# North Carolina

# Solid Waste Management

# Annual Report

## JULY 1, 1991 - JUNE 30, 1992

STATE OF NORTH CAROLINA
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DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
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# 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). These 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 an annual report on the status of solid waste management in North Carolina. Data for this report comes from sanitary landfill and incinerator reports completed by local governments and private municipal solid waste facilities for the period July 1, 1991 to June 30, 1992 and submitted to the State during December 1992. Data for recycling and other waste management activities comes from the Solid Waste Management Annual Reports submitted by North Carolina's 100 counties and 518 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 October 1993 is included.

The following statements include some key findings of this report:

In FY 1991-1992, North Carolina's 106 public landfills, six private landfills, two scrap tire monofills and three incinerators received nearly 88 percent of the reported 6,823,381 tons of municipal solid waste (MSW).

The disposal rate for North Carolina citizens was one ton per person per year (per capita) during FY 1991-92.

Sixty local governments (22 counties, 38 municipalities) indicated that they had an operating source reduction program in FY 1991-1992.

There were 483 documented local government recycling programs, and they reported recycling 436,544 tons of materials from July 1, 1991 to June 30, 1992.

Since July 1991, nine local governments have hosted 14 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. Approximately 90

percent of the state's estimated 6.7 million scrap tires generated were legally disposed, leaving 635,000 tires of unknown disposition.

Currently, the non-disposal solid waste facilities in operation include composting, materials recovery (source separated), mixed waste processing and transfer stations. More than 75 percent of the new facilities permitted since 1989 were non-disposal facilities.

Sixty local governments (22 counties, 38 municipalities) indicated they had a formal source reduction program. This is an increase of 81 percent over the 33 programs reported in 1990-91 and suggests that more attention is being given to waste avoidance throughout the state. However, this represents only 9.7 percent of the 618 local governments who should be implementing source reduction programs.

Currently, eight solid waste incinerators are permitted to operate in North Carolina. Five of these are privately-owned facilities - three medical waste incinerators and two industrial waste incinerators. The remaining three facilities are MSW incinerators owned by local governments.

During FY 1991-1992, there were six lined municipal solid waste landfills in operation, managing 14 percent of the state's residential and commercial waste stream. It is estimated this amount will exceed 25 percent by 1993 and increase to approximately 42 percent by 1994 due to additional lined municipal and regional landfills.

Communities with low waste generation rates are turning to regional or privately owned landfills as methods to provide cost-effective disposal services.

As of September 1993, there were 110 active permitted sanitary landfills in North Carolina which used 1000 water quality (groundwater) monitoring wells. More than 75 percent of the unlined landfills show some evidence of on-site ground water degradation.

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

Currently permitted, there are 110 MSW landfills, 31 industrial waste landfills, 150 land clearing and inert debris landfills, nine incinerators, 14 yard waste composting facilities, 11 mixed waste processing facilities, 17 transfer facilities, and 94 scrap tire collection sites. Additionally, 231 septage sites are inspected quarterly and 325 septage haulers are inspected semiannually by waste management specialists.

Another 200 facilities must be evaluated each year to assure compliance with the "Standards for Special Tax Treatment." These standards allow a business which 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 responsible for permitting and monitoring 325 septage firms and 231 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 267,428 tons of yard waste were collected statewide in 1992.

During FY 1991-1992 a total of 165 local governments (21 counties =21 percent, and 144 municipalities =28 percent) operated compost programs.

The Office of Waste Reduction administers the Solid Waste Management Trust Fund. Since the trust fund was started in January 1990, 56 grants to local governments have been awarded, totaling more than $925,000, to help North Carolina reach its goal of a 40 percent reduction in the amount of solid waste disposed by the year 2001.

The data presented in this report represents the state's second 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.

# SOLID WASTE DISPOSAL

## CHAPTER ONE

## Municipal Solid Waste Disposal

Putting municipal solid waste (MSW) in the "county landfill" is still the principal method of disposal for solid waste in North Carolina. In FY 1991-92, all but six counties in the state had public sanitary landfills receiving MSW. These 106 public municipal solid waste landfills (MSWLF) received nearly 88 percent of the 6,823,381 tons of MSW disposed in North Carolina. The remaining waste was managed by six private landfills, three incinerators and two scrap tire monofills. Appendix A lists 106 public landfills, six private landfills, three incinerators, two scrap tire monofills and 26 industrial landfills that completed and submitted Solid Waste Management Annual Report Forms to the State for FY 1991-1992.

In addition to the 6,823,381 tons of MSW landfilled, 2,207,176 tons of industrial wastes such as sludge, ash, or other process wastes were disposed of in 26 private industrial landfills serving specific industrial operations.

**TABLE 1**
**Solid Waste Disposal by Facility Type**

| No. of Facilities | Facility Type | Total Tons Received |
|---|---|---|
| 106 | PUBLIC LANDFILLS | 5,972,752 |
| 6 | PRIVATE LANDFILLS | 708,826 |
| 2 | SCRAP TIRE MONOFILLS | 19,859 |
| 3 | INCINERATORS* | 121,944 |
| 117 | TOTAL MSW DISPOSED | 6,823,381 |
| 26 | INDUSTRIAL LANDFILLS | 2,207,176 |
| 143 | FACILITIES REPORTED 1991-1992 | 9,030,557 |

*Adjusted downward by 58,304 tons of ash landfilled to avoid double counting of material disposed.

Sanitary landfills receiving municipal solid waste ranged in size from 430 tons per year to 404,979 tons per year. Of the 117 MSW facilities, 73 received less than the average amount of 200 tons per day (based on 280 working days) and 46 of those facilities received less than 100 tons per day.

In FY 1991-92, 60 percent of the facilities receiving MSW decreased the amount of waste disposed from FY 1990-91. Statewide, the total amount of MSW disposed decreased by 406,293 tons. Haywood County had the largest decrease due to a one time construction project in the previous year.

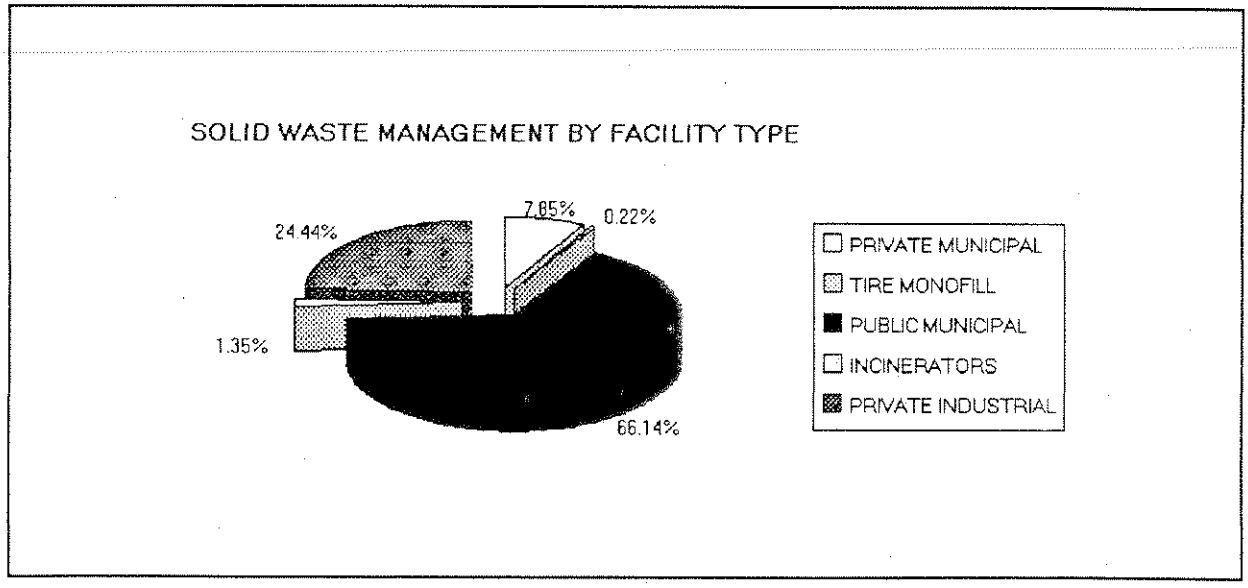
Six sanitary landfills operating in FY 1991-92 were equipped with liners and leachate collection systems. This is twice as many as in FY 1990-91. The six lined landfills are Piedmont Landfill & Recycling Center in Forsyth County, New Hanover Secure Landfill, Charlotte Motor Speedway Landfill in Cabarrus County, Rowan County Landfill, Transylvania County Landfill, and Macon County Landfill.

The Transylvania and Macon county landfills opened late in FY 1991-92 and did not receive a full year of solid waste. Piedmont Landfill received waste from 32 counties in North Carolina. Charlotte Motor Speedway Landfill received waste from two counties. All other lined landfills received waste solely from the county in which they are located. Lined MSWLFs received a total of 720,198 tons of waste or 10.6 percent of the state's total.

When the lined landfills that are either currently under construction or are in the permit review process replace existing landfills, a total of approximately 1.5 million tons per year of solid waste would be disposed in lined facilities. Since five of these facilities are regional landfills, it can be anticipated that an additional 700,000 tons per year will be disposed of in lined facilities for an approximate total of 2.9 million tons (42.7 percent) of the state's MSW total during the next year. The additional tons represent total waste from counties anticipated to send waste to regional lined facilities.

The six counties without a MSW landfill were Camden, Chowan, Gates, Hyde, Mitchell, and Tyrrell. They sent their waste to neighboring county landfills. Facilities in Dare, Cabarrus, Pamlico, Beaufort, Forsyth, Harnett, Pasquotank, Perquimans, Washington, Scotland, and Yancey counties accepted waste from more than one county. Many counties sent some portion of their solid waste to a disposal site in another county. This practice should increase dramatically with the expansion of regionalization.

FIGURE 1



Industrial landfills comprised 26 of the 143 facilities that reported solid waste disposal. These 26 facilities received a total of 2,207,176 tons of waste or 24 percent of the state's total. Waste accepted at industrial landfills includes ash, asbestos, construction and demolition waste, and industrial waste.

There are two scrap tire monofills - Central Carolina Recycling in Harnett County and US Tire Disposal in Cabarrus County. They received a total of 19,859 tons of waste. Central Carolina Recycling opened late in FY 1991-92 and did not receive a full year of waste.

For the reporting period, North Carolina had three incineration facilities: Northeast Waste-To-Energy in Mecklenburg County, New Hanover County Incinerator, and Town of Wrightsville Beach Incinerator in New Hanover County. These incinerators received 121,944 tons of waste and generated 58,304 tons of ash for FY 1991-92.

## Disposal Rates

Each landfill and incinerator reported the county of origin of the MSW disposed. This data provided the basis for a per capita disposal rate which can be established by dividing the county's estimated population total into the waste disposed. The per capita disposal rate, expressed as tons per year, provides a basis for comparing amounts of waste disposed. It is the means for 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 from the 26 industrial landfills.

The county per capita disposal rates varied greatly across the state for several reasons. Inaccurate estimates of solid waste disposed in landfills operating without scales was a major factor. Other reasons included differences in economic activity, waste management practices and one-time event activities.

The three counties with the highest per capita disposal rates were Dare (2.23), Martin (1.78) and Wilson (1.82). Dare County has a significant tourism industry which generates large amounts of seasonal solid waste. Neither Martin nor Wilson counties had tipping fees during the reporting period.

Counties with low disposal rates could reflect aggressive waste reduction, poor estimates, a large amount of individual waste disposal on private property (backyard disposal), very little disposal of construction debris or other wastes from industrial and other economic activities, or a combination of these factors. Refer to Appendix B for information on solid waste disposal by county.

As shown in Table 2, 15 counties generated slightly more than 50 percent of North Carolina's municipal solid waste. Tonnages in Table 2 do not include the 26 industrial landfills.

**TABLE 2**
**Solid Waste Disposal by County FY 1991-1992**

| County | Total Tonnage | Population July,1991 | Waste Per Capita Disposal | % of Total (Cumulative) |
|---|---|---|---|---|
| MECKLENBURG | 601,055 | 524,463 | 1.15 | 8.81 |
| WAKE | 539,814 | 442,803 | 1.22 | 16.72 |
| GUILFORD | 464,235 | 349,764 | 1.33 | 23.52 |
| FORSYTH | 278,824 | 267,237 | 1.04 | 27.61 |
| DURHAM | 210,104 | 186,540 | 1.13 | 30.69 |
| CUMBERLAND | 203,145 | 279,995 | 0.73 | 33.67 |
| GASTON | 154,581 | 176,828 | 0.87 | 35.93 |
| NEW HANOVER | 149,582 | 123,309 | 1.21 | 38.12 |
| ONSLOW | 147,868 | 152,865 | 0.97 | 40.29 |
| BUNCOMBE | 142,042 | 176,714 | 0.80 | 42.37 |
| DAVIDSON | 133,647 | 129,631 | 1.03 | 44.33 |
| CATAWBA | 129,948 | 119,837 | 1.08 | 46.24 |
| PITT | 124,372 | 109,904 | 1.13 | 48.06 |
| ORANGE | 122,054 | 96,302 | 1.27 | 49.85 |
| WILSON | 117,123 | 66,443 | 1.76 | 51.56 |

## Tipping Fees

Eighty MSWLF facilities reported receiving some fee for accepting solid waste. Most sanitary landfills charged by the ton for accepting solid waste although 11 facilities charged by the cubic yard for disposal. In order to make a 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 tabulations. Appendix A lists facilities and their tipping fees.

Tipping fees in FY 1991-1992 statewide ranged from a high of $60 per ton in New Hanover County to a low of $6 per ton in Wilkes County. In addition, twenty-six (26) counties did not charge to dispose of solid waste. The average tipping fee is $16.06 while the weighted average tipping fee is $20.27 (due to more waste being disposed in facilities with tipping fees).

North Carolina law requires landfill operators to be certified by 1996, but no regulations currently exist specifying the certification process. However, the Solid Waste Association of North America (SWANA) offers a landfill operator certification course. In FY 1991-92, certified operators were present at 43 of North Carolina's 106 public MSW landfills, two of the six private MSW landfills, and two of the three MSW incineration facilities.

## Progress Toward State Waste Reduction Goals

GS 130A-309 establishes FY 1991-92 as the base year for measuring progress toward the state's waste reduction goal. The law provides for recognizing prior waste reduction efforts and this report attempts to acknowledge those efforts.

The base year amount for the state was determined by adding the total municipal solid waste disposed by landfilling and incineration to the amount of waste managed through recycling, composting, and mulching by local governments. This total waste managed becomes the base year amount and the total recycled, composted, and mulched becomes the amount reduced.

Future comparison of the amount landfilled and incinerated to the base amount will show the increase or reduction in waste disposed and the progress toward achieving the state's goal. By showing the goal and disposal rate as a per capita ratio, the annual population change will be taken into account.

This process allows North Carolina to show its progress toward the 25 percent waste reduction goal. A total of 6 percent or 434,538 tons of the solid waste managed was recycled or composted/mulched. In order to meet the state goal for FY 1992-93, an additional 1,380,000 tons or 19 percent must be reduced.

