North Carolina

SOLID WASTE MANAGEMENT

Annual Report

JULY 1, 1995 - JUNE 30, 1996

State of North Carolina
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Department of Environment,
Health, and Natural Resources
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Reduce, Reuse, Recycle

May 1997

Published by:

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This document is submitted in satisfaction of state requirements to prepare an annual report on the status of solid waste management in North Carolina. Information for this document was gathered from solid waste facility reports submitted by operators of permitted facilities (both public and private), and from annual solid waste management reports submitted by local governments.

Special thanks to:

Local government staff in North Carolina counties and municipalities

200 copies of this public document were printed at a cost of $164.40 or .82 per copy.

Note: Some data may have changed since publication of the FY 1994-95 Solid Waste Management Annual Report because data is updated as changes are received.

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Waste Reduction Requires Further Commitment from State and Local Government

Solid Waste Management reports for FY 1995-96 show that there has been no decrease in waste disposed in North Carolina from FY 1994-95, or from the base year FY 1991-92. At the current rate of development, local government recycling efforts will not, by themselves, allow the state to achieve its 40 percent waste reduction goal by 2001.

Waste reduction efforts in North Carolina are directed primarily toward the residential waste stream. While success has been achieved through mechanisms such as "pay as you throw" (volume- based fee for use of waste management infrastructure) and the enactment of material bans and recycling ordinances, the rate of waste reduction achievement is levelling off. Renewed educational promotion of these and other measures is a minimal requirement to avoid reversal of progress.

Advancement of the state's waste reduction goal depends upon assistance from the state's waste generators. Reduction of commercial, industrial and construction and demolition solid waste streams, along with the continued development of the recycling economy must be achieved if the state is to reach its 40 percent waste reduction goal by 2001.

Promotion of Business Opportunities Supports Environmental Interests

The actions of private generators will depend on a number of factors, including the costs of solid waste collection and disposal (as opposed to the cost of waste reduction), the amount of help and encouragement they receive from local and state government (such as disposal diversion ordinances), and access to recycling services and markets. Currently, North Carolina and its local governments concentrate on bottles, cans and newspapers. We must shift the focus to items such as pallets, film wrap and other transportation packaging wastes, industrial solid waste by-products, and the wood, brick, metal, sheetrock, and other discards found on construction sites.

New markets and uses for waste materials are now available to North Carolina generators. In the past two years, a collection and end-use infrastructure has developed for previously ignored waste streams that included carpet, oil filters, mirror glass, construction wastes, gypsum wallboard, tires, vinyl siding, household textiles and cotton gin wastes. Generators and collectors of these waste streams now have diversion opportunities not available even three years ago. Diversion of these materials from disposal must show economic benefits; the availability of new recycling options must be shared with generators, local governments, and private waste handling firms.

Waste Management Facilities Operations

Improvements in waste management practices have differing results on counties' per capita waste disposal rates. Some counties have reduced waste by staffing collection centers, which reduces out-of-county waste. Yet desirable trends such as drops in illegal dumping (from increased local enforcement) and reduction of backyard disposal have caused increases in amounts of waste being sent to permitted facilities.

The amount of waste presented for disposal at landfills does not represent all the waste produced or managed within this state. Various waste materials are managed by recycling, composting, land applying, mulching, disposing on site, and, unfortunately, by illegal dumping and littering. Since some

of these activities are not regulated or reported, the quantity of materials managed by such methods is difficult to pinpoint. Therefore, for purposes of tracking the amount of waste disposed in North Carolina, the state measures only quantities of waste received by permitted facilities, such as landfills and incinerators.

In FY 1995-96, unlined municipal solid waste landfills received over 4,632,440 tons of solid waste. Lined landfills managed 2,692,294. Tonnage managed at lined landfills is expected to increase dramatically in 1998, which is the deadline year for closure of unlined landfills. Fewer than 50 municipal solid waste landfills are expected to be in operation by 1998. Much more waste is expected by that time to be managed by transfer stations.

Total export of solid waste from North Carolina in fiscal year 1995-96 is estimated to be 356,863 tons. North Carolina imports approximately one third the amount it exports, or 118,954 tons. Tonnage figures for waste exported and imported may also be expected to change significantly as a result of fluctuations on the solid waste management landscape as the 1998 deadline approaches.

Water Quality Monitoring of Solid Waste Facilities

In 1991, North Carolina adopted regulations that required all MSW landfills to be lined and equipped with groundwater detection systems by 1998. The intent of these (and federal) regulations is to halt the disposal of waste in unlined landfills and ensure that waste is disposed in environmentally protective lined facilities. As a result of these regulations and a general increase in awareness and concern for public health, communities are moving away from reliance on unlined landfills and transferring waste to lined landfills.

Although all unlined municipal solid waste landfills are being phased out of operation by January 1998, the majority of currently permitted landfills and all of the closed landfill units are unlined. Leachate generated at each of these unlined landfills has affected ground water quality in the immediate vicinity of the disposal areas.

More than 90 percent of the unlined landfills equipped with monitoring wells have shown evidence of some degradation of ground water quality. This evidence has occurred in monitoring systems where wells are located close to the waste boundaries within the landfill permitted areas. Because most landfill facilities are located in relatively remote areas near groundwater discharge features, the potential threat to public health from groundwater contamination from these facilities is minimal. However, there have been instances where solid waste facilities have affected nearby private water supplies.

Little information is available concerning degradation of surface waters from unlined landfills. Little is known about the physical condition of these sites, such as cap and slope integrity, vegetative cover, distance to nearest receptor, or other indicators of environmental quality.

Water quality investigations and assessments will become necessary at nearly all of the unlined landfill facilities. They will determine the nature and extent of contamination and measure the potential risk to public health and the environment if contamination moves off site or can be predicted to move outside the permitted boundary. These investigations and assessments will allow a proper evaluation of corrective action and remediation strategies for affected facilities.

RECOMMENDATIONS

The Department of Environment, Health and Natural Resources is required by law to make annual recommendations for the improvement of solid waste management and recycling of solid waste in the state. The department has evaluated the status of solid waste management, waste reduction and recycling efforts in North Carolina for fiscal year 1995-96, and makes the following recommendations:

1. Identify funds to update the State Solid Waste Management Plan and to renew efforts to achieve the state's waste reduction goal.

Updating the State Solid Waste Management Plan

The State Solid Waste Management Plan, written in 1992, is long overdue the legislatively mandated update of "at least every three years." In addition to satisfying the legislative mandate, an update of the State Plan is especially important given the quantity and quality of current information. As local government representatives have noted, significant changes in the law, as well as information derived from practical application of early waste reduction efforts have, in the last five years, resulted in new waste management perspectives and new issues.

The State Solid Waste Management Plan update will rely to a great extent on analysis of local government solid waste management plans. The assessment and analysis of data from these plans, and the subsequent formulation of the State Plan will require either new positions within the Department or contracts with a consulting firm.

Actions to be initiated for furthering the State's waste reduction goal

a. *Intensify educational efforts.* Analysis of local government management reports indicates the importance of intensifying educational outreach to local government. Educational efforts should:

- encourage recycling of materials whose recovery rates are currently weak;
- continue efforts to promote local government strategies for waste reduction, such as variable rate pricing, full cost analysis and disposal diversion ordinances; and
- promote the critical role of waste reduction in safeguarding public health and the environment.

b. *Target industrial and commercial waste streams.* Targeting these waste streams will require increased participation of private business. Such participation should be encouraged through:

- educational outreach to generators (such as workshops that link reduction efforts with cost avoidance);
- support of tax incentives for business waste reduction activity; and
- support for statewide ban of materials for which markets are strong.

c. *Extend State disposal bans to cardboard, wood pallets and used oil filters.* The difficulty of recovering certain materials, such as aluminum, is directly attributable to weakness in the markets for recycling them. While educational efforts must be intensified for materials with weak markets, statewide disposal bans of materials that have established markets for recycling encourages additional progress toward the state waste reduction goal. Materials such as corrugated cardboard and wood are good candidates for bans because of their strong recycling infrastructures. Further, statewide disposal bans of materials such as used oil filters, which have a growing infrastructure for collection, would also help reduce potentially toxic leachate in landfills.

2. Identify funds to support investigations of releases from unlined landfills and to support state and local programs to implement corrective strategies.

Identifying problem areas

The few closed landfills for which clear information is available indicate that contaminated groundwater releases from these facilities could pose a serious threat to public health in North Carolina. Much remains to be learned about the scope of the problem and the various options and associated costs.

Implementing strategies

Management strategies would include programs for identification of old closed landfills that are sources of groundwater contamination, and subsequent assessment and remediation activities, where appropriate.

Introduction

Effective management of solid waste is a critical element of North Carolina's environmental future. To guide the course of solid waste management, the General Assembly has established both the 40 percent waste reduction goal and a hierarchy of management methods to be applied to the waste stream. Source reduction, reuse, recycling and composting are at the top of that hierarchy and hold the key to reducing the state's disposal burden.

These waste reduction methods also provide environmental benefits -- natural resource and energy conservation, and prevention of air, water and land pollution. Safe disposal practices are also essential to North Carolina's strategy for protecting human health and the environment. These practices are designed to provide long-term protection against ground and surface water contamination and misuse of land resources.

The FY 1995-96 Solid Waste Annual Report notes that while North Carolina has failed to make progress toward the state waste reduction goal, it has made progress in other areas. The amount of solid waste entering unlined sanitary landfills continues to decline, and the waste reduction infrastructure in the state is on a strong foundation. The report also indicates that local government waste reduction programs aimed at residential wastes have reached certain limits. The activities of commercial and industrial generators of solid waste and the further development of the recycling economy hold the key to substantial future reduction of waste.

This document fulfills the requirements of North Carolina General Statute 130A-309.06(c), which directs the Department of Environment, Health and Natural Resources to make an annual report "on the status of solid waste management efforts in the State."

State Progress Toward The Waste Reduction Goal

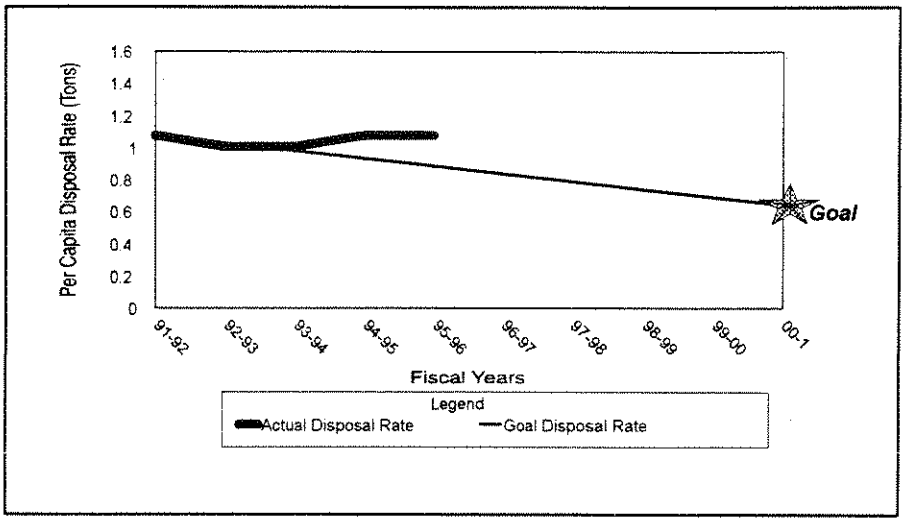
In 1991, amendments to the Act to Improve the Management of Solid Waste established a statewide waste reduction goal of 40 percent for June 30, 2001. The state measures waste reduction by comparing the amount of waste each person disposed (per capita disposal rate) in the base year (FY 1991-92) to the per capita rate in the current year.

In other words:

Total Waste Disposed ÷ population = per capita disposal rate

The per capita rate for the FY 1991-92 base year was 1.08 tons. After a slight decrease in intervening fiscal years, the FY 1994-95 per capita rate returned to 1.08 tons (see **Figure 1**). FY 1995-96 is the second consecutive year that the disposal rate is 1.08 tons.

Figure 1: Progress Toward 40% Waste Reduction Goal



To achieve the state goal of 40 percent waste reduction by June 30, 2001, the state per capita disposal rate would have to decrease to .65 tons per person. Between 2 million and 3 million tons of waste currently being disposed by landfilling or incineration would either have to be managed in some other way (reused, recycled, composted, or mulched) or not be generated (source-reduced).

Table 1 shows the amount of municipal solid waste (MSW) disposed each year, the state population, and the resulting per capita rates of disposal. Municipal solid waste is calculated by adding North Carolina waste landfilled, incinerated, and monofilled (industrial waste is not included). Disposal figures have been collected since FY 1990-91, though waste reduction is measured from the base year FY 1991-92. As the table reflects, the per capita disposal rate decreased temporarily in FY 1992-93 and FY 1993-94 before rising again to the baseline level in FY 1994-95.

Table 1: NC Per Capita Disposal Rates and Waste Reduction, FYs 1990-91 to 1995-96.

