 for ongoing projects in FY 1992-93 and an additional $398,935 was earmarked to fund this fiscal year's round of Recycling Assistance Grants awarded in late June 1993, but for which there was no expenditure until FY 1993-94.

Most items funded through the trust fund fall within one of two main categories - grant projects and educational projects. In addition, a portion of the trust fund was allocated for staff support and graduate interns. The following describes in greater detail the projects completed and ongoing activities of the trust fund during FY 1992-93:

I. Grants

Completed Projects

1. **Triangle J Council of Governments Construction and Demolition Waste Regional Recycling Demonstration Project.** A regional strategy for managing construction and demolition (C & D) waste for four of the six counties in the Triangle J Council of Governments was developed. The final report identifies waste reduction measures to be used by public and private entities, identifies markets for construction and demolition waste, and has led to the formation of an ongoing C & D task force for the region. $25,000

2. **Chapel Hill/Carrboro City Schools Reduction, Recycling and Composting Demonstration Project**. Recycling, waste reduction and composting activities were expanded to all nine schools in the school district. The project successfully established the composting of preconsumer cafeteria food waste in the school system, reuse of postconsumer cafeteria food waste and included the beginning of training programs for all school personnel involved (students, teachers, janitorial and food service staff) in recycling and composting operations. In addition, the project included teaching about composting. $15,000

3. **Davie County Materials Recovery Enhancement Project.** Through the use of low-cost technologies, Davie County's material recovery program was improved by adding a sorting line for recyclables and increasing the county's material handling capability. $25,000

4. **Durham County Compost Demonstration Site at the N.C. Museum of Life Sciences.** Trust fund money was matched by SunShares and the Durham Cooperative Extension Service to establish a compost demonstration site at the N.C. Museum of Life and Science. The outdoor exhibit includes five different types of backyard composting methods and serves as the site for community training on backyard composting. $3,700.

5. Regional Material Recovery and Marketing System - Western Carolina University's Center for Improving Mountain Living and the Six Appalachian Lead Regional Organizations. A thorough analysis of both public and private recycling systems in the region was conducted to determine opportunities for regional cooperation in the 31-county area. $54,800

6. **Jones County**. The county built a recycling trailer, constructed a recycling center, converted a soft drink truck to a recycling vehicle, and developed educational materials for the project. $ 15,000

7. **Towns of Middlesex-Bailey**. Two wood chippers and a leaf collection vehicle were purchased to help the two towns better manage their yard waste and meet the January 1, 1993 yard waste ban. $22,160

8. **Town of Marshville**. The town established its recycling program, which included a drop-off site for recyclables and the construction of a mobile recycling unit. $15,000

9. **Town of Kernersville**. A commercial recycling program was established for the Kernersville business community and recycling equipment purchased for use at the town's compost facility. $15,000

10. **Town of Oriental**. Recycling equipment was purchased for the town's drop-off recycling site. $8,000

Ongoing Grant Projects

The following grant projects were still in progress at the end of the fiscal year.

1. **Region K Council of Governments**. Five counties in the Region K Council of Governments (Franklin, Person, Granville, Vance and Warren) cooperatively purchased a mobile tub grinder for processing yard and other wood wastes; the grinder is to be used by each county on a rotating basis. $40,000

2. **Lincoln County**. Two composting operations are being established that will enable residents of the towns of Denver, Westport, and Lake Norman to be serviced through this county effort. $15,000

3. **Town of Spencer**. Recycling equipment and the development of educational materials are being funded through this grant. $ 11,200

4. **Tricounty Solid Waste Management Authority**. The establishment of a solid waste authority for Cherokee, Clay and Graham counties and financing the salary of a full-time recycling coordinator to coordinate the multi-county efforts is being accomplished through this grant. $40,000

5. **Towns of Burgaw and St. Helena**. The two towns are working on a joint yard waste program, including the purchase of composting equipment. $35,000

6. **Town of Smithfield**. The town is establishing a curbside recycling program and funding a recycling coordinator's salary through this grant. $15,000

7. **Town of Edenton**. The town is establishing a curbside recycling program and using funds to help purchase necessary recycling equipment. $11,700

8. **City of Jacksonville**. A commercial recycling project is being undertaken to reduce waste from businesses in the city. $15,000

9. **Northampton County**. The county is using grant funds to establish its "Recycle Now" project and to hire a full-time recycling coordinator for the program. $15,000

1993 Recycling Assistance Grant Awards

The 1993 grant cycle of OWR's Recycling Assistance Grant Awards was initiated when the request for proposals was sent to all 100 counties, more than 500 municipalities, and the 18 regional councils of government in March 1993. OWR received proposals requesting a total of $ 1,184,662 in funding and completed its review process in June. While the final awards for the 1993 grant cycle were not made until mid-July 1993, the total amount awarded for the 28 projects selected was $398,935. For a copy of the 1993 list of Recycling Assistance Grant Awards, please contact the Office of Waste Reduction.

This year, for the first time, private sector contributions to the trust fund were secured. The American Plastics Council contributed $35,000 to the trust fund to support the development of seven plastics recycling projects. A more extensive recruitment effort for private sector contributions will be conducted in FY 1993-94 to expand trust fund support for waste reduction projects.

II. Educational Projects:

1. **County and Municipal Recycling Coordinators Training Course** - During FY 1992-93, the 1992 training course was completed and a contract negotiated and underway for the 1993 course. For the second year in a row, OWR awarded a contract to the North Carolina Recycling Association to assist in conducting the state's three-and-a-half day training course for local government recycling coordinators. Sixty-two individuals completed the 1992 course offered in Hickory (November 1992) and Wrightsville Beach (December 1992). By the end of FY 1992-93, a total of 172 recycling coordinators had completed the training. $15,000

2. **North Carolina Cooperative Extension Service Backyard Composting Project** - Following the success of last year's project, a second grant was awarded to continue the placement of compost demonstration sites in an additional 10 counties and to print additional copies of two brochures on backyard composting and "grasscycling." $15,000

3. **1992 "Buy-Recycled" Conference** - Five state departments joined forces to plan and conduct North Carolina's first "Buy-Recycled" Conference to promote the purchase of products made with recycled content. A contract was awarded to the U.N.C. Small Business and Technology Development Center to handle all conference logistics and registration. Approximately 300 conference attendees and exhibitors participated in the two-day event. $12,800

III. Staff Support:

For the first time, FY 1992-93 saw the use of the trust fund to provide staff support in both the Office of Waste Reduction and the Division of Solid Waste Management, Solid Waste Section. At the time these positions were established, no staff support existed to perform any market development work or tire site identification and prioritization work, and only one solid waste education specialist position existed. To expedite activity in these areas, full-time positions were created and funded to carry out the duties. Since these positions were not filled until the spring, the total amount of funding used from the trust fund was minimal during FY 1992-93. $9,359. The total amount of funding required to support these three positions during a full fiscal year (salary plus benefits) will be approximately $114,599.

Market Development Specialist (OWR). This is the first full-time position in state government dedicated to helping improve the market situation for local governments and others involved in recyclable materials collection.

Educational Specialist (OWR). In addition to conducting the annual Recycling Coordinator's Training Course and other training seminars, this position is responsible for development of educational materials and programs on solid waste issues to audiences ranging from school children to adult populations.

Nuisance Tire Site Clean-Up Coordinator (SWS). This position is responsible for identifying, mapping, ranking and overseeing the cleanup of nuisance tire sites in all North Carolina counties. Through an agreement with the Solid Waste Section, funding for this position from the trust fund will end in 1996.

Graduate Intern Program:

Through a contract with the University of North Carolina at Chapel Hill's Department of City and Regional Planning, OWR obtains the services of two student interns for a full year. The students work full time (40 hours/week) during the summer months and 12 hours per week during the academic year. Student interns during FY 1992-93 were from the Public Policy Analysis Program and the Environmental Sciences and Engineering Program in the UNC School of Public Health. $21,320

PLANNED EXPENDITURES FOR FY 1993-94

Trust expenditures for FY 1993-94 will include:

-- the third round of the Recycling Coordinators Training Course, which was completed in September 1993;
-- a continued emphasis on recycled product procurement through the "Buy-Recycled" Campaign;
-- increased emphasis on market development initiatives including assistance to the N.C. Market Development Council and the preparation of the legally required Market Assessment Report;
-- development of a solid waste reduction manual for school systems;
-- a promotional campaign for general public recycling; and
-- increased funding to local governments through the 1994 grant cycle of OWR's Recycling Assistant Grants.

NEWSPRINT TAX RECEIPT ISSUE

While the majority of trust fund revenues come from the tire tax, a small percentage goes into the trust fund from a tax on virgin newsprint. In FY 1992-93 revenues from the newsprint tax generated only $2,518 or less than 1 percent of total trust fund revenues. Newsprint revenues are generated from those newsprint producers who choose to use virgin newsprint instead of recycled newsprint and subsequently pay a tax at the rate of $15 per ton. The newsprint law provides for an exemption from the tax for those newspaper producers who can document attempts to obtain recycled newsprint, but are unable to due to availability or for other reasons. On face value, the following conclusions can be made: 1) either the newsprint law is working well and the majority of newspaper producers in the state are using recycled newsprint (and avoiding having to pay the tax); or 2) the majority of newspaper producers are seeking exemptions from the tax; or 3) the law is not being adequately enforced.

Office of Waste Reduction staff has attempted to determine the law's effectiveness. Because of the confidential nature of the Department of Revenue documents, the staff has been unable to determine the number of newspaper producers seeking exemptions and the number of newspaper producers required to report to the Department of Revenue. Since the newsprint statute does not require an audit of the exemptions producers have submitted, there is currently no way to determine recycled newsprint use by newspaper producers across the state and no method to determine if the revenues received are accurate.

At its regular commission meeting in October 1993, however, the Environmental Review Commission voted to send a letter to the Revenue Laws Study Committee to examine the issue and determine if there is a better way to determine the affect of the 1992 virgin newsprint law.

CHAPTER TEN

LOCAL GOVERNMENT SOLID WASTE PROGRAM FUNDING

The Local Government Solid Waste Management Annual Reports provide data on county and municipal funding of disposal, collection, and recycling for FY 1992-93. Data from the reports indicate that many local governments used multiple funding sources to support the three activities; some local governments used a single funding source for each solid waste service.

A. Funding for County Solid Waste Programs

TABLE 10-1 shows funding sources for solid waste disposal, collection, and recycling services provided by North Carolina counties in FY 1991-92.

TABLE 10-1: Number of Counties Using Specific Funding Sources for Specific Solid Waste Services:

Funding Source	Disposal	Collection	Recycling
Tipping fees	68	23	36
Tire tax refunds	71	NA	NA
Property taxes	44	45	39
Per household charges	31	32	22
Volume/Weight-based fees	7	7	6
Sale of recyclables	21	8	39
Grants	4	0	6
Other	18	12	14

Of the 68 counties using tipping fees for disposal revenue, 11 relied on the fees to provide 100 percent of funding; 17 more used tipping fees to more than 90 percent of disposal costs. Of the 44 counties using property taxes to support disposal, six relied on property taxes as the sole revenue source; an additional 12 used property tax revenue to finance more than 90 percent of disposal costs.

Four counties used tipping fees to cover all of their solid waste collection service costs; two others relied on tipping fees for 90 percent or more of collection funding. Twenty-nine counties made property taxes their exclusive revenue source for solid waste collection; another three covered more than 90 percent of costs with taxes. Twelve counties funded solid waste collection solely with per household charges.