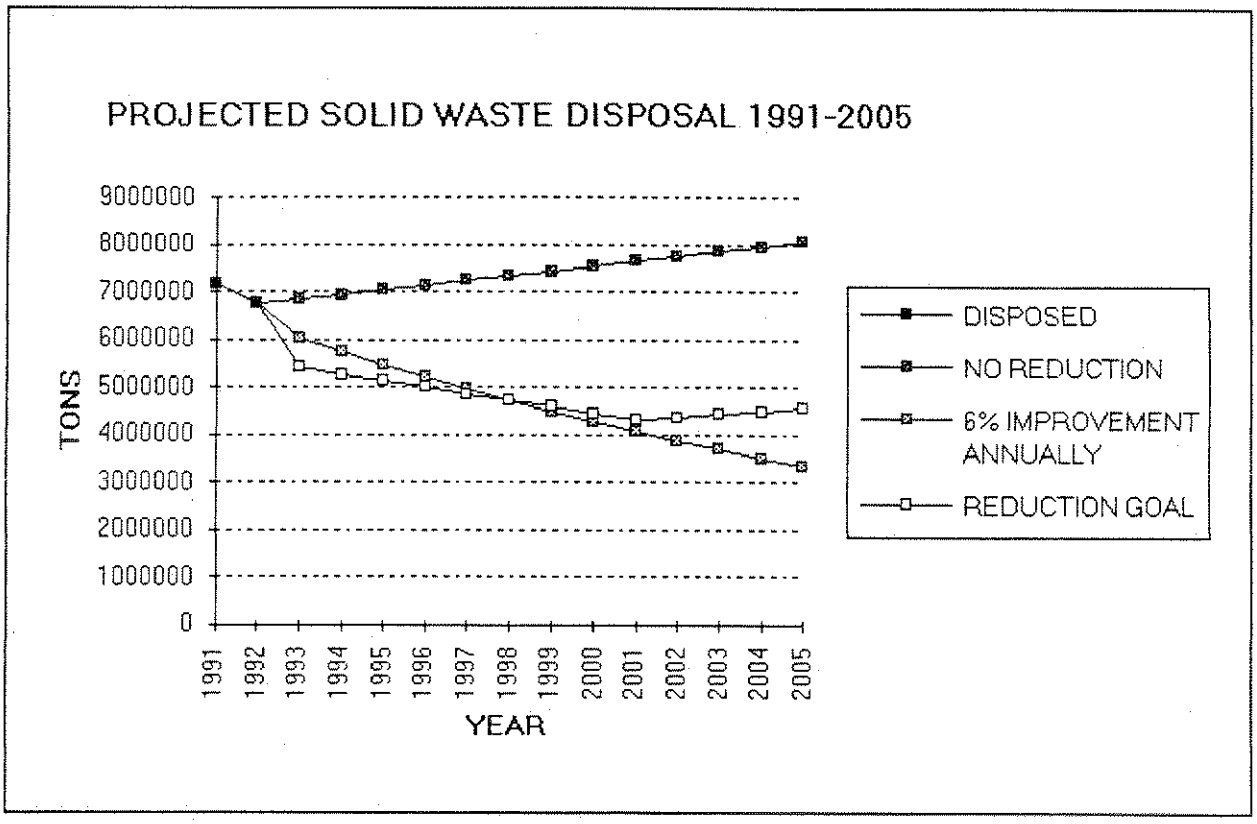
Individual counties show a wide range of reduction efforts. Several counties are making exceptional progress toward meeting the state's waste reduction goal while others have established alternative base years for measuring their county's progress. These alternative base years generally indicate additional progress being made toward the state's goal. The alternative base year amounts will be used to measure progress towards the state's goal as well as other solid waste planning activities.

## Trends in MSW Reduction

During FY 1991-92, local governments recycled a total of 197,288 tons and composted 237,250 tons of yard waste. This amount must be increased if recycling and composting by local governments is to account for the full waste reduction. Business and industry working with local governments must also develop and implement alternative operations to substantially increase their recycling and source reduction efforts if the state goal is to be met.

Projections are difficult given the number of factors that influence MSW disposal. However, patterns in waste reduction are beginning to emerge from the information gathered from the Solid Waste Management Annual Report Forms. The following projected trend graph (Figure 2) presents three scenarios in North Carolina's waste reduction management.

FIGURE 2




The first line represents the change in MSW disposed given projected population increases through the year 2005. If no waste reduction efforts are made and waste generation 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 second line represents waste disposal if North Carolinians achieve a 6 percent reduction in solid waste each year. By 1996, North Carolina will reach its 25 percent waste reduction goal and be well on its way to achieving a 40 percent reduction by the year 2000. Under present policies and strategies, much effort will be necessary to achieve substantial, long term waste reduction. Without such efforts, landfill and incineration facilities will be heavily burdened to make up the difference.

The final scenario (third line) illustrates the state's waste reduction goals, a 25 percent reduction in MSW disposed per person by 1993, and a 40 percent reduction in MSW disposed per person by 2001. However, even with a 40 percent reduction in waste generation, the amount of waste managed will continue to grow due to population growth, although at a lower rate.

CHAPTER TWO

# SOURCE REDUCTION

North Carolina solid waste legislation ranks source reduction of waste as the top priority, over reuse or recycling, in the state's hierarchy for reducing solid waste. Source reduction means avoiding the creation of waste by reducing the amount or toxicity of waste before it is generated and decreasing the quantity of materials that must be collected, processed, or disposed of via landfilling, incineration, municipal composting or recycling.

Examples of source reduction of waste include: redesigning products or packaging so that less material is used; making voluntary or mandatory behavioral changes in the use of materials, such as circulating only one copy of a memo or sending it via electronic mail rather than printing and distributing multiple copies; and substituting durable or re-usable items for disposable items, e.g., replacing disposable coffee cups with reusable ceramic mugs. Other 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.

Source reduction methods employed by local governments may include both those that are implemented in-house (e.g., reducing waste paper generated at local government offices by using methods described in the previous paragraph) and those that are directed at the public. The latter may include promoting and educating households or commercial establishments, including offices, retail stores, or local industry, about source reduction of waste.

The Solid Waste Annual Report for July 1991-June 1992 asked each local government whether it had a source reduction program and to describe the program if it answered "yes." In addition, the report asked what audience the source reduction program targeted--in-house, the public or both. This was new information from the previous annual report. 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."

Sixty local governments (22 counties, 38 municipalities) indicated they had a formal source reduction program. This is an increase of 81.8 percent over the 33 programs reported in 1990-91 and suggests that more attention is being given to waste avoidance throughout the state. However, this still represents only 9.7 percent of the 618 local governments that should be implementing source reduction programs.

Of the 60 local governments with source reduction programs, 27 reported that they targeted their source reduction program in-house only. An additional 22 only target their source reduction programs to the public. Finally, 11 programs attempt to educate both types of audiences with their source reduction messages. Only ten local governments - the cities of Carrboro, Chapel Hill, Raleigh, Rolesville, Mooresville, Wilmington, Wilson, and the counties of Transylvania, Watauga and Mecklenburg - said they passed source reduction ordinances, policies, or resolutions.

## TABLE 1: LOCAL GOVERNMENT SOURCE REDUCTION PROGRAMS

| PROGRAM | COUNTY 23 PROGRAMS | CITY 37 PROGRAMS | TOTAL 60 PROGRAMS |
|---|---|---|---|
| Public Only | 10 | 13 | 23 |
| In-House Only | 9 | 17 | 26 |
| Both | 4 | 7 | 11 |
| Policy | 3 | 7 | 10 |

The most popular types of local government source reduction programs incorporated discussion of source reduction into public education presentations and brochures. Another common source reduction program required or recommended duplex copying and note pads from used one-sided paper. In addition, several local governments provided ceramic mugs for employees. Other examples of source reduction programs include recognition of businesses with source reduction programs, community waste reduction committees, and reuse of envelopes for inter-office communication.

Source reduction is the preferred solid waste management method identified in North Carolina's solid waste management legislation. Although the number of source reduction programs is increasing, it is still neglected by most local governments. Local governments have the opportunity and responsibility to do much more to promote source reduction throughout their counties and municipalities. Source reduction reduces disposal needs, avoids disposal costs, and can help local governments achieve the state's waste reduction goals. In many cases, implementation of source reduction measures by one major local industry can have a far greater effect than local government source reduction efforts targeted at residents and commercial establishments alone.

CHAPTER THREE

# RECYCLING

## Recycling Requirements in General Statutes

The 1989 Solid Waste Management Act (SB 111) and the subsequent major modification of that law, HB 1109 (passed in 1991), provided the foundation for recycling and waste reduction in North Carolina. Among their many provisions, the two laws established in statute the following:

- A hierarchy of approved solid waste management strategies:
- 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, and lead acid batteries;
- A requirement that all designated local governments establish a recycling program effective July 1, 1991; and
- 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.

The local government Solid Waste Management Annual Reports include descriptions of educational efforts, the amount of waste received at solid waste management facilities, the amount and type of materials recycled, and other information regarding local programs and waste diversion efforts. Municipalities that do not participate in their county's report must prepare their own.

The annual reports from local governments provide information critical to assessing the state's progress toward its waste reduction goals. This information also provides a foundation for the state's recycling market development and technical assistance efforts. Recycling program information from the annual reports covering FY 1991-92 is presented in this chapter. Data from FY 1992-93 will be available in early 1994.

## Summary of Data from the 1991-92 Local Government Waste Management Annual Reports

### A. Total tons collected for recycling in FY 1991-92.

FY 1991-92 was the first in which designated local governments were required by law to have a recycling program in place. Most of the state-wide disposal bans were in effect in FY 91-92, with the exception of the yard waste ban (effective 1/1/93).

Total overall tonnage and tonnages for each major material type, except paper, increased substantially over FY 1990-91. The overall total for materials recycled by local governments in FY 1991-92 was 432,430 tons. Specific amounts by major material type are reported in **Table 1**.

## TABLE 1: TOTAL TONNAGE RECYCLED BY MAJOR MATERIAL TYPE

| Material | 1991-92 Tons | Percentage of Total | 1990-91 Tons | Percent change: FY 1991 - FY 1992 |
|---|---|---|---|---|
| Paper | 98,729 | 23% | 99,488 | -1% |
| Glass | 25,997 | 6% | 16,816 | 55% |
| Metals | 34,148 | 8% | 18,736 | 82% |
| Plastics | 6,128 | 1% | 2,878 | 113% |
| Organics | 267,428 | 62% | 105,871 | 153% |
| TOTAL | 432,430 | 100% | 243,789 | 77% |

Note: The large numbers for organics includes leaf, yard waste, pallet and woodwaste collection programs operated by towns and cities. Some local governments reported organics numbers in cubic yards, which were converted into tonnages for this table using a ratio of 400 pounds per cubic yard.

A more detailed examination reveals that local governments increased their collection of most specific types of recyclable materials, and that the number of programs collecting the materials also increased generally from FY 1990-91 to FY 1991-92 (see **Table 2**). Figures for a few materials decreased in FY 1991-92. Some of the decrease may be due to changes in the reporting format; for example much of the cardboard collected in FY 1990-91 may have been reported as mixed paper for FY 1991-92.

## TABLE 2: SPECIFIC MATERIAL TONNAGES AND FREQUENCY OF COLLECTION

| Material | 1990-91 Tons | 1991-92 Tons | Number of programs collecting material 1990-91 | Number of programs collecting material 1991-92 |
|---|---|---|---|---|
| Newspaper | 53,104.90 | 70,866.14 | 280 | 346 |
| Cardboard | 36,677.40 | 14,257.06 | 164 | 204 |
| Office Paper | NA | 1,869.96 | NA | 109 |
| Other paper | 710.30 | 761.78 | 93 | 45 |
| Mixed paper | NA | 10,974.68 | NA | 110 |

| Material | 1990-91 Tons | 1991-92 Tons | Number of programs collecting material 1990-91 | Number of programs collecting material 1991-92 |
|---|---|---|---|---|
| Clear Glass | 8,520.82 | 13,456.39 | 294 | 359 |
| Green Glass | 4,021.98 | 4,279.95 | 281 | 345 |
| Brown Glass | 4,274.35 | 8,261.06 | 283 | 349 |
| Aluminum | 1,639.36 | 2,601.92 | 286 | 379 |
| Steel Cans | 425.52 | 1,597.61 | 131 | 180 |
| #1 plastic | 1,766.71 | 2,660.16 | 196 | 278 |
| #2 plastic | 911.77 | 2,989.50 | 168 | 272 |
| #3 plastic | 18.57 | 76.29 | 26 | 32 |
| #4 plastic | 37.70 | 148.86 | 20 | 27 |
| #5 plastic | 71.71 | 34.23 | 13 | 27 |
| #6 plastic | 19.3 | 166.50 | 18 | 26 |

In addition to the listed materials in **Table 2**, local governments report collecting 16,312 lead-acid batteries and 262,559 gallons of used motor oil in FY 1991-92.

B. Total number of recycling programs

The increase in tonnage collected from FY 1990-91 to FY 1991-92 was matched by a rise in the number of local recycling programs. The number of programs reported for FY 1991-92 was 483, a 15 percent increase from the previous year.

Local governments have implemented 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 1-6**). There were 228 municipalities (44 percent of all municipalities) and 75 counties (75 percent of all counties) that reported having in-house programs.

Many local governments use a combination of collection methods to target the various generators of recyclable materials in their communities (resulting in more programs than there are counties and municipalities). **Tables 3 and 4** show how many of each type of program North Carolina cities and counties have put in place, and the changes from FY 1990-91 to FY 1991-92.

## TABLE 3: NUMBER OF PROGRAMS REPORTED BY TYPE FOR MUNICIPALITIES

| Program Type | FY 1990-91 | FY 1991-92 | Percent change |
|---|---|---|---|
| Curbside Recycling | 88 | 119 | 35% |
| Drop-off Recycling | 126 | 132 | 5% |
| Reuse/Reconditioning | 26 | 18 | -31% |
| Buy-back Recycling | 4 | 3 | -25% |
| "Other" Recycling | 23 | 37 | 61% |
| TOTAL | 275 | 309 | 12% |

**Table 3** shows that 119 municipalities, almost a quarter of all towns and cities in North Carolina offered curbside programs to their residents in FY 1991-92. The total population served by municipal curbside programs was 1,954,344.

## TABLE 4: NUMBER OF PROGRAMS REPORTED BY TYPE FOR COUNTIES

| Program Type | FY 1990-91 | FY 1991-92 | Percent change |
|---|---|---|---|
| Curbside Recycling | 7 | 7 | 0% |
| Drop-off Recycling | 73 | 85 | 16% |
| Reuse/Reconditioning | 29 | 26 | -10% |
| Buy-back Recycling | 14 | 11 | -21% |
| "Other" Recycling | 22 | 45 | 105% |
| TOTAL | 145 | 174 | 20% |

**Table 4** shows that citizens in 85 counties (85 percent of all counties) had access to drop-off recycling service in FY 1991-92, and citizens in seven counties (seven percent of all counties) had access to curbside recycling service.

**Tables 3 and 4** show declines in the numbers of reuse/reconditioning and buy-back programs. However, these programs represent only a small part of local government recycling efforts.

Miscellaneous Items of Interest

A. Funding for Recycling Programs

As in FY 1990-91, local governments relied on a wide array of funding sources to support recycling programs in FY 1991-92. **Table 5** shows that taxes, tipping fees, and user fees remained the leading sources of recycling program funds for counties. Municipalities relied heavily on taxes but also made use of other sources, such as the sale of recyclables (**Table 6**). Although most programs generated revenue from the sale of materials, the funds did not cover the full costs of the programs. Many programs were based on multiple funding sources: for example, some local governments use a combination of fees, taxes, and sales of recyclables to finance drop-off programs.

**TABLE 5: FUNDING FOR COUNTY RECYCLING PROGRAMS**

| Funding Source | Curbside | Drop-off | Buy-back | Other | Total | Percent of Total |
|---|---|---|---|---|---|---|
| Tipping fees | 4 | 32 | 5 | 12 | 53 | 20% |
| Diversion Credits | 1 | 3 | 0 | 0 | 4 | 1% |
| Taxes | 1 | 52 | 5 | 16 | 74 | 28% |
| User fees | 2 | 24 | 4 | 4 | 34 | 13% |
| Sale of recyclables | 1 | 45 | 9 | 23 | 78 | 29% |
| Corporate Contrib. | 0 | 2 | 0 | 1 | 3 | 1% |
| Grant Funds | 1 | 3 | 0 | 0 | 4 | 1% |
| Other | 2 | 7 | 2 | 9 | 20 | 7% |

**TABLE 6: FUNDING FOR MUNICIPAL RECYCLING PROGRAMS**

| Funding Source | Curbside | Drop-off | Buy-back | Other | Total | Percent of Total |
|---|---|---|---|---|---|---|
| Tipping fees | 9 | 7 | 1 | 6 | 23 | 6% |
| Diversion Credits | 5 | 6 | 0 | 5 | 16 | 4% |

| Funding Source | Curbside | Drop-off | Buy-back | Other | Total | Percentage of total |
|---|---|---|---|---|---|---|
| Taxes | 74 | 85 | 1 | 25 | 185 | 46% |
| User fees | 35 | 10 | 0 | 2 | 47 | 11% |
| Sale of recyclables | 20 | 40 | 1 | 18 | 79 | 19% |
| Corporate Contrib. | 2 | 1 | 0 | 2 | 5 | 1% |
| Grant Funds | 0 | 1 | 0 | 1 | 2 | 1% |
| Other | 11 | 22 | 0 | 16 | 49 | 12% |

B. Recycling Program Administration

Local governments continue to devote staff to recycling and waste reduction efforts. In FY 1991-92, 37 counties and 44 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. Seventy-seven counties and 170 municipalities reported having someone in the position of "solid waste manager or similar position."

C. Solid Waste Educational Activities

Public education is essential to the success of any solid waste program. It must be continual and provide periodic reminders and any new information about solid waste operations in the community.

The state of North Carolina recommends proactive solid waste eduction programs that reach both school children and adults and many other sub-groups of the population. Public education should contain a motivational message to encourage responsible waste management practices and to explain how to participate in local solid waste management programs.