Fiscal Years	Tons Disposed	Population	Per Capita Disposal Rate	Percent Waste Reduction from Base Year 1991-92
1995-96	7,773,262.16	7,194,238	1.08	0%
1994-95	7,624,144.85	7,064,470	1.08	0%
1993-94	7,038,505.34	6,949,095	1.01	6%
1992-93	6,890,818.15	6,836,977	1.01	6%
1991-92	7,257,428.09 (managed)	6,739,959	1.08 (Base Year	
1991-92	6,822,890.35	6,739,959	1.01	
1990-91	7,161,455.00	6,648,689	1.07	

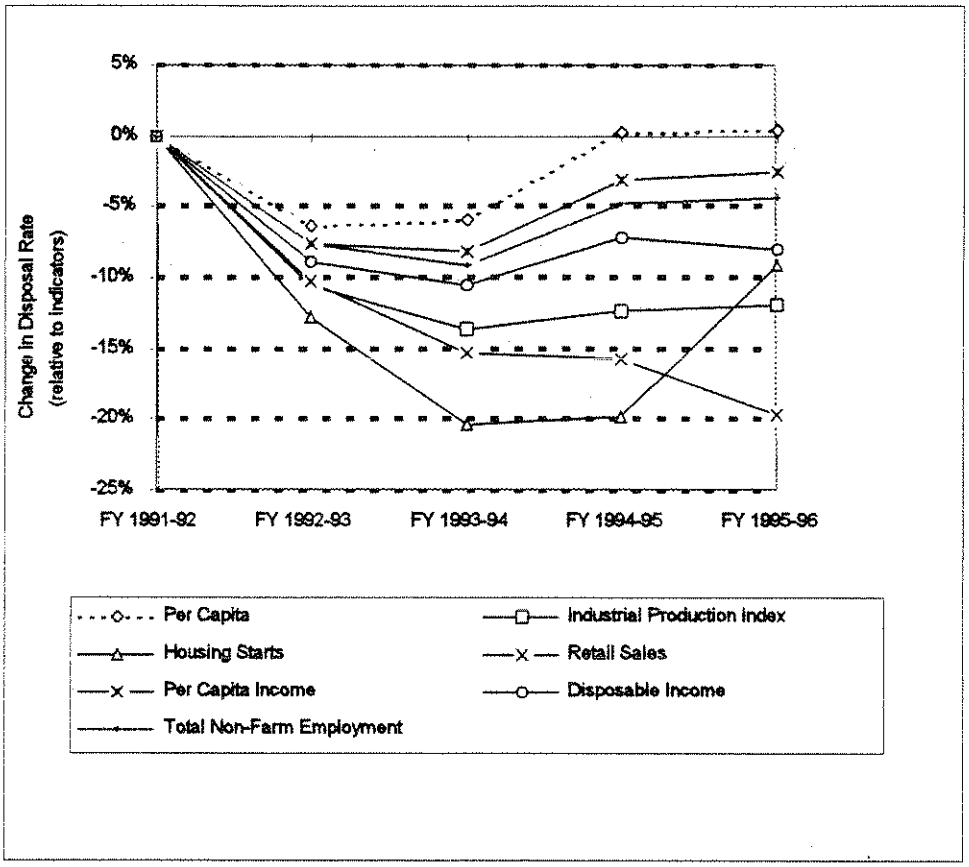
The base year per capita disposal rate was calculated by dividing the FY 1991-92 tons managed by the state's July 1991 population. The tons-managed figure was determined by adding the total amount of municipal solid waste disposed in landfills and incinerators to the amount of waste managed through recycling, composting, and mulching efforts of local governments in FY 1991-92. Recycling, composting, and mulching were added to the tons disposed in recognition of the fact that some local governments had begun waste reduction programs prior to 1991. Industrial waste managed at private industrial landfills is not included in these calculations.

Current high disposal rates are, theoretically, consistent with continued economic strength. Thus, part of North Carolina's lack of progress towards its per capita waste reduction goal may be attributed to a strong economy. The figure below compares solid waste generation rates to a set of indicators commonly used by the NC Governors Planning Office to measure the economic well-being of North Carolina: the Industrial Production Index, retail sales, disposable income, housing starts, per capita income, and employment (non-farming.)

In **Figure 2**, the change in the disposal rate relative to economic indicators is compared to the base line year, FY 91-92, to arrive at a percent change in the disposal rate.[1] For example, the graph shows that, relative to retail sales, solid waste disposal has decreased by 20 percent in FY 1995-96 compared to FY 1991-92. The more negative the values, the greater is North Carolina's waste reduction. Although no official formula exists to calculate waste reduction rates against economic indicators, a simple average of the FY 1995-95 data indicates a 9 percent reduction in waste disposed since FY 1991-92. It should be noted, however, that these economic indices show that North Carolina has made little waste reduction progress in the past two fiscal years.

[1] The equation used for each data point is as follows: [(economic indicator value / tons disposed) - (economic indicator value in base year / tons disposed in base year)] ÷ [economic indicator value in base year / tons disposed in base year]

Figure 2: Solid Waste Disposal Rates Relative to Six Economic Indicators

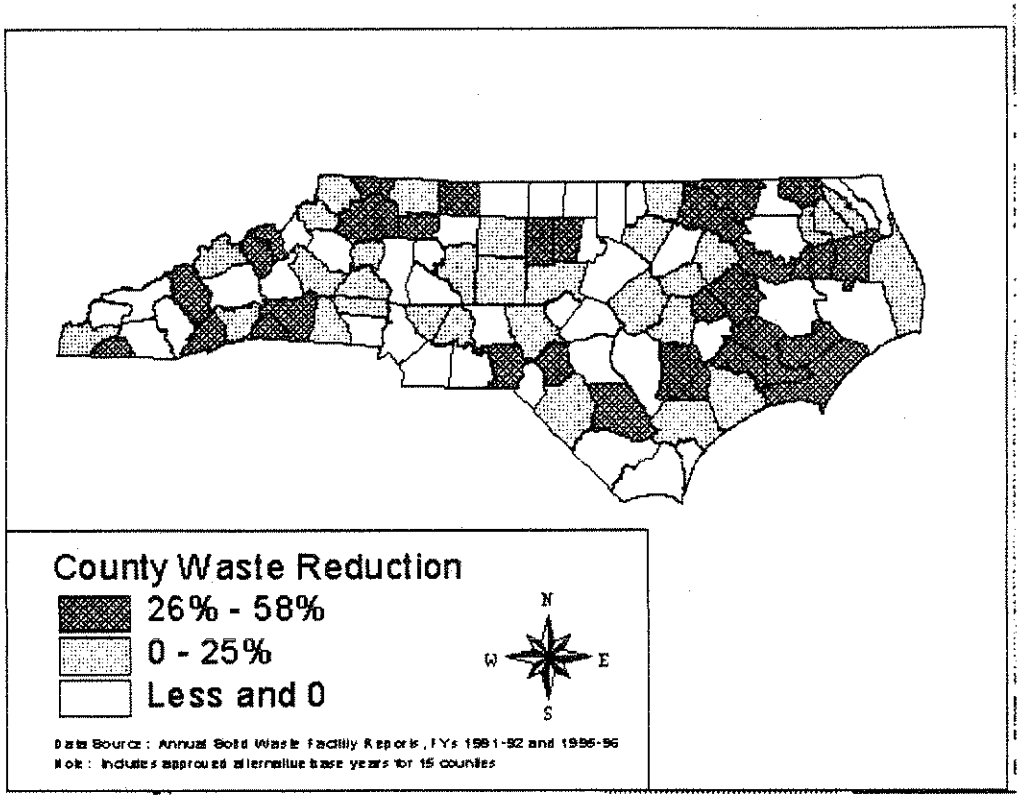


The effects of Hurricanes Bertha and Fran are not reflected in this report because they occurred in July and September of 1996, outside the reporting period for this fiscal year. Next year's report will undoubtedly show a strong effect on waste disposal from these two storms.

Individual County Progress Toward the Waste Reduction Goal

Despite the lack of statewide progress in waste reduction, several counties have accomplished a significant amount of waste reduction (see **Figure 3**). "Pay as you throw" programs in Transylvania and Craven counties have been especially successful. These programs are different, yet each requires a volume-based fee for use of the waste management infrastructure in their respective counties. The enactment of various material bans and recycling ordinances by Alamance county has also been successful.

Figure 3: Waste Reduction by County, FY 1995-96



Because non-residential waste is such a significant portion of the waste stream in North Carolina (estimated at 66 percent of total waste), changes in a business or industry can have a major effect on whether a county shows a waste increase or decrease. This is especially true for less populated counties where the base for adjusting to changes is small. The fact that one business can have a strong effect on the balance of a community's waste stream may help explain why 33 of the state's least populated counties show a waste reduction rate above 20 percent, though overall changes in their waste management practices have been minimal.

Only two of the state's 16 most populous counties -- Pitt and Alamance -- have achieved a waste reduction rate above 20 percent. The lack of progress in other populous counties may be due to the large amounts of waste generated by the industrial/commercial bases of these larger counties.

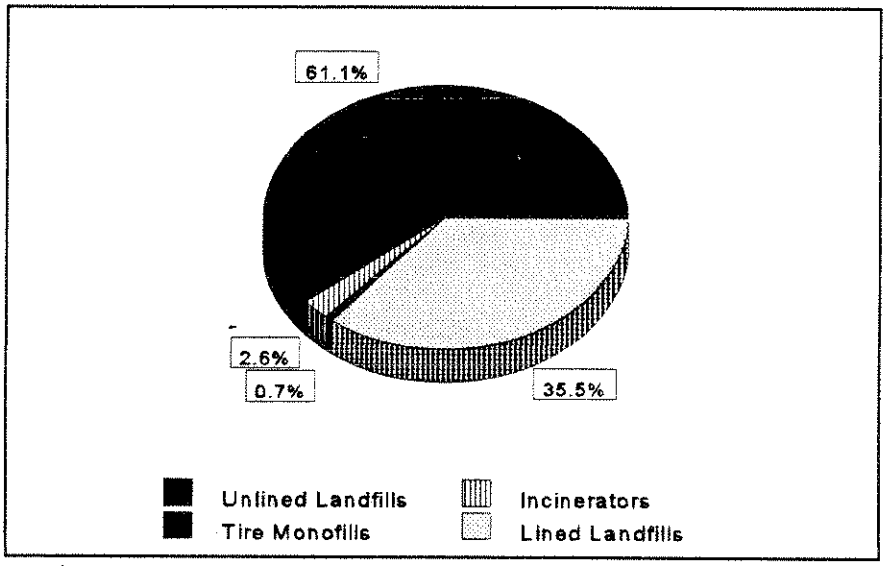
Improvements in waste management practices have different results on counties' per capita waste disposal rates. Some counties have reduced waste by staffing collection centers, which reduces out-of-county waste. Yet desirable trends, such as drops in illegal dumping (as a result of increased local enforcement) and reduction of backyard disposal, have caused *increases* in the amounts of waste being sent to permitted facilities.

Some counties' efforts to measure progress toward the goal have been distorted by poor record keeping. This is especially true for counties that used landfills that had not installed scales by FY 1991-1992 and consequently relied on rough estimates for base year totals.

Waste Management Facilities

In FY 1995-96, nearly 7.75 quarter million tons of solid waste were presented for disposal at North Carolina landfills and incinerators as a result of activities within this state. As **Figure 4** indicates, the principle disposal method was landfilling in an unlined landfill.

Figure 4: Municipal Solid Waste Management, by Facility Type, FY 1995-96



The amount of waste presented for disposal at these facilities does not represent all the waste produced or managed within this state. Various waste materials are managed by recycling, composting, land applying, mulching, disposing on site, and, unfortunately, by illegal dumping and littering. Since some of these activities are not regulated or reported, the quantity of materials managed by such methods is difficult to pinpoint. Therefore, for purposes of tracking the amount of waste disposed in North Carolina, the state measures only quantities of waste received by permitted facilities, such as landfills and incinerators.

About 1.5 million tons of industrial process waste were landfilled in 26 industrial waste landfills. These facilities receive primarily sludge and ash that is produced and disposed on site. Wastes such as concrete, brick, uncontaminated soil, untreated wood and yard trash are disposed in land clearing and inert debris landfills.

North Carolina has more than 100 permitted waste disposal facilities (see **Table 2**) that report amounts of waste managed. **Appendix A1-A5** lists all permitted disposal facilities that have reported quantities of waste received in North Carolina from 1991 to FY 1995-96.

Table 2: North Carolina Solid Waste Disposal Facilities, FY 1995-96.

No. of Facilities	Facility Type	Total Tons Managed*
65	MSW Landfills**	6,615,023.86
28	C&D Landfills***	709,718.95
2	Scrap Tire Monofills	78,004.36
2	Incinerators (MSW)	198,971.33
26	Industrial Landfills	1,588,509.25

* Includes 100,296.40 tons of waste imported to N.C. landfills and Monofills.
** Includes 66,200.57 tons of ash from 2 incinerators.
***Includes 18,372.19 tons disposed in 5 permit-pending facilities.