TABLE 10-2: Number of Municipalities Using Specific Funding Sources for Specific Solid Waste Services

Funding Source	Disposal	Collection	Recycling
Tipping fees	5	0	5
Tire tax proceeds	2	NA	NA
Diversion credits	NA	NA	3
Property taxes	2	299	166
Per household charges	1	164	86
Volume/Weight-based fees	1	14	2
Sale of recyclables	1	7	32
Grants	0	1	4
Other	0	20	19

Of the six municipalities that operated disposal facilities in FY 1992-93, two used tipping fees exclusively to finance their disposal program. For other solid waste services, municipalities continued to rely heavily on the property tax base as a primary revenue source. More than two-thirds of cities and towns (209 out of 299) used taxes as their sole revenue source for solid waste collection services, while another nine used taxes to fund 90 percent of the costs of their solid waste collection program. Almost half of the municipalities using household fees (81 of 164) covered 100 percent of their solid waste collection costs with the fees.

Finally, property taxes were a common source of financial support for municipal recycling programs. One hundred-twenty cities and towns financed recycling exclusively from the property tax base and 63 municipalities did so with household fees. Four municipalities reported covering 100 percent of recycling costs with the sale of recyclables.

CHAPTER ELEVEN

SOLID WASTE EDUCATIONAL ACTIVITIES:

Public education is essential to the success of any solid waste program. It must be clear, consistent, concise, continuous, updated, and provide new information about solid waste operations in the community. The state of North Carolina recommends proactive solid waste educational activities that reach the total population of the community that includes school children, adults, and special groups contained within the population. Effective public education programs teach methods for responsible solid waste management practices, increase recycling participation rates, and decrease improper disposal.

Local Government Solid Waste Education:

Data from the FY 1992-93 Solid Waste Management Annual Reports reveal that local governments develop school programs for children and place newspaper advertisements, and use "take home" items such as brochures, printed bags, refrigerator magnets, etc. as the primary vehicles for general public education. Other types of education used include radio and television advertisements, mass mail, direct mail, indirect mail, special events, telephone "hotlines," workshops and conferences.

TABLE 11-1 shows that there were 217 local governments in North Carolina (81 counties, 136 municipalities) that reported sponsoring solid waste management educational programs in FY 1992-93. This represents 81 percent of county governments and 26 percent of municipalities. Some communities independently provide solid waste education while others coordinate educational activities with groups such as Keep America Beautiful, local cooperative extension agents, and neighboring municipalities or counties.

TABLE 11-1: Topics Covered in Solid Waste Education Programs

SOLID WASTE TOPICS	COUNTY PROGRAMS	MUNICIPAL PROGRAMS (136)	TOTAL PROGRAMS (217)
Residential Source Reduction	58 (71%)	62 (45%)	120 (55%)
Industrial/Commercial Source	40 (49%)	25 (18%)	65 (29%)
Reuse	54 (66%)	37 (27%)	91 (41%)
Recycling	81 (100%)	129 (94%)	200 (92%)
Recycled product procurement	47 (58%)	33 (24%)	80 (36%)
Backyard composting	49 (60%)	37 (27%)	86 (39%)
MSW composting	10 (12%)	7 (5%)	17 (7%)
Incineration	10 (12%)	8 (5%)	18 (8%)
Landfilling	61 (75%)	44 (32%)	105 (48%)
Household Hazardous Waste	26 (32%)	14 (10%)	40 (18%)
Other	8 (9%)	5 (3%)	13 (5%)

The 217 local governments that provided solid waste education covered many different solid waste management topics. The previous table shows the most common topic was recycling, which was addressed by 92 percent of all solid waste education programs. Residential source reduction, landfilling and reuse were also popular topics.

TABLE 11-2 below indicates that local governments used a variety of activities to teach about solid waste. More than half of the local governments that provided solid waste education offered "take home items," such as brochures, printed bags, cups or magnets, presented school programs, and placed newspaper advertisements in the local papers. Other common practices included workshops, special events, radio advertisements, and mailings.

TABLE 11-2: Activities and Mediums Used To Convey Solid Waste Education

EDUCATIONAL ACTIVITIES	PERCENT OF MUNICIPAL PROGRAMS (136 TOTAL)	PERCENT OF COUNTY PROGRAMS (81 TOTAL)
Radio	19%	41%
Television	16%	17%
Newspaper	47%	65%
Mass Mailings	28%	22%
Direct Mail	28%	25%
Indirect Mail	35%	20%
Special Events	22%	56%
"Take Home Items": brochures, printed bags cups,	44%	80%
Hotline	11%	20%
Workshops	18%	51%
School Programs	39%	80%
Other	16%	23%

Effective solid waste education programs use messages tailored to specific audiences. TABLE 11-3 indicates audiences targeted by the 217 local governments that reported having solid waste education programs. Residential participants were targeted by 83 percent of the educational programs, and civic groups such as environmental organizations, and neighborhood and community groups, were targeted by 74 percent of the programs. This is supported by the high number of programs that are using "take home items" as the main method/activity to convey solid waste education. This type of education usually teaches how to use recycling drop-off and curbside programs, including the hours of operation, days of collection, and what types of items are accepted in the program. School children were targeted by 60 pecent of the programs.

TABLE 11-3: Audiences Targeted by Solid Waste Education

AUDIENCES TARGETED	MUNICIPAL PROGRAMS (136 TOTAL)	COUNTY PROGRAMS	TOTAL PROGRAMS
School Children	61	70	131 (60%)
Manufacturing firms	23	32	55 (25%)
Industries	24	38	62 (28%)
Small Business	59	43	102 (47%)
Residential participants	116	65	181 (83%)
Elected Officials	46	38	84 (38%)
Institutions (schools, hospitals, prisons, etc.)	29	48	97 (44%)
Government employees	47	52	99 (45%)
News and editorial media	31	32	63 (29%)
Environmental, neighborhood and civic groups	35	64	162 (74%)
Industry (trade) and professional associations	11	23	34 (15%)
Other	9	5	14 (6%)

State Solid Waste Education Efforts:

The state plays an important role in promoting solid waste education. In 1991, the Office of Waste Reduction (OWR) funded three statewide education projects from the Solid Waste Management Trust Fund, which cost $115,000. These three projects included: 1) an Educational Program in Home Yard Waste Composting developed by the N.C. Cooperative Extension Service; 2) a Public Education Campaign on Waste Reduction and Recycling conducted by the Environmental Defense Fund (EDF); and 3) the State of North Carolina's Training Course for County and Municipal Recycling Coordinators. Some of these initial projects were continued in 1992, 1993, and 1994.

The State Recycling Coordinator's Training Course is offered annually for local government recycling coordinators and other solid waste management professionals. To date, 217 persons have been trained. The three-day course provides information about integrated solid waste management techniques in an interactive format.

In 1991, the EDF campaign message was "If you're not recycling you're throwing it all away." The 1994 EDF campaign message is "Buy Recycled. And Save." This campaign includes public service announcements that target newspaper, radio, and television.

The 1991 Home Yard Waste education program produced a video and several brochures for statewide distribution and constructed compost demonstration sites in 14 counties during the first year. The program was extended in the second year to include 10 additional counties.

The demonstration sites have become ongoing projects of the counties, and are currently in operation. In addition to those three projects, Recycling Assistance Grants funded through the Solid Waste Management trust fund were awarded to three counties in the FY 1992-93 grant cycle, and to seven counties in the FY 1993-94 grant cycle specifically to develop educational programs. One of the projects funded in the FY 1993-94 grant cycle was the Watauga County project to develop a K-8 solid waste curriculum in the public school system in the county.

The Office of Waste Reduction also educates local government officials, recycling coordinators and solid waste professionals in North Carolina through workshops. A workshop on Construction and Demolition Debris Recycling was offered at the 1994 N.C. Recycling Association's (NCRA) conference in Asheville. A Residential and Commercial Source Reduction workshop was presented in September 1993, in Greenville, in cooperation with the NCRA, SunShares, the city of Greensboro, Mecklenburg County, INFORM, N.C. Cooperative Extension Service, and Prete-Wilmot Associates.

The OWR has developed a Commercial/Industrial workshop on waste reduction strategies for businesses and industries that it presents to local governments upon request. The OWR also prepared a Commercial/Industrial Waste Reduction Guidance Manual for local governments in March 1994. In addition, the OWR produces many publications every year, including SWRPalerts (up-to-date information bulletins on waste reduction and recycling concerns in the state), fact sheets, a recycling markets directory, and a local contacts directory. The OWR also has an extensive library on all media waste open to the public during regular business hours. For a complete listing contact the Office of Waste Reduction at (919) 571-4100.

CHAPTER TWELVE

RECYCLING MARKETS AND MARKET DEVELOPMENT

Recycling often reflects images of placing bottles, cans and newspapers in collection bins; but recently recycling has moved beyond this supply-side focus. Across the country, state recycling programs have increasingly concentrated on how developing markets for recyclable materials can strengthen recyclable material demand and stimulate economic development. Recognizing this trend, the Office of Waste Reduction (OWR) has made significant budgetary commitments to market recycling, including the recent hiring of two market development analysts. The following narrative highlights current North Carolina state government activities to market recycling.

NC Directory of Markets for Recyclable Materials:

To encourage and improve recycling efforts, OWR recently published the third edition of the NC Directory of Markets for Recyclable Materials (previously titled the "Directory of Industrial and Commercial Recyclers Serving North Carolina Businesses and Industries"). OWR also maintains the market information contained in this directory on a computerized database, which is updated as new businesses and recycling capacity develop. The directory and the database provide the essential link between businesses, industries, and local governments that are searching for markets for their recyclables and companies that accept the materials for reprocessing and reuse.

More than 5,000 copies of the directory, the major list of recycling markets in North Carolina and adjacent states, have been distributed to date. The directory identifies industrial and commercial recyclers (including brokers, handlers, processors, end users, exporters, fuel-blenders and burners) by business name, location, and materials accepted. Contacts for additional information and assistance from the 420 businesses and industries listed are also provided.

Recycling Industry And Recycled Materials In North Carolina Assessment:

The passage of legislation in the 1993 session of the General Assembly shifted the responsibility for preparing a biennial report assessing the recycling industry and recycling materials in the state from the Department of Commerce (DOC) to the Department of Environment, Health, and Natural Resources (DEHNR). In order to meet this mandate and to provide a foundation for its expanded market development program, OWR issued a request for proposals in March 1994 and is currently seeking proposals from qualified firms to assist in the preparation of an updated market assessment report.

OWR staff members have begun to prepare a detailed assessment of the current and potential future supply of various recyclable materials generated in this state. The next step will be to assess the current and potential future demand for recyclable materials by intermediate processors and end-users. Data collected and examined will be analyzed to determine by material the potential for successful recycling. The analysis

will include, but not be limited to: the materials identified as having the best match of supply and demand; the materials that could be efficiently collected in significant quantities (supply), but have problematic market availability (demand); and materials with promising demand trends, but limited collection efforts to date. Both short and long term trends will be identified.

Based upon the information compiled from the activities described above, overall market development needs and issues will be identified, including an examination of current local, state and industry initiatives. Recommendations made as a result of this investigation will be expressed as an "Agenda for Action."

EPA 1994 Jobs Through Recycling Initiative:

OWR, in cooperation with the NC DOC, was recently selected by the US EPA to negotiate a contract that would establish a Recycling and Reuse Business Assistance Center (RBAC) in North Carolina. The 18-month project will provide a structure for coordinating the many programs and activities for marketing, recycling and economic development in the state by focusing those resources to achieve three primary goals:

1) To expand existing market development capacity for recyclable materials collected in public and private recycling programs throughout the state;

2) To link existing business financing and incentive programs to the recycling community; and

3) To support the recycling industry in order to create jobs and strengthen the economy of the state.