Data from the 1991-92 annual report reveal that local governments use press releases, public service announcements, advertisements, brochures, posters, and seminars to educate the public about solid waste. Often, the provider of public education programs is not the county or municipality, but the N.C. Cooperative Extension, local environmental groups, or other civic organizations. Most local governments that do provide educational programs combine several approaches in order to reach the largest audience possible.

There were 209 local governments in North Carolina (79 counties, 130 municipalities) that reported sponsoring solid waste management educational programs between July 1, 1991 and

June 30, 1992. This represents 33.8 percent of the 618 local governments. Some programs do provide solid waste education programs independently and educate the public through cooperative efforts with other municipalities or counties.

The 209 local governments that provided solid waste education in their communities covered many different areas of solid waste management. **Table 7** shows that the most common topic for solid waste education was recycling, which was covered by 99 percent of those providing any education. Residential source reduction, reuse, and landfilling also were popular topics.

**TABLE 7: TOPICS COVERED IN SOLID WASTE EDUCATION PROGRAMS**

| TOPICS | COUNTY 79 PROGRAMS | CITY 130 PROGRAMS | TOTAL 209 PROGRAMS |
|---|---|---|---|
| Residential Source Reduction | 53 (67%) | 53 (40.8%) | 106 (50.7%) |
| Industry/Commercial Source Reduction | 32 (40.5%) | 26 (20%) | 58 (27.8%) |
| Reuse | 47 (59.5%) | 40 (30.8%) | 87 (41.6%) |
| Recycling | 78 (98.7%) | 129 (99.2%) | 207 (99%) |
| Buy-Recycled | 43 (54.4%) | 28 (21.5%0 | 71 (34%) |
| Backyard Composting | 41 (51.9%) | 35 (26.9%) | 76 (36.4%) |
| MSW Composting | 7 (8.9%) | 13 (10%) | 20 (9.6%) |
| Incineration | 8 (10.1%) | 4 (3.1%0 | 12 (5.7%) |
| Landfilling | 64 (81%) | 32 (24.6%) | 96 (45.9%) |
| Other | 10 (12.6%) | 10 (7.7%) | 20 (9.6%) |

**Table 8** indicates that local governments used a variety of educational mediums and sponsored a number of different educational programs and activities to communicate information about solid waste management. More than half of the local governments that provided solid waste education offered school assemblies or programs, advertised in the newspaper, or gave away trinkets, such as magnets, buttons, bumper stickers, key rings or pencils. Other common practices included workshops, displays at special events, mailings, and public service announcements on the radio.

**TABLE 8: MEDIUMS USED TO COMMUNICATE SOLID WASTE EDUCATION MESSAGES**

| ACTIVITY | COUNTY 79 PROGRAMS | CITY 130 PROGRAMS | TOTAL 209 PROGRAMS |
|---|---|---|---|
| Radio | 34 (43%) | 31 (23.8%) | 63 (31.1%) |
| Television | 13 (16.4%) | 19 (14.6%) | 32 (15.3%) |
| Newspaper | 53 (65.8%) | 68 (52.3%) | 120 (57.4%) |
| Mass Mailings | 15 (19%) | 45 (34.6%) | 60 (28.7%) |
| Direct Mail | 16 (20.3%) | 25 (19.2%) | 41 (19.6%) |
| Indirect Mail | 15 (19%) | 41 (31.5%) | 56 (26.8%) |
| Special Events | 41 (51.9%) | 30 (23.1%) | 71 (33.9%) |
| Trinkets | 61 (77.2%) | 56 (43.1%) | 117 (55.9%) |
| Hotline | 11 (13.9%) | 14 (10.8%) | 25 (11.9%) |
| Workshops | 38 (48.1%) | 28 (21.5%) | 66 (31.5%) |
| School Programs | 61 (77.2%) | 49 (37.7%) | 110 (52.6%) |
| Other | 26 (32.9%) | 37 (28.5%) | 63 (30.1%) |

Effective education programs use tailored messages targeted at multiple audiences. **Table 9** lists some of the audiences that the 209 local governments targeted directly with educational activities. Most programs directed education efforts at community residents. This type of education usually includes flyers or pamphlets teaching the public how to separate and prepare materials for participation in the community's curbside or drop-off recycling program. Almost two-thirds of those programs conducting any education also chose to educate school children. More than 40 percent of the local governments educated elected officials, civic groups, and small businesses about solid waste management issues.

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, totaling $115,000. These three projects included: State Training Program for Recycling Coordinators; a Public Education Campaign on Waste Reduction and Recycling conducted by the Environmental Defense Fund; and an Educational Program in Home Yard Waste Composting to the North Carolina Cooperative Extension Service. There were 110 persons who attended the Recycling Coordinator's Training Course in 1991, and 62 were trained in 1992. The Public Education Campaign aired public service announcements, and the Yard Waste education program produced a video and several brochures for statewide distribution and constructed compost demonstration sites in 14 counties with the project.

Other educational projects were funded through the Solid Waste Management Trust Fund during the 1992-93 cycle. Recycling Assistance Grants were awarded to Jones County, the town of Spencer, and the city of Jacksonville. In addition, 1993 Recycling Assistance Grants awarded to Mecklenburg County, Caldwell County, Buncombe County, Cape Fear Council of Government, town of Franklinton, and town of Butner fund programs with educational components. Watauga County and Edgecombe County received grants to fund development of solid waste curriculums in their public schools.

**TABLE 9: AUDIENCES OF EDUCATIONAL PROGRAMS**

| AUDIENCE | COUNTY 79 PROGRAMS | CITY 130 PROGRAMS | TOTAL 209 PROGRAMS |
|---|---|---|---|
| School Children | 73 (92.4%) | 58 (44.6%) | 131 (62.6%) |
| Manufacturing Firms | 26 (32.9%) | 17 (13.1%) | 43 (20.5%) |
| Industries | 23 (29.1%) | 19 (14.6%) | 42 (20.1%) |
| Small Businesses | 36 (45.6%) | 50 (38.5%) | 86 (41.2%) |
| Residents | 61 (77.2%) | 113 (86.9%) | 174 (83.2%) |
| Elected Officials | 43 (54.4%) | 42 (32.3%) | 85 (40.6%) |
| Institutions | 41 (51.9%) | 28 (21.5%) | 69 (33%) |
| Government Employees | 42 (53.2%) | 35 (26.9%) | 77 (36.8%) |
| Media | 35 (44.3%0 | 33 (25.4%) | 68 (32.5%) |
| Civic Groups | 57 (72.2%) | 37 (28.5%) | 94 (44.9%) |
| Professional Assoc. | 22 (27.8%) | 11 (8.5%) | 33 (15.7%) |
| Other | 2 (2.5%) | 5 (3.8%) | 7 (3.3%) |

The Office of Waste Reduction coordinates solid waste education efforts in North Carolina. OWR educates and trains industries, local governments, trade organizations, professional organizations, citizens' groups, and other agencies critical to the state's overall waste reduction effort. New staff members working specifically on education and training issues were added to the OWR staff in the spring of 1993. In addition to general and technical presentations, they also conduct in-depth training sessions, workshops and conferences, and develop educational materials for statewide distribution.

D. Buy-Recycled Efforts

Collecting recyclable materials is only part of the recycling process. Materials collected in a

recycling program are not truly recycled until they have been used in a manufacturing process to make new products that are then sold. Local governments and state agencies can increase demand and help strengthen the markets for recyclable materials by changing their procurement habits and purchasing products made with recycled content, especially for items that are used in large quantities, such as paper. Purchase of recycled products increases the demand for and lowers the prices on goods made with recycled materials for all consumers and develops markets for materials collected in North Carolina recycling programs.

Former Governor Jim Martin signed Executive Order #172 on July 24, 1992, which stated that all state agencies must encourage the use of recycled products and make every effort to purchase products made from recycled materials on state contract. Governor Jim Hunt followed this by signing Executive Order #8 on April 22, 1993, which strengthened the earlier executive order. The "new" executive order also requires state agencies to use recycled paper and directs them to maximize their efforts to purchase and use products made wholly or in part from recycled materials.

The Division of Purchase and Contract in the Department of Administration, through state term contracts, offers many recycled products including continuous stock forms and labels, paper napkins, bathroom tissue, paper towels and utility wipes, office paper and envelopes, filing supplies, miscellaneous office supplies, and carpet and carpet cushion. Local governments, schools, community colleges, universities, and others are eligible to purchase recycled products through the state term contracts.

When asked how local governments were helping with the buy-recycled effort (**Table 10**), 302 (48.9 percent) local governments reported purchasing at least some materials with recycled content during FY 1991-92. Sixteen (2.6 percent) local governments have passed written resolutions, policies, or ordinances requiring or encouraging the procurement of products made with recycled content, also known as "Buy Recycled" policies. These local governments include: Ashe County, Chapel Hill, Carrboro, Chatham County, Camden County, Pasquotank County, Belmont, Lincoln County, Reidsville, Craven County, Raleigh, Roxboro, Davie County, Pitt County, Gaston County and Cleveland County. Cary, Asheville, Wake Forest, Wake County, and Greensboro have passed "Buy-Recycled" policies since June 30, 1992.

**TABLE 10: LOCAL GOVERNMENT BUY-RECYCLED EFFORTS FY 1991-92**

| PROGRAM | COUNTY 100 Programs | CITY 518 Programs | TOTAL 618 Programs |
|---|---|---|---|
| Purchase Recycled Products | 70 (70%) | 232 (44.8%) | 302 (48.9%) |
| Policy | 10 (10%) | 6 (1.2%) | 16 (2.6%) |

The state initiated a "Buy Recycled" campaign in 1992. More than 300 persons, including vendors of recycled products, local government, state agency, and private purchasing agents, attended the state's first "Buy-Recycled" conference held in July 1992.

The conference trained attendees in recycled product procurement and enabled vendors of recycled products to exhibit their product lines. Additional buy-recycled efforts are currently underway by the Office of Waste Reduction to encourage full support of companies using recycled materials in their production processes in order to spur demand of secondary materials in North Carolina.

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 reports on lead-acid batteries, white goods (refrigerators, washers, stoves, etc.), used oil and tires for FY 1991-92.

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 traditionally been recycled or can be recycled. Reduced demand periods are occasionally experienced within the recycling market, but through the years there have been successful recycling programs for many 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 and indications are that a very high percentage of used batteries are recovered through the retail recovery process. Local governments reported receiving 16,312 batteries in FY 1991-92.

**White goods** have been recovered for years through existing scrap yard dealers and metal recoverers. Due to concerns regarding PCBs in some manufactured white goods, there was a period when recycling of this material was difficult. However, EPA studies indicated there was little chance of PCB contamination. 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 dealers, and through local government programs. In FY 1991-92 a total of 25,749 tons of white goods were collected by local governments. A significant number of white goods are also taken 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 1991-92 local governments collected a total of 262,559 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 DIY used oil is taken to private facilities and some is non-recoverable (burned or leaked), it is evident that the 262,559 gallons collected at public used oil facilities is far short of the estimated millions of gallons that could be collected from those who change their own oil.

Table 4-1: Special Waste Volumes 1990-91 and 1991-92

| Material | 1990-91 | 1991-92 |
|---|---|---|
| Lead-Acid Batteries (#) | 3,338 | 16,312 |
| White Goods (Tons) | 47,354 | 25,749 |
| Used Oil (Gallons) | 147,816 | 262,559 |

**Medical Waste:** North Carolina had three commercial medical waste incinerators in operation in 1991-1992 which treated predominately out-of-state waste shipped from hospitals and medical clinics. The total permitted capacity was 14,300 pounds per operational hour for all three incinerators.

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 report.

The North Carolina Medical Waste Management Regulations 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 which is typically incinerated is mostly nonregulated medical waste such as used gloves, tubing, drapes, sharps, bloody gauze and dressings.

Approximately 21,572 tons (78 percent) of the total 27,592 tons of medical waste incinerated in North Carolina originated out-of-state (**Table 4-2**). About 22 percent of the total tonnage incinerated at the three facilities originated in North Carolina. A total of 5,738 tons of incinerator ash was disposed in North Carolina landfills from the three incinerators in 1991-1992.

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. recently purchased a mobile microwave treatment unit and is offering services in 1993 to treat medical waste on-site at hospitals.

**Table 4-2. Tonnage of medical waste incinerated and incineration ash generated by three commercial incinerators in FY 1991-1992.**

TONS

| Incinerator | North Carolina | Out-of-State | Total | Ash Disposal |
|---|---|---|---|---|
| WMI* | 1,149 | 6,252 | 7,401 | 1,595 |
| RCA | 2,571 | 11,991 | 14,562 | 2,571 |
| BFI | 2,300 | 3,329 | 5,629 | 1,572 |
| Total (Tons) | 6,020 | 21,572 | 27,592 | 5,738 |

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

About 82 percent of the out-of-state waste originated from four states - New York, New Jersey, Pennsylvania, and Maryland (Figs. 4-1, 4-2). These states shipped 17,756 tons, which was 64 percent of the total tonnage of medical waste incinerated by the three facilities.

**Household Hazardous Waste** (HHW) temporary collection days have been tracked by the state's Solid Waste Section (SWS) since July 1991. The SWS issues temporary and permanent HHW identification numbers which are used for tracking HHW collection, treatment, disposal, and recycling in the state. In FY 1991-1992, there were 14 household hazardous waste collection days in the state. The nine hosting communities were Greensboro, Durham, Raleigh, Winston-Salem, Buncombe Co. (Asheville), Granville Co. (Butner), Mecklenburg Co. (Charlotte), Rockingham Co. (Reidsville), and Orange Co. (Chapel Hill). For more information on individual programs or upcoming events, contact the communities listed above.

The items most frequently collected and either recycled or reused 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. The SWS encourages the establishment of permanent HHW collection sites such as the one in Cumberland County. Several communities are considering establishing permanent sites and have initiated the permitting process.

**Tires** present complex disposal problems, and a special program was required in each county. North Carolina generated approximately 6.7 million scrap tires or one per capita in FY 1991 - 1992, based on total tire sales reported for the state's 1 percent tire disposal tax. Based on national averages, approximately 1.3 million additional scrap tires are assumed generated by

removal from junk cars.

It is estimated that the North Carolina tire retreading industry has extended the use of approximately 1.5 million tires. This may have prevented the generation of an additional 660,000 scrap tires in North Carolina. About 90 percent of the estimated 6.7 million scrap tires generated were managed by counties or hauled directly to U.S. Tire Recycling in Concord, N.C. or Metro Tire Division in Pinson, Ala. The disposition of the remaining 635,000 tires (10 percent) is unknown.

Fourteen counties increased disposal fees and reported receiving 355,530 fewer tires than in the previous year. Twenty-nine counties lowered disposal fees and reported receiving 666,201 more tires than in FY 1990-91.

The 1 percent state disposal tax revenue distributed to the counties totaled $3,637,903.82, which represented $ 0.54 for each scrap tire generated and $ 0.65 for each tire reported managed by the counties. The 1 percent state disposal tax revenue distributed to the counties covered 74 percent of total county expenses to dispose of tires. Distribution of the 1 percent state disposal tax proceeds to counties based on population did not cover county costs equitably. Counties received 21 percent to more than 200 percent of actual costs of their individual tire programs.

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. The purpose of these water quality monitoring rules is:

1) to monitor the effectiveness of the design, construction, and operation of the sanitary landfill or other solid waste management unit; and

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

Since all permitted sanitary landfills were required to install ground water monitoring systems by July 1, 1989, ground water quality data has accumulated for at least four years at nearly all permitted sanitary landfill sites. As of June 1993, there are 139 active permitted sanitary landfills in North Carolina. Some closed landfill sites and illegal open dumps have also been required to establish ground water monitoring systems. The state's Solid Waste Section has approximately 1000 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 monitoring wells for which the Solid Waste Section is responsible will continue to increase. Since most of the currently permitted sanitary landfills are unlined facilities, leachate is being generated that affects ground water. Slightly more than 50 percent of the existing sites have documented evidence of on-site ground water contamination. Another 25 percent of the existing facilities show some indication of ground water contamination that is beginning to show up in the on-site monitoring wells. Therefore, slightly more than 75 percent of all currently permitted unlined sanitary landfills are showing some evidence of on-site ground water degradation.

Because most of these landfill facilities are located in relatively remote areas and located near ground water discharge features, there does not appear to be an immediate threat to public health from these facilities. 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. However, it is obvious from the ground water quality monitoring data accumulated that unlined landfill facilities are having a significant effect on ground water resources in the immediate area of the waste disposal activities.