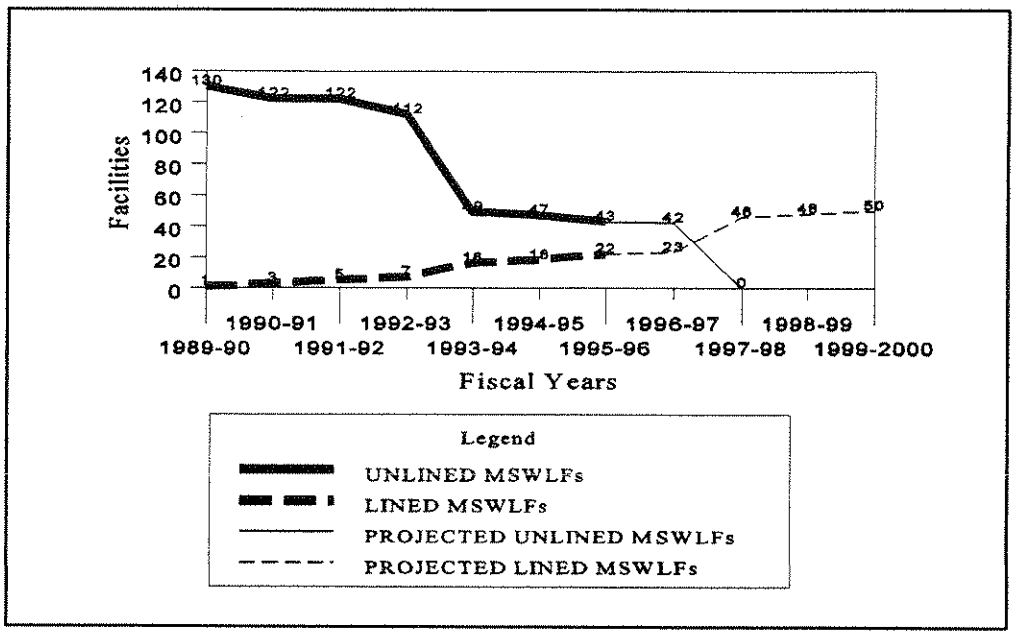
MSW Landfills

In 1991, North Carolina adopted regulations that required all MSW (municipal solid waste) landfills to be lined and equipped with groundwater detection systems by 1998. The intent of these regulations, as well as federal regulations (known as Subtitle D), is to halt the disposal of waste in unlined landfills and ensure that waste is disposed in more environmentally protective lined facilities. As a result of these regulations and a general increase in awareness and concern for public health, North Carolina communities are moving away from reliance on unlined landfills and transferring waste to lined landfills that are designed meet a superior standard for protection of public health and the environment.

In FY 1992-93, prior to the Subtitle D effective date, there were 119 MSW landfills operating within the state (see **Figure 5**). Following the effective date of the Subtitle D regulations in FY 1994-95, there were only 65 MSW landfills operating. Forty-nine of these landfills were unlined and 16 were lined. As of this report's publication (March 1997) there are 23 lined landfills in operation, five more under construction, and 17 in the permit review process.

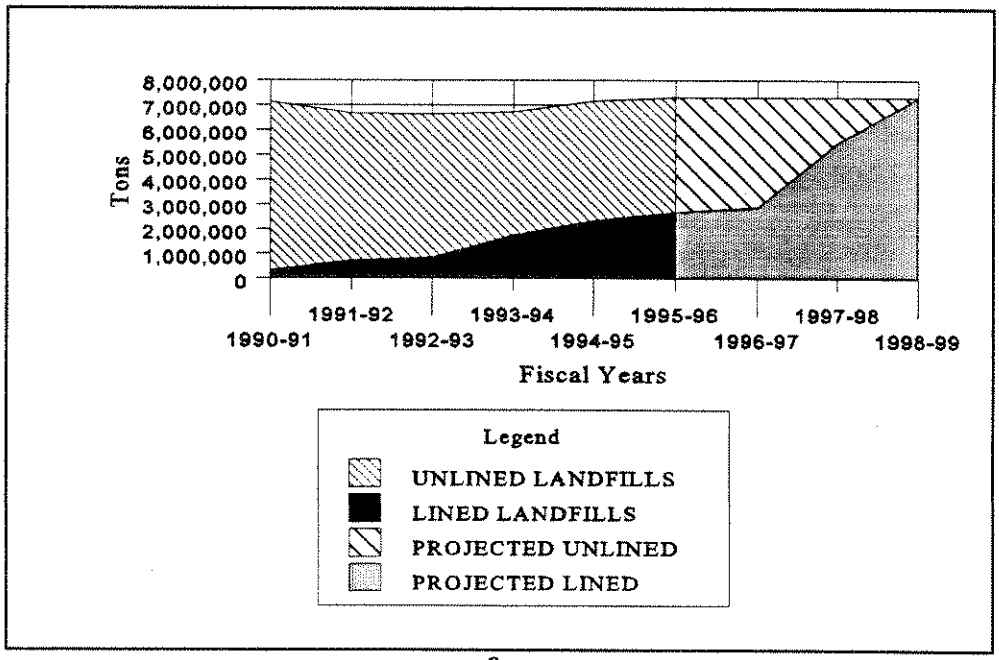
It is anticipated that in 1998, fewer than 50 MSW landfills will be in operation; all will be lined. By 2000, some of the smaller MSW landfills are expected to have closed due to the high cost of operating a small lined landfill.

Figure 5: Projected Number of Permitted MSW Landfills, FYs 1989-90 to 1999-00



In FY 1995-96, facilities equipped with liners managed 2,692,294 tons of MSW while unlined facilities managed 4,632,449 tons (see **Figure 6**). Please note this chart does not include industrial waste.

Figure 6: Waste Managed at North Carolina MSW Landfills, FYs 1990-91 to 1995-96



Incinerators

During this reporting period there were two MSW incinerators in operation in North Carolina. The New Hanover County Waste to Energy mass burn facility has been in operation since 1975. A second new incinerator located in Bladen County at the DuPont industrial plant began operations in August of 1995 and stopped operations in August of 1996. This facility burned refuse-derived fuel [RDF].

The RDF was prepared at a facility in Cumberland County designed to remove recyclable material and non-combustible waste. The remaining material was prepared for use as a fuel to provide power for the DuPont industrial plant.

These facilities were serving Bladen, Cumberland, Hoke, Brunswick, and Columbus counties. **Table 3** indicates the amount of waste the facilities managed. A similar facility has been planned for operation in Lenoir County.

Table 3: Materials Managed through BACH, FY 1995-96

Management of Materials	Tons
Waste Received	169,596.76
Materials Recycled	2,930.70
Materials Landfilled	101,133.70
Materials Incinerated for Fuel	65,532.36

Transfer Stations

Many communities that closed a landfill constructed transfer stations to transport waste to another landfill. Some counties, such as Brunswick, had several transfer stations.

Other counties, such as Swain and Caswell, used transfer stations that operated before receiving a North Carolina permit. Swain County transported MSW to the Tribal Utilities Transfer Station in the Cherokee Qualla Boundary (within Swain County). This tribal-owned facility is not required to have a permit from the state. From this facility, the Swain County waste was hauled to the Palmetto Landfill in South Carolina. Caswell County sent waste to the Piedmont Transfer Station in Danville, Virginia. Waste Management, Inc. then hauled the waste back to its Piedmont Landfill in Kernersville, North Carolina.

Industrial Landfills

In FY 1995-96, private companies owned and operated 26 industrial landfills for the sole use of their process waste (e.g., paper mill sludge). Since industrial landfills are a type of sanitary landfill, they are affected by the rule that requires sanitary landfills to be lined by 1998. Recently adopted rules in North Carolina require that industrial landfills demonstrate that groundwater standards established under 15A NCAC 2L are not exceeded at their compliance boundaries.

Construction and Demolition Landfills

Construction and demolition debris is not required to be placed in a lined landfill. Since transportation of construction and demolition waste is costly, many counties have chosen to use old, unlined landfill sites for placement of this type of waste. More construction and demolition landfills are expected to open as more of the old MSW landfills close. **Table 4** shows the number of permitted and permit-pending construction and demolition sites in North Carolina in FY 1995-96.

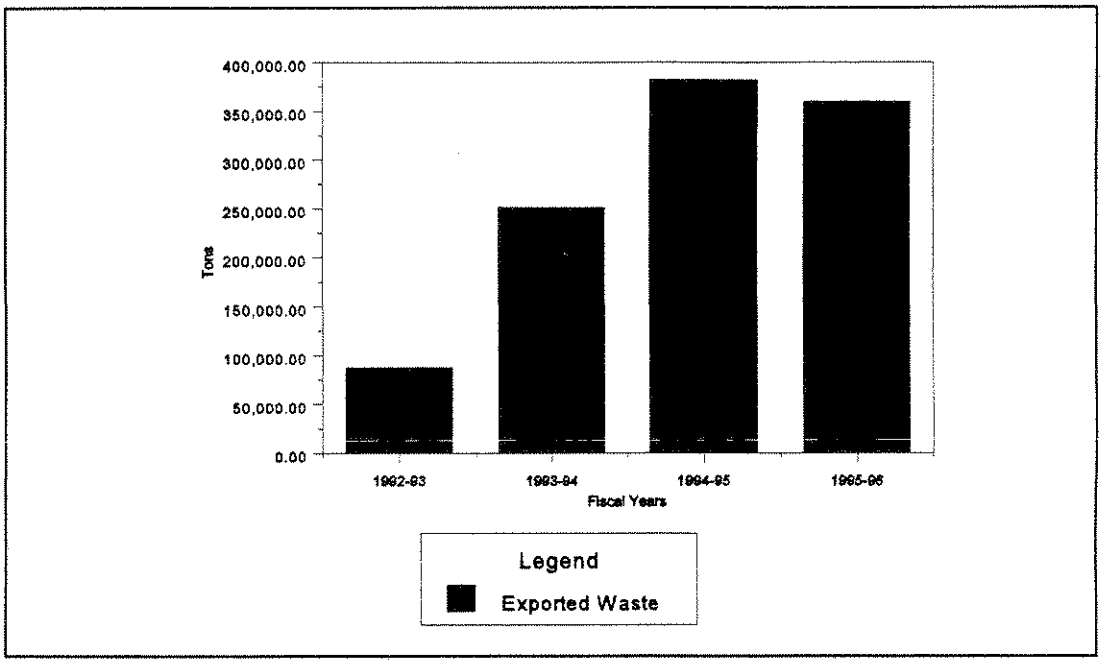
Table 4: Number of Construction & Demolition Facilities and Tons Received, FY 1995-96

Construction & Demolition Facilities	Number of Facilities	Tons
Permitted landfills	23	691,346.76
Permit-pending landfills	5	18,372.19
TOTAL	28	709,718.95

Waste Exports

Not all waste generated in North Carolina is managed in North Carolina. In FY 1995-96, 356,863 tons of MSW were reportedly exported to South Carolina (see **Figure 7**). This is slightly lower than in the previous year, when North Carolina exported 382,559 tons. Between FY 1992-93 and FY 1993-94, the reported exports increased from 87,000 tons to 251,243 tons.

Figure 7: North Carolina Waste Exported, FYs 1991-92 to 1995-96.



Of the 356,863 tons of waste exported, 231,818 tons were sent through transfer stations. All of the transferred waste was disposed at the Palmetto Landfill near Spartanburg, South Carolina (see **Table 5**).

Mecklenburg County, which requires haulers to report direct hauls, reported 122,560 tons of waste hauled directly to NorthEast Sanitary Landfill, Inc., in Richland County, South Carolina. Polk County also had MSW hauled directly to South Carolina. It is possible that more waste is going to South Carolina by direct haul than is revealed by the state reporting process.

Table 5: North Carolina Waste Exported, FY 1995-96.

County of Origin	Tons	Destination
Buncombe	60,480.79	Palmetto Landfill, SC
Gaston	93,490.31	Palmetto Landfill, SC
Henderson	1,499.07	Palmetto Landfill, SC
Lincoln	9,035.04	Palmetto Landfill, SC
Mecklenburg	35,968.50	Palmetto Landfill, SC
Mecklenburg	122,559.87*	NorthEast Sanitary LF, SC
Mitchell	6,784.12	Palmetto Landfill, SC
Polk	5,522**	Palmetto Landfill, SC
Swain	5,940.29	Palmetto Landfill, SC
Transylvania	5,568.96	Palmetto Landfill, SC
Union	57.77	Palmetto Landfill, SC
Yancey	9,956.92	Palmetto Landfill, SC
TOTAL	356,863.64	

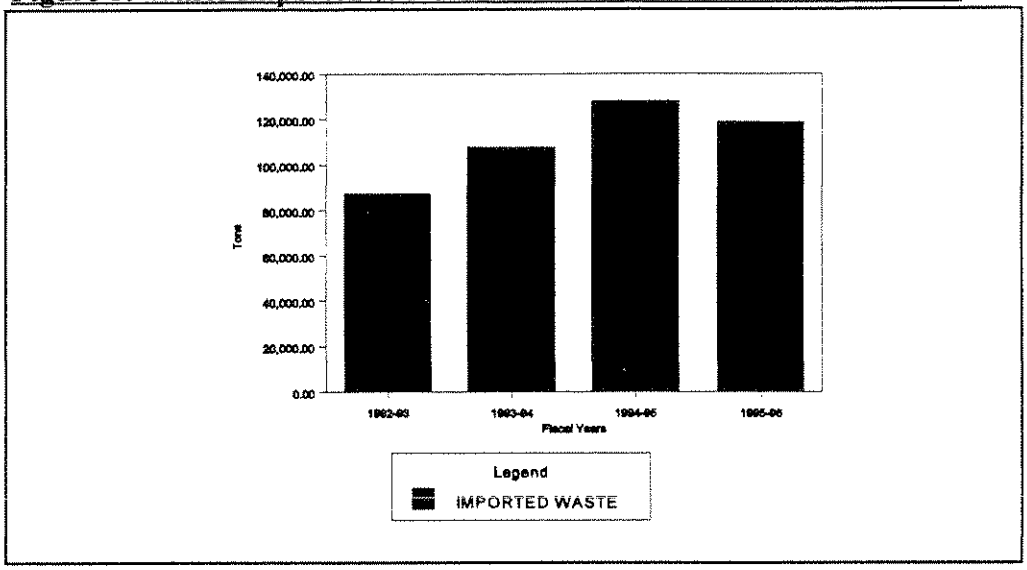
* Direct haul

**Includes 2,486.29 tons transported by direct haul to Palmetto Landfill

Waste Imports

North Carolina accepted approximately 118,000 tons of waste from other states in FY 1995-96. (See **Figure 8**). This amount represents a slight decrease from the previous year.