These goals will be achieved through a combination of:

- -- technical assistance to recycling businesses and to businesses interested in using recycled materials in lieu of virgin materials;
- -- training programs for professionals in both the recycling and economic development fields to foster a thorough understanding of each discipline and foster interaction between the two fields;
- -- demonstration projects to test marketing approaches for recycling;
- -- promotion of recycled product procurement to drive the demand for secondary materials; and
- -- development of a structure to coordinate the economic and recycling market development fields to achieve common objectives.

North Carolina, California, Minnesota, and New York were selected from 23 applicants. The total project budget for the RBAC is $739,713, which includes a state-contributed 34 percent match of $250,281. The OWR's request from EPA is for $489,432.

Comprehensive Strategic Economic Development Plan:

As a result of the public hearings held in the fall of 1993 on the statewide Comprehensive Strategic Economic Development Plan (the plan), a number of "Issues Groups" were formed to develop reports based on the issues identified. One of the groups was charged with presenting explicit legislative and

administrative actions to meet the challenge of developing a statewide recycling system. Incorporated into the plan from the Recycling Issues Working Group Report was the objective to recruit and start companies that provide markets for recycled materials.

Actions taken to achieve this goal include funding for activities undertaken by the RBAC that were described in the previous section ($500,000 in 1994 and $375,000 per year from 1995 through 1998) and the establishment of a recycling grants program ($500,000 per year from 1995 through 1998) to support public/private partnerships in developing markets for recycled materials. Priority on grant awards would be given to projects that address difficult marketing barriers and provide guaranteed markets for multiple municipal or county recycling programs.

The plan was adopted by the N.C. Economic Development Board and presented to the governor at its April 11, 1994 Board meeting. Plan recommendations will be presented to the legislature during the 1994 session.

Special Projects:

OWR has been working with a number of organizations in research and development activities that could significantly increase the markets available, or improve the economics of marketing selected materials. The following three projects are examples of those activities.

Use of Mixed Paper as Animal Bedding for Chicken Houses: An alternative to present practices currently under investigation by the OWR in conjunction with the N.C. Department of Agriculture, N.C. State University and East Carolina Vocational Center, is the use of ground recycled mixed paper for animal bedding for chicken houses. An estimated 60 million cubic feet of bedding material is used in rearing the 560 million broilers, 66 million turkeys and 8 million broiler breeders grown in North Carolina annually. Pine shavings are usually used as bedding for these types of poultry, as well as some peanut hulls and sawdust. Finding a reliable source of these shavings at an acceptable cost is often difficult. Therefore, alternatives for pine shavings have been and will continue to be considered by the poultry industry in an attempt to assure satisfactory and cost-effective bedding supplies. If the project proves successful, up to 150,000 tons per year of recycled mixed paper could be used for poultry bedding.

Use of Gypsum Wallboard as a Soil Amendment in Peanut Production: Ground gypsum wallboard, which makes up approximately 15 percent of the construction and demolition debris waste stream, has been tested as a soil amendment in peanut production to replace commercial land plaster. The OWR, the N.C. Department of Agriculture, and the N.C. Cooperative Extension Service of Pitt County are working together to test the overall feasibility of this project. Soon-to-be-published test results from N.C. State University indicate that ground gypsum wallboard is comparable to commercial land plaster relative to soil pH, presence of metals in the soils, and quality of the peanut meat. Based upon initial estimates, all of the approximate 120,000 tons per year of gypsum wallboard generated in North Carolina and requiring disposal could be used in soil amendment applications.

Glass Consolidation Facility: The Office of Waste Reduction was instrumental in the establishment of an Eastern Carolina Glass Consolidation Facility, a cooperative effort of Pitt County, Eastern Carolina

Vocational Center (ECVC), the Glass Packaging Institute, and OWR. At OWR's suggestion, Pitt County and ECVC developed a facility that could accept glass from recycling programs located throughout eastern North Carolina in order to reduce costs of by transporting small quantities of glass to a processor in Raleigh. The facility, located at ECVC and completed in March 1994, will purchase glass in quantity from any recycling program. The total cost was $25,000 and funding was provided through a $15,000 grant from OWR, and donations of $6,000 and $4,000 from Pitt County and the Glass Packaging Institute. The facility's design and construction were provided by the Pitt County Engineering Department.

Other State Agencies' Activities:

In addition to the activities undertaken by OWR, several state agencies are also playing significant roles in developing markets for recycling. The Business/Industry Development Division of the DOC has helped locate industries that use recycled materials and has assisted a number of existing industries in increasing their current production levels. The Department of Transportation (DOT) has established a Recycled Products and Solid Waste Utilization Task Force to act as a central point of contact for various agencies, municipalities, or industries that have specific proposals to use recycled or solid waste materials in highway construction or maintenance operations. The Division of Purchase and Contract of the Department of Administration (DOA) is exploring and providing opportunities for state agencies to purchase recycled content products and has designated a primary contact whom state agencies may call about recycled-content purchase issues. The DEHNR Solid Waste Section administers a Recycling and Resource Recovery Equipment and Facilities Tax Credit Program that gives special tax treatment to individuals and corporations that purchase equipment for recycling and resource recovery or that construct facilities for recycling and resource recovery.

North Carolina's Buy Recycled Campaign:

The amount of materials collected for recycling increases daily, yet many North Carolina consumers and businesses are not "completing the loop" by buying recycled products. Materials are not recycled unless they are made into new products and those products are purchased. North Carolina's Buy Recycled Campaign was officially kicked off in July 1992, when the Governor's Office, DOA, DOC, DEHNR and DOT hosted the state's first Recycled Products Procurement Conference. Spearheaded by OWR, the conference targeted state agencies, local government and industrial purchasing personnel. Vendors of recycled products exhibited their products at the conference and discussed recycled product purchasing with purchasing agents. Other components of North Carolina's Buy Recycled Campaign include the following activities:

Buy Recycled Workshops and/Seminars. OWR has presented six sessions over the past two years on "buy recycled" issues at the N.C. Recycling Association's annual conference. Also, for two consecutive years, OWR and the DOA's Division of Purchase and Contract (P&C) have discussed recycled product procurement at the Carolina Association of Government Purchasers bi-annual conference. OWR also works with local community groups to give presentations on buying recycled content products. In addition, OWR and P&C are planning regional "buy recycled" workshops for fall 1994.

Buy Recycled Publications. OWR and P&C have jointly published two issues of the brochure "Buying Recycled Products through NC State Contracts." This brochure was developed to ease the purchase of recycled products by state and local purchasing agents and others eligible to purchase from state contract including local governments, schools, universities, non-profit agencies and others. OWR is also compiling a list of manufacturers in the state who use recycled materials in the manufacture of their products. These industries will be highlighted in a future OWR publication. A future OWR information bulletin will focus on "How to Set Up a Buy Recycled Program." This bulletin will also feature highlights of buy recycled policies and resolutions passed by North Carolina local governments as a way to help expand recycling markets.

State Agency Recycled Product Procurement. OWR was instrumental in drafting Executive Orders focusing on recycled product procurement by state agencies for both Governors Martin and Hunt. OWR, the DOA and DOT also helped develop procurement legislation passed by the 1993 General Assembly, Senate Bill (SB) 58, that requires all state agencies to increase their recycled content purchases. OWR is currently drafting guidelines for state agencies to report on progress towards meeting recycled product procurement goals specified in Executive Order 8 and SB 58.

1994 Buy Recycled Media Project. The DEHNR and the Environmental Defense Fund have collaborated to produce a Buy Recycled Media Project, which consists of 30 and 10-second television public service announcements (PSAs), four different radio PSAs and various newspaper and magazine print ads to spread the message about buying recycled products. Press kits were mailed to North Carolina media outlets on March 1, 1994. Beginning this spring, radio and television PSAs and print ads will feature the DEHNR/OWR logos.

APPENDIX A-1: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

PERMIT	PUBLIC FACILITIES	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONNAGE CHANGE FY 92-93	TONS/DAY (280 DAYS) FY 92-93	TIPPING FEE FY 90-91	TIPPING FEE FY 91-92	TIPPING FEE FY 92-93	CERTIFIED OPERATOR FY 91-92	CERTIFIED OPERATOR FY 92-93
4103	GREENSBORO LF (GUILFORD CO)	322,946.00	327,574.00	283,000.00	-44,574.00	1,010.71	$22.00	$26.00	$26.25	YES	YES
9201	WAKE CO (WILDERS GROVE) LF	276,652.00	258,796.00	267,984.00	9,188.00	957.09	$21.00	$28.00	$28.00	YES	YES
3402	WINSTON SALEM LF (FORSYTH)	229,531.00	210,246.46	216,125.79	5,879.33	771.88	$15.00	$18.00	$18.00	YES	YES
3201	DURHAM LF (DURHAM)	217,020.00	208,360.00	194,281.00	-14,079.00	693.86	$26.00	$38.00	$38.00	NO	NO
2601	ANN ST LF (CUMBERLAND CO)	174,445.00	160,880.67	179,920.67	19,040.00	642.57	$2.00	$25.00	$29.00	YES	YES
3606	GASTON CO LF	149,198.00	153,105.00	161,864.00	8,759.00	578.09	$22.00	$22.00	$22.00	YES	YES
1101	BUNCOMBE CO LF	192,476.00	141,928.01	143,267.00	1,338.99	511.67	$28.00	$28.00	$28.00	YES	YES
1803	CATAWBA CO LF	131,201.00	129,948.00	136,459.00	6,511.00	487.35	$10.00	$15.00	$20.00	YES	NO
4101	HIGH POINT LF (GUILFORD CO)	118,968.00	118,118.30	126,083.78	7,965.48	450.30	$21.00	$26.00	$30.00	NO	NO
6801	ORANGE CO REGIONAL LF	95,123.00	121,318.00	125,452.00	4,134.00	448.04	$20.00	$22.00	$21.50	YES	YES
4901	IREDELL CO LF	148,500.00	110,357.00	124,625.00	14,268.00	445.09	$24.00	$24.00	$27.00	YES	YES
9209	WAKE CO LF	156,958.00	150,967.70	122,444.10	-28,523.60	437.30	$21.00	$28.00	$28.00	YES	YES
2902	DAVIDSON CO LF	117,211.00	132,258.00	121,503.00	-10,755.00	433.94	$18.00	$21.00	$21.30	YES	YES
9801	WILSON CO LF	108,637.00	117,112.00	121,419.00	4,307.00	433.64	$0.00	$0.00	$0.00	NO	NO
7401	PITT CO LF	142,110.00	124,008.00	119,270.00	-4,738.00	425.96	$0.00	$20.00	$20.00	NO	NO
9601	WAYNE CO	111,083.00	97,386.32	101,716.09	4,329.77	363.27	$14.00	$14.00	$14.00	YES	YES
9203	FELTONSVILLE LF (WAKE CO)	89,035.00	92,433.74	100,764.82	8,331.08	359.87	$21.00	$28.00	$28.00	NO	YES
8003	ROWAN CO LF	87,159.00	85,708.00	88,639.00	2,931.00	316.57	$27.00	$28.00	$31.00	YES	YES
6504	NEW HANOVER CO LF	123,538.00	80,575.58	83,273.11	2,697.53	297.40	$60.00	$60.00	$60.00	YES	YES
7803	ROBESON CO	84,066.00	91,048.50	80,676.70	-10,371.80	288.13	$13.00	$23.00	$22.50	NO	NO
1007	BRUNSWICK CO LF	70,836.00	76,560.00	80,477.00	3,917.00	287.42	$0.00	$0.00	$0.00	NO	NO
9001	UNION CO LF	105,570.00	71,787.37	79,465.89	7,678.52	283.81	$26.00	$30.00	$30.00	NO	NO
3301	EDGECOMBE CO LF	64,079.00	71,037.00	78,894.52	7,857.52	281.77	$10.00	$10.00	$15.00	YES	YES
6401	NASH CO LF	78,495.00	79,402.87	78,454.78	-948.09	280.20	$8.00	$12.00	$15.00	NO	NO
1602	CARTERET CO LF	105,358.00	84,433.00	78,281.00	-6,152.00	279.58	$20.00	$15.00	$30.00	NO	NO
7601	RANDOLPH CO LF	74,700.00	75,533.00	77,660.00	2,127.00	277.36	$20.00	$20.00	$24.00	YES	YES
4501	HENDERSON CO LF	89,488.00	77,763.00	77,501.00	-262.00	276.79	$0.00	$17.00	$26.00	YES	YES
101	ALAMANCE CO LF	98,552.00	89,089.64	76,632.91	-12,456.73	273.69	$29.00	$31.00	$30.67	NO	NO
5403	LENOIR CO LF	60,347.00	67,323.66	74,062.00	6,738.34	264.51	$12.00	$12.00	$12.00	NO	NO
6705	ONSLOW CO LF	74,195.00	63,530.27	69,992.56	6,462.29	249.97	$35.00	$35.00	$35.00	NO	NO
8401	ALBEMARLE LF (STANLY)	62,328.00	67,498.00	69,503.00	2,005.00	248.23	$0.00	$0.00	$0.00	YES	YES
2503	CRAVEN CO LF	97,232.00	77,108.17	68,675.15	-8,433.02	245.27	$25.00	$25.00	$25.00	NO	NO
5101	JOHNSTON CO LF	72,048.00	70,045.00	68,578.00	-1,467.00	244.92	$18.00	$27.00	$27.00	NO	NO
1203	BURKE CO LF	54,509.50	64,619.00	68,081.55	3,462.55	243.15	$18.00	$20.00	$23.00	YES	YES
2301	CLEVELAND CO LF	74,096.00	64,749.87	67,888.77	3,138.90	242.46	$19.00	$19.00	$23.00	NO	NO
1401	CALDWELL CO LF	45,866.00	62,112.59	66,951.53	4,838.94	239.11	$18.00	$18.00	$25.00	NO	NO