Water quality investigation and/or assessment is necessary at nearly all of the existing unlined sanitary 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 June 1993, 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 Catawba

County Newton Landfill, the city of High Point Riverdale Road Landfill, the Charlotte York Road Landfill, the Ashe County Landfill, the Watauga County Landfill, and the Buncombe County Landfill. Formal assessments are also being conducted by other state or federal agencies at the Caldwell County Landfill, the Hoechst Celanese Landfill, and the Lithium Corporation Landfill.

Preliminary ground water investigations have also been required by the Solid Waste Section at the Lexington Landfill and following county landfill facilities: Bladen, Caswell, Duplin, Franklin and Perquimans. A number of other landfills have been asked to perform more frequent sampling and/or organic analysis of water quality samples in addition to the routine detection parameters normally required at solid waste management facilities.

The recent EPA RCRA 40 CFR Part 258 Solid Waste Disposal Facility Criteria require changes in the current water quality monitoring program. These include increased sampling frequency, routine monitoring for more chemical constituents that includes volatile organic analysis, statistical analysis of water quality data, and an automatic increase to Phase II monitoring if significant increases are reported in the routine detection monitoring. Also, more formalized processes for ground water assessments and corrective action, and 30-year post-closure monitoring are required under Part 258.

CHAPTER SIX

## SOLID WASTE ENFORCEMENT AND COMPLIANCE

The Solid Waste Section currently employs 12 waste management specialists, four environmental technicians, two environmental engineers and two environmental supervisors to implement 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 110 MSW (municipal solid waste) landfills, 31 industrial waste landfills, 150 land clearing and inert waste landfills, nine incinerators, 14 yard waste composting facilities, 11 mixed waste processing facilities, 17 transfer facilities, 94 scrap tire collection sites, 231 septage sites and 325 septage firms.

The group also evaluates approximately 200 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 S.B. 111 in 1989, H.B. 1109 in 1991, and S.B. 1159 in 1992, major changes have taken place throughout the state in solid waste management. Likewise, the state's solid waste regulatory program is directly impacted. 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 implement enterprise funds and other financing mechanisms to fund solid waste management, enforcement generally is not considered. Only 30 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 which do not have permits and are operated for economic gain. Local governments, through health departments and solid waste enforcement officers, should address illegal dumping which 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 75 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 mitigated 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 30 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 in order 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. "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, as the cost per ton for disposal/recycling increases within the state, there is a direct increase in illegal disposal practices.

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 implementing of an integrated solid waste management program within North Carolina. Specialization of field positions will concentrate efforts toward local government planning assistance, enforcement, and permitting. This Branch remains committed to protecting the citizens and environment of North Carolina by investigation and resolution of illegal solid waste disposal practices.

From July 1, 1990 through June 30, 1992, the Field Operations Branch Compliance Orders are summarized by state fiscal years (July 1 thru June 30):

| N.C. Fiscal Year | Category Type | Violation | Penalty Totals | Case Status |
|---|---|---|---|---|
| 1990-1991 | 17-Nonconformance | No Permit | $227,000<br>45,250 | 13-Cases Settled<br>4-Cases Pending |
| 1990-1991 | 1-Sanitary Landfill<br>1-Demolition Landfill | Operational Requirements | $ 18,000<br>4,000 | 1-Case Settled<br>1-Case Pending |
| 1990-1991 | 4-Demolition Landfills | Operational Requirements | $ 13,700 | 4-Cases Settled |
| 1991-1992 | 1-Sanitary Landfill | Operational Requirements | $ 3,000 | 1-Case Pending |
| 1991-1992 | 1-Sanitary Landfill | No Scales | $ 200 per day* | 1-Case Pending |
| 1991-1992 | 6-Nonconformance | No Permit | $ 58,000<br>21,500 | 2-Cases Pending<br>4-Cases Settled |
| 1992-1993 | 4-Nonconformance | No Permit | $ 23,750 | 1-Case Pending |
| 1992-1993 | 3-Sanitary Landfill | Operational Requirements | $ 20,000 | 1-Case Pending |
| 1992-1993 | 1-Private Sanitary Landfill | No Scales | $ 2,000 | Settled |
| 1992-1993 | 1-Demolition Landfill | Operational Requirements | $ 5,000<br>TOTAL<br>$441,200* | Settled |

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

Field Operations Branch

| NUMBER OF COMPLIANCE ACTIONS | |
|---|---|
| FY - 89 | 25 NOV's |
| | 9 Compliance Orders |
| | |
| FY - 90 | 59 NOV's |
| | 1 Injunctive Action |
| | 4 Compliance Orders |
| | |
| FY - 91 | 113 NOV's |
| | 21 Compliance Orders |
| | |
| FY - 92 | 20 NOV's |
| | 8 Compliance Orders |
| | 1 Injunctive Action |
| | |
| FY - 93 | 97 NOV's |
| | 9 Compliance Orders |
| | |

CHAPTER SEVEN

# SEPTAGE MANAGEMENT

In 1988, legislation was adopted which 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 rules are now handled by the Solid Waste Section's Septage Management Program in Raleigh, North Carolina.

As a result of this program, 300 firms have paid their 1992 fees and 229 firms have been permitted as of August 7, 1992. The remaining 62 firms have not been permitted pending completion of site reviews and the permitting process or pending completion of their applications. Nine firms have not been permitted pending resolution of compliance matters. Eleven notices of violation and 12 compliance orders have been issued since January 1, 1992 for failure to pay permit fees.

**SEPTAGE**
**PERMITTING STATUS**

| | |
|---|---|
| 300 FIRMS | PAID 1992 FEES |
| 229 FIRMS | PERMITTED FOR 1992 |
| 62 FIRMS | INCOMPLETE APPLICATIONS |
| 9 FIRMS | OUTSTANDING COMPLIANCE ORDERS |

Septage is properly managed at permitted septage disposal sites primarily through land application and sewage treatment plants. There are 183 permitted septage disposal sites. A small number of these (less than 10) are currently inactive. At least 17 sites are in various stages of the permitting process. Sixty different counties have at least one disposal site with the number of sites per county ranging up to nine. One of the sites uses spray irrigation as part of the disposal process, the remaining are strictly land application sites. Lime stabilization to reduce disease is used on some of the sites and the remainder goes into the soil within 24 hours of application.

Sixty-three sewage treatment plants in 51 counties accept septage for treatment and disposal. Many of these plants will not, however, accept material pumped from 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. Eleven counties - Avery, Clay, Dare, Greene, Hyde, Jones, Mitchell, New Hanover, Tyrrell, Washington, 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 sites 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 into the soil within 24 hours of application, site overloading, and incomplete lime stabilization. Fifteen notices of violation, six compliance orders and 14 compliance orders with administrative penalties have been issued for improper septage management or illegal firm operation during 1992.

For the past year, the primary emphasis of the Septage Management Program 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 for a shift of emphasis to certain rules and permit conditions which have not previously been rigidly enforced. Some specific points within the rules which will be carefully examined include having the necessary information properly displayed on the trucks and pumper rigs. Permit conditions which will be followed up on include adherence to crop management plans, site loading, and adequate lime stabilization.

CHAPTER EIGHT

# COMPOSTING & YARD WASTE

## SOLID WASTE COMPOSTING

On December 1, 1991, new rules were implemented for solid waste composting. These rules describe the minimum criteria for siting, designing, and operating a compost facility. Most importantly, the rules establish standards for the *classification and use of the compost product.* Directly related to the types of waste processed, the quality of the final product has been a common problem for the pioneering composting facilities in the United States. The processed wastes (*feedstock*) include: tobacco dust, burlap, boiler ash, select municipal solid waste, restaurant waste, crab waste, vegetable waste, scrap packaging materials, and yard waste. A collective effort including N.C. State University, the N.C. Department of Agriculture, industry specialists, and environmental regulators, developed product standards that are designed to promote composting as a practical reuse technology.

Local interest in composting specific wastes is increasing. The Solid Waste Section has approved eight pilot composting projects and is currently reviewing several additional proposals.

During FY 1991-92, 165 local governments in North Carolina (21 counties = 21 percent and 144 municipalities = 28 percent) operated compost programs.

## YARD WASTE DATA

Yard waste facilities are sites where stumps, limbs, leaves, wooden pallets, and other untreated wood wastes may be collected and processed either into mulch or compost products.

Yard waste facility regulations became effective February 1, 1991. Since enactment of these rules, more than 50 facilities have been permitted or have notified the Solid Waste Section of their operation and the number is growing.

From the data accumulated from the 1992 Solid Waste Management Annual Report Forms and presented below, it is evident that yard waste diverted from ultimate disposal (landfill or incineration) can definitely help communities achieve their waste reduction goals.

## YARD WASTE ANNUAL REPORT DATA SUMMARY

In FY 1991-92, 267,428 tons of yard waste were collected in North Carolina. This figure includes leaves, limbs, grass, stumps, pallets, and other wood waste in descending order of volume received. The tonnage represents 62 percent of all recyclable material collected during FY 1991-92.

Twenty-one percent of all counties and 28 percent of all cities reported some type of collection program for yard waste. Yard waste was most frequently collected at drop-off centers. The second and third most common methods of collection were curbside and buy-back centers,

respectively.

Of the 267,428 tons of yard waste collected, 34,878 tons were delivered directly to individuals or farmers without any processing or staging. Farmers typically disk the raw materials into their fields and homeowners add the material to the soil in home gardens.

The rest of the yard waste collected (approximately 232,550 tons) was sent to sites for processing into a compost or mulch product. At the processing sites, an average of 47 percent of the final product was picked-up by individuals, eight percent was picked up by professionals, nine percent was sold, and the remaining 36 percent was stockpiled on site for further processing in the upcoming year.

CHAPTER NINE

# STATE FUNDING FOR SOLID WASTE PROJECTS

The Solid Waste Management Act of 1989 (Senate Bill 111) established the Solid Waste Management Trust Fund. The purpose of the trust fund is to provide monies for a wide range of activities, including technical assistance, education activities, demonstration projects, research, and market development. The monies are supplied by part of the 1 percent fee on tire sales in North Carolina and the tax on non-recycled newsprint. The fund receives an average of $85,000 each quarter.

The Office of Waste Reduction administers the trust fund. Since the trust fund was activated in January 1990, 56 grants to local governments have been awarded, totaling more than $925,000, to help North Carolina reach its goal of a 40 percent reduction in the amount of solid waste destined for disposal by the year 2001. More than $140,000 was awarded the first year, almost $99,000 the second year, more than $228,000 in the third year, and just under $400,000 the fourth year. The American Plastics Council provided $35,000 in matching funds which helped raise the amount available in the fourth year. The trust fund has also been used to fund three educational projects and two applied research projects. In addition, it helps market development efforts by partially funding the state's "Buy-Recycled" campaign.

## I. FY 1990-91 Grant Funding Cycle

In response to the Request for Proposals for "Grants to Demonstrate Solid Waste Solutions" in 1990, 52 proposals were submitted. Grants were awarded for six projects, which assisted recycling efforts in 35 counties. The following is a list of projects funded for the 1990-91 grant cycle:

1. Western Carolina University, Center for Improving Mountain Living - $54,800

   Appalachian Lead Regional Organizations A through I (31 counties) developed a regional material recovery and marketing system.

2. Chatham County Waste Management Task Force Demonstration Project for Solid Waste Management Education - $7,000

   Recycling education and curriculum materials were developed and used at teacher training workshops held for Chatham County teachers and other teachers throughout the state.

3. Sunshares Demonstration Project for Mixed Paper Incineration, Marketing, and Use as a Sludge Bulking Agent - $29,850

   Markets for mixed paper were investigated and the use of mixed paper as a sludge bulking agent and as a fuel source was tested.

4. Land-of-Sky Regional Council/Madison County Demonstration Project for Volume-Based User Fees in Rural Counties - $7,500

   A feasibility study was conducted to design a model program for volume-based user fees for Madison County using rural convenience center collection systems.

5. Pitt County Engineering Department Demonstration Project for Confidential and Non-Confidential Office Paper Recycling - $26,000

   A county-wide recycling program for confidential and non-confidential paper was implemented.

6. Watauga County Sanitation Department Demonstration Project for Using Newsprint as Animal Bedding - $15,000

   A newsprint processing and marketing program for animal bedding was developed and implemented.

   In addition, a demonstration project was conducted to determine the feasibility of using crumb rubber in asphalt paving. The Department of Transportation's Trial Use of Recycled Scrap Tires in Highway Construction was carried out in Johnston and Yancey counties. Sections of roads were resurfaced with rubber-filled asphalt concrete (RFAC). Crumb rubber used in the RFAC was from scrap tires generated in North Carolina.

## II. FY 1991-92 Grant Funding Cycle

In 1991, 46 proposals were submitted for demonstration projects. Close to $99,000 was awarded for six projects, which assisted nine counties throughout the state.

1. Wilkes County Vocational Workshop - $ 22,667

   The existing vocational workshop, which trains handicapped individuals and helps them seek employment in local industries, expanded its recycling efforts to include wooden pallets, documented its unique recycling program which includes mirror waste, and disseminated this information to other vocational workshops throughout the state.

2. Chapel Hill/Carrboro City Schools Reduction, Recycling and Composting Demonstration Project - $ 15,000

   Recycling, waste reduction, and composting activities which have proven successful were expanded to all nine schools in the school district. The project also included composting of cafeteria food waste and brown paper towels as well as the development and implementation of training programs for all school personnel involved in the recycling and composting operations. In addition, the project included the implementation of a composting curriculum in the school system.

3. Davie County Materials Recovery Enhancement Project - $ 25,000

   Davie County's materials recovery program at the landfill was expanded and improved by adding a sorting line for the recyclables and enlarging the existing warehouse to facilitate processing. A complete case study of Davie County's innovative waste reduction program was written as part of the project.

4. Wayne County Comprehensive Yard Waste Composting Educational Demonstration Site - $ 7,300

   A compost demonstration site, public garden, and educational exhibit were developed to better familiarize Wayne County residents with at least seven types of backyard composting methods. As a part of the overall educational program, "Master Composter" training workshops were held at the site.

5. Durham County Compost Demonstration Site at the N.C. Museum of Life and Science - $3,700

   A compost demonstration site was developed at the N.C. Museum of Life and Science in Durham which included five different types of composting methods and serves as the site for a community training program for backyard composting.

6. Triangle J Council of Governments Construction and Demolition Waste Regional Recycling Demonstration Project - $ 25,000

   A regional strategy for managing construction and demolition waste for the Triangle J Council of Governments was developed concentrating on waste reduction measures to be implemented by public and private entities in four of the six counties in the region.

In addition, three statewide recycling education projects were funded in FY 1991-92, for a total of $115,000. Descriptions of the projects follow:

1. State Training Program for Recycling Coordinators - N.C. Recycling Association - $55,000

   The Office of Waste Reduction, the N.C. Recycling Association, and the N.C. Soft Drink Association jointly developed a 3½ day training course in planning and implementing recycling programs for county and municipal recycling coordinators. State-of-the-art technical information on recycling and waste reduction has been presented on five separate occasions throughout the state.

2. Public Education Campaign on Waste Reduction and Recycling - Environmental Defense Fund - $30,000

National print, radio, and television promotional spots developed by the Environmental Defense Fund and the National Ad Council were modified for North Carolina. Hundreds of thousands of dollars worth of public service advertising has been distributed to television, radio, and print media. Respondents receive a brochure about recycling, listing five sources of recycling information near the callers.

3. Educational Program on Home Yard Waste Composting - North Carolina Cooperative Extension Service - $30,000

"Master Compost Volunteers," a how-to videotape and information distributed through garden centers, helps educate citizens on how to compost their yard waste. In addition, 14 demonstration counties received small grants and developed composting demonstration sites.

## III. 1992-93 Grant Funding Cycle

The third cycle of grant funding was only open to local governments, including municipalities, counties, councils of government, and regional solid waste authorities. Local governments in the early stages of setting up solid waste recycling or reduction programs, with demonstrated technical and economic need, as well as local hardships, were encouraged to apply. Some 156 proposals were submitted. Grants were awarded for 15 projects, which have assisted recycling efforts in 21 counties. The total amount awarded was $288,000.

### 1. Person County - $40,000

Five counties in the Region K Council of Governments (Franklin, Person, Granville, Vance and Warren) purchased a mobile tub grinder for processing yard and other wood wastes. The equipment is being be rotated to each county on a regular schedule.

### 2. Jones County - $15,000

Jones County built a recycling trailer, constructed a recycling center, converted a drink truck to a recycling vehicle, and designed and purchased needed educational materials for the project.

### 3. Lincoln County - $15,000

Two composting operations - one for leaves and grass clippings, the other for yard waste and wood waste were established with the grant funds. The residents of Denver, Westport, and Lake Norman communities are serviced through this county effort.