Figure 8: Waste Imported to North Carolina, FYs 1992-93 to 1995-96.



North Carolina imported several kinds of waste from 13 states and the District of Columbia in FY 1995-96 (see **Table 6**). Seventy-five percent of the waste was municipal solid waste, 18 percent was scrap tires, 7 percent was medical waste, and less than 1 percent was industrial waste.

Table 6: Waste Imported to North Carolina, FY 1995-96.

Waste Type	Source	Tons Imported
Municipal Solid Waste	VA	88,981.68
Medical Waste	DC, GA, KY, MD, NY, OH, PA, SC, TN, VA, WV	8,193.83
Industrial Waste	SC, TN, VA	270.81
Scrap Tires	FL, GA ,NJ, SC, TN, VA	21,217.47
TOTAL		118,663.79

Imported waste was transported to several types of facilities. Municipal solid waste was imported from Virginia to the Piedmont Landfill in Forsyth County (88,982 tons). Medical waste was incinerated at BFI Medical Systems, Inc. in Alamance County (4,394 tons) and Bio-Medical Waste of North Carolina in Mecklenburg County (3,800 tons). Industrial sludge was imported to HOH Corporation in Forsyth County for predisposal treatment and then sent to the Piedmont Landfill. U.S. Tire Recycling Partners monofill in Cabarrus County, Tire Disposal and Recycling Service in Union County, Envirotire Recycling in Harnett County, and T.I.R.E.S. Inc. in Forsyth County received 21,217 tons of tires from other states.

Waste Management Fees

There are various payment arrangements for waste management services. Some local governments charge household fees to cover waste management costs. In Madison County, for example, residents pay an annual fee of $43.

Household fees were assessed at both the municipal and county levels. County household fees ranged from $12 per year to $180 per year. Municipal household fees ranged from $10 per year to more than $200 per year.

Tipping fees are still a standard method of payment. Sometimes a tipping fee charge depends on whether the waste is from inside or outside the county. Both the Cherokee County landfill and Sampson County Disposal, Inc. have charged disposal fees in this fashion. Several regional landfills have varying schedules of fees depending on origin and type of waste.

In FY 1990-91, the average tipping fee was $19.03 per ton. The average tipping fee increased to $26.53 per ton in FY 1993-94, but decreased to $25.77 in FY 1994-95. This decrease was due to the imposition of household fees and slight reduction of tipping fees at the landfill scale. The average tipping fee for FY 1995-96 increased to $28.05.

In past annual reports, tipping fee averages were calculated only for public MSW landfills. Since private landfills now play an active role in the state's solid waste management infrastructure, current calculations include their tipping fees. The average tipping fee for public, private, and publicly owned and privately operated landfills in FY 1995-96 was $26.36 per ton.

Solid Waste Composting

Composting is a means by which source-separated organic wastes are converted to a reusable product. There were 20 yard waste and two solid waste composting facilities permitted in North Carolina during FY 1995-96. Twenty-one solid waste compost demonstration facilities were operated during the fiscal year. These facilities composted a variety of materials, including manures, seafood, fruit and vegetable processing wastes, mixed paper, trout mortality and processing wastes, restaurant waste, hatchery waste, and grease trap pumpings.

The revision of the solid waste compost rules was completed during FY 1995-96. Yard waste composting rules and solid waste composting rules are now contained in Section .1400 of the Solid Waste Management Rules. The revised rules lessen certain permitting and siting requirements for some smaller facilities.

Septage Management

During calendar year 1996, the state permitted 367 septage management firms to operate in North Carolina. These firms are allowed to pump septic tanks, portable toilets, and grease traps. Some septage management firms treat grease trap pumpings and recycle them into animal feed; other firms compost grease trap pumpings.

Although 26 new septage land application sites were permitted during calendar year 1996, the number of these sites decreased from 220 to 182. Most of the sites that closed were unable to meet nutrient management requirements that became effective in October 1995.

Land Application

Materials such as wood ash, tobacco dust, and coal ash, are land applied at agronomic rates for the nutrients in the waste. Gypsum from a china factory and whey from a cheese factory have recently been added to materials being land-applied.

Perennial grasses, such as bermuda and fescue, are the primary crops being used to manage nutrients on land application sites. Other crops used on sites to manage nutrients include small grain, sorghum-sudan grass, and cotton.

Water Quality Monitoring of Solid Waste Facilities

All permitted sanitary landfills in North Carolina have been required since 1989 to monitor groundwater quality. Groundwater monitoring is now conducted at closed sanitary landfills, open sanitary landfills, industrial landfills, municipal solid waste landfills, and several non-conforming open dump sites. Groundwater monitoring at recently permitted construction and demolition landfills is now required. There are more than 1,000 monitoring wells for which water quality monitoring is required. As new facilities are permitted and as water quality assessments and investigations are increased at sites found to have contamination, the number of wells will continue to increase.

Although all unlined MSWLF units are being phased out of operation by January 1998, the majority of currently permitted landfills and virtually all of the closed landfill units are unlined. Leachate generated at each of these unlined landfills has affected ground water quality in the immediate vicinity of the disposal areas. More than 90 percent of the unlined landfills have shown evidence of some degradation of groundwater quality in the monitoring systems where wells are located close to the waste boundaries within the landfill permitted areas.

The detection monitoring systems are designed to provide an early warning of groundwater contamination so that any water quality problems can be assessed and corrected before there is any threat to public health. Because most landfill facilities are located in relatively remote areas near groundwater discharge features, the potential threat to public health from groundwater contamination from these facilities is minimal. However, there have been instances where solid waste facilities have affected nearby private water supplies. These facilities are currently conducting water quality assessments to determine the extent and magnitude of the contamination. While contaminants from solid waste facilities have been detected in surface

water, there has been no significant degradation of surface water quality off site in the streams serving as discharge features.

Water quality investigations and assessments will become necessary at nearly all of the unlined landfill facilities. They will determine the nature and extent of contamination and measure the potential risk to public health and the environment if contamination moves off site or can be predicted to move outside the permitted boundary. These investigations and assessments will allow a proper evaluation of corrective action and remediation strategies for affected facilities.

As of March 1, 1997, water quality assessments or groundwater investigations are being conducted at 70 landfill sites. Preliminary groundwater investigations are now required by the Solid Waste Section at six landfills.

While recent regulatory changes have improved management and monitoring of existing landfills, little is known about the hundreds of older closed sites and their effect on ground and surface water quality. A large number of these solid waste disposal sites operated prior to the 1970s and were essentially unregulated by solid waste rules. Landfills in operation before the mid 1980s commonly contained levels of hazardous materials that will eventually leach into surface waters via groundwater. Little is known about the fate and transport of such constituents to and in the surface water around these disposal sites. Little is known about the physical condition of these sites, such as cap and slope integrity, condition of vegetative cover, distance to nearest receptor(s), their contribution to surface water sediment loading, etc. There is no environmental surveillance at these facilities. Long-term program objectives are to locate, monitor and evaluate the effects old closed solid waste disposal sites have on the quality of ground and surface water.

Source Reduction, Reuse, and Recycling

Most of the information on source reduction and recycling in this report comes from required annual reports submitted by local governments on their programs. In addition, the Division of Pollution Prevention and Environmental Assistance [DPPEA] conducted a survey of private recycling companies in 1996 to help determine an overall state recycling rate, the results of which are also presented below. The state has no comprehensive data on the waste reduction efforts of private commercial and industrial generators. However, as waste management costs continue to rise, and as local governments reach their own program limitations, private sector waste reduction activities will gain in importance.

At the current rate of development, local government recycling efforts will not, by themselves, allow the state to achieve its 40 percent waste reduction goal by 2001. The growth of local government source reduction and recycling programs has flattened through the 1990s. Local program recycling tonnages are following a path of steady but only gradual upward progress. Factors contributing to this slow growth include:

- limited local education programs to support waste reduction;
- the failure of local governments to embrace progressive waste management strategies, such as variable rate (pay-as-you-throw) pricing and full cost analysis;
- lack of state funding for local government waste reduction programs;
- downturns in some recycling markets in FY 1995-96, continuing into FY 1996-97;

- the failure of tipping fees to rise statewide as fast as was expected in the late 1980s and early 1990s;
- the general abundance of landfill capacity; and
- pressure on some local governments to meet contractual obligations related to disposal facilities, thereby diminishing their commitment to source reduction and recycling.

Despite these negative factors, North Carolina has a strong recycling foundation. Local governments statewide offer North Carolina households a basic level of recycling services. These activities may be expanded into other sectors (e.g., commercial/industrial) and other programs (e.g., backyard composting). A number of North Carolina cities and counties have demonstrated commitment to waste reduction through the implementation of aggressive, innovative programs. North Carolina continues to be a leader among the 50 states in the establishment of ordinances that divert local materials from disposal in a cost effective manner. The private sector recycling infrastructure appears healthy (as indicated by the recycling rate study), and new markets continue to arise for previously uncollected and unmarketed items (e.g., oil filters, carpet, mirror glass, construction and demolition wastes). A continued steady expansion of these largely private sector efforts, plus a renewed commitment by local governments to reduce waste in their 10-year solid waste plans (due July 1, 1997), will assist North Carolina's progress in waste reduction.

Local Government Source Reduction Programs

The number of local governments reporting a public source reduction program decreased by 37 percent between FY 1994-95 and 1995-96. Only 40 percent of counties and 8 percent of municipalities made any formal commitment to the top of the waste management hierarchy. **Table 7** shows the trends in local government source reduction programs; backyard composting continues to be the most widely used source reduction method. Bulk mail reduction, which rose 100 percent from FY 1994-95, was the only source reduction activity to increase in FY 1995-96.

Table 7: Trends in Publicly Targeted Local Government Source Reduction Programs

Program type	FY 1993-94	FY 1994-95	FY 1995-96
Backyard Composting	90	92	61
Grasscycling	52	49	40
Xeriscaping	10	12	12
Enviroshopping	35	35	27
Promote use of non-tonics	29	38	34
Bulk Mail Reduction	16	20	40
Other	14	11	10
Total Local Governments	**106**	**132**	**83**

The implementation of reuse programs appears to be gaining some ground, albeit slowly, as shown by **Table 8**. Nine municipalities and 28 counties reported having reuse programs of some sort in FY 1995-96. Local Government Annual Reports for FY 1995-96 began tracking a different type of reuse program -- swap sheds at material drop-off centers.

Table 8: Trends in Local Government Reuse Programs

Program Type	FY 1993-94	FY 1994-95	FY 1995-96
Paint Exchange	12	17	22
Swap Sheds	N/A	N/A	13
Pallet or other Materials Exchange	14	18	13

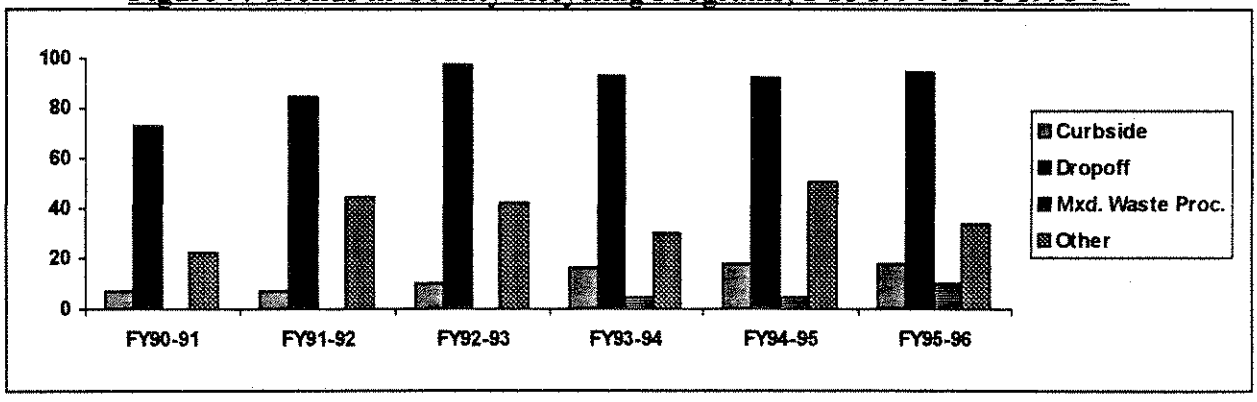
Source reduction programs still offer potential for new, cost-effective programs by local governments to divert materials from the waste stream. Backyard composting, for example, has been shown in national studies to be more cost-effective than standard curbside or drop-off programs in diverting waste materials, and more cost-effective than disposal.[2] Source reduction projects rely primarily on education and promotion, which require little, if any, capital investment.