APPENDIX A-1: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

PERMIT	PUBLIC FACILITIES	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONNAGE CHANGE FY 92-93	TONS/DAY (280 DAYS) FY 92-93	TIPPING FEE FY 90-91	TIPPING FEE FY 91-92	TIPPING FEE FY 92-93	CERTIFIED OPERATOR FY 91-92	CERTIFIED OPERATOR FY 92-93
8103	CENTRAL LF (RUTHERFORD CO)	48,208.00	52,047.64	64,894.31	12,846.67	231.77	$28.00	$17.00	$17.00	YES	YES
7901	ROCKINGHAM CO LF	60,155.00	37,377.46	60,661.85	23,284.39	216.65	$13.00	$18.00	$18.00	YES	YES
6301	MOORE CO LF	72,690.00	70,706.43	58,114.30	-12,592.13	207.55	$10.00	$10.00	$10.00	YES	NO
1302	CABARRUS CO LF	59,832.00	59,335.70	57,641.70	-1,694.00	205.86	$25.00	$28.00	$28.00	YES	YES
9701	WILKES CO LF	83,832.00	55,722.00	55,832.00	110.00	199.40	$3.00	$6.00	$3.40	NO	NO
2802	EAST LAKE LF (DARE CO)	48,613.00	50,101.00	52,052.36	1,951.36	185.90	$0.00	$0.00	$0.00	YES	NO
4204	HALIFAX CO LF	60,000.00	52,309.79	52,036.12	-273.67	185.84	$9.00	$9.00	$9.00	NO	NO
8602	SURRY CO LF	49,296.00	45,907.00	51,518.00	5,611.00	183.99	$0.00	$0.00	$0.00	NO	NO
4403	HAYWOOD CO LF	40,560.00	39,240.00	50,878.47	11,638.47	181.71	$0.00	$0.00	$0.00	NO	YES
4302	HARNETT CO LF	59,804.00	54,770.00	49,985.00	-4,785.00	178.52	$10.00	$10.00	$25.00	NO	NO
8301	SCOTLAND CO LF	46,800.00	43,041.84	45,668.00	2,626.16	163.10	$17.00	$19.00	$19.00	NO	YES
2401	COLUMBUS CO LF	35,880.00	44,536.31	45,361.11	824.80	162.00	$16.00	$16.00	$16.00	YES	NO
702	BEAUFORT CO LF	37,200.00	38,748.17	44,531.19	5,783.02	159.04	$0.00	$0.00	$0.00	NO	NO
5503	LINCOLN CO LF	51,450.00	42,297.00	44,194.64	1,897.64	157.84	$10.00	$20.00	$28.00	YES	YES
5301	LEE CO LF	45,981.00	46,750.83	43,398.70	-3,352.13	155.00	$9.00	$14.00	$25.00	NO	NO
6201	MONTGOMERY CO LF	18,096.00	28,800.00	42,542.43	13,742.43	151.94	$7.00	$0.00	$22.50	NO	YES
3901	OXFORD LF (GRANVILLE CO)	32,246.00	36,341.03	39,190.64	2,849.61	139.97	$15.00	$14.00	$14.20	NO	NO
9101	VANCE CO LF	46,954.00	40,053.06	38,242.34	-1,810.72	136.58	$12.00	$14.00	$18.40	NO	NO
7702	RICHMOND CO LF	47,662.00	60,103.48	36,885.79	-23,217.69	131.73	$35.00	$35.00	$35.00	YES	YES
9502	WATAUGA CO LF	32,206.00	32,881.82	35,208.00	2,326.18	125.74	$15.00	$15.00	$20.00	YES	YES
8201	SAMPSON CO LF	36,000.00	33,234.59	34,975.86	1,741.27	124.91	$20.00	$20.00	$17.50	NO	YES
4404	CANTON LF (HAYWOOD CO)	95,735.00	13,957.00	34,592.00	20,635.00	123.54	$40.00	$23.00	$23.00	NO	NO
3501	FRANKLIN CO LF	25,881.00	27,887.46	32,477.41	4,589.95	115.99	$14.00	$18.00	$32.00	NO	NO
7002	PASQUOTANK CO LF	34,478.00	30,004.99	31,638.80	1,633.81	113.00	$25.00	$25.00	$25.00	YES	YES
5901	MARTIN CO LF	25,956.00	30,086.00	30,690.00	604.00	109.61	$0.00	$0.00	$0.00	NO	NO
5601	MCDOWELL CO LF	28,900.00	27,460.96	30,279.63	2,818.67	108.14	$21.00	$21.00	$21.00	NO	YES
3101	DUPLIN CO LF	48,900.00	31,571.92	29,913.64	-1,658.28	106.83	$12.00	$27.00	$26.85	NO	NO
1901	CHATHAM CO LF	31,910.00	30,552.00	29,805.00	-747.00	106.45	$19.00	$30.00	$35.00	NO	NO
901	BLADEN CO	47,110.00	24,810.00	28,330.00	3,520.00	101.18	$13.00	$12.00	$13.40	NO	NO
7201	PERQUIMANS CHOWAN GATES REG LF	24,508.00	24,700.00	26,410.31	1,710.31	94.32	$25.00	$25.00	$25.00	YES	YES
7301	ROXBORO LF (PERSON CO)	42,996.00	22,528.99	25,251.59	2,722.60	90.18	$0.00	$14.00	$20.00	YES	YES
9902	YADKIN CO LF	25,800.00	20,487.33	22,529.86	2,042.53	80.46	$0.00	$0.00	$0.00	NO	NO
8603	ELKIN AREA LF (SURRY CO)	32,760.00	26,726.00	21,604.00	-5,122.00	77.16	$0.00	$0.00	$0.00	NO	NO
1	YANCEY/MITCHELL CO LF	31,296.00	30,915.00	21,072.00	-9,843.00	75.26	$0.00	$0.00	$0.00	NO	NO
201	ALEXANDER CO LF	28,880.00	25,182.00	20,712.00	-4,470.00	73.97	$12.00	$24.00	$24.00	NO	NO
3902	GRANVILLE CO (BUTNER) LF	14,090.00	17,915.14	19,320.50	1,405.36	69.00	$15.00	$14.00	$14.20	NO	NO

APPENDIX A-1: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

PERMIT	PUBLIC FACILITIES	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONNAGE CHANGE FY 92-93	TONS/DAY (280 DAYS) FY 92-93	TIPPING FEE FY 90-91	TIPPING FEE FY 91-92	TIPPING FEE FY 92-93	CERTIFIED OPERATOR FY 91-92	CERTIFIED OPERATOR FY 92-93
5002	JACKSON CO LF	16,833.00	16,703.00	19,309.07	2,606.07	68.96	$0.00	$24.00	$24.00	NO	NO
4701	HOKE CO LF	20,306.00	17,515.04	19,150.05	1,635.01	68.39	$15.00	$15.00	$15.00	YES	YES
3001	DAVIE CO LF	19,070.00	15,109.98	18,284.35	3,174.37	65.30	$30.00	$30.00	$30.00	NO	NO
501	ASHE CO LF	16,389.00	17,756.20	18,000.17	243.97	64.29	$18.00	$18.00	$30.00	NO	NO
2001	CHEROKEE CO LF	15,840.00	15,926.00	17,610.69	1,684.69	62.90	$0.00	$12.00	$12.00	NO	NO
7101	PENDER CO LF	18,133.00	17,875.79	17,277.29	-598.50	61.70	$30.00	$54.00	$54.00	NO	NO
801	BERTIE CO LF	12,600.00	17,255.30	16,864.00	-391.30	60.23	$0.00	$0.00	$0.00	NO	NO
8501	STOKES CO LF	16,896.00	16,784.00	16,671.26	-112.74	59.54	$20.00	$20.00	$20.00	NO	NO
5703	MACON CTY LANDFILL	0.00	3,648.70	16,645.53	12,996.83	59.45	$0.00	$0.00	$20.00	YES	YES
8807	TRANSYLVANIA CO LF	0.00	3,220.00	16,384.00	13,164.00	58.51	$0.00	$0.00	$0.00	YES	YES
401	ANSON CO LF	14,831.00	13,942.30	15,702.29	1,759.99	56.08	$30.00	$30.00	$30.00	YES	YES
2701	CURRITUCK CO LF	14,569.00	13,721.00	15,001.00	1,280.00	53.58	$0.00	$0.00	$0.00	NO	NO
4601	HERTFORD CO LF	12,475.00	14,269.00	14,819.00	550.00	52.93	$19.00	$20.00	$40.00	NO	NO
9402	WASHINGTON CO LF	11,773.00	13,233.05	14,735.51	1,502.46	52.63	$15.00	$18.00	$18.00	YES	NO
6601	NORTHAMPTON CO LF	12,384.00	18,890.00	14,435.18	-4,454.82	51.55	$0.00	$0.00	$0.00	NO	NO
6902	PAMLICO CO LF	11,083.00	10,600.00	11,895.54	1,295.54	42.48	$0.00	$0.00	$25.00	YES	YES
4303	ANDERSON CREEK LF (HARNETT CO)	10,355.00	13,691.00	11,841.00	-1,850.00	42.29	$10.00	$10.00	$25.00	NO	NO
5802	MADISON CO LF	12,090.00	11,154.00	10,404.59	-749.41	37.16	$0.00	$0.00	$0.00	YES	YES
9301	WARREN CO LF	13,490.00	10,968.00	8,976.00	-1,992.00	32.06	$14.00	$25.00	$16.00	NO	NO
4002	GREENE CO LF	14,064.00	6,815.28	8,729.64	1,914.36	31.18	$0.00	$14.00	$20.00	NO	NO
302	ALLEGHANY CO LF	17,060.00	13,995.00	7,684.00	-6,311.00	27.44	$0.00	$18.00	$18.00	NO	NO
7502	POLK CO LF	9,318.00	8,808.86	7,515.49	-1,293.37	26.84	$30.00	$30.00	$30.00	YES	YES
9702	ROARING RIVER LF (WILKES CO)	9,146.00	1,637.00	6,501.00	4,864.00	23.22	$3.00	$6.00	$3.40	NO	NO
8701	SWAIN CO LF	4,663.00	5,521.30	6,152.27	630.97	21.97	$0.00	$0.00	$0.00	NO	NO
1701	CASWELL CO LF	5,807.60	5,102.43	4,818.11	-284.32	17.21	$9.00	$15.00	$30.00	NO	NO
3801	GRAHAM CO LF	4,710.00	4,422.96	4,741.00	318.04	16.93	$0.00	$0.00	$12.00	NO	NO
5702	HIGHLANDS LF (MACON CO)	7,365.00	4,267.04	3,655.53	-611.51	13.06	$0.00	$0.00	$20.00	YES	YES
2201	CLAY CO LF	4,720.00	3,965.60	3,425.00	-540.60	12.23	$0.00	$12.00	$12.00	NO	NO
8102	CLIFFSIDE SOUTH (RUTHERFORD CO) LF	12,051.00	31,228.58	3,184.21	-28,044.37	11.37	$28.00	$0.00	$0.00	NO	NO
5201	JONES CO LF	3,648.00	4,360.00	2,878.00	-1,482.00	10.28	$0.00	$20.00	$20.00	NO	NO
601	AVERY CO LF	16,060.00	10,800.00	2,830.00	-7,970.00	10.11	$0.00	$0.00	$0.00	NO	NO
5701	MACON CO LF (FRANKLIN)	28,215.00	9,531.32	1,011.49	-8,519.83	3.61	$0.00	$0.00	$0.00	YES	YES
2904	THOMASVILLE LF (DAVIDSON CO)	7,502.00	0.00	0.00	0.00	0.00	$0.00	$0.00	$0.00	NO	NO
6001	MECKLENBURG CO LF	221,124.00	150,603.00	0.00	-150,603.00	0.00	$25.00	$28.00	$0.00	YES	NO
8803	TRANSYLVANIA CO LF	26,740.00	25,620.00	0.00	-25,620.00	0.00	$0.00	$0.00	$0.00	YES	YES
	TOTAL	6,497,532.10	5,972,752.39	5,845,439.53	-127,312.86	20,876.57				43	43