### 4. Town of Spencer - $11,200

The town purchased a recycling vehicle to transport recyclables to the Davie County recycling center. Funds were also used to develop, print, and distribute educational materials.

5. **Towns of Middlesex-Bailey - $22,160**

Two pieces of equipment, a leaf collection vehicle and a wood chipper, enabled the two towns to manage their yard waste and meet the state's landfill ban on yard waste by January 1, 1993.

6. **Tri-County Solid Waste Management Authority - $40,000**

Funds were used to purchase equipment necessary for the start-up of a solid waste authority for Cherokee, Clay and Graham counties; to hire a full-time recycling coordinator to coordinate multi-county efforts; and to standardize recycling operations in the three-county area.

7. **Towns of Burgaw and St. Helena - $35,000**

This joint effort enabled the two towns to purchase a brush chipper and two-ton truck to manage their yard waste and avoid sending this material to the Pender County landfill.

8. **Town of Marshville - $15,000**

The town established a Solid Waste and Recycling Program (SWARP) which enabled it to set up a drop-off site for recyclables and construct a mobile recycling unit.

9. **Town of Kernersville - $15,000**

A commercial recycling program was initiated for the Kernersville business community. In addition, the town purchased a "Bobcat" loader for use at their compost facility.

10. **Town of Smithfield - $15,000**

The grant award was used to establish a curbside recycling program and help fund a part-time recycling coordinator position for Smithfield.

11. **Town of Oriental - $8,000**

Funds helped the town to purchase two recycling roll-off containers for a drop-off recycling site. Pamilco County assisted by providing transportation of collected recyclables.

12. **Scotland County - $15,000**

Three new drop-off sites for recyclables were constructed, including laying concrete slabs and purchasing new roll-off containers.

13. **Town of Edenton - $11,700**

A recycling trailer was purchased to enable the town to begin a curbside recycling

program for its residents.

**14. City of Jacksonville - $15,000**

A pilot commercial recycling project was initiated and a recycling educator was hired to promote source reduction efforts in the city.

**15. Northampton County - $15,000**

The grant funds enabled Northampton County to begin its "Recycle Now" project and to hire a recycling coordinator for the program.

Additional trust fund money was used to assist in-state market development efforts. This project is described below.

**1. State Buy-Recycled Campaign - $15,000**

A "Buy-Recycled" campaign was initiated in North Carolina. One of the key aspects of this project was a recycled products procurement conference held in July 1992. The conference brought together nearly 300 attendees, including vendors of recycled products and local government, state agency and private purchasing agents. Training in procedures for the procurement of recycled materials was provided.

## IV. FY 1993-94 Grant Funding Cycle

As in 1992-93, the fourth cycle of grant funding was open only to local governments and was designed to assist in recycling program implementation. Eighty-nine proposals were received for approximately $1.2 million in funding. With the help of $35,000 in matching funds from the American Plastics Council, 28 grants were made, totaling $398,935.

1. **Jackson, Swain, and Macon Counties - $40,000**

Grant funds will be used for construction of a larger recycling facility at Webster Enterprises, a vocational center which processes and markets recyclables for six western rural counties.

2. **New Hanover County - $2,000**

New Hanover County will establish a system to construct backyard composting bins from waste wooden pallets and distribute them to the public.

3. **Catawba County - $15,000**

This project involves the purchase of equipment and hiring of personnel to establish a mobile yard waste processing service for Catawba County, the city of Hickory, and other small towns in the county.

4. **Mecklenburg County - $7,825**

The grant will fund production of a waste reduction video, featuring the Charlotte Hornet's star "Muggsy" Bogues for distribution to elementary schools across the state.

5. **Town of Wallace - $15,000**

The project will enable the town to implement a comprehensive cardboard collection service for its business and industry. It will also lend support to a town ordinance banning cardboard disposal and help town reach the 40 percent reduction rate by 2001.

6. **Caldwell County - $15,000**

The county will use the funds to construct a staffed convenience center in a remote area, establish a mobile recycling drop-off program, and begin intensive recycling education in Caldwell elementary schools.

7. **Buncombe County - $15,000**

The funds will be used for comprehensive recycling and waste reduction education program administered by a new schools solid waste education coordinator for 44 city and county schools.

8. **City of Laurinburg - $13,085**

The city will begin a cardboard recycling program by expanding its processing center to include a baler and storage building.

9. **Madison County - $15,000**

Grant funds will be used to implement a county processing center for recyclables.

10. **Burke County - $15,000**

Burke County will construct a permanent center, including purchase of certified equipment, for processing and recycling chlorofluorocarbons extracted from white goods prior to recycling.

11. **Cape Fear (Region O) Council of Governments - $31,798**

The money will be used to hire a solid waste coordinator to implement region-wide waste reduction and recycling, with emphasis on commercial and industrial recycling, regional marketing and education.

12. **Town of Franklinton - $13,590**

The funds will be used to implement a curbside recycling program, purchase equipment

and bins, and provide intensive public education.

13. **Camden County - $7,467**

The grant will help improve three staffed recycling centers and add more recycling containers.

14. **Edgecombe County - $15,000**

The project includes construction and operation of a staffed recycling center in a rural area of the county.

15. **Ashe County Recycling Project - $15,000**

Ashe County will establish five permanent recycling drop-off centers, in cooperation with the towns of Jefferson and West Jefferson.

16. **Town of Marshville - $8,960**

The funds will be used to complete Marshville's recycling system by adding a baler for corrugated cardboard and office paper, and a collection program for town businesses.

17. **Town of Lake Waccamaw - $15,000**

The town will add two new recycling drop-off sites and hire a coordinator to oversee the sites and exercise quality control of recyclables.

18. **Orange Regional Landfill - $4,900**

The project calls for design, construction, and placement of custom recycling bins for pedestrian areas such as downtown and malls.

19. **Watauga County - $15,000**

The funds will be used to develop and implement a written waste reduction curriculum for kindergarten through eighth grade science and social studies programs.

20. **Iredell County - $15,000**

Iredell County will use the grant to purchase a tub grinder to process yard waste and non-treated wood waste. It will also be used to incorporate the yard waste and composting operations of the cities of Statesville and Mooresville into a county operation.

21. **Hyde County - $15,000**

The funds will be used to construct and implement a staffed recycling drop-off center on

Ocracoke Island which is physically isolated from the rest of the county.

22. **Town of Faison - $2,410**

The town will construct an unloading ramp to more efficiently process recyclables, particularly plastics.

23. **Town of Princeville - $15,000**

This project will include the establishment of a curbside recycling program and sorting center to process the materials collected.

24. **Town of Butner/Granville Environmental Action Team (G.R.E.A.T.) - $11,900**

The funds will be used to expand the current plastics collection program, establish a baling and processing center, and provide an educational program for schools.

25. **Northampton County - $5,000**

The project calls for the collection, processing, and marketing of plastic pesticide containers and implementation of an educational program for area farmers.

26 **Hertford County - $15,000**

The county will convert its plastics and "other recyclables" collection system from barrels to rolloff containers at staffed convenience centers.

27. **Town of Andrews - $15,000**

The grant will allow the town to acquire three trailers and a truck to activate a voluntary/partially mandatory curbside recycling system.

28. **Counties of Union/Anson/Stanly - $25,000**

The funds will be used to establish a regional recycling center for plastic pesticide containers.

CHAPTER TEN

# LOCAL GOVERNMENT SOLID WASTE PROGRAM FUNDING

The local government annual reports provide data on county and municipal funding of disposal, collection, and recycling for FY 1991-92. Data from the reports indicate that many local governments used multiple funding sources to support the three activities while some used a single funding source for each solid waste service.

A. Funding for County Solid Waste Programs

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

**Table 1: Number of Counties Using Specific Funding Sources for Specific Solid Waste Services**

| Funding Source | Disposal | Collection | Recycling |
|---|---|---|---|
| Tipping Fees | 62 | 15 | 35 |
| State Tire Tax Proceeds | 65 | 9 | 15 |
| Ad Valorem Taxes | 48 | 46 | 43 |
| Per Household Charges | 27 | 23 | 18 |
| Volume/Weight-based Fees | 8 | 6 | 4 |
| Sale of Recyclables | 22 | 6 | 35 |
| Grants | 1 | 0 | 3 |
| Other | 17 | 9 | 11 |

Of the 62 counties using tipping fees for disposal revenue, eight relied on the fees to provide 100 percent of funding; 13 more used tipping fees to cover more than 90 percent of their disposal costs. Of the 48 counties using property taxes to support disposal, nine relied on property taxes as the sole revenue source; an additional 12 used property tax revenue to finance more than 90% percent of their disposal costs.

Three counties used tipping fees to cover all of their solid waste collection service costs; two others relied on tipping fees for 99 percent of collection funding. Thirty counties made property taxes their exclusive revenue source for solid waste collection; another four covered

more than 90 percent of costs with taxes. Nine counties funded solid waste collection solely with per household charges.

**Table 2: Number of Municipalities using Specific Funding Sources for Specific Solid Waste Services**

| Funding Source | Disposal | Collection | Recycling |
|---|---|---|---|
| Tipping fees | 37 | 12 | 10 |
| Tire tax proceeds | 4 | 0 | 2 |
| Ad valorem taxes | 234 | 350 | 162 |
| Per household charges | 125 | 150 | 47 |
| Volume/Weight-based fees | 10 | 9 | 0 |
| Sale of recyclables | 0 | 7 | 48 |
| Grants | 0 | 0 | 2 |
| Other | 30 | 37 | 44 |

In FY 1991-92, municipalities relied heavily on their ad valorem tax base to support solid waste services. Out of 234 towns and cities, 127 used taxes to cover 100 percent of disposal costs; another 11 covered 90 percent or more of disposal costs with taxes. Household charges were the second most common funding source for disposal. Sixty-two municipalities used household fees as their exclusive revenue source for disposal costs.

Municipal solid waste collection services were also financed heavily from the ad valorem tax base and household fees. Over two thirds of the cities and towns (253 out of 350) used taxes as their sole revenue source, while another 12 used taxes to fund 90 percent of the costs of their solid waste collection program. Forty percent of municipalities (60 of 150) covered 100 percent of their solid waste collection costs with household fees.

Finally, ad valorem taxes were a common source of financial support for municipal recycling programs. Ninety-six cities and towns financed recycling exclusively from the property tax base while 27 used household fees. Five municipalities reported covering 100 percent of recycling costs through the sale of recyclables.

APPENDIX A: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

| PERMIT | PUBLIC FACILITIES | TONS FY 90-91 | TONS FY 91-92 | TONNAGE CHANGE FY 91-92 | TONS/DAY (280 DAYS) FY 91-92 | TIPPING FEE FY 90-91 | TIPPING FEE FY 91-92 | CERTIFIED OPERATOR FY 90-91 | CERTIFIED OPERATOR FY 91-92 |
|---|---|---|---|---|---|---|---|---|---|
| 4103 | GREENSBORO LF (GUILFORD CO) | 322,946.00 | 327,574.00 | 4,628.00 | 1,169.91 | $22.00 | $26.00 | YES | YES |
| 9201 | WAKE CO (WILDERS GROVE) LF | 276,652.00 | 258,796.00 | -17,856.00 | 924.27 | $21.00 | $28.00 | YES | YES |
| 3402 | WINSTON-SALEM LF (FORSYTH) | 229,531.00 | 210,246.46 | -19,284.54 | 750.88 | $15.00 | $18.00 | YES | YES |
| 3201 | DURHAM LF (DURHAM) | 217,020.00 | 208,360.00 | -8,660.00 | 744.14 | $26.00 | $38.00 | NO | NO |
| 2601 | ANN ST LF (CUMBERLAND CO) | 174,445.00 | 160,880.67 | -13,564.33 | 574.57 | $2.00 | $25.00 | YES | YES |
| 3606 | GASTON CO LF | 149,198.00 | 153,105.00 | 3,907.00 | 546.80 | $22.00 | $22.00 | YES | YES |
| 9209 | WAKE CO LF | 156,958.00 | 150,967.70 | -5,990.30 | 539.17 | $21.00 | $28.00 | YES | YES |
| 6001 | MECKLENBURG CO LF | 221,124.00 | 150,603.00 | -70,521.00 | 537.87 | $25.00 | $28.00 | YES | YES |
| 1101 | BUNCOMBE CO LF | 192,476.00 | 141,928.01 | -50,547.99 | 506.89 | $28.00 | $28.00 | YES | YES |
| 2902 | DAVIDSON CO LF | 117,211.00 | 132,258.00 | 15,047.00 | 472.35 | $18.00 | $21.00 | NO | YES |
| 1803 | CATAWBA CO LF | 131,201.00 | 129,948.00 | -1,253.00 | 464.10 | $10.00 | $15.00 | YES | YES |
| 7401 | PITT CO LF | 142,110.00 | 124,008.00 | -18,102.00 | 442.89 | $0.00 | $20.00 | NO | NO |
| 6801 | ORANGE CO REGIONAL LF | 95,123.00 | 121,318.00 | 26,195.00 | 433.28 | $20.00 | $22.00 | YES | YES |
| 4101 | HIGH POINT LF (GUILFORD CO) | 118,968.00 | 118,118.30 | -849.70 | 421.85 | $21.00 | $26.00 | NO | NO |
| 9801 | WILSON CO LF | 108,637.00 | 117,112.00 | 8,475.00 | 418.26 | $0.00 | $0.00 | NO | NO |
| 4901 | IREDELL CO LF | 148,500.00 | 110,357.00 | -38,143.00 | 394.13 | $24.00 | $24.00 | YES | YES |
| 9601 | WAYNE CO | 111,083.00 | 97,386.32 | -13,696.68 | 347.81 | $14.00 | $14.00 | YES | YES |
| 9203 | FELTONSVILLE LF (WAKE CO) | 89,035.00 | 92,433.74 | 3,398.74 | 330.12 | $21.00 | $28.00 | NO | NO |
| 7803 | ROBESON CO | 84,066.00 | 91,048.50 | 6,982.50 | 325.17 | $13.00 | $23.00 | NO | NO |
| 101 | ALAMANCE CO LF | 98,552.00 | 89,089.64 | -9,462.36 | 318.18 | $29.00 | $31.00 | NO | NO |
| 8003 | ROWAN CO LF | 87,159.00 | 85,708.00 | -1,451.00 | 306.10 | $27.00 | $28.00 | YES | YES |
| 1602 | CARTERET CO LF | 105,358.00 | 84,433.00 | -20,925.00 | 301.55 | $20.00 | $15.00 | NO | NO |
| 6504 | NEW HANOVER CO LF | 123,538.00 | 80,575.58 | -42,962.42 | 287.77 | $60.00 | $60.00 | YES | YES |
| 6401 | NASH CO LF | 78,495.00 | 79,402.87 | 907.87 | 283.58 | $8.00 | $12.00 | YES | NO |
| 4501 | HENDERSON CO LF | 89,488.00 | 77,763.00 | -11,725.00 | 277.73 | $0.00 | $17.00 | NO | YES |
| 2503 | CRAVEN CO LF | 97,232.00 | 77,108.17 | -20,123.83 | 275.39 | $25.00 | $25.00 | NO | NO |
| 1007 | BRUNSWICK CO LF | 70,836.00 | 76,560.00 | 5,724.00 | 273.43 | $0.00 | $0.00 | NO | NO |
| 7601 | RANDOLPH CO LF | 74,700.00 | 75,533.00 | 833.00 | 269.76 | $20.00 | $20.00 | YES | YES |
| 9001 | UNION CO LF | 105,570.00 | 71,787.37 | -33,782.63 | 256.38 | $26.00 | $30.00 | NO | NO |
| 3301 | EDGECOMBE CO LF | 64,079.00 | 71,037.00 | 6,958.00 | 253.70 | $10.00 | $10.00 | YES | YES |
| 6301 | MOORE CO LF | 72,690.00 | 70,706.43 | -1,983.57 | 252.52 | $10.00 | $10.00 | YES | YES |
| 5101 | JOHNSTON CO LF | 72,048.00 | 70,045.00 | -2,003.00 | 250.16 | $18.00 | $27.00 | NO | NO |
| 8401 | ALBEMARLE LF (STANLY) | 62,328.00 | 67,498.00 | 5,170.00 | 241.06 | $0.00 | $0.00 | YES | YES |
| 5403 | LENOIR CO LF | 60,347.00 | 67,323.66 | 6,976.66 | 240.44 | $12.00 | $12.00 | NO | NO |
| 2301 | CLEVELAND CO LF | 74,096.00 | 64,749.87 | -9,346.13 | 231.25 | $19.00 | $19.00 | NO | NO |
| 1203 | BURKE CO LF | 54,509.50 | 64,619.00 | 10,109.50 | 230.78 | $18.00 | $20.00 | YES | YES |