Local Government Recycling Programs

A total of 401 local governments reported having a recycling program in FY 1995-96, which represents less than a 1 percent change from FY 1994-95. Most municipalities either had a recycling program (58 percent) or participated in the program of another local government (15 percent). Ninety-seven counties reported having a recycling program; only Forsyth, Guilford, and Robeson counties did not.

Figure 9 shows the trends in types of recovery programs implemented by North Carolina counties. Drop-off programs remain the chief recovery method chosen by counties. Use of mixed waste processing has increased significantly since FY 1992-93, although recent developments may reduce local government dependence on mixed waste systems. If the trends in county recovery programs hold, increases in material recovery (see **Table 11**) will most likely come from the improvement of existing recycling programs rather than the addition of new ones.

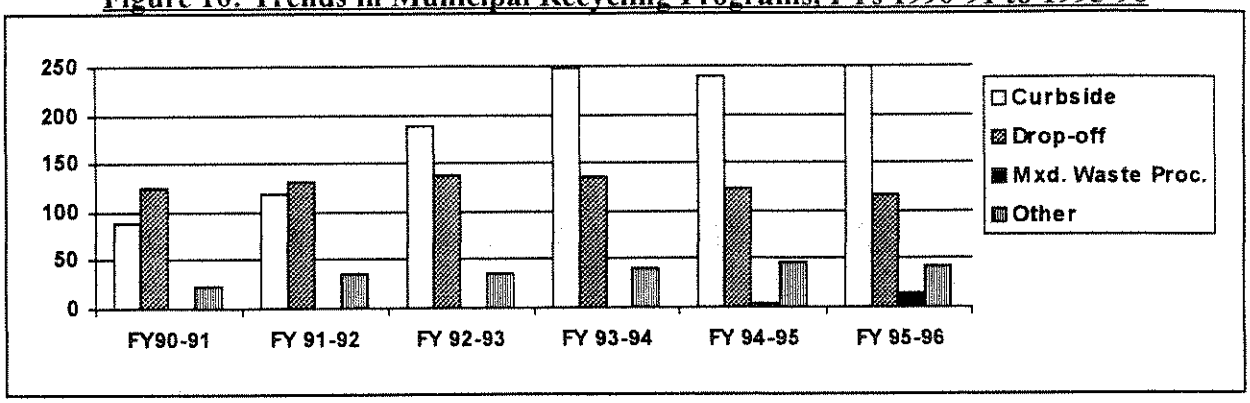
Figure 9: Trends in County Recycling Programs, FYs 1990-91 to 1995-96



[2] A study conducted by the National Composting Council in 1995 showed that the average cost of diverting a ton of organic material through backyard composting programs was $12/ton.

Municipalities have, like the counties, seen very little new programs added in the past few years. Any substantial rise in recyclables recovery by municipalities will also probably depend more on improvements in current programs rather than the addition of new ones. **Figure 10** shows the growth rates for municipal recovery programs.

Figure 10: Trends in Municipal Recycling Programs, FYs 1990-91 to 1995-96



For both curbside and drop-off programs in FY 1995-96, a couple of basic operational patterns dominated. The vast majority of curbside programs collected materials once per week (84 percent) in plastic bins provided to the resident. Municipal drop-off programs tended to use unstaffed centers (89 percent), while county drop-off centers tended to be staffed (80 percent). In all, 62 percent of the 942 drop-off centers statewide in FY 1995-96 were staffed.

Many local governments will have to work closely with their private contractors to improve their recycling programs. Both cities and counties relied heavily on private service providers to operate their recycling programs in FY 1995-96 (see **Table 9**).

Table 9: Public vs. Private Operation of Local Recycling Programs in FY 1995-96

Program Type	Percentage Using Private Contractors	
	Counties	Municipalities
Curbside	77%	75%
Drop-off	44%	60%
Mixed Waste Processing	90%	94%
Other Programs	58%	41%

If the citizens of North Carolina are to make real progress diverting materials from disposal, the state will have to reduce commercial and industrial solid wastes. Local governments can take leadership roles to target these waste streams in various ways, such as facilitating waste exchanges or actually providing recycling services. **Table 10** shows, unfortunately, that the reported number of recycling programs that either include or target commercial and industrial generators declined slightly from FY 1994-95 to FY 1995-96.

Table 10: Local Governments Providing Recycling To Commercial & Industrial Generators

Program Type	FY 1994-95		FY 1995-96	
	Commercial	Industrial	Commercial	Industrial
Curbside	118 (48%)	23 (9%)	119 (48%)	25 (10%)
Drop-off	114 (53%)	49 (23%)	106 (48%)	45 (20%)
Number of communities with targeted commercial/industrial recycling programs.	34		29	

Estimated Statewide Participation in Local Recycling Programs

Municipal and county recycling programs tend to concentrate on the residential waste stream. With 250 curbside recycling programs and 942 public drop-off points statewide, it is safe to say that the vast majority of North Carolina's 7.2 million citizens have access to recycling services.

One gauge of the effectiveness of recycling programs is the participation rate. Each year local governments are requested to estimate their community's recycling participation rate. For FY 1994-95, the cumulative estimated rate was 43 percent.

An estimated 3.28 million people in North Carolina were offered curbside recycling services by local governments in FY 1995-96. About 2.07 million people actually took part in the programs for an overall 64 percent participation rate. Approximately 1.3 million people took part in drop-off programs in FY 1995-96. Altogether, roughly 3.37 million people recycled in North Carolina in FY 1995-96, which equals an overall statewide participation rate of 47 percent.

Local Government Solid Waste Educational Efforts

Consistent public education programs that use a variety of media are one of the best ways to encourage source reduction and recycling activities in a community. Only a third of all local governments had ongoing public education efforts in FY 1995-96. Only 74 counties sponsored any educational efforts, and within those counties, ten communities used only one media method out of a variety identified (e.g., radio, tv, mass mailings, workshops). On that basis, less than two thirds of the counties had what could be considered an adequate education program.

Local Government Program Recycling Tonnages

Local government diversion of materials by recycling and composting in FY 1995-96 increased only 6 percent above the rate of the previous fiscal year. **Table 11** shows the recovery tonnages for the major material groups from FY 1990-91 to FY 1995-96.

Table 11: Diversion of Materials from Disposal by Local Governments FYs 1990-91 - 1995-96

Material	FY 1990-91	FY 1991-92	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96
Paper	99,488	98,729	151,676	164,806	185,270	206,394
Glass	16,816	25,997	32,611	37,537	38,088	47,857
Plastic	2,878	6,128	9,264	9,797	12,339	15,726
Metal*	30,875	34,148	44,302	51,468	59,483	65,504
Organics**	105,871	267,428	378,516	350,142	495,034	498,583
Other***	N/A	N/A	4272.23	16,387	5,987	9,259
Total	256,108	432,430	620,641 23	630,137	796,201	843,333
Motor oil (gal.)	147,816	262,559	356,771	391,178	484,386	499,244
Batteries (No.)	3,338	16,312	21,918	36,637	35,281	51,367
Antifreeze (gal.)	N/A	N/A	N/A	N/A	9,379	18,859

* Includes white goods, aluminum cans, steel cans, and other metals
**Includes yard waste, pallets, and wood waste
***Includes tons reported as commingled

Figure 11 shows local government diversion totals compared to the disposed waste stream in North Carolina. In FY 1995-96, local government diversion was equivalent to just under 11 percent of the waste stream.

Figure 11: Local Government Diversion Compared to Total Disposed Tonnage

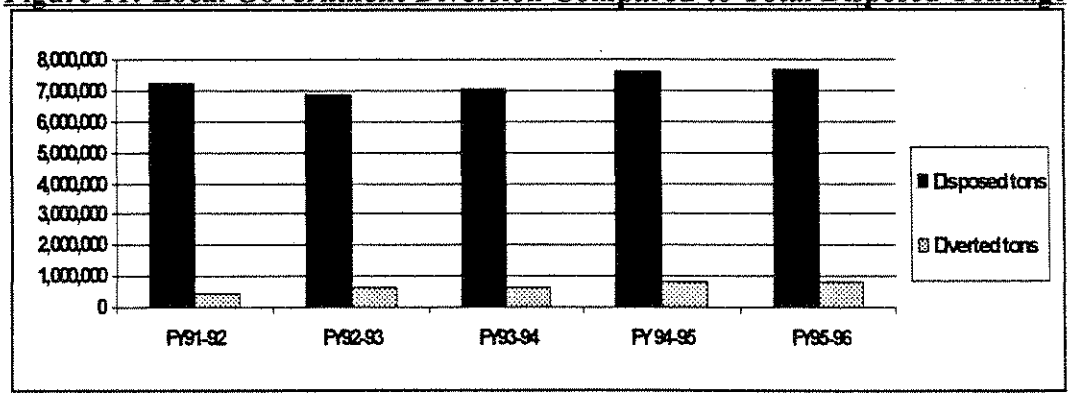


Table 12 shows that curbside and drop-off programs are still the dominant means of recovering recyclables for local governments:

Table 12: Local Government Recovery of Recyclable Materials by Method, FY 1995-96

Program Type	Total Tons	Percentage of Recovery
Curbside	145,134.42	40%
Drop-off	163,236.50	45%
Mixed Waste Processing	18,374.38	5%
Other Programs	34,443.01	10%

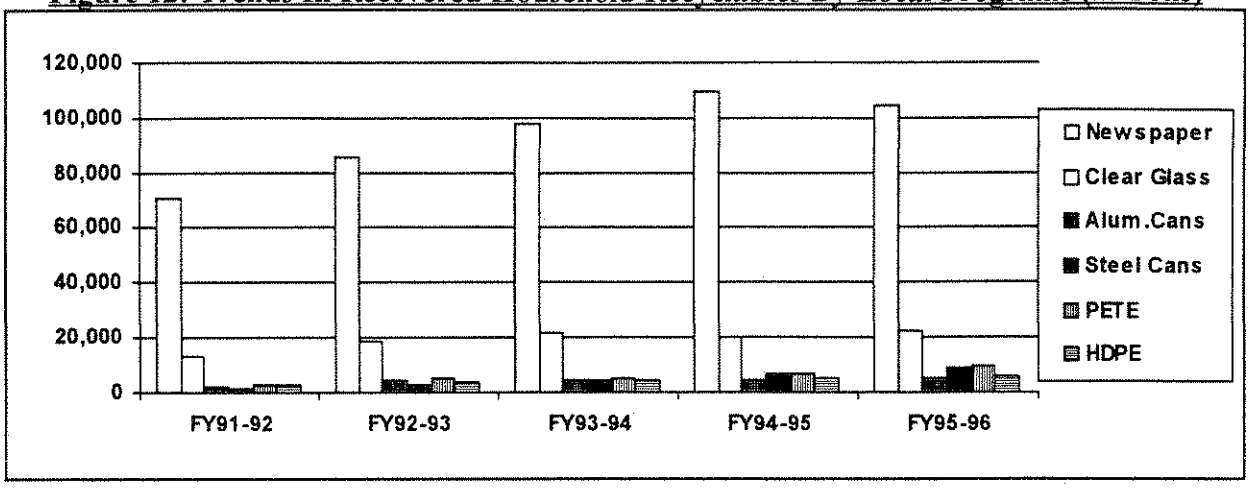
Table 13 shows local government materials recovery figures for specific commodities. With a few exceptions, most commodities exhibited modest increases.

Table 13: Local Government Recovery Tonnages for Specific Commodities

Material	Tons of Material Received			
	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96
Newspaper	85,727.53	97,534.27	109,927.22	104,034.31
Cardboard	27,679.33	42,904.74	51,464.44	60,490.90
Magazines	1,289.33	2,738.84	2,749.48	3,643.45
Office Paper	13,499.73	4,920.94	5,777.06	5,769.45
Mixed Paper	15,004.40	6,972.92	12,615.99	28,381.74
Other Paper	315.21	2,720.04	1,735.46	4,074.60
Clear Glass	18,580.02	21,275.91	19,801.66	22,722.44
Brown Glass	7,611.56	8,919.80	9,801.66	15,417.70
Green Glass	6,419.28	7,341.21	8,484.92	9,716.70
Aluminum Cans	4,484.13	4,208.04	4,784.88	5,468.54
Steel Cans	3,179.40	4,288.87	6,503.73	8,895.24
White Goods	28,769.00	34,126.05	41,296.00	39,995.68
PETE	4,856.69	5,308.29	6,882.54	9,660.29
HDPE	3,500.85	4,117.99	5,390.41	6,046.42
All other plastics	570.81	346.92	66.51	18.99

Figure 12 shows recovery trend lines for some of the commonly collected household recyclables. The graph shows the steady but slow growth in recovery for most of the commodities.

Figure 12: Trends In Recovered Household Recyclables By Local Programs (in Tons)



Local Government Special Waste Programs

In addition to traditional recyclable items, a number of local governments provide collection and diversion programs for certain special wastes such as used motor oil, antifreeze, lead acid batteries, and household hazardous wastes. **Table 14** shows basic information and trends in these program areas.