PERMIT	FACILITY	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONS CHANGE	TONS/DAY FY 92-93 (280 DAYS)	TIPPING FEE FY 90-91	TIPPING FEE FY 91-92	TIPPING FEE FY 92-93	CERTIFIED OPERATOR FY 91-92	CERTIFIED OPERATOR FY 92-93
1304	CHARLOTTE MTR SPEEDWAY	359,918.00	404,978.70	493,962.61	88,983.91	1,764.15	$30.00	$28.00	$29.00	YES	YES
3406	PIEDMONT LF & RECYCLING CTR	128,148.00	142,067.36	146,847.90	4,780.54	524.46	$74.00	$24.00	$24.00	NO	NO
6703	CAMP LEJEUNE SANITARY LF	59,403.00	83,823.43	83,823.43	0.00	299.37	$0.00	$0.00	$0.00	YES	YES
9204	SORRELLS SANITARY LF	DNR	37,530.00	50,138.00	12,608.00	179.06	DNR	$21.00	$21.00	NO	NO
2602	FORT BRAGG SANITARY LF	80,000.00	39,996.00	36,000.00	-3,996.00	128.57	$0.00	$0.00	$0.00	NO	NO
5001	WESTERN CAROLINA UNIVERSITY	612.00	430.45	402.42	-28.03	1.44	$0.00	$0.00	$0.00	NO	NO
	TOTAL	628,081.00	708,825.94	811,174.36	102,348.42	2,897.05				2	2

DNR = DID NOT REPORT

PERMIT	FACILITY	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONS CHANGE	TONS/DAY FY 92-93 (280 DAYS)
1303	U S TIRE RECYCLING, L P	15,444.00	17,094.25	17,873.23	778.98	63.83
4304	CENTRAL CAROLINA TIRE DISPOSAL	0.00	2,764.61	4,824.43	2,059.82	17.23
	TOTAL TONS	15,444.00	19,858.86	22,697.66	2,838.80	81.06

PERMIT	FACILITY	GROSS TONS FY 90-91	ASH TONS FY 90-91	TONS FY 90-91	GROSS TONS FY 91-92	ASH TONS FY 91-92	TONS FY 91-92	GROSS TONS FY 92-93	ASH TONS FY 92-93	TONS FY 92-93	TONS/DAY FY 92-93 (280 DAYS)	NET REDUCTION
6505	NEW HANOVER CO WTE FACILITY	29,265.00	12,290.00	16,975.00	103,611.40	39,608.72	64,002.68	95,236.96	33,132.56	62,104.40	221.80	-8,374.44
6010	NORTHEAST WTE FACILITY	74,263.00	18,600.00	55,663.00	71,443.00	17,307.00	54,136.00	67,102.00	16,517.00	50,585.00	180.66	-4,341.00
6506	TOWN OF WRIGHTSVILLE BEACH	5,856.00	1,265.60	4,590.40	5,194.20	1,388.50	3,805.70	3,153.50	936.30	2,217.20	7.92	-2,040.70
	TOTAL TONS	80,119.00	19,865.60	60,253.40	180,248.60	58,304.22	121,944.38	165,492.46	50,585.86	114,906.60	410.38	-14,756.14

PERMIT	FACILITY	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONNAGE CHANGE	TONS/DAY FY 92-93 (280 DAYS)
7302	ROXBORO S E PLANT	DNR	528,486.00	632,421.90	103,935.90	2,258.65
4406	CHAMPION INT'L CORP LF NO. 6	DNR	389,689.00	379,899.00	-9,790.00	1,356.78
1804	MARSHALL STEAM STATION LF	DNR	329,457.00	344,543.80	15,086.80	1,230.51
2402	FEDERAL PAPER BOARD COMPANY, INC	139,375.00	194,929.00	268,341.00	73,412.00	958.36
8503	BELEWS CREEK ASH LF	DNR	242,268.00	164,675.00	-77,593.00	588.13
3605	FMC CORPORATION LF	DNR	184,462.00	154,923.00	-29,539.00	553.30
9401	WEYERHAEUSER PAPER CO	DNR	99,732.30	119,283.00	19,550.70	426.01
2302	CLEVELAND CONTAINER SERVICE	DNR	67,155.00	73,918.00	6,763.00	263.99
5404	E I DUPONT CO - KINSTON SITE	6,442.30	8,227.00	57,011.31	48,784.31	203.61
3405	R J REYNOLDS TOBACCO CO LF	68,019.00	59,576.71	48,997.79	-10,578.92	174.99
1006	E I DUPONT	14,147.00	20,767.85	23,852.30	3,084.45	85.19
4203	CHAMPION INT'L CORP	31,698.00	17,839.10	21,768.80	3,929.70	77.75
1102	BASF CORPORATION	23,400.00	25,726.00	20,652.00	-5,074.00	73.76
8801	ECUSTA PAPER LF (SLUDGE)	13,337.00	10,999.70	10,134.90	-864.80	36.20
2502	WEYERHAEUSER COMPANY	10,252.00	6,633.00	8,249.00	1,616.00	29.46
8805	ECUSTA PAPER LF	DNR	7,522.10	7,026.00	-496.10	25.09
5603	COLLINS & AIKMAN SANITARY LF	DNR	6,846.70	6,440.00	-406.70	23.00
9703	ABITIBI PRICE CORP	3,846.00	3,999.00	4,288.00	289.00	15.31
6603	GEORGIA-PACIFIC	709.00	530.40	816.80	286.40	2.92
802	R J REYNOLDS TOBACCO CO, AVOCA DIV	225.20	766.30	702.60	-63.70	2.51
6004	MCGUIRE SITE LF	101.00	90.80	463.20	372.40	1.65
8806	DUPONT BREVARD PLANT	DNR	490.20	412.00	-78.20	1.47
7602	EVEREADY BATTERY COMPANY, INC	DNR	612.70	337.80	-274.90	1.21
1001	BRUNSWICK PLANT SANITARY LF	446.00	194.00	323.00	129.00	1.15
9210	SHEARON HARRIS LF	350.00	176.00	162.33	-13.67	0.58
4401	CHAMPION INT'L CORP LF NO. 5	DNR	0.00	0.00	0.00	0.00
4503	CRANSTON PRINT WORKS	DNR	DNR	0.00	DNR	0.00
	TOTAL TONS	312,347.50	2,207,175.86	2,349,642.53	142,466.67	8,391.58

DNR = DID NOT REPORT

APPENDIX B-1: DESCENDING ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92 Jul-91	Population FY 92-93 Jul-92	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
AVERY	14,946	14,999	16,060.00	10,947.65	11,130.09	2,952.16	0.74	0.20	73.57%	294.28%
ALLEGHANY	9,749	9,884	17,060.00	14,064.73	14,130.83	7,730.65	1.45	0.78	46.04%	184.16%
TRANSYLVANIA	25,940	26,338	27,930.00	28,841.91	30,072.05	16,482.27	1.16	0.63	46.02%	184.08%
TYRRELL	3,765	3,887	1,768.00	1,739.71	2,984.83	1,742.86	0.79	0.45	43.44%	173.77%
YANCEY	15,430	15,813	15,648.00	15,465.38	15,576.12	9,725.43	1.01	0.62	39.07%	156.30%
JONES	9,347	9,461	3,648.00	4,360.00	4,360.00	2,878.00	0.47	0.30	34.79%	139.14%
MITCHELL	14,236	14,495	15,648.00	15,606.00	15,768.10	11,567.00	1.11	0.80	27.95%	111.82%
MONTGOMERY	23,474	23,528	18,096.00	28,800.00	28,873.00	21,588.14	1.23	0.92	25.40%	101.61%
NORTHAMPTON	20,818	20,732	12,384.00	18,945.30	19,527.80	14,515.70	0.94	0.70	25.36%	101.43%
RUTHERFORD	57,325	57,763	60,259.00	83,631.84	89,175.34	68,322.46	1.56	1.18	23.97%	95.86%
MOORE	60,083	61,417	72,690.00	70,814.60	74,061.56	58,488.88	1.23	0.95	22.74%	90.97%
ALAMANCE*	109,119	109,978	99,742.00	90,510.91	99,301.89	77,599.29	0.91	0.71	22.47%	89.86%
POLK	14,706	15,085	9,318.00	8,808.86	9,327.33	7,515.49	0.63	0.50	21.45%	85.80%
CRAVEN*	82,489	83,709	97,402.00	77,355.31	86,549.01	69,274.99	1.05	0.83	21.13%	84.50%
WARREN	17,329	17,448	13,490.00	10,968.00	10,978.00	8,976.00	0.63	0.51	18.79%	75.18%
ALEXANDER	28,434	28,076	8,880.00	25,182.00	25,716.32	20,712.00	0.90	0.74	18.43%	73.73%
ROBESON	105,257	107,294	85,584.00	98,123.17	104,700.17	88,563.88	0.99	0.83	17.02%	68.07%
CLAY	7,295	7,184	4,720.00	3,965.60	4,172.34	3,425.00	0.57	0.48	16.64%	66.57%
CABARRUS	100,878	103,917	88,078.00	88,784.55	95,215.19	83,841.32	0.94	0.81	14.52%	58.08%
DAVIDSON	129,631	132,259	125,903.00	133,646.84	139,616.85	122,370.71	1.08	0.93	14.09%	56.38%
HARNETT	68,278	70,820	71,349.00	68,857.51	69,073.39	62,479.25	1.01	0.88	12.79%	51.17%
CHATHAM	39,358	40,725	33,100.00	31,209.91	33,235.13	30,109.23	0.84	0.74	12.45%	49.79%
BURKE	76,793	76,901	54,507.00	65,366.52	78,005.51	68,540.36	1.02	0.89	12.26%	49.03%
PITT	109,904	113,147	143,300.00	124,372.19	132,896.09	120,058.98	1.21	1.06	12.25%	49.00%
CARTERET	53,721	55,159	105,358.00	84,516.70	86,894.30	78,481.53	1.62	1.42	12.04%	48.14%
DURHAM*	186,540	187,911	218,210.00	210,104.06	218,971.80	195,038.13	1.17	1.04	11.58%	46.32%
VANCE	39,095	39,078	46,954.00	40,053.06	43,266.86	38,242.34	1.11	0.98	11.57%	46.30%
CATAWBA*	119,837	121,418	131,201.00	129,948.00	151,559.31	136,462.83	1.26	1.12	11.13%	44.53%
MECKLENBURG	524,463	536,403	650,910.00	601,055.45	677,573.24	617,277.17	1.29	1.15	10.93%	43.71%
MADISON	17,069	17,230	12,090.00	11,258.61	11,676.23	10,548.13	0.68	0.61	10.51%	42.02%
NASH	77,668	79,373	78,495.00	79,402.87	84,593.77	78,454.78	1.09	0.99	9.25%	37.00%
JOHNSTON	83,977	86,515	72,048.00	70,607.64	74,169.34	69,416.75	0.88	0.80	9.15%	36.61%
DUPLIN*	40,616	41,066	48,900.00	32,213.65	33,309.90	30,709.73	0.82	0.75	8.82%	35.27%
LEE	41,845	43,138	45,981.00	46,902.98	48,341.02	45,474.19	1.16	1.05	8.75%	35.00%