APPENDIX A: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

| PERMIT | PUBLIC FACILITIES | TONS FY 90-91 | TONS FY 91-92 | TONNAGE CHANGE FY 91-92 | TONS/DAY (280 DAYS) FY91-92 | TIPPING FEE FY90-91 | TIPPING FEE FY91-92 | CERTIFIED OPERATOR FY 90-91 | CERTIFIED OPERATOR FY 91-92 |
|---|---|---|---|---|---|---|---|---|---|
| 6705 | ONSLOW CO LF | 74,195.00 | 63,530.27 | -10,664.73 | 226.89 | $35.00 | $35.00 | NO | NO |
| 1401 | CALDWELL CO LF | 45,866.00 | 62,112.59 | 16,246.59 | 221.83 | $18.00 | $18.00 | NO | NO |
| 7702 | RICHMOND CO LF | 47,662.00 | 60,103.48 | 12,441.48 | 214.66 | $35.00 | $35.00 | YES | YES |
| 1302 | CABARRUS CO LF | 59,832.00 | 59,335.70 | -496.30 | 211.91 | $25.00 | $28.00 | YES | YES |
| 9701 | WILKES CO LF | 83,832.00 | 55,722.00 | -28,110.00 | 199.01 | $3.00 | $6.00 | NO | NO |
| 4302 | HARNETT CO LF | 59,804.00 | 54,770.00 | -5,034.00 | 195.61 | $10.00 | $10.00 | NO | NO |
| 4204 | HALIFAX CO LF | 60,000.00 | 52,309.79 | -7,690.21 | 186.82 | $9.00 | $9.00 | NO | NO |
| 8103 | CENTRAL LF (RUTHERFORD CO) | 48,208.00 | 52,047.64 | 3,839.64 | 185.88 | $28.00 | $17.00 | YES | YES |
| 2802 | EAST LAKE LF (DARE CO) | 48,613.00 | 50,101.00 | 1,488.00 | 178.93 | $0.00 | $0.00 | YES | YES |
| 5301 | LEE CO LF | 45,981.00 | 46,750.83 | 769.83 | 166.97 | $9.00 | $14.00 | NO | NO |
| 8602 | SURRY CO LF | 49,296.00 | 45,907.00 | -3,389.00 | 163.95 | $0.00 | $0.00 | NO | NO |
| 2401 | COLUMBUS CO LF | 35,880.00 | 44,536.31 | 8,656.31 | 159.06 | $16.00 | $16.00 | YES | YES |
| 8301 | SCOTLAND CO LF | 46,800.00 | 43,041.84 | -3,758.16 | 153.72 | $17.00 | $19.00 | NO | NO |
| 5503 | LINCOLN CO LF | 51,450.00 | 42,297.00 | -9,153.00 | 151.06 | $10.00 | $20.00 | YES | YES |
| 9101 | VANCE CO LF | 46,954.00 | 40,053.06 | -6,900.94 | 143.05 | $12.00 | $14.00 | NO | NO |
| 4403 | HAYWOOD CO LF | 40,560.00 | 39,240.00 | -1,320.00 | 140.14 | $0.00 | $0.00 | NO | NO |
| 702 | BEAUFORT CO LF | 37,200.00 | 38,748.17 | 1,548.17 | 138.39 | $0.00 | $0.00 | NO | NO |
| 7901 | ROCKINGHAM CO LF | 60,155.00 | 37,377.46 | -22,777.54 | 133.49 | $13.00 | $18.00 | YES | YES |
| 3901 | OXFORD LF (GRANVILLE CO) | 32,246.00 | 36,341.03 | 4,095.03 | 129.79 | $15.00 | $14.00 | NO | NO |
| 8201 | SAMPSON CO LF | 36,000.00 | 33,234.59 | -2,765.41 | 118.69 | $20.00 | $20.00 | NO | NO |
| 9502 | WATAUGA CO LF | 32,206.00 | 32,881.82 | 675.82 | 117.44 | $15.00 | $15.00 | YES | YES |
| 3101 | DUPLIN CO LF | 48,900.00 | 31,571.92 | -17,328.08 | 112.76 | $12.00 | $27.00 | NO | NO |
| 8102 | CLIFFSIDE SOUTH (RUTHERFORD CO) LF | 12,051.00 | 31,228.58 | 19,177.58 | 111.53 | $28.00 | $0.00 | YES | NO |
| 1 | YANCEY/MITCHELL CO LF | 31,296.00 | 30,915.00 | -381.00 | 110.41 | $0.00 | $0.00 | NO | NO |
| 1901 | CHATHAM CO LF | 31,910.00 | 30,552.00 | -1,358.00 | 109.11 | $19.00 | $30.00 | NO | NO |
| 5901 | MARTIN CO LF | 25,956.00 | 30,086.00 | 4,130.00 | 107.45 | $0.00 | $0.00 | NO | NO |
| 7002 | PASQUOTANK CO LF | 34,478.00 | 30,004.99 | -4,473.01 | 107.16 | $25.00 | $25.00 | YES | YES |
| 6201 | MONTGOMERY CO LF | 18,096.00 | 28,800.00 | 10,704.00 | 102.86 | $7.00 | $0.00 | NO | NO |
| 3501 | FRANKLIN CO LF | 25,881.00 | 27,887.46 | 2,006.46 | 99.60 | $14.00 | $18.00 | YES | NO |
| 5601 | MCDOWELL CO LF | 28,900.00 | 27,460.96 | -1,439.04 | 98.07 | $21.00 | $21.00 | NO | NO |
| 8603 | ELKIN AREA LF (SURRY CO) | 32,760.00 | 26,726.00 | -6,034.00 | 95.45 | $0.00 | $0.00 | NO | NO |
| 8803 | TRANSYLVANIA CO LF | 26,740.00 | 25,620.00 | -1,120.00 | 91.50 | $0.00 | $0.00 | YES | YES |
| 201 | ALEXANDER CO LF | 28,880.00 | 25,182.00 | -3,698.00 | 89.94 | $12.00 | $24.00 | NO | NO |
| 901 | BLADEN CO | 47,110.00 | 24,810.00 | -22,300.00 | 88.61 | $13.00 | $12.00 | NO | NO |
| 7202 | PERQUIMANS CHOWAN GATES REG LF | 24,508.00 | 24,700.00 | 192.00 | 88.21 | $25.00 | $25.00 | NO | YES |
| 7301 | ROXBORO LF (PERSON CO) | 42,996.00 | 22,528.99 | -20,467.01 | 80.46 | $0.00 | $14.00 | NO | YES |

APPENDIX A: PUBLIC MUNICIPAL SOLID WASTE LANDFILL FACILITIES

| PERMIT | PUBLIC FACILITIES | TONS FY 90-91 | TONS FY 91-92 | TONNAGE CHANGE FY 91-92 | TONS/DAY (280 DAYS) FY91-92 | TIPPING FEE FY90-91 | TIPPING FEE FY91-92 | CERTIFIED OPERATOR FY 90-91 | CERTIFIED OPERATOR FY 91-92 |
|---|---|---|---|---|---|---|---|---|---|
| 9902 | YADKIN CO LF | 25,800.00 | 20,487.33 | -5,312.67 | 73.17 | $0.00 | $0.00 | NO | NO |
| 6601 | NORTHAMPTON CO LF | 12,384.00 | 18,890.00 | 6,506.00 | 67.46 | $0.00 | $0.00 | NO | NO |
| 3902 | GRANVILLE CO (BUTNER) LF | 14,090.00 | 17,915.14 | 3,825.14 | 63.98 | $15.00 | $14.00 | NO | NO |
| 7101 | PENDER CO LF | 18,133.00 | 17,875.79 | -257.21 | 63.84 | $30.00 | $54.00 | NO | NO |
| 501 | ASHE CO LF | 16,389.00 | 17,756.20 | 1,367.20 | 63.42 | $18.00 | $18.00 | NO | NO |
| 4701 | HOKE CO LF | 20,306.00 | 17,515.04 | -2,790.96 | 62.55 | $15.00 | $15.00 | YES | YES |
| 801 | BERTIE CO LF | 12,600.00 | 17,255.30 | 4,655.30 | 61.63 | $0.00 | $0.00 | NO | NO |
| 8501 | STOKES CO LF | 16,896.00 | 16,784.00 | -112.00 | 59.94 | $20.00 | $20.00 | NO | NO |
| 5002 | JACKSON CO LF | 16,833.00 | 16,703.00 | -130.00 | 59.65 | $0.00 | $24.00 | NO | NO |
| 2001 | CHEROKEE CO LF | 15,840.00 | 15,926.00 | 86.00 | 56.88 | $0.00 | $12.00 | NO | NO |
| 3001 | DAVIE CO LF | 19,070.00 | 15,109.98 | -3,960.02 | 53.96 | $30.00 | $30.00 | NO | NO |
| 4601 | HERTFORD CO LF | 12,475.00 | 14,269.00 | 1,794.00 | 50.96 | $19.00 | $20.00 | NO | NO |
| 302 | ALLEGHANY CO LF | 17,060.00 | 13,995.00 | -3,065.00 | 49.98 | $0.00 | $18.00 | NO | NO |
| 4404 | CANTON LF (HAYWOOD CO) | 95,735.00 | 13,957.00 | -81,778.00 | 49.85 | $40.00 | $23.00 | NO | NO |
| 401 | ANSON CO LF | 14,831.00 | 13,942.30 | -888.70 | 49.79 | $30.00 | $30.00 | NO | YES |
| 2701 | CURRITUCK CO LF | 14,569.00 | 13,721.00 | -848.00 | 49.00 | $0.00 | $0.00 | NO | NO |
| 4303 | ANDERSON CREEK LF (HARNETT CO) | 10,355.00 | 13,691.00 | 3,336.00 | 48.90 | $10.00 | $10.00 | NO | NO |
| 9402 | WASHINGTON CO LF | 11,773.00 | 13,233.05 | 1,460.05 | 47.26 | $15.00 | $18.00 | YES | YES |
| 5802 | MADISON CO LF | 12,090.00 | 11,154.00 | -936.00 | 39.84 | $0.00 | $0.00 | YES | YES |
| 9301 | WARREN CO LF | 13,490.00 | 10,968.00 | -2,522.00 | 39.17 | $14.00 | $25.00 | NO | NO |
| 601 | AVERY CO LF | 16,060.00 | 10,800.00 | -5,260.00 | 38.57 | $0.00 | $0.00 | NO | NO |
| 6902 | PAMLICO CO LF | 11,083.00 | 10,600.00 | -483.00 | 37.86 | $0.00 | $0.00 | YES | YES |
| 5701 | MACON CO LF (FRANKLIN) | 28,215.00 | 9,531.32 | -18,683.68 | 34.04 | $0.00 | $0.00 | YES | YES |
| 7502 | POLK CO LF | 9,318.00 | 8,808.86 | -509.14 | 31.46 | $30.00 | $30.00 | NO | YES |
| 4002 | GREENE CO LF | 14,064.00 | 6,815.28 | -7,248.72 | 24.34 | $0.00 | $14.00 | NO | NO |
| 8701 | SWAIN CO LF | 4,663.00 | 5,521.30 | 858.30 | 19.72 | $0.00 | $0.00 | NO | NO |
| 1701 | CASWELL CO LF | 5,807.60 | 5,102.43 | -705.17 | 18.22 | $9.00 | $15.00 | NO | NO |
| 3801 | GRAHAM CO LF | 4,710.00 | 4,422.96 | -287.04 | 15.80 | $0.00 | $0.00 | NO | NO |
| 5201 | JONES CO LF | 3,648.00 | 4,360.00 | 712.00 | 15.57 | $0.00 | $20.00 | NO | NO |
| 5702 | HIGHLANDS LF (MACON CO) | 7,365.00 | 4,267.04 | -3,097.96 | 15.24 | $0.00 | $0.00 | YES | YES |
| 2201 | CLAY CO LF | 4,720.00 | 3,965.60 | -754.40 | 14.16 | $0.00 | $12.00 | NO | NO |
| 5703 | MACON CTY LANDFILL | 0.00 | 3,648.70 | 3,648.70 | 13.03 | $0.00 | $0.00 | NO | YES |
| 8807 | TRANSYLVANIA CO LF | 0.00 | 3,220.00 | 3,220.00 | 11.50 | $0.00 | $0.00 | YES | YES |
| 9702 | ROARING RIVER LF (WILKES CO) | 9,146.00 | 1,637.00 | -7,509.00 | 5.85 | $3.00 | $6.00 | NO | NO |
| 2904 | THOMASVILLE LF (DAVIDSON CO) | 7,502.00 | 0.00 | -7,502.00 | 0.00 | $0.00 | $0.00 | NO | NO |
| | TOTAL | 6,497,532.10 | 5,972,752.39 | -524,779.71 | 21,331.26 | | | 39 | 43 |

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS CHANGE | TONS/DAY FY 91-92 (280 DAYS) | TIPPING FEE FY 90-91 | TIPPING FEE FY 91-92 | CERTIFIED OPERATOR FY 90-91 | CERTIFIED OPERATOR FY 91-92 |
|---|---|---|---|---|---|---|---|---|---|
| 1301 | CHARLOTTE MTR SPEEDWAY | 359,918.00 | 404,978.70 | 45,060.70 | 1,446.35 | $30.00 | $28.00 | YES | YES |
| 3406 | PIEDMONT LF & RECYCLING CTR | 128,148.00 | 142,067.36 | 13,915.36 | 507.38 | $74.00 | $24.00 | NO | NO |
| 6703 | CAMP LEJEUNE SANITARY LF | 59,403.00 | 83,823.43 | 24,420.43 | 299.37 | $0.00 | $0.00 | YES | YES |
| 2602 | FORT BRAGG SANITARY LF | 80,000.00 | 39,996.00 | -40,008.00 | 142.84 | $0.00 | $0.00 | NO | NO |
| 9204 | SORRELLS SANITARY LF | DNR | 37,530.00 | DNR | 134.04 | DNR | $21.00 | NO | NO |
| 5001 | WESTERN CAROLINA UNIVERSITY | 612.00 | 430.45 | -181.55 | 1.54 | $0.00 | $0.00 | NO | NO |
| | TOTAL | 628,081.00 | 708,825.94 | 43,206.94 | 2,531.52 | | | 2 | 2 |

DNR = DID NOT REPORT

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS CHANGE | TONS/DAY FY 91-92 (280 DAYS) |
|---|---|---|---|---|---|
| 1303 | U S TIRE RECYCLING, L P | 15,444.00 | 17,094.25 | 1,650.25 | 61.05 |
| 4304 | CENTRAL CAROLINA TIRE DISPOSAL | 0.00 | 2,764.61 | 2,764.61 | 9.87 |
| | TOTAL TONS | 15,444.00 | 19,858.86 | 4,414.86 | 70.92 |

| 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 | TONS/DAY FY 91-92 (280 DAYS) | NET REDUCTION |
|---|---|---|---|---|---|---|---|---|---|
| 6010 | NORTHEAST WTE FACILITY | 74,263.00 | 18,600.00 | 55,663.00 | 71,443.00 | 17,307.00 | 54,136.00 | 193.34 | -2,820.00 |
| 6505 | NEW HANOVER CO WTE FACILITY | 29,265.00 | 12,290.00 | 16,975.00 | 103,611.40 | 39,608.72 | 64,002.68 | 228.58 | 74,346.40 |
| 6506 | TOWN OF WRIGHTSVILLE BEACH | 5,856.00 | 1,265.60 | 4,590.40 | 5,194.20 | 1,388.50 | 3,805.70 | 13.59 | -661.80 |
| | TOTAL TONS | 109,384.00 | 32,155.60 | 77,228.40 | 180,248.60 | 58,304.22 | 121,944.38 | 435.52 | 70,864.60 |