Table 14: Local Government Programs Targeting Special Wastes

Material	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96
Used Motor Oil				
Number of local programs	124	122	118	118
Number of sites	N/A	360	368	704
Amount collected (in gallons)	356,771	391,178	484,386	499,244
Antifreeze				
Number of local programs	N/A	N/A	30	59
Number of sites	N/A	N/A	112	206
Amount collected (in gallons)	N/A	N/A	9,379	18,859
Lead Acid Batteries				
Number of local programs	90	92	N/A	85
Number of batteries collected	21,918	36,637	35,281	51,367
Household Hazardous Waste				
Number of local programs	7	14	19	19
Number of Permanent Sites	0	2	6	6
Number of pounds collected	N/A	737,529	795,903	891,486

The reported cost for local government household hazardous waste [HHW] programs statewide for FY 1995-96 was $894,257, which, if divided by the reported pounds for the same period, makes the statewide average cost of HHW programs a little more than $1/pound, or $2000/ton.

Private Sector Recycling and the North Carolina Recycling Rate

In the summer of 1996, to help calculate a recycling rate for the state, NC DPPEA conducted a survey of 317 private recycling companies serving North Carolina. This private sector information was matched with already collected local government data to estimate the total recycling tonnage for the state. The private sector respondents were specifically asked to break out local government materials they handled to avoid double counting. Similarly, the target group for the survey was recycling processors, chosen to avoid double counting of materials handled by collectors and end-users whose materials pass through processors. Some end-users who receive material directly from generators were also asked to respond. About 50 percent responded to the survey.

Data on tonnages of materials that were unlikely to be disposed at a MSW landfill at any time (e.g., auto bodies) were excluded from the surveys collected. Given the adjustment for these exclusions, the estimate for North Carolina's recycling rate is at least 22 percent. Since the survey response rate was fairly low, the rate is probably higher. **Table 15** shows the results of the study, with tonnage figures rounded to the nearest thousand.

Table 15: Overall MSW and Recycling Tonnages in North Carolina for FY 1995-96*

	Local Government Tonnage	Private Sector Tonnage	Total Recycled Tonnage	MSW Disposed	Recycling Rate**
Raw	843,000	2,080,000	2,923,000	7,770,000	29%
Adjusted***	843,000	1,311,000	2,154,000	7,770,000	22%

* Private sector tonnages were actually for calendar year 1995.

** Total Recycled/(Total Recycled + MSW Disposed)

***Adjusted totals reflect exclusions of materials normally not thought of as MSW (e.g., auto bodies, sawdust and bark, etc.)

Recovery rates for a number of individual commodities may be based on results of the private sector recycling survey, local government recovery figures and the conclusions of the 1995 North Carolina Recycling Market Assessment. **Table 16** shows this commodity recovery analysis.

Table 16 suggests both the possibilities and limitations of increased recovery of these basic commodities. This information can also help state and local governments decide where to direct additional recycling efforts. For example, given the high recovery rates of newspaper and corrugated cardboard, North Carolina and its local governments may now be advised to focus on other paper grades such as office paper, magazines, and mixed paper. Improvement in recovery of containers (glass, aluminum, plastic) is needed. Analysis of **Table 16** indicates that despite a statewide disposal ban, only a quarter of all aluminum cans are being recovered.

Table 16: Recovery Rates for Specific Commodities

Commodity	Private Tons	Public Tons	Total Tons	Supply in Waste Stream	Recovery Rate
Total Paper	623,400	206,400	839,900	1,881,900	45%
Newspaper	54,400	104,000	158,400	275,000	58%
Cardboard	409,300	60,500	469,800	705,000	67%
Total Glass	21,400	47,900	69,300	332,000	21%
Total Plastics	23,800	15,700	39,500	191,300	21%
HDPE	3,900	6,000	9,900	34,700	29%
Total Metals	30,900	65,500	96,400	183,500	53%
Alum. Cans	5,400	5,500	10,900	43,700	25%

Tonnages rounded to nearest hundred

Markets and Market Prices

Prices for many recyclable commodities, particularly plastic and paper, fell substantially in FY 1995-96 from the huge jumps in FY 1994-95. The North Carolina Recycling Business Assistance Center (RBAC) tracks sample prices received by processors in the eastern, central, and western parts of North Carolina. **Table 17** below shows the composite trends of prices for four sample times between October 1995 and August 1996.

Table 17: Price Trends for Select Materials Between October 1995 and August 1996

Material	October, 1995	January, 1996	April, 1996	August, 1996
Aluminum Cans, lbs. loose	$.62	$.54	$.55	$.47
Steel Cans, gross ton baled	N/A	$70	$62.50	$67
PETE, lbs. baled	$.28	$.16	$.12	$.10
HDPE, lbs. baled	$.11	$.08	$.08	$.07
Newsprint, ton baled	$105	$35	$32.50	$30
Corrugated, ton baled	$85	$40	$45	$37
Office paper, ton baled	$300	$140	$155	$112
Magazines, ton baled	N/A	$3	$30	$0
Mixed paper, ton baled	$55	$10	$10	N/A
Clear glass, ton	$30	$30	$30	$35
Brown glass, ton	$25	$25	$25	$22
Green glass, ton	$5	$5	$5	$7

Yard Waste and Other Organics Management

Yard waste has been banned from disposal in all North Carolina municipal solid waste landfills since January 1993. Much of the yard waste generated is managed by local governments. Most of this material is diverted from disposal either through delivery directly to end users (e.g., leaves are given directly to farmers or gardeners) or through municipal and county compost and mulch programs.

Table 18 provides information on local government management of yard waste in FY 1995-96.

Table 18: Yard Waste Management by NC Local Governments in FY 1995-96

Destination of materials	Number/Local Govts. using destination	Leaves and Grass (tons)	Limbs and Brush (tons)	Mixed Yard Waste (tons)	Totals by Destination
End Users	80	35,398.97	9,497.82	2,047	46,943.79*
Local Government mulch/compost facility	165	66,183.02	135,795.03	233,212.7	435,190.7*
TOTAL					485,134.49
Other Public Facility	53	8,198.1	28,162.87	31,594.81	67,955.78**
Private Facility	32	13,602.2	23,543.89	10,273.9	47,419.99***
LCID landfill	66	N/A	N/A	85,693.4	85,693.4****

* Total counted as the total yard waste diversion by local governments and included in Organics figure in Table 11 above.
** Excluded from diversion to avoid double counting with local government mulch/compost facility figure.
*** Tons noted below in total private sector yard waste and organics diversion tonnage.
**** Excluded from diversion because use constitutes diversion.

In addition to local government programs, there are 10 private permitted yard and organic waste composting facilities in North Carolina. A few of these facilities receive some material from local governments that is not included in the diversion figures above. Most, however, receive material directly from generators or private sector collectors and handlers of yard waste. As required by statute, these facilities report the total tonnage they manage each year. For FY 1995-96, that figure was 147,360.79.

Local Government Solid Waste Funding and Other Management Issues

In addition to source reduction and recycling issues, local governments provide data to the state on personnel, program funding, management practices, solid waste collection services, and in-house programs. This section of the annual report presents some of the highlights of that data.

In-House Local Government Waste Reduction and Buy-Recycled Programs

In FY 1995-96, slightly less than 50 percent of local governments had an in-house waste reduction program. Most of these local governments had recycling programs; a much smaller number had reuse programs. Only 11 percent of all local governments practiced source reduction.

A total of 145 cities and counties (less than a quarter of all local governments) had a buy-recycled program; of those, 36 had established a formal commitment to buying recycled.

Local Solid Waste Administration

Only 61 counties and 102 municipalities reported having a person in the position of recycling coordinator. There were 80 counties and 110 municipalities with someone in a solid waste

manager or equivalent position. One-hundred sixteen local governments (50 counties and 66 cities) reported having a solid waste enforcement program.

Local Solid Waste Funding Issues

In all, 36 municipalities and 56 counties reported using an enterprise fund to administer solid waste program budgets in FY 1995-96. Forty-one counties and 63 cities reported having conducted a full cost analysis of their solid waste program, although there has been no official state verification of these analyses or the methods used by these local governments to complete them. Local governments are asked each year on their Solid Waste Management Annual Report form to give specific budgetary figures for their solid waste collection, disposal, and waste reduction programs. Incomplete answers are very common each year, indicating that full cost analysis is a highly under-utilized management technique among local governments.

Local governments do a better job reporting on their solid waste program financing methods. A number of patterns continued from previous years into FY 1995-96, including widespread dependence on property taxes to finance solid waste collection services (284 municipalities and 43 counties). The next popular solid waste collection financing method was household fees (178 municipalities and 39 counties). Tipping fees remained the chief source of financing of county disposal costs (68 counties). Waste reduction services were supported by property taxes (185 local governments), household fees (119), and tipping fees (33 counties). Thirty-five cities and 42 counties relied in part on the sale of recyclables for some funding support.

Local Variable Rate Pricing Programs

One very effective mechanism for encouraging greater source reduction and recycling by residents in a community is the establishment of variable rate, or "pay-as-you-throw," pricing of solid waste collection services. Such a system, which charges generators (in most cases, households) a fee based on the amount of solid waste they produce, has been shown to increase waste reduction rates in communities that implement it. The concept of variable rate pricing is relatively new, but, like full cost analysis, it is under-utilized in North Carolina. As of FY 1995-96, only nine counties and two cities had variable rate programs (although all of the towns in Craven and Jones counties were covered by the county ordinance).

State and Local Disposal Diversion Policies

A number of local governments in North Carolina have successfully diverted recyclable material from landfilling through the passage of a local restriction policy on their disposal. This mechanism continues to be one of the most cost-effective waste reduction methods available to local government, achieving large-scale diversion with no investment in expensive collection and processing systems. Though this is a low cost-per-ton option, the number of new local governments implementing this tool has slowed in recent years.

Table 19 shows the number of local governments that had disposal diversion ordinances in place through December 1996.

Table 19: Number of Local Governments with Disposal Diversion Ordinances by Material

	Cardboard	Household recyclables*	Wood or other materials
Municipalities	5	3	1**
Counties	26	4	3***

* Household recyclables generally include newspaper, glass, aluminum cans, steel cans, and PETE and HDPE plastics
** Blowing Rock's ordinance targets all commercial recyclables
*** Alamance County includes textile cardboard tubes, office paper, and metal coat hangers in its ordinance.

Waste reduction efforts in this state might also be assisted through expansion of North Carolina's statutory list of items banned from disposal in MSW landfills and incinerators.

Corrugated cardboard and wooden pallets are two materials that have a strong recycling infrastructure and stable, long-term, alternative management options. The Assessment of the Recycling Industry and Recycling Materials, 1995 Update documented that end-use capacity for cardboard in North Carolina and the Southeast exceeds projected supplies. The private collection and processing infrastructure for cardboard is also strong statewide; 26 counties have already placed disposal restrictions on the material.

The recycling infrastructure for pallets is one of the fastest growing components of North Carolina's recycling economy. Over half of all discarded pallets are already recovered. In addition to recycling, pallets are often managed in public mulching and composting operations statewide. Generators of pallets also have several options to reduce the burden of a disposal ban on their operations, including adoption of no-pallet handling systems, vendor take-backs, and pallet reuse and exchange programs.

Oil filters are a material that may contribute to landfill leachate volume and toxicity, and should be considered for a future ban. Used motor oil is already banned from disposal in MSW landfills. Ironically, used oil filters are not, though they can contain as much as 2 cups of used oil. The collection and processing infrastructure for used oil filters is growing. DPPEA has worked directly with at least six companies in the past two years that are beginning collection services. To allow this infrastructure time to mature, the state should consider a used filter disposal ban that is set to take effect in a few years.

Local Solid Waste Collection Issues

Most local governments offered solid waste collection services to households in FY 1995-96. Over half of municipalities also served commercial customers. **Table 20** shows an account of these services:

Table 20: Local Government Solid Waste Collection Services and Sector Served

	Residential	Commercial	Industrial
Municipalities	393 (75%)	281 (54%)	74 (14%)
Counties	78 (78%)	20 (20%)	12 (12%)

For municipalities serving the residential sector, once per week solid waste collection service is the prevailing pattern (70 percent). More than 100 cities still provide twice per week solid waste collections. For counties, staffed collection centers are the dominant solid waste collection method (81 percent). Although the data is not complete, the remaining counties are assumed to provide door-to-door county-wide solid waste collection.

Overview

The data reported every year by local governments, along with information gathered through surveys of private sector recycling, provide the opportunity to make some observations on the overall status of source reduction and recycling in North Carolina. More specifically, this annual evaluation process allows North Carolina to identify ways to improve its waste reduction efforts, especially toward achieving the state's 40 percent solid waste reduction goal by 2001.

There is considerable room for improvement in local waste reduction programs. The data in this report indicate that local commitment to solid waste reduction has fallen are. It underscores:

- the lack (and even decline) of specific local programs focused at the top of the waste management hierarchy -- source reduction and reuse;
- the slow growth in both new programs and the amount of recyclables recovered by existing programs;
- the small number of local governments formally providing waste reduction services to commercial and industrial generators;
- the large numbers of local governments that either offer no local waste reduction education program or make very limited educational efforts;
- the small number of local governments to date embracing such powerful mechanisms as variable rate pricing, full cost analysis, and disposal diversion ordinances; and
- the reluctance of some local governments to divert materials from landfills and transfer stations for fear of losing tipping fee revenue that in turn helps them meet debt or disposal contract obligations.

All of these trends must be reversed if local governments are going to contribute to achieving the 40 percent reduction goal. The solid waste planning process set in motion by the passage of House Bill 859 in 1996 may provide the best opportunity for local governments to deal with this issue.