APPENDIX B-1: DESCENDING ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92	Population FY 92-93	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
WAKE*	442,803	459,544	523,880.00	539,817.04	569,621.89	542,427.42	1.29	1.18	8.24%	32.97%
NEW HANOVER	123,309	127,928	159,849.00	149,582.43	157,646.89	151,075.83	1.28	1.18	7.63%	30.51%
ORANGE	96,302	99,674	95,123.00	122,053.92	131,067.45	125,766.70	1.36	1.26	7.29%	29.16%
CLEVELAND	85,304	85,976	74,096.00	65,533.73	73,137.50	68,606.32	0.86	0.80	6.93%	27.71%
FORSYTH*	267,237	269,678	278,242.00	278,824.06	304,289.69	286,079.05	1.14	1.06	6.84%	27.34%
CASWELL	20,829	20,956	5,810.00	5,102.43	5,136.12	4,818.11	0.25	0.23	6.76%	27.04%
DAVIE	28,396	28,869	19,070.00	15,231.34	19,348.40	18,380.80	0.68	0.64	6.56%	26.23%
PENDER	30,218	30,950	18,133.00	17,895.86	18,187.76	17,444.49	0.60	0.56	6.36%	25.42%
HENDERSON	71,185	72,252	89,488.00	78,014.26	81,497.83	77,761.09	1.14	1.08	5.99%	23.98%
BUNCOMBE*	176,714	180,265	192,476.00	142,041.61	159,040.21	152,762.69	0.90	0.85	5.84%	23.36%
HALIFAX	56,154	56,638	60,000.00	52,352.39	54,906.78	52,265.76	0.98	0.92	5.62%	22.49%
WATAUGA	37,097	37,760	32,206.00	33,065.54	36,755.38	35,360.04	0.99	0.94	5.49%	21.94%
GUILFORD	349,764	354,477	453,446.00	464,235.29	471,540.90	452,645.06	1.35	1.28	5.28%	21.13%
CUMBERLAND	279,995	283,405	255,639.00	203,144.90	227,301.67	218,485.71	0.81	0.77	5.04%	20.14%
BERTIE	20,154	20,508	12,600.00	17,255.30	17,371.98	16,864.00	0.86	0.82	4.60%	18.40%
CHOWAN	13,846	13,973	12,254.00	12,353.00	13,691.72	13,182.67	0.99	0.94	4.59%	18.37%
RICHMOND	44,839	45,204	47,662.00	60,606.28	60,752.03	58,619.57	1.35	1.30	4.29%	17.16%
PASQUOTANK*	31,212	31,994	32,081.00	28,236.53	30,150.34	29,647.20	0.97	0.93	4.07%	16.29%
PAMLICO	11,458	11,449	6,795.00	7,223.00	8,541.24	8,196.50	0.75	0.72	3.96%	15.84%
WAYNE	106,330	107,130	111,167.00	97,852.09	106,149.38	102,716.65	1.00	0.96	3.96%	15.83%
SAMPSON	47,962	48,303	36,000.00	33,234.59	33,545.35	32,492.71	0.70	0.67	3.82%	15.29%
SCOTLAND	34,211	34,287	45,282.00	37,136.51	39,867.42	38,645.81	1.17	1.13	3.28%	13.12%
DARE	22,994	23,260	46,770.00	48,446.08	51,299.83	50,260.74	2.23	2.16	3.15%	12.58%
GATES	9,395	9,558	5,392.00	5,430.00	5,896.67	5,832.71	0.63	0.61	2.77%	11.09%
PERQUIMANS	10,327	10,436	6,862.00	6,917.00	7,519.55	7,394.93	0.73	0.71	2.68%	10.74%
RANDOLPH	107,946	109,227	74,700.00	75,720.11	78,663.37	77,711.28	0.73	0.71	2.37%	9.48%
GASTON	176,828	176,874	149,198.00	154,581.05	165,099.79	163,093.42	0.93	0.92	1.24%	4.96%
SURRY	62,387	62,771	82,056.00	72,633.00	73,595.30	73,187.82	1.18	1.17	1.16%	4.65%
ROWAN	112,223	112,764	90,131.00	86,180.41	90,081.47	89,479.30	0.80	0.79	1.15%	4.58%
LINCOLN	50,966	51,999	52,640.00	43,979.51	44,442.34	45,067.93	0.87	0.87	0.61%	2.43%
WILSON	66,443	66,868	108,637.00	117,122.46	120,870.35	121,443.14	1.82	1.82	0.16%	0.66%
ASHE	22,439	22,434	16,389.00	17,883.94	18,089.13	18,056.01	0.81	0.80	0.16%	0.64%
MARTIN	25,231	25,750	25,956.00	30,087.39	30,111.58	30,690.00	1.19	1.19	0.13%	0.53%
COLUMBUS	49,904	50,134	35,880.00	44,536.31	45,199.16	45,361.11	0.91	0.90	0.10%	0.41%

APPENDIX B-1: DESCENDING ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92	Population FY 92-93	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
BRUNSWICK	52,721	54,519	70,836.00	76,560.00	78,123.11	80,805.94	1.48	1.48	-0.02%	-0.09%
STANLY	52,342	53,015	62,328.00	67,940.50	69,288.07	70,276.73	1.32	1.33	-0.14%	-0.56%
UNION	86,398	88,248	105,570.00	72,046.54	77,842.49	79,870.19	0.90	0.91	-0.45%	-1.82%
STOKES	37,881	38,190	18,086.00	17,691.72	17,976.32	18,354.91	0.47	0.48	-1.28%	-5.12%
HOKE	22,886	23,594	20,306.00	17,515.04	18,331.15	19,173.39	0.80	0.81	-1.46%	-5.82%
CALDWELL	70,941	71,829	45,866.00	62,642.56	65,531.52	67,461.78	0.92	0.94	-1.67%	-6.69%
PERSON	30,280	30,769	42,996.00	22,528.99	24,249.07	25,251.59	0.80	0.82	-2.48%	-9.92%
MCDOWELL	35,751	36,000	28,900.00	27,460.96	29,179.96	30,279.63	0.82	0.84	-3.05%	-12.20%
CURRITUCK	13,844	14,566	14,569.00	13,721.00	13,792.48	15,001.00	1.00	1.03	-3.37%	-13.48%
ONSLOW	152,865	144,004	133,598.00	147,867.58	158,344.22	154,526.10	1.04	1.07	-3.59%	-14.37%
JACKSON	27,404	27,537	17,445.00	17,179.24	18,660.87	19,711.49	0.68	0.72	-5.12%	-20.48%
ROCKINGHAM	86,152	86,206	81,947.00	65,416.57	71,480.71	75,228.09	0.83	0.87	-5.18%	-20.71%
HERTFORD	22,620	22,280	12,475.00	14,269.00	14,288.00	14,819.00	0.63	0.67	-5.30%	-21.20%
MACON	24,062	24,656	35,580.00	17,447.06	19,738.31	21,312.55	0.82	0.86	-5.37%	-21.50%
HYDE	5,535	5,379	3,043.00	2,675.55	2,761.59	2,850.50	0.50	0.53	-6.21%	-24.85%
GRANVILLE	39,202	39,713	46,336.00	54,259.99	54,547.90	58,759.72	1.39	1.48	-6.34%	-25.34%
YADKIN	31,018	31,628	25,800.00	20,508.45	20,778.78	22,529.86	0.67	0.71	-6.34%	-25.34%
WILKES	60,378	60,379	92,978.00	57,629.50	58,817.60	62,581.61	0.97	1.04	-6.40%	-25.59%
GRAHAM	7,241	7,115	4,710.00	4,422.96	4,508.08	4,741.00	0.62	0.67	-7.03%	-28.12%
CAMDEN	5,987	5,952	2,397.00	1,768.46	1,850.16	1,991.60	0.31	0.33	-8.28%	-33.11%
SWAIN	11,191	11,244	4,663.00	5,521.30	5,650.66	6,152.27	0.50	0.55	-8.36%	-33.46%
IREDELL	96,384	96,865	152,340.00	110,967.87	114,539.18	124,812.55	1.19	1.29	-8.43%	-33.71%
ANSON	23,144	23,543	14,831.00	13,942.30	14,229.30	15,703.82	0.61	0.67	-8.49%	-33.97%
LENOIR	57,697	58,351	60,347.00	67,323.66	67,692.88	74,556.23	1.17	1.28	-8.90%	-35.62%
CHEROKEE	20,629	20,726	15,841.00	15,960.17	16,020.17	17,623.89	0.78	0.85	-9.50%	-37.98%
FRANKLIN	37,738	38,794	25,881.00	27,887.46	28,701.81	32,477.41	0.76	0.84	-10.07%	-40.30%
WASHINGTON	13,874	13,989	10,005.00	11,493.34	11,699.36	12,992.65	0.84	0.93	-10.14%	-40.57%
EDGECOMBE	57,180	56,642	64,079.00	71,037.00	71,471.38	78,894.52	1.25	1.39	-11.43%	-45.74%
BEAUFORT	42,411	42,841	40,118.00	41,104.54	41,796.03	47,546.61	0.99	1.11	-12.62%	-50.47%
BLADEN	29,065	28,647	47,110.00	24,823.83	25,048.21	28,330.00	0.86	0.99	-14.75%	-59.01%
GREENE	15,546	15,987	15,254.00	7,339.34	7,427.74	9,342.85	0.48	0.58	-22.31%	-89.25%
HAYWOOD	47,775	48,323	136,295.00	53,197.00	57,841.80	85,470.47	1.21	1.77	-46.09%	-184.36%
TOTAL	6,739,959	6,836,977	7,161,455.00	6,822,890.35	7,257,428.09	6,890,818.15	1.08	1.01	6.40%	25.60%