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS/DAY FY 91-92 (280 DAYS) |
|---|---|---|---|---|
| 7302 | ROXBORO S E PLANT | DNR | 528,486.00 | 1,887.45 |
| 4406 | CHAMPION INT'L CORP LF NO. 6 | DNR | 389,689.00 | 1,391.75 |
| 1804 | MARSHALL STEAM STATION LF | DNR | 329,457.00 | 1,176.63 |
| 8503 | BELEWS CREEK ASH LF | DNR | 242,268.00 | 865.24 |
| 2402 | FEDERAL PAPER BOARD COMPANY, INC | 139,375.00 | 194,929.00 | 696.18 |
| 3605 | FMC CORPORATION LF | DNR | 184,462.00 | 658.79 |
| 9401 | WEYERHAEUSER PAPER CO | DNR | 99,732.30 | 356.19 |
| 2302 | CLEVELAND CONTAINER SERVICE | DNR | 67,155.00 | 239.84 |
| 3405 | R J REYNOLDS TOBACCO CO LF | 68,019.00 | 59,576.71 | 212.77 |
| 1102 | BASF CORPORATION | 23,400.00 | 25,726.00 | 91.88 |
| 1006 | E I DUPONT | 14,147.00 | 20,767.85 | 74.17 |
| 4203 | CHAMPION INT'L CORP | 31,698.00 | 17,839.10 | 63.71 |
| 8801 | ECUSTA PAPER LF (SLUDGE) | 13,337.00 | 10,999.70 | 39.28 |
| 5404 | E I DUPONT CO - KINSTON SITE | 6,442.30 | 8,227.00 | 29.38 |
| 8805 | ECUSTA PAPER LF | DNR | 7,522.10 | 26.86 |
| 5603 | COLLINS & AIKMAN SANITARY LF | DNR | 6,846.70 | 24.45 |
| 2502 | WEYERHAEUSER COMPANY | 10,252.00 | 6,633.00 | 23.69 |
| 9703 | ABITIBI PRICE CORP | 3,846.00 | 3,999.00 | 14.28 |
| 802 | R J REYNOLDS TOBACCO CO, AVOCA DIV | 225.20 | 766.30 | 2.74 |
| 7602 | EVEREADY BATTERY COMPANY, INC | DNR | 612.70 | 2.19 |
| 6603 | GEORGIA-PACIFIC | 709.00 | 530.40 | 1.89 |
| 8806 | DUPONT BREVARD PLANT | DNR | 490.20 | 1.75 |
| 1001 | BRUNSWICK PLANT SANITARY LF | 446.00 | 194.00 | 0.69 |
| 9210 | SHEARON HARRIS LF | 350.00 | 176.00 | 0.63 |
| 6004 | MCGUIRE SITE LF | 101.00 | 90.80 | 0.32 |
| 4401 | CHAMPION INT'L CORP LF NO.5 | DNR | 0.00 | 0.00 |
| | **TOTAL TONS** | 312,347.50 | 2,207,175.86 | 7,882.77 |

DNR = DID NOT REPORT

APPENDIX B: SOLID WASTE DISPOSAL BY COUNTY

| COUNTY | Population *1 | MSW Tons *2 | MSW Tons *3 | Tons *4 | Tons *5 | MSW *6 | Base Year *7 | Disposal *8 | Waste *9 | Progress *10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | FY 91-92 | Disposed | Disposed | Recycled | Yard Waste | Managed | Per Capita | Rate | Reduction | Toward |
| | Jul-91 | FY90-91 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY 91-92 | FY91-92 | Goal |
| ALAMANCE | 109,119 | 99,742.00 | 90,510.91 | 2,460.98 | 6,330.00 | 99,301.89 | 0.91 | 0.83 | 8.85% | 35.41% |
| ALEXANDER | 28,434 | 8,880.00 | 25,182.00 | 478.32 | 56.00 | 25,716.32 | 0.90 | 0.89 | 2.08% | 8.31% |
| ALLEGHANY | 9,749 | 17,060.00 | 14,064.73 | 66.10 | 0.00 | 14,130.83 | 1.45 | 1.44 | 0.47% | 1.87% |
| ANSON | 23,144 | 14,831.00 | 13,942.30 | 81.00 | 206.00 | 14,229.30 | 0.61 | 0.60 | 2.02% | 8.07% |
| ASHE | 22,439 | 16,389.00 | 17,883.94 | 205.19 | 0.00 | 18,089.13 | 0.81 | 0.80 | 1.13% | 4.54% |
| AVERY | 14,946 | 16,060.00 | 10,947.65 | 22.44 | 160.00 | 11,130.09 | 0.74 | 0.73 | 1.64% | 6.56% |
| BEAUFORT | 42,411 | 40,118.00 | 41,104.54 | 691.49 | 0.00 | 41,796.03 | 0.99 | 0.97 | 1.65% | 6.62% |
| BERTIE | 20,154 | 12,600.00 | 17,255.30 | 108.68 | 8.00 | 17,371.98 | 0.86 | 0.86 | 0.67% | 2.69% |
| BLADEN | 29,065 | 47,110.00 | 24,823.83 | 224.38 | 0.00 | 25,048.21 | 0.86 | 0.85 | 0.90% | 3.58% |
| BRUNSWICK | 52,721 | 70,836.00 | 76,560.00 | 1,191.11 | 372.00 | 78,123.11 | 1.48 | 1.45 | 2.00% | 8.00% |
| BUNCOMBE | 176,714 | 192,476.00 | 142,041.61 | 7,655.80 | 9,342.80 | 159,040.21 | 0.90 | 0.80 | 10.69% | 42.75% |
| BURKE | 76,793 | 54,507.00 | 65,366.52 | 9,507.99 | 3,131.00 | 78,005.51 | 1.02 | 0.85 | 16.20% | 64.81% |
| CABARRUS | 100,878 | 88,078.00 | 88,784.55 | 3,597.64 | 2,833.00 | 95,215.19 | 0.94 | 0.88 | 6.75% | 27.02% |
| CALDWELL | 70,941 | 45,866.00 | 62,642.56 | 2,460.96 | 428.00 | 65,531.52 | 0.92 | 0.88 | 4.41% | 17.63% |
| CAMDEN | 5,987 | 2,397.00 | 1,768.46 | 81.70 | 0.00 | 1,850.16 | 0.31 | 0.30 | 4.42% | 17.66% |
| CARTERET | 53,721 | 105,358.00 | 84,516.70 | 1,561.60 | 816.00 | 86,894.30 | 1.62 | 1.57 | 2.74% | 10.94% |
| CASWELL | 20,829 | 5,810.00 | 5,102.43 | 33.69 | 0.00 | 5,136.12 | 0.25 | 0.24 | 0.66% | 2.62% |
| CATAWBA | 119,837 | 131,201.00 | 129,948.00 | 11,786.31 | 9,825.00 | 151,559.31 | 1.26 | 1.08 | 14.26% | 57.04% |
| CHATHAM | 39,358 | 33,100.00 | 31,209.91 | 1,413.22 | 612.00 | 33,235.13 | 0.84 | 0.79 | 6.09% | 24.37% |
| CHEROKEE | 20,629 | 15,841.00 | 15,960.17 | 60.00 | 0.00 | 16,020.17 | 0.78 | 0.77 | 0.37% | 1.50% |
| CHOWAN | 13,846 | 12,254.00 | 12,353.00 | 928.72 | 410.00 | 13,691.72 | 0.99 | 0.89 | 9.78% | 39.11% |
| CLAY | 7,295 | 4,720.00 | 3,965.60 | 206.74 | 0.00 | 4,172.34 | 0.57 | 0.54 | 4.96% | 19.82% |
| CLEVELAND | 85,304 | 74,096.00 | 65,533.73 | 2,418.77 | 5,185.00 | 73,137.50 | 0.86 | 0.77 | 10.40% | 41.59% |
| COLUMBUS | 49,904 | 35,880.00 | 44,536.31 | 662.85 | 0.00 | 45,199.16 | 0.91 | 0.89 | 1.47% | 5.87% |
| CRAVEN | 82,489 | 97,402.00 | 77,355.31 | 5,016.70 | 4,177.00 | 86,549.01 | 1.05 | 0.94 | 10.62% | 42.49% |
| CUMBERLAND | 279,995 | 255,639.00 | 203,144.90 | 10,697.77 | 13,459.00 | 227,301.67 | 0.81 | 0.73 | 10.63% | 42.51% |
| CURRITUCK | 13,844 | 14,569.00 | 13,721.00 | 71.48 | 0.00 | 13,792.48 | 1.00 | 0.99 | 0.52% | 2.07% |
| DARE | 22,994 | 46,770.00 | 48,446.08 | 2,248.75 | 605.00 | 51,299.83 | 2.23 | 2.11 | 5.56% | 22.25% |
| DAVIDSON | 129,631 | 125,903.00 | 133,646.84 | 1,142.01 | 4,828.00 | 139,616.85 | 1.08 | 1.03 | 4.28% | 17.10% |
| DAVIE | 28,396 | 19,070.00 | 15,231.34 | 4,112.06 | 5.00 | 19,348.40 | 0.68 | 0.54 | 21.28% | 85.11% |
| DUPLIN | 40,616 | 48,900.00 | 32,213.65 | 1,096.25 | 0.00 | 33,309.90 | 0.82 | 0.79 | 3.29% | 13.16% |
| DURHAM | 186,540 | 218,210.00 | 210,104.06 | 7,177.74 | 1,690.00 | 218,971.80 | 1.17 | 1.13 | 4.05% | 16.20% |
| EDGECOMBE | 57,180 | 64,079.00 | 71,037.00 | 29.38 | 405.00 | 71,471.38 | 1.25 | 1.24 | 0.61% | 2.43% |
| FORSYTH | 267,237 | 278,242.00 | 278,824.06 | 11,134.63 | 14,331.00 | 304,289.69 | 1.14 | 1.04 | 8.37% | 33.48% |

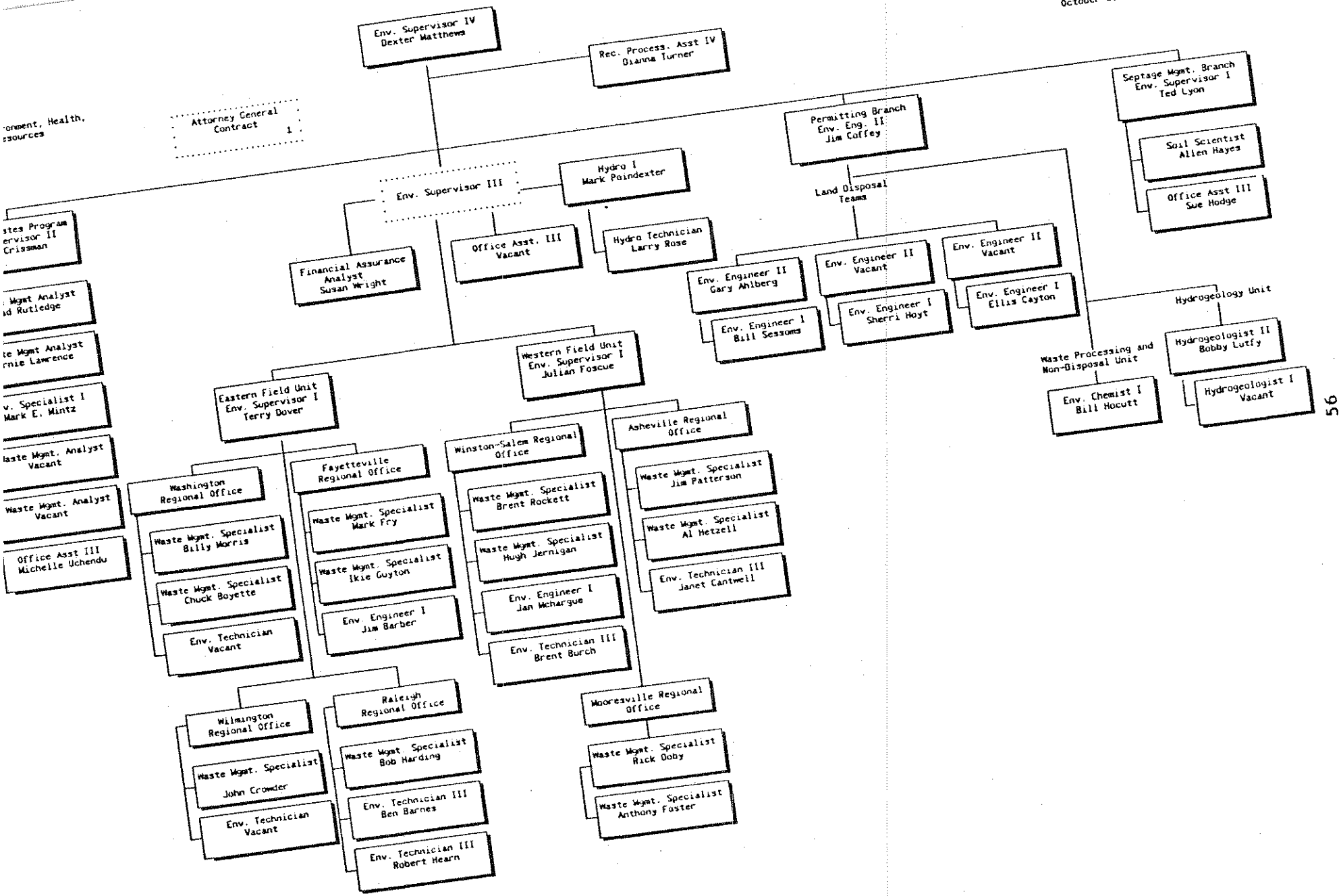
## APPENDIX B: SOLID WASTE DISPOSAL BY COUNTY

| COUNTY | Population | MSW Tons | MSW Tons | Tons | Tons | MSW | Base Year | Disposal | Waste | Progress |
|---|---|---|---|---|---|---|---|---|---|---|
| | FY 91-92 | Disposed | Disposed | Recycled | Yard Waste | Managed | Per Capita | Rate | Reduction | Toward |
| | Jul-91 | FY90-91 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY 91-92 | FY91-92 | Goal |
| FRANKLIN | 37,738 | 25,881.00 | 27,887.46 | 614.35 | 200.00 | 28,701.81 | 0.76 | 0.74 | 2.84% | 11.35% |
| GASTON | 176,828 | 149,198.00 | 154,581.05 | 2,836.34 | 7,682.40 | 165,099.79 | 0.93 | 0.87 | 6.37% | 25.48% |
| GATES | 9,395 | 5,392.00 | 5,430.00 | 349.67 | 117.00 | 5,896.67 | 0.63 | 0.58 | 7.91% | 31.66% |
| GRAHAM | 7,241 | 4,710.00 | 4,422.96 | 85.12 | 0.00 | 4,508.08 | 0.62 | 0.61 | 1.89% | 7.55% |
| GRANVILLE | 39,202 | 46,336.00 | 54,259.99 | 287.91 | 0.00 | 54,547.90 | 1.39 | 1.38 | 0.53% | 2.11% |
| GREENE | 15,546 | 15,254.00 | 7,339.34 | 50.00 | 38.40 | 7,427.74 | 0.48 | 0.47 | 1.19% | 4.76% |
| GUILFORD | 349,764 | 453,446.00 | 464,235.29 | 5,485.61 | 1,820.00 | 471,540.90 | 1.35 | 1.33 | 1.55% | 6.20% |
| HALIFAX | 56,154 | 60,000.00 | 52,352.39 | 508.39 | 2,046.00 | 54,906.78 | 0.98 | 0.93 | 4.65% | 18.61% |
| HARNETT | 68,278 | 71,349.00 | 68,857.51 | 215.88 | 0.00 | 69,073.39 | 1.01 | 1.01 | 0.31% | 1.25% |
| HAYWOOD | 47,775 | 136,295.00 | 53,197.00 | 2,224.80 | 2,420.00 | 57,841.80 | 1.21 | 1.11 | 8.03% | 32.12% |
| HENDERSON | 71,185 | 89,488.00 | 78,014.26 | 1,676.57 | 1,807.00 | 81,497.83 | 1.14 | 1.10 | 4.27% | 17.10% |
| HERTFORD | 22,620 | 12,475.00 | 14,269.00 | 19.00 | 0.00 | 14,288.00 | 0.63 | 0.63 | 0.13% | 0.53% |
| HOKE | 22,886 | 20,306.00 | 17,515.04 | 56.11 | 760.00 | 18,331.15 | 0.80 | 0.77 | 4.45% | 17.81% |
| HYDE | 5,535 | 3,043.00 | 2,675.55 | 86.04 | 0.00 | 2,761.59 | 0.50 | 0.48 | 3.12% | 12.46% |
| IREDELL | 96,384 | 152,340.00 | 110,967.87 | 855.31 | 2,716.00 | 114,539.18 | 1.19 | 1.15 | 3.12% | 12.47% |
| JACKSON | 27,404 | 17,445.00 | 17,179.24 | 1,408.63 | 73.00 | 18,660.87 | 0.68 | 0.63 | 7.94% | 31.76% |
| JOHNSTON | 83,977 | 72,048.00 | 70,607.64 | 810.70 | 2,751.00 | 74,169.34 | 0.88 | 0.84 | 4.80% | 19.21% |
| JONES | 9,347 | 3,648.00 | 4,360.00 | 0.00 | 0.00 | 4,360.00 | 0.47 | 0.47 | 0.00% | 0.00% |
| LEE | 41,845 | 45,981.00 | 46,902.98 | 938.04 | 500.00 | 48,341.02 | 1.16 | 1.12 | 2.97% | 11.90% |
| LENOIR | 57,697 | 60,347.00 | 67,323.66 | 369.22 | 0.00 | 67,692.88 | 1.17 | 1.17 | 0.55% | 2.18% |
| LINCOLN | 50,966 | 52,640.00 | 43,979.51 | 462.83 | 0.00 | 44,442.34 | 0.87 | 0.86 | 1.04% | 4.17% |
| MACON | 24,062 | 35,580.00 | 17,447.06 | 2,291.25 | 0.00 | 19,738.31 | 0.82 | 0.73 | 11.61% | 46.43% |
| MADISON | 17,069 | 12,090.00 | 11,258.61 | 417.62 | 0.00 | 11,676.23 | 0.68 | 0.66 | 3.58% | 14.31% |
| MARTIN | 25,231 | 25,956.00 | 30,087.39 | 24.19 | 0.00 | 30,111.58 | 1.19 | 1.19 | 0.08% | 0.32% |
| MCDOWELL | 35,751 | 28,900.00 | 27,460.96 | 1,135.00 | 584.00 | 29,179.96 | 0.82 | 0.77 | 5.89% | 23.56% |
| MECKLENBURG | 524,463 | 650,910.00 | 601,055.45 | 22,380.79 | 54,137.00 | 677,573.24 | 1.29 | 1.15 | 11.29% | 45.17% |
| MITCHELL | 14,236 | 15,648.00 | 15,606.00 | 159.10 | 3.00 | 15,768.10 | 1.11 | 1.10 | 1.03% | 4.11% |
| MONTGOMERY | 23,474 | 18,096.00 | 28,800.00 | 25.00 | 48.00 | 28,873.00 | 1.23 | 1.23 | 0.25% | 1.01% |
| MOORE | 60,083 | 72,690.00 | 70,814.60 | 2,332.76 | 914.20 | 74,061.56 | 1.23 | 1.18 | 4.38% | 17.54% |
| NASH | 77,668 | 78,495.00 | 79,402.87 | 1,413.30 | 3,777.60 | 84,593.77 | 1.09 | 1.02 | 6.14% | 24.55% |
| NEW HANOVER | 123,309 | 159,849.00 | 149,582.43 | 3,107.46 | 4,957.00 | 157,646.89 | 1.28 | 1.21 | 5.12% | 20.46% |
| NORTHAMPTON | 20,818 | 12,384.00 | 18,945.30 | 582.50 | 0.00 | 19,527.80 | 0.94 | 0.91 | 2.98% | 11.93% |
| ONSLOW | 152,865 | 133,598.00 | 147,867.58 | 1,710.64 | 8,766.00 | 158,344.22 | 1.04 | 0.97 | 6.62% | 26.47% |
| ORANGE | 96,302 | 95,123.00 | 122,053.92 | 6,238.53 | 2,775.00 | 131,067.45 | 1.36 | 1.27 | 6.88% | 27.51% |