The state must continue to offer technical assistance to ensure completion of quality plans and to help local governments identify and establish progressive waste reduction measures. The state should explore ways to increase funds for these local improvements. Approximately two-thirds of local grant requests from the Solid Waste Management Trust Fund are not met each year for lack of resource. North Carolina's grant funding level has consistently lagged behind other states that are making progress toward waste reduction and recycling goals (e.g., Florida, South Carolina).

Another observation that can be made from the data, and from other sources, is that North Carolina will not make progress toward its waste reduction goal by focusing on the residential

waste stream. Local government programs to date have concentrated on recycling household discards; while those efforts can be improved, they will soon reach limits. North Carolina and its local governments are more likely to make substantial progress toward both the state goal and local goals by shifting attention to the commercial, industrial, and construction/demolition waste streams.

The actions of private generators will depend on a number of factors, including the costs of solid waste collection and disposal (as opposed to the cost of waste reduction), the amount of help and encouragement they receive from local and state government (such as disposal diversion ordinances), and access to recycling services and markets. Currently, North Carolina and its local governments concentrate on bottles, cans and newspapers. They must shift the focus to items such as pallets, film wrap and other transportation packaging wastes, industrial solid waste by-products, and the wood, brick, metal, sheetrock, and other discards found on construction sites.

Fortunately, new markets and uses for waste materials are available to North Carolina generators. In FY 1995-96 and FY 1996-97, the collection and end use infrastructure began to develop for a number of previously ignored waste streams, including carpet, oil filters, mirror glass, construction wastes, gypsum wallboard, tires, vinyl siding, household textiles, and cotton gin wastes. Generators and collectors of these waste streams now have diversion opportunities not available even three years ago. Diversion of these materials from disposal must show economic benefits; the availability of new recycling options must be shared with generators, local governments, and private waste handling firms

Markets for traditional household and commercial recyclable materials must be strengthened. Given recent market downturns for such materials as newspaper, mixed paper, and PETE plastic, North Carolina should consider steps to bolster and expand the recycling opportunities for these items. For example, the state should possibly reexamine its minimum-recycled content newsprint law to close loopholes and strengthen requirements. In addition, North Carolina should continue to pursue alternative end-uses for mixed residential paper, such as compost and animal bedding.

For materials such as PETE, it is perhaps worth considering a state minimum content law for drink containers to spur end-use of recycled feedstock. North Carolina should also continue its efforts to encourage feedstock conversion among companies currently using virgin materials in their production processes. Finally, North Carolina should reinvigorate its "buy-recycled" efforts, particularly among state and other public agencies.

Many other opportunities exist for expanded waste reduction activity by communities and generators. Cost-effective source reduction activities, such as backyard composting programs, hold a lot of promise for local governments that want to increase diversion and save costs over time (e.g., by reducing yard waste pickup services). Markets exist right now that will pay as much as $100/ton for collected clothing.

Organic waste streams are beginning to enjoy alternative uses, from edible food rescue programs to large scale private composting. In some parts of the state, construction waste generators can access source-separated collection services and large scale recycling facilities. In short, the opportunities for increased diversion are increasing for many communities and generators.

Despite North Carolina's lack of progress toward its waste reduction goal and some slackening in local government efforts, the state has a generally strong recycling economy and the potential for much greater diversion of valuable materials from disposal.

Other Information Available:

Previous State Solid Waste Annual Reports contained information that also appeared in other state agency reports. Those reports include:

- Annual Report on State Agency Waste Reduction and Buy-Recycled Activities
- Solid Waste Trust Fund Annual Report
- NC DPPEA Annual Report
- White Goods Account Annual Report
- Scrap Tire Disposal Account Annual Report

Please contact NC DPPEA at (919)715-6500 or NC DWM, Solid Waste Section at (919) 733-0692 for copies of these reports.

APPENDIX A-1 PUBLIC AND PRIVATE MUNICIPAL SOLID WASTE LANDFILLS (INCLUDES CONSTRUCTION AND DEMOLITION LANDFILLS), DESCENDING ORDER OF TONS, FY 1995-96

PERMIT	FACILITY	TONS FY 91-92	TONS FY 92-93	TONS FY 93-94	TONS FY 94-95	TONS FY 95-96	LINED LANDFILL FY 95-96	TIPPING FEE FY 95-96	CERTIFIED OPERATOR FY 95-96
1304	BFI-CHARLOTTE MTR SPEEDWAY LANDFILL	404,978.70	493,962.61	536,526.51	548,442.00	593,658.69	YES	$32.65	NO
3406	PIEDMONT SANITARY LANDFILL	142,067.36	146,847.90	350,508.77	507,123.30	552,898.66	YES	$29.00	YES
803	EAST CAROLINA REGIONAL LANDFILL	0.00	0.00	154,583.16	282,654.49	361,516.87	YES	$36.00	NO
3402	WINSTON-SALEM LANDFILL (FORSYTH CO)	210,246.46	216,125.79	258,632.45	300,571.34	299,140.39	NO	$25.00	YES
9201	RALEIGH, CITY OF - LANDFILL (WAKE CO)	258,796.00	267,984.00	268,428.00	288,370.95	296,906.21	NO	$22.00	YES
4103	GREENSBORO LANDFILL (GUILFORD CO)	327,574.00	283,000.00	285,068.45	277,940.86	284,828.75	NO	$26.25	YES
6013	NORTH MECKLENBURG C&D LANDFILL	0.00	0.00	110,881.33	195,345.10	248,115.27	NO	$19.00	NO
9214	HOLLY SPRINGS DISPOSAL, INC	0.00	0.00	87,176.52	196,607.12	234,408.03	NO	$22.00	NO
8201	BFI - SAMPSON COUNTY DISPOSAL, INC.	33,234.59	34,975.86	97,003.97	163,174.54	231,232.73	YES	$26.00	YES
6201	MONTGOMERY COUNTY LANDFILL	28,800.00	42,542.43	94,875.75	138,041.07	188,684.81	NO	$24.00	YES
3201	DURHAM CITY LANDFILL (DURHAM CO)	208,360.00	194,281.00	206,575.00	206,381.00	177,360.00	NO	$39.50	NO
1803	CATAWBA COUNTY LANDFILL	129,948.00	136,459.00	144,450.00	148,852.00	160,186.00	NO	$30.00	YES
9203	WAKE COUNTY LANDFILL (FELTONSVILLE)	92,433.74	100,764.82	97,259.43	106,524.22	120,639.12	NO	$22.00	YES
9801	WILSON COUNTY LANDFILL	117,112.00	121,419.00	123,875.12	112,522.65	119,131.00	NO	$25.00	YES
1101	BUNCOMBE COUNTY LANDFILL	141,928.01	143,267.00	96,753.33	102,185.39	119,083.00	NO	$28.00	YES
2504	CRSWMA* INT. REGIONAL LANDFILL	0.00	0.00	69,184.92	110,797.99	118,679.00	YES	$45.00	YES
6504	NEW HANOVER COUNTY LANDFILL	80,575.58	83,273.11	82,189.00	80,786.00	114,365.00	YES	$30.00	YES
9209	WAKE COUNTY LANDFILL (NORTH)	150,967.70	122,444.10	119,382.59	110,378.52	114,287.33	NO	$22.00	YES
4903	IREDELL COUNTY SANITARY LANDFILL	0.00	0.00	85,180.65	125,741.55	103,585.50	YES	$27.00	YES
1203	BURKE COUNTY LANDFILL	64,619.00	68,081.55	72,669.35	99,953.51	102,602.39	NO	$23.00	YES
2601	CUMBERLAND COUNTY LANDFILL (ANN ST)	160,880.67	179,920.67	178,479.98	186,366.00	97,371.90	NO	$37.00	YES
4104	HIGH POINT (GUILFORD CO)	0.00	0.00	83,750.71	98,794.81	93,248.30	YES	$36.00	YES
2906	DAVIDSON COUNTY LINED LANDFILL	0.00	0.00	0.00	73,652.58	92,136.71	YES	$33.00	NO
6401	NASH COUNTY LANDFILL	79,402.87	78,454.78	81,645.51	80,908.32	91,896.03	NO	$25.00	NO
7803	ROBESON COUNTY	91,048.50	80,676.70	80,588.00	92,548.35	90,886.20	NO	$22.50	NO
9601	WAYNE COUNTY LANDFILL	97,386.32	101,716.09	92,544.75	86,820.38	90,832.99	NO	$20.00	YES
8003	ROWAN COUNTY LANDFILL	85,708.00	88,639.00	97,180.00	105,367.00	83,378.00	YES	$31.00	YES
1007	BRUNSWICK COUNTY LANDFILL	76,560.00	80,477.00	76,005.31	79,917.00	83,116.00	NO	$0.00	YES
3606	GASTON COUNTY LANDFILL	153,105.00	161,864.00	130,097.00	80,204.00	81,208.47	NO	$24.50	YES
6705	ONSLOW COUNTY LANDFILL	63,530.27	69,992.56	76,450.22	79,105.84	80,597.83	NO	$38.50	YES
5101	JOHNSTON COUNTY LANDFILL	70,045.00	68,578.00	74,151.00	72,960.64	78,095.00	NO	$28.00	YES
9001	UNION COUNTY LANDFILL	71,787.37	79,465.89	84,001.19	77,257.39	75,305.00	NO	$30.00	YES
1401	CALDWELL COUNTY LANDFILL	62,112.59	66,951.53	68,029.87	75,670.80	74,870.64	NO	$35.00	NO
5403	LENOIR COUNTY LANDFILL	67,323.66	74,062.00	71,568.70	77,319.43	74,418.00	NO	$20.00	YES
7601	RANDOLPH COUNTY LANDFILL	75,533.00	77,660.00	74,677.00	75,658.00	74,100.00	NO	$24.00	YES
4302	HARNETT COUNTY LANDFILL	54,770.00	49,985.00	55,254.25	68,063.69	73,555.45	NO	$25.00	YES

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2602	US ARMY-FORT BRAGG LANDFILL	39,996.00	36,000.00	34,954.00	45,238.00	71,062.00	NO	$0.00	YES
2301	CLEVELAND COUNTY LANDFILL	64,749.87	67,888.77	65,878.77	71,298.20	70,479.65	NO	$26.00	NO
104	AUSTIN QUARTER SWM FACILITY	0.00	0.00	23,169.68	77,253.44	67,484.30	YES	$30.67	YES
4501	HENDERSON COUNTY LANDFILL	77,763.00	77,501.00	56,091.00	59,925.00	67,451.00	NO	$26.00	YES
3301	EDGECOMBE COUNTY LANDFILL	71,037.00	78,894.52	73,759.15	73,225.00	64,989.03	NO	$25.00	YES
6801	ORANGE COUNTY REGIONAL LANDFILL	121,318.00	125,452.00	121,345.00	124,611.00	57,889.11	NO	$31.00	YES
8301	SCOTLAND COUNTY LANDFILL	43,041.84	45,668.00	50,062.00	48,654.00	57,150.00	NO	$27.00	YES
7904	ROCKINGHAM COUNTY LANDFILL	0.00	0.00	0.00	0.00	52,473.92	YES	$34.00	YES
8103	RUTHERFORD COUNTY LANDFILL (CENTRAL)	52,047.64	64,894.31	77,057.00	69,039.85	50,076.40	NO	$17.00	NO
8602	SURRY COUNTY LANDFILL	45,907.00	51,518.00	52,260.00	53,341.00	50,065.34	NO	$22.00	YES
9101	VANCE COUNTY LANDFILL	40,053.06	38,242.34	43,603.47	45,826.74	49,369.27	NO	$35.00	NO
2401	ARS-COLUMBUS COUNTY LANDFILL	44,536.31	45,361.11	88,446.90	100,015.14	47,185.20	NO	$22.00	NO
8401	ALBEMARLE, CITY OF-LANDFILL (STANLY CO)	67,498.00	69,503.00	54,627.00	48,187.00	47,033.00	NO	$23.00	YES
1302	CABARRUS COUNTY LANDFILL	59,335.70	57,641.70	61,247.98	52,691.21	44,795.08	NO	$28.00	YES
3901	GRANVILLE COUNTY LANDFILL (OXFORD)	36,341.03	39,190.64	46,242.50	45,697.88	43,212.48	NO	$28.00	YES
9704	WILKES COUNTY MSW LANDFILL	0.00	0.00	32,924.56	53,892.00	41,371.83	YES	$35.00	NO
6703	US MARINE CORPS-CAMP LEJEUNE LANDFILL	83,823.43	83,823.43	46,532.51	33,636.04	39,356.10	NO	$0.00	YES
4407	HAYWOOD COUNTY WHITE OAK LANDFILL	0.00	0.00	22,451.00	34,735.95	38,630.05	YES	$0.00	YES
4204	HALIFAX COUNTY LANDFILL	52,309.79	52,036.12	49,887.82	165,160.44	37,728.24	NO	$24.00	NO
5503	LINCOLN COUNTY LANDFILL	42,297.00	44,194.64	40,873.00	34,090.00	34,237.56	YES	$32.00	YES
6801	ORANGE COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	31,341.93	NO	$31.00	YES
1301	BFI-CHARLOTTE MTR SPEEDWAY C&D LF	0.00	0.00	0.00	0.00	29,482.28	NO	$18.00	NO
5002	JACKSON COUNTY LANDFILL	16,703.00	19,309.07	20,033.57	24,296.36	26,812.60	NO	$50.00	NO
4903	IREDELL COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	24,278.30	NO	$8.00	YES
2001	CHEROKEE COUNTY LANDFILL	15,926.00	17,610.69	18,374.00	24,617.50	23,057.71	NO	$40.00	NO
201	ALEXANDER COUNTY LANDFILL	25,182.00	20,712.00	21,477.00	21,671.04	22,026.45	NO	$33.00	NO
3902	GRANVILLE COUNTY LANDFILL	17,915.14	19,320.50	17,585.40	20,457.35	21,224.11	NO	$28.00	YES
5703	MACON COUNTY LANDFILL	3,648.70	16,645.53	17,108.79	18,779.02	19,473.54	YES	$30.00	YES
8603	SURRY COUNTY LANDFILL (ELKIN)	26,726.00	21,604.00	22,191.00	22,110.81	18,970.05	NO	$22.00	YES
8201	BFI - SAMPSON COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	18,686.23	NO	$26.00	YES
9003	GRIFFIN FARMS C&D LANDFILL	0.00	0.00	0.00	0.00	17,070.00	NO	$18.00	NO
2803	DARE COUNTY C&D LANDFILL	0.00	0.00	0.00	16,649.39	14,638.01	NO	$10.00	NO
501	ASHE COUNTY LANDFILL	17,756.20	18,000.17	17,946.35	15,993.26	14,540.47	YES	$30.00	NO
6204	UWHARRIE ENVIRON. REG. LANDFILL	0.00	0.00	0.00	0.00	13,054.60	YES	$35.00	YES
8103	RUTHERFORD COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	12,103.66	NO	$17.00	NO
4002	GREENE COUNTY LANDFILL	13,305.00	8,729.64	9,669.16	10,177.63	10,774.15	NO	$20.00	NO