APPENDIX B-2: ALPHABETICAL ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92 Jul-91	Population FY 92-93 Jul-92	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
ALAMANCE*	109,119	109,978	99,742.00	90,510.91	99,301.89	77,599.29	0.91	0.71	22.47%	89.86%
ALEXANDER	28,434	28,076	8,880.00	25,182.00	25,716.32	20,712.00	0.90	0.74	18.43%	73.73%
ALLEGHANY	9,749	9,884	17,060.00	14,064.73	14,130.83	7,730.65	1.45	0.78	46.04%	184.16%
ANSON	23,144	23,543	14,831.00	13,942.30	14,229.30	15,703.82	0.61	0.67	-8.49%	-33.97%
ASHE	22,439	22,434	16,389.00	17,883.94	18,089.13	18,056.01	0.81	0.80	0.16%	0.64%
AVERY	14,946	14,999	16,060.00	10,947.65	11,130.09	2,952.16	0.74	0.20	73.57%	294.28%
BEAUFORT	42,411	42,841	40,118.00	41,104.54	41,796.03	47,546.61	0.99	1.11	-12.62%	-50.47%
BERTIE	20,154	20,508	12,600.00	17,255.30	17,371.98	16,864.00	0.86	0.82	4.60%	18.40%
BLADEN	29,065	28,647	47,110.00	24,823.83	25,048.21	28,330.00	0.86	0.99	-14.75%	-59.01%
BRUNSWICK	52,721	54,519	70,836.00	76,560.00	78,123.11	80,805.94	1.48	1.48	-0.02%	-0.09%
BUNCOMBE*	176,714	180,265	192,476.00	142,041.61	159,040.21	152,762.69	0.90	0.85	5.84%	23.36%
BURKE	76,793	76,901	54,507.00	65,366.52	78,005.51	68,540.36	1.02	0.89	12.26%	49.03%
CABARRUS	100,878	103,917	88,078.00	88,784.55	95,215.19	83,841.32	0.94	0.81	14.52%	58.08%
CALDWELL	70,941	71,829	45,866.00	62,642.56	65,531.52	67,461.78	0.92	0.94	-1.67%	-6.69%
CAMDEN	5,987	5,952	2,397.00	1,768.46	1,850.16	1,991.60	0.31	0.33	-8.28%	-33.11%
CARTERET	53,721	55,159	105,358.00	84,516.70	86,894.30	78,481.53	1.62	1.42	12.04%	48.14%
CASWELL	20,829	20,956	5,810.00	5,102.43	5,136.12	4,818.11	0.25	0.23	6.76%	27.04%
CATAWBA*	119,837	121,418	131,201.00	129,948.00	151,559.31	136,462.83	1.26	1.12	11.13%	44.53%
CHATHAM	39,358	40,725	33,100.00	31,209.91	33,235.13	30,109.23	0.84	0.74	12.45%	49.79%
CHEROKEE	20,629	20,726	15,841.00	15,960.17	16,020.17	17,623.89	0.78	0.85	-9.50%	-37.98%
CHOWAN	13,846	13,973	12,254.00	12,353.00	13,691.72	13,182.67	0.99	0.94	4.59%	18.37%
CLAY	7,295	7,184	4,720.00	3,965.60	4,172.34	3,425.00	0.57	0.48	16.64%	66.57%
CLEVELAND	85,304	85,976	74,096.00	65,533.73	73,137.50	68,606.32	0.86	0.80	6.93%	27.71%
COLUMBUS	49,904	50,134	35,880.00	44,536.31	45,199.16	45,361.11	0.91	0.90	0.10%	0.41%
CRAVEN*	82,489	83,709	97,402.00	77,355.31	86,549.01	69,274.99	1.05	0.83	21.13%	84.50%
CUMBERLAND	279,995	283,405	255,639.00	203,144.90	227,301.67	218,485.71	0.81	0.77	5.04%	20.14%
CURRITUCK	13,844	14,566	14,569.00	13,721.00	13,792.48	15,001.00	1.00	1.03	-3.37%	-13.48%
DARE	22,994	23,260	46,770.00	48,446.08	51,299.83	50,260.74	2.23	2.16	3.15%	12.58%
DAVIDSON	129,631	132,259	125,903.00	133,646.84	139,616.85	122,370.71	1.08	0.93	14.09%	56.38%
DAVIE	28,396	28,869	19,070.00	15,231.34	19,348.40	18,380.80	0.68	0.64	6.56%	26.23%
DUPLIN*	40,616	41,066	48,900.00	32,213.65	33,309.90	30,709.73	0.82	0.75	8.82%	35.27%
DURHAM*	186,540	187,911	218,210.00	210,104.06	218,971.80	195,038.13	1.17	1.04	11.58%	46.32%
EDGECOMBE	57,180	56,642	64,079.00	71,037.00	71,471.38	78,894.52	1.25	1.39	-11.43%	-45.74%
FORSYTH*	267,237	269,678	278,242.00	278,824.06	304,289.69	286,079.05	1.14	1.06	6.84%	27.34%

APPENDIX B-2: ALPHABETICAL ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92	Population FY 92-93	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
FRANKLIN	37,738	38,794	25,881.00	27,887.46	28,701.81	32,477.41	0.76	0.84	-10.07%	-40.30%
GASTON	176,828	176,874	149,198.00	154,581.05	165,099.79	163,093.42	0.93	0.92	1.24%	4.96%
GATES	9,395	9,558	5,392.00	5,430.00	5,896.67	5,832.71	0.63	0.61	2.77%	11.09%
GRAHAM	7,241	7,115	4,710.00	4,422.96	4,508.08	4,741.00	0.62	0.67	-7.03%	-28.12%
GRANVILLE	39,202	39,713	46,336.00	54,259.99	54,547.90	58,759.72	1.39	1.48	-6.34%	-25.34%
GREENE	15,546	15,987	15,254.00	7,339.34	7,427.74	9,342.85	0.48	0.58	-22.31%	-89.25%
GUILFORD	349,764	354,477	453,446.00	464,235.29	471,540.90	452,645.06	1.35	1.28	5.28%	21.13%
HALIFAX	56,154	56,638	60,000.00	52,352.39	54,906.78	52,265.76	0.98	0.92	5.62%	22.49%
HARNETT	68,278	70,820	71,349.00	68,857.51	69,073.39	62,479.25	1.01	0.88	12.79%	51.17%
HAYWOOD	47,775	48,323	136,295.00	53,197.00	57,841.80	85,470.47	1.21	1.77	-46.09%	-184.36%
HENDERSON	71,185	72,252	89,488.00	78,014.26	81,497.83	77,761.09	1.14	1.08	5.99%	23.98%
HERTFORD	22,620	22,280	12,475.00	14,269.00	14,288.00	14,819.00	0.63	0.67	-5.30%	-21.20%
HOKE	22,886	23,594	20,306.00	17,515.04	18,331.15	19,173.39	0.80	0.81	-1.46%	-5.82%
HYDE	5,535	5,379	3,043.00	2,675.55	2,761.59	2,850.50	0.50	0.53	-6.21%	-24.85%
IREDELL	96,384	96,865	152,340.00	110,967.87	114,539.18	124,812.55	1.19	1.29	-8.43%	-33.71%
JACKSON	27,404	27,537	17,445.00	17,179.24	18,660.87	19,711.49	0.68	0.72	-5.12%	-20.48%
JOHNSTON	83,977	86,515	72,048.00	70,607.64	74,169.34	69,416.75	0.88	0.80	9.15%	36.61%
JONES	9,347	9,461	3,648.00	4,360.00	4,360.00	2,878.00	0.47	0.30	34.79%	139.14%
LEE	41,845	43,138	45,981.00	46,902.98	48,341.02	45,474.19	1.16	1.05	8.75%	35.00%
LENOIR	57,697	58,351	60,347.00	67,323.66	67,692.88	74,556.23	1.17	1.28	-8.90%	-35.62%
LINCOLN	50,966	51,999	52,640.00	43,979.51	44,442.34	45,067.93	0.87	0.87	0.61%	2.43%
MACON	24,062	24,656	35,580.00	17,447.06	19,738.31	21,312.55	0.82	0.86	-5.37%	-21.50%
MADISON	17,069	17,230	12,090.00	11,258.61	11,676.23	10,548.13	0.68	0.61	10.51%	42.02%
MARTIN	25,231	25,750	25,956.00	30,087.39	30,111.58	30,690.00	1.19	1.19	0.13%	0.53%
MCDOWELL	35,751	36,000	28,900.00	27,460.96	29,179.96	30,279.63	0.82	0.84	-3.05%	-12.20%
MECKLENBURG	524,463	536,403	650,910.00	601,055.45	677,573.24	617,277.17	1.29	1.15	10.93%	43.71%
MITCHELL	14,236	14,495	15,648.00	15,606.00	15,768.10	11,567.00	1.11	0.80	27.95%	111.82%
MONTGOMERY	23,474	23,528	18,096.00	28,800.00	28,873.00	21,588.14	1.23	0.92	25.40%	101.61%
MOORE	60,083	61,417	72,690.00	70,814.60	74,061.56	58,488.88	1.23	0.95	22.74%	90.97%
NASH	77,668	79,373	78,495.00	79,402.87	84,593.77	78,454.78	1.09	0.99	9.25%	37.00%
NEW HANOVER	123,309	127,928	159,849.00	149,582.43	157,646.89	151,075.83	1.28	1.18	7.63%	30.51%
NORTHAMPTON	20,818	20,732	12,384.00	18,945.30	19,527.80	14,515.70	0.94	0.70	25.36%	101.43%
ONSLOW	152,865	144,004	133,598.00	147,867.58	158,344.22	154,526.10	1.04	1.07	-3.59%	-14.37%
ORANGE	96,302	99,674	95,123.00	122,053.92	131,067.45	125,766.70	1.36	1.26	7.29%	29.16%