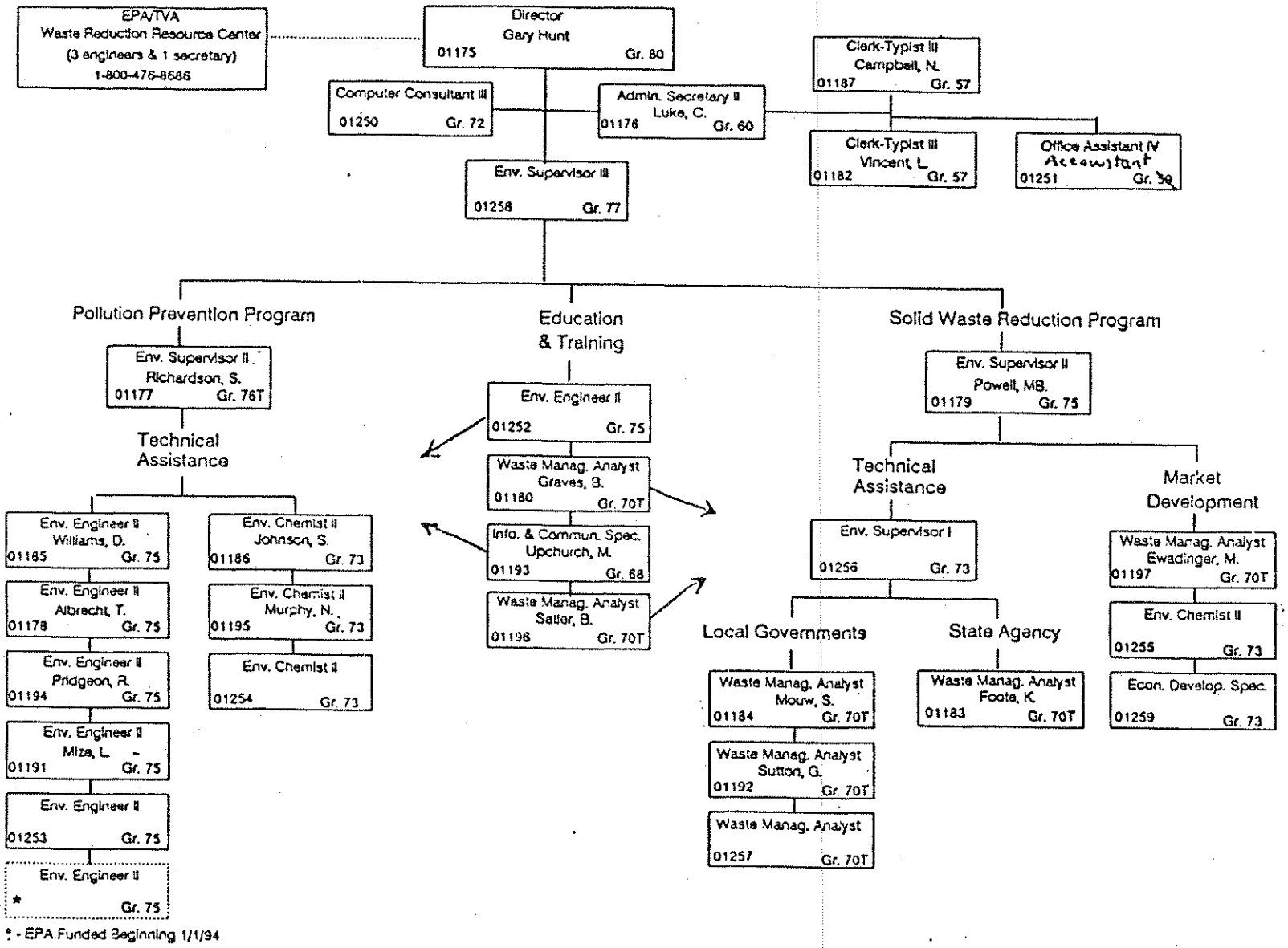
## APPENDIX B: SOLID WASTE DISPOSAL BY COUNTY

| COUNTY | Population | MSW Tons | MSW Tons | Tons | Tons | MSW | Base Year | Disposal | Waste | Progress |
|---|---|---|---|---|---|---|---|---|---|---|
| | FY 91-92 | Disposed | Disposed | Recycled | Yard Waste | Managed | Per Capita | Rate | Reduction | Toward |
| | Jul-91 | FY90-91 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY91-92 | FY 91-92 | FY91-92 | Goal |
| PAMLICO | 11,458 | 6,795.00 | 7,223.00 | 437.24 | 881.00 | 8,541.24 | 0.75 | 0.63 | 15.43% | 61.74% |
| PASQUOTANK | 31,212 | 32,081.00 | 28,236.53 | 1,163.81 | 750.00 | 30,150.34 | 0.97 | 0.90 | 6.35% | 25.39% |
| PENDER | 30,218 | 18,133.00 | 17,895.86 | 291.90 | 0.00 | 18,187.76 | 0.60 | 0.59 | 1.60% | 6.42% |
| PERQUIMANS | 10,327 | 6,862.00 | 6,917.00 | 452.55 | 150.00 | 7,519.55 | 0.73 | 0.67 | 8.01% | 32.05% |
| PERSON | 30,280 | 42,996.00 | 22,528.99 | 814.08 | 906.00 | 24,249.07 | 0.80 | 0.74 | 7.09% | 28.37% |
| PITT | 109,904 | 143,300.00 | 124,372.19 | 2,871.90 | 5,652.00 | 132,896.09 | 1.21 | 1.13 | 6.41% | 25.66% |
| POLK | 14,706 | 9,318.00 | 8,808.86 | 469.47 | 49.00 | 9,327.33 | 0.63 | 0.60 | 5.56% | 22.23% |
| RANDOLPH | 107,946 | 74,700.00 | 75,720.11 | 1,195.86 | 1,747.40 | 78,663.37 | 0.73 | 0.70 | 3.74% | 14.97% |
| RICHMOND | 44,839 | 47,662.00 | 60,606.28 | 125.75 | 20.00 | 60,752.03 | 1.35 | 1.35 | 0.24% | 0.96% |
| ROBESON | 105,257 | 85,584.00 | 98,123.17 | 537.00 | 6,040.00 | 104,700.17 | 0.99 | 0.93 | 6.28% | 25.13% |
| ROCKINGHAM | 86,152 | 81,947.00 | 65,416.57 | 1,392.54 | 4,671.60 | 71,480.71 | 0.83 | 0.76 | 8.48% | 33.93% |
| ROWAN | 112,223 | 90,131.00 | 86,180.41 | 1,976.06 | 1,925.00 | 90,081.47 | 0.80 | 0.77 | 4.33% | 17.32% |
| RUTHERFORD | 57,325 | 60,259.00 | 83,631.84 | 475.30 | 5,068.20 | 89,175.34 | 1.56 | 1.46 | 6.22% | 24.87% |
| SAMPSON | 47,962 | 36,000.00 | 33,234.59 | 310.76 | 0.00 | 33,545.35 | 0.70 | 0.69 | 0.93% | 3.71% |
| SCOTLAND | 34,211 | 45,282.00 | 37,136.51 | 446.91 | 2,284.00 | 39,867.42 | 1.17 | 1.09 | 6.85% | 27.40% |
| STANLY | 52,342 | 62,328.00 | 67,940.50 | 1,343.57 | 4.00 | 69,288.07 | 1.32 | 1.30 | 1.94% | 7.78% |
| STOKES | 37,881 | 18,086.00 | 17,691.72 | 284.60 | 0.00 | 17,976.32 | 0.47 | 0.47 | 1.58% | 6.33% |
| SURRY | 62,387 | 82,056.00 | 72,633.00 | 712.30 | 250.00 | 73,595.30 | 1.18 | 1.16 | 1.31% | 5.23% |
| SWAIN | 11,191 | 4,663.00 | 5,521.30 | 119.36 | 10.00 | 5,650.66 | 0.50 | 0.49 | 2.29% | 9.16% |
| TRANSYLVANIA | 25,940 | 27,930.00 | 28,841.91 | 1,230.14 | 0.00 | 30,072.05 | 1.16 | 1.11 | 4.09% | 16.36% |
| TYRRELL | 3,765 | 1,768.00 | 1,739.71 | 111.12 | 1,134.00 | 2,984.83 | 0.79 | 0.46 | 41.71% | 166.86% |
| UNION | 86,398 | 105,570.00 | 72,046.54 | 1,550.95 | 4,245.00 | 77,842.49 | 0.90 | 0.83 | 7.45% | 29.78% |
| VANCE | 39,095 | 46,954.00 | 40,053.06 | 282.80 | 2,931.00 | 43,266.86 | 1.11 | 1.02 | 7.43% | 29.71% |
| WAKE | 442,803 | 523,880.00 | 539,817.04 | 16,773.85 | 13,031.00 | 569,621.89 | 1.29 | 1.22 | 5.23% | 20.93% |
| WARREN | 17,329 | 13,490.00 | 10,968.00 | 10.00 | 0.00 | 10,978.00 | 0.63 | 0.63 | 0.09% | 0.36% |
| WASHINGTON | 13,874 | 10,005.00 | 11,493.34 | 206.02 | 0.00 | 11,699.36 | 0.84 | 0.83 | 1.76% | 7.04% |
| WATAUGA | 37,097 | 32,206.00 | 33,065.54 | 1,866.84 | 1,823.00 | 36,755.38 | 0.99 | 0.89 | 10.04% | 40.16% |
| WAYNE | 106,330 | 111,167.00 | 97,852.09 | 6,048.29 | 2,249.00 | 106,149.38 | 1.00 | 0.92 | 7.82% | 31.27% |
| WILKES | 60,378 | 92,978.00 | 57,629.50 | 534.50 | 653.60 | 58,817.60 | 0.97 | 0.95 | 2.02% | 8.08% |
| WILSON | 66,443 | 108,637.00 | 117,122.46 | 1,079.89 | 2,668.00 | 120,870.35 | 1.82 | 1.76 | 3.10% | 12.40% |
| YADKIN | 31,018 | 25,800.00 | 20,508.45 | 270.33 | 0.00 | 20,778.78 | 0.67 | 0.66 | 1.30% | 5.20% |
| YANCEY | 15,430 | 15,648.00 | 15,465.38 | 110.74 | 0.00 | 15,576.12 | 1.01 | 1.00 | 0.71% | 2.84% |
| | | | | | | | | | | |
| TOTAL | 6,739,959 | 7,161,455.00 | 6,822,890.35 | 197,287.54 | 237,250.20 | 7,257,428.09 | 1.08 | 1.01 | 5.99% | 23.95% |

| | |
|---|---|
| *1 | Population by county for fiscal year 1991-92. |
| *2 | Tons of municipal solid waste disposed by county for fiscal year 1990-91. |
| *3 | Tons of municipal solid waste disposed by county for fiscal year 1991-92. |
| *4 | Tons recycled including white goods for fiscal year 1991-92. |
| *5 | Tons of yard waste disposed for fiscal year 1991-92. |
| *6 | MSW disposed + recycled + yard waste for fiscal year 1991-92. |
| *7 | MSW managed divided by population for fiscal year 1991-92. |
| *8 | MSW disposed divided by population for fiscal year 1991-92. |
| *9 | MSW managed - MSW disposed divided by MSW managed. |
| *10 | Waste reduction divided by 25%. |


Env. Supervisor IV
Dexter Matthews
Rec. Process. Asst IV
Dianna Turner
Attorney General
Contract 1
Permitting Branch
Env. Eng. II
Jim Coffey
Septage Mgmt. Branch
Env. Supervisor I
Ted Lyon
Soil Scientist
Allen Hayes
Office Asst III
Sue Hodge
Env. Supervisor III
Hydro I
Mark Poindexter
Financial Assurance
Analyst
Susan Wright
Office Asst. III
Vacant
Hydro Technician
Larry Rose
Land Disposal
Teams
Env. Engineer II
Gary Ahlberg
Env. Engineer II
Vacant
Env. Engineer II
Vacant
Env. Engineer I
Bill Sessoms
Env. Engineer I
Sherri Hoyt
Env. Engineer I
Ellis Cayton
Hydrogeology Unit
Hydrogeologist II
Bobby Lutfy
Hydrogeologist I
Vacant
Waste Processing and
Non-Disposal Unit
Env. Chemist I
Bill Hocutt
Western Field Unit
Env. Supervisor I
Julian Foscue
Eastern Field Unit
Env. Supervisor I
Terry Dover
Asheville Regional
Office
Waste Mgmt. Specialist
Jim Patterson
Waste Mgmt. Specialist
Al Hetzell
Env. Technician III
Janet Cantwell
Winston-Salem Regional
Office
Waste Mgmt. Specialist
Brent Rockett
Waste Mgmt. Specialist
Hugh Jernigan
Env. Engineer I
Jan Mchargue
Env. Technician III
Brent Burch
Fayetteville
Regional Office
Waste Mgmt. Specialist
Mark Fry
Waste Mgmt. Specialist
Ikie Guyton
Env. Engineer I
Jim Barber
Washington
Regional Office
Waste Mgmt. Specialist
Billy Morris
Waste Mgmt. Specialist
Chuck Boyette
Env. Technician
Vacant
Mooresville Regional
Office
Waste Mgmt. Specialist
Rick Ooby
Waste Mgmt. Specialist
Anthony Foster
Raleigh
Regional Office
Waste Mgmt. Specialist
Bob Harding
Env. Technician III
Ben Barnes
Env. Technician III
Robert Hearn
Wilmington
Regional Office
Waste Mgmt. Specialist
John Crowder
Env. Technician
Vacant
Office Asst III
Michelle Uchendu
Waste Mgmt. Analyst
Vacant
Mgmt Analyst
Rutledge
Mgmt Analyst
Lawrence
Specialist I
Mark E. Mintz

# Office of Waste Reduction Organizational Chart




* - EPA Funded Beginning 1/1/94

Division Director

Revised: August 1993