APPENDIX B-2: ALPHABETICAL ORDER COUNTIES GOAL PROGRESS FY 1992-93

COUNTY	Population FY 91-92	Population FY 92-93	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	MSW Managed FY91-92	MSW Tons Disposed FY92-93	Base Year Per Capita FY91-92	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
PAMLICO	11,458	11,449	6,795.00	7,223.00	8,541.24	8,196.50	0.75	0.72	3.96%	15.84%
PASQUOTANK*	31,212	31,994	32,081.00	28,236.53	30,150.34	29,647.20	0.97	0.93	4.07%	16.29%
PENDER	30,218	30,950	18,133.00	17,895.86	18,187.76	17,444.49	0.60	0.56	6.36%	25.42%
PERQUIMANS	10,327	10,436	6,862.00	6,917.00	7,519.55	7,394.93	0.73	0.71	2.68%	10.74%
PERSON	30,280	30,769	42,996.00	22,528.99	24,249.07	25,251.59	0.80	0.82	-2.48%	-9.92%
PITT	109,904	113,147	143,300.00	124,372.19	132,896.09	120,058.98	1.21	1.06	12.25%	49.00%
POLK	14,706	15,085	9,318.00	8,808.86	9,327.33	7,515.49	0.63	0.50	21.45%	85.80%
RANDOLPH	107,946	109,227	74,700.00	75,720.11	78,663.37	77,711.28	0.73	0.71	2.37%	9.48%
RICHMOND	44,839	45,204	47,662.00	60,606.28	60,752.03	58,619.57	1.35	1.30	4.29%	17.16%
ROBESON	105,257	107,294	85,584.00	98,123.17	104,700.17	88,563.88	0.99	0.83	17.02%	68.07%
ROCKINGHAM	86,152	86,206	81,947.00	65,416.57	71,480.71	75,228.09	0.83	0.87	-5.18%	-20.71%
ROWAN	112,223	112,764	90,131.00	86,180.41	90,081.47	89,479.30	0.80	0.79	1.15%	4.58%
RUTHERFORD	57,325	57,763	60,259.00	83,631.84	89,175.34	68,322.46	1.56	1.18	23.97%	95.86%
SAMPSON	47,962	48,303	36,000.00	33,234.59	33,545.35	32,492.71	0.70	0.67	3.82%	15.29%
SCOTLAND	34,211	34,287	45,282.00	37,136.51	39,867.42	38,645.81	1.17	1.13	3.28%	13.12%
STANLY	52,342	53,015	62,328.00	67,940.50	69,288.07	70,276.73	1.32	1.33	-0.14%	-0.56%
STOKES	37,881	38,190	18,086.00	17,691.72	17,976.32	18,354.91	0.47	0.48	-1.28%	-5.12%
SURRY	62,387	62,771	82,056.00	72,633.00	73,595.30	73,187.82	1.18	1.17	1.16%	4.65%
SWAIN	11,191	11,244	4,663.00	5,521.30	5,650.66	6,152.27	0.50	0.55	-8.36%	-33.46%
TRANSYLVANIA	25,940	26,338	27,930.00	28,841.91	30,072.05	16,482.27	1.16	0.63	46.02%	184.08%
TYRRELL	3,765	3,887	1,768.00	1,739.71	2,984.83	1,742.86	0.79	0.45	43.44%	173.77%
UNION	86,398	88,248	105,570.00	72,046.54	77,842.49	79,870.19	0.90	0.91	-0.45%	-1.82%
VANCE	39,095	39,078	46,954.00	40,053.06	43,266.86	38,242.34	1.11	0.98	11.57%	46.30%
WAKE*	442,803	459,544	523,880.00	539,817.04	569,621.89	542,427.42	1.29	1.18	8.24%	32.97%
WARREN	17,329	17,448	13,490.00	10,968.00	10,978.00	8,976.00	0.63	0.51	18.79%	75.18%
WASHINGTON	13,874	13,989	10,005.00	11,493.34	11,699.36	12,992.65	0.84	0.93	-10.14%	-40.57%
WATAUGA	37,097	37,760	32,206.00	33,065.54	36,755.38	35,360.04	0.99	0.94	5.49%	21.94%
WAYNE	106,330	107,130	111,167.00	97,852.09	106,149.38	102,716.65	1.00	0.96	3.96%	15.83%
WILKES	60,378	60,379	92,978.00	57,629.50	58,817.60	62,581.61	0.97	1.04	-6.40%	-25.59%
WILSON	66,443	66,868	108,637.00	117,122.46	120,870.35	121,443.14	1.82	1.82	0.16%	0.66%
YADKIN	31,018	31,628	25,800.00	20,508.45	20,778.78	22,529.86	0.67	0.71	-6.34%	-25.34%
YANCEY	15,430	15,813	15,648.00	15,465.38	15,576.12	9,725.43	1.01	0.62	39.07%	156.30%
TOTAL	6,739,959	6,836,977	7,161,455.00	6,822,890.35	7,257,428.09	6,890,818.15	1.08	1.01	6.40%	25.60%

APPENDIX B-3: LIST OF COUNTIES WITH ALTERNATIVE BASE YEARS

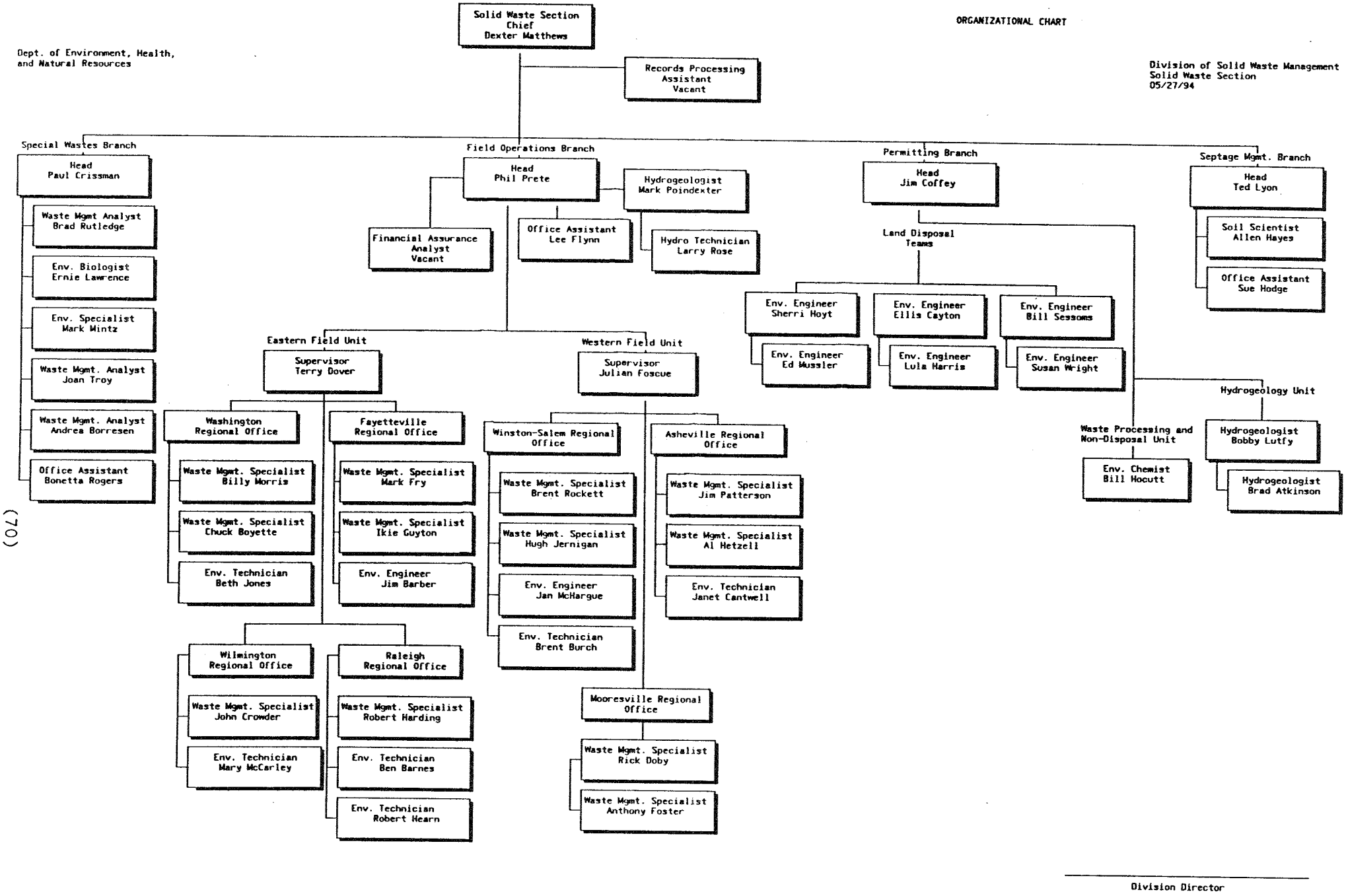
*ALTERNATIVE BASE YEAR COUNTIES

COUNTY	Base Year Population	Population FY 92-93	MSW Tons Disposed FY90-91	MSW Tons Disposed FY91-92	Base Year Tonnage	MSW Tons Disposed FY92-93	Base Year Per Capita	Disposal Rate FY 92-93	% Waste Reduction FY92-93	Progress Toward Goal
ALAMANCE (FY89-90)	106,956	109,978	99,742.00	90,510.91	117,861.83	77,599.29	1.10	0.71	35.97%	143.88%
BUNCOMBE (FY88-89)	173,198	180,265	192,476.00	142,041.61	157,660.00	152,762.69	0.91	0.85	6.90%	27.62%
CATAWBA (FY89-90)	118,427	121,418	131,201.00	129,948.00	179,351.00	136,462.83	1.51	1.12	25.79%	103.15%
CRAVEN (FY90-91)	81,715	83,709	97,402.00	77,355.31	98,536.00	69,274.99	1.21	0.83	31.37%	125.48%
DUPLIN (FY90-91)	39,976	41,066	48,900.00	32,213.65	48,900.00	30,709.73	1.22	0.75	38.87%	155.46%
DURHAM (FY88-89)	171,483	187,911	218,210.00	210,104.06	224,196.00	195,038.13	1.31	1.04	20.61%	82.44%
FORSYTH (FY88-89)	266,353	269,678	278,242.00	278,824.06	357,474.00	286,079.05	1.34	1.06	20.96%	83.84%
PASQUOTANK (FY90-91)	31,368	31,994	32,081.00	28,236.53	32,081.00	29,647.20	1.02	0.93	9.39%	37.58%
WAKE (FY 88-89)	388,502	459,544	523,880.00	539,817.04	544,520.00	542,427.42	1.40	1.18	15.78%	63.14%
TOTAL	989,476	1,026,019	1,098,254.00	989,234.13	1,216,059.83	977,573.91	1.23	0.95	22.47%	89.90%

ORGANIZATIONAL CHART

Dept. of Environment, Health, and Natural Resources

Division of Solid Waste Management
Solid Waste Section
05/27/94



Division Director

Office of Waste Reduction
Organizational Chart

EPA/TVA
Waste Reduction Resource Center
(3 engineers & 1 secretary)
1-800-476-8686

Director
Gary Hunt
29001 Gr. 80

Computer Consultant III
29003 Gr. 72

Accounting Tech. II
29004 Gr. 61

Admin. Secretary II
Luke, C.
29005 Gr. 60

Clerk-Typist III
Reed, A.
29006 Gr. 57

Clerk-Typist III
Vincent, L.
29007 Gr. 57

Env. Supervisor III
29002 Gr. 77

Admin. Assistant II
Still, R.
29027 Gr. 63

Pollution Prevention Program

Env. Supervisor II
Vacant
29008 Gr. 76T

Technical Assistance

Env. Engineer II
Williams, D.
29009 Gr. 75

Env. Engineer II
Albrecht, T.
29011 Gr. 75

Env. Engineer II
Pridgeon, R.
29013 Gr. 75

Env. Engineer II
Mize, L.
29015 Gr. 75

Env. Engineer II
29016 Gr. 75

Env. Engineer II
29017 Gr. 75

Env. Chemist II
Johnson, S.
29010 Gr. 73

Env. Chemist II
Murphy, N.
29012 Gr. 73

Env. Chemist II
29014 Gr. 73

Education & Training

Env. Engineer II
29018 Gr. 75

Info. & Commun. Spec.
Upchurch, M.
29020 Gr. 68

Solid Waste Reduction Program

Env. Supervisor II
Powell, MB.
29021 Gr. 75

Education & Training

Waste Manag. Analyst
29019 Gr. 70T

Waste Manag. Analyst
Satler, B.
29700 Gr. 70T

Technical Assistance

Env. Supervisor I
29022 Gr. 73

Local Governments

Waste Manag. Analyst
Mouw, S.
29023 Gr. 70T

Waste Manag. Analyst
Sutton, G.
29024 Gr. 70T

Waste Manag. Analyst
Graves, E.
29025 Gr. 70T

State Agency

Waste Manag. Analyst
Foote, K.
29026 Gr. 70T

Market Development

Econ. Develop Spec.
Ewadinger, M.
29701 Gr. 73

Econ. Develop. Spec.
29028 Gr. 73

Gary Hunt
Division Director

Revised: February 1994

JULY 1, 1992 - JUNE 30, 1993

1200 copies of this public document were printed at a cost of $1,008.00 or $ .84 per copy.

July 1994

PRINTED ON RECYCLED PAPER