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5803	MADISON COUNTY LANDFILL	0.00	0.00	7,411.37	10,773.30	9,954.27	YES	$43.00	YES
104	AUSTIN QUARTER C&D UNIT***	N/A	N/A	N/A	N/A	9,299.15	NO	$30.67	YES
8807	TRANSYLVANIA COUNTY SANITARY LF	3,220.00	16,384.00	18,874.00	16,451.60	9,294.38	YES	$40.00	YES
07A**	BEAUFORT COUNTY DEMO LANDFILL	0.00	0.00	0.00	0.00	8,844.73	NO	$15.00	NO
7301	PERSON COUNTY C&D LANDFILL	0.00	0.00	0.00	7,041.93	8,101.63	NO	$35.00	YES
3003	DAVIE COUNTY C&D LANDFILL	0.00	0.00	0.00	0.00	6,859.21	NO	$39.00	YES
5301	LEE COUNTY C&D LANDFILL	0.00	0.00	0.00	3,893.33	5,370.26	NO	$18.00	NO
5704	MACON COUNTY C&D LANDFILL	0.00	0.00	2,625.46	4,378.75	4,356.15	NO	$30.00	YES
10002	YANCEY-MITCHELL C&D LANDFILL	0.00	0.00	0.00	3,253.91	3,599.85	NO	$40.00	NO
5901	MARTIN COUNTY C&D LANDFILL	0.00	0.00	0.00	0.00	3,529.75	NO	$20.00	NO
5503	LINCOLN COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	3,052.57	NO	$16.00	YES
9902	YADKIN COUNTY C&D LANDFILL	0.00	0.00	0.00	1,687.81	2,728.18	NO	$40.00	NO
9502	WATAUGA COUNTY C&D LANDFILL	0.00	0.00	0.00	0.00	2,522.01	NO	$37.00	YES
7002	PASQUOTANK COUNTY C&D LANDFILL	0.00	0.00	0.00	0.00	1,794.45	NO	$25.00	YES
5803	MADISON COUNTY C&D UNIT***	N/A	N/A	N/A	N/A	1,062.41	NO	$10.00	YES
9404	WASHINGTON COUNTY C&D LANDFILL	0.00	0.00	0.00	0.00	102.70	NO	$38.00	NO
101	ALAMANCE COUNTY LANDFILL	89,089.64	76,632.91	21,076.80	0.00	0.00	NO	N/A	N/A
302	ALLEGHANY COUNTY LANDFILL	13,995.00	7,684.00	6,615.35	0.00	0.00	NO	N/A	N/A
401	ANSON COUNTY LANDFILL	13,942.30	15,702.29	10,786.60	0.00	0.00	NO	N/A	N/A
601	AVERY COUNTY LANDFILL	10,800.00	2,830.00	3,560.00	0.00	0.00	NO	N/A	N/A
702	BEAUFORT COUNTY LANDFILL	38,748.17	44,531.19	18,175.96	9,573.00	0.00	NO	N/A	N/A
801	BERTIE COUNTY LANDFILL	17,255.30	16,864.00	5,944.10	0.00	0.00	NO	N/A	N/A
901	BLADEN COUNTY LANDFILL	24,810.00	28,330.00	20,944.18	0.00	0.00	NO	N/A	N/A
1602	CARTERET COUNTY LANDFILL	84,433.00	78,281.00	22,808.00	0.00	0.00	NO	N/A	N/A
1701	CASWELL COUNTY LANDFILL	5,102.43	4,818.11	5,554.57	0.00	0.00	NO	N/A	N/A
1901	CHATHAM COUNTY LANDFILL	30,552.00	29,805.00	9,372.66	0.00	0.00	NO	N/A	N/A
2201	CLAY COUNTY LANDFILL	3,965.60	3,425.00	1,806.65	0.00	0.00	NO	N/A	N/A
2503	CRAVEN COUNTY LANDFILL	77,108.17	68,675.15	19,658.86	0.00	0.00	NO	N/A	N/A
2701	CURRITUCK COUNTY LANDFILL	13,721.00	15,001.00	4,589.00	0.00	0.00	NO	N/A	N/A
2802	DARE COUNTY LANDFILL (EAST LAKE)	50,101.00	52,052.36	20,851.53	0.00	0.00	NO	N/A	N/A
2902	DAVIDSON COUNTY LANDFILL	132,258.00	121,503.00	31,388.89	0.00	0.00	NO	N/A	N/A
2904	THOMASVILLE, LANDFILL (DAVIDSON CO)	0.00	0.00	0.00	0.00	0.00	NO	N/A	N/A
3001	DAVIE COUNTY LANDFILL	15,109.98	18,284.35	9,174.70	0.00	0.00	NO	N/A	N/A
3101	DUPLIN COUNTY LANDFILL	31,571.92	29,913.64	8,745.48	0.00	0.00	NO	N/A	N/A
3501	FRANKLIN COUNTY LANDFILL	27,887.46	32,477.41	22,325.72	0.00	0.00	NO	N/A	N/A
3801	GRAHAM COUNTY LANDFILL	4,422.96	4,741.00	3,566.00	0.00	0.00	NO	N/A	N/A

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PERMIT	FACILITY	TONS FY 91-92	TONS FY 92-93	TONS FY 93-94	TONS FY 94-95	TONS FY 95-96	LINED LANDFILL FY 95-96	TIPPING FEE FY 95-96	CERTIFIED OPERATOR FY 95-96
4101	HIGH POINT LANDFILL (GUILFORD CO)	118,118.30	126,083.78	19,335.44	0.00	0.00	NO	N/A	N/A
4303	HARNETT COUNTY LF (ANDERSON CRK)	13,691.00	11,841.00	7,586.19	578.47	0.00	NO	N/A	N/A
4403	HAYWOOD COUNTY LANDFILL	39,240.00	50,878.47	12,434.28	0.00	0.00	NO	N/A	N/A
4404	CANTON LANDFILL (HAYWOOD CO)	13,957.00	34,592.00	17,470.05	0.00	0.00	NO	N/A	N/A
4601	HERTFORD COUNTY LANDFILL	14,269.00	14,819.00	11,531.30	0.00	0.00	NO	N/A	N/A
4701	HOKE COUNTY LANDFILL	17,515.04	19,150.05	2,149.76	0.00	0.00	NO	N/A	N/A
4901	IREDELL COUNTY LANDFILL	110,357.00	124,625.00	31,226.80	0.00	0.00	NO	N/A	N/A
5001	WESTERN CAROLINA UNIV. LANDFILL	430.45	402.42	108.34	0.00	0.00	NO	N/A	N/A
5201	JONES COUNTY LANDFILL	4,360.00	2,878.00	2,734.45	0.00	0.00	NO	N/A	N/A
5301	LEE COUNTY LANDFILL	46,750.83	43,398.70	13,548.46	0.00	0.00	NO	N/A	N/A
5601	MCDOWELL COUNTY LANDFILL	27,460.96	30,279.63	26,484.07	4,460.53	0.00	NO	N/A	N/A
5701	MACON COUNTY LANDFILL (FRANKLIN)	9,531.32	1,011.49	0.00	0.00	0.00	NO	N/A	N/A
5702	MACON COUNTY LANDFILL (HIGHLANDS)	4,267.04	3,655.53	1,299.51	0.00	0.00	NO	N/A	N/A
5802	MADISON COUNTY LANDFILL	11,154.00	10,404.59	2,706.34	0.00	0.00	NO	N/A	N/A
5901	MARTIN COUNTY LANDFILL	30,086.00	30,690.00	8,398.51	1,935.63	0.00	NO	N/A	NO
6001	MECKLENBURG COUNTY LANDFILL	150,603.00	0.00	25,246.00	0.00	0.00	NO	N/A	N/A
6301	MOORE COUNTY LANDFILL	70,706.43	58,114.30	27,225.61	12,290.55	0.00	NO	N/A	N/A
6601	NORTHAMPTON COUNTY LANDFILL	18,890.00	14,435.18	2,715.23	315.91	0.00	NO	N/A	N/A
6902	PAMLICO COUNTY LANDFILL	10,600.00	11,895.54	2,044.42	0.00	0.00	NO	N/A	N/A
7002	PASQUOTANK COUNTY LANDFILL	30,004.99	31,638.80	22,915.18	0.00	0.00	NO	N/A	N/A
7101	PENDER COUNTY LANDFILL	17,875.79	17,277.29	10,606.33	0.00	0.00	NO	N/A	N/A
7201	PERQUIMANS CHOWAN GATES LANDFILL	24,700.00	26,410.31	8,547.00	0.00	0.00	NO	N/A	N/A
7301	PERSON COUNTY LANDFILL (ROXBORO)	22,528.99	25,251.59	23,281.29	0.00	0.00	NO	N/A	N/A
7401	PITT COUNTY LANDFILL	124,008.00	119,270.00	125,313.00	101,769.00	0.00	NO	N/A	N/A
7502	POLK COUNTY LANDFILL	8,808.86	7,515.49	6,062.57	1,556.60	0.00	NO	N/A	N/A
7702	RICHMOND COUNTY LANDFILL	60,103.48	36,885.79	4,855.66	0.00	0.00	NO	N/A	N/A
7901	ROCKINGHAM COUNTY LANDFILL	37,377.46	60,661.85	77,891.04	47,175.36	0.00	NO	N/A	N/A
8102	RUTHERFORD COUNTY LANDFILL (SOUTH)	31,228.58	3,184.21	0.00	0.00	0.00	NO	N/A	N/A
8501	STOKES COUNTY LANDFILL	16,784.00	16,671.26	7,633.04	0.00	0.00	NO	N/A	N/A
8701	SWAIN COUNTY LANDFILL	5,521.30	6,152.27	4,859.24	0.00	0.00	NO	N/A	N/A
8803	TRANSYLVANIA COUNTY LANDFILL	25,620.00	0.00	0.00	0.00	0.00	NO	N/A	N/A
9204	SORRELLS SANITARY LANDFILL	37,530.00	50,138.00	DNR	0.00	0.00	NO	N/A	N/A
9301	WARREN COUNTY LANDFILL	10,968.00	8,976.00	6,571.00	0.00	0.00	NO	N/A	N/A
9402	WASHINGTON COUNTY LANDFILL	13,233.05	14,735.51	4,225.78	0.00	0.00	NO	N/A	N/A
9502	WATAUGA COUNTY LANDFILL	32,881.82	35,208.00	27,438.50	0.00	0.00	NO	N/A	N/A

APPENDIX A-1 PUBLIC AND PRIVATE MUNICIPAL SOLID WASTE LANDFILLS (INCLUDES CONSTRUCTION AND DEMOLITION LANDFILLS), DESCENDING ORDER OF TONS, FY 1995-96

PERMIT	FACILITY	TONS FY 91-92	TONS FY 92-93	TONS FY 93-94	TONS FY 94-95	TONS FY 95-96	LINED LANDFILL FY 95-96	TIPPING FEE FY 95-96	CERTIFIED OPERATOR FY 95-96
9701	WILKES COUNTY LANDFILL	55,722.00	55,832.00	9,584.70	0.00	0.00	NO	N/A	N/A
9702	WILKES COUNTY LANDFILL (ROARING RIVER)	1,637.00	6,501.00	0.00	0.00	0.00	NO	N/A	N/A
9902	YADKIN COUNTY LANDFILL	20,487.33	22,529.86	8,214.95	0.00	0.00	NO	N/A	N/A
10001	YANCEY-MITCHELL COUNTY LANDFILL	30,915.00	21,072.00	18,259.54	0.00	0.00	NO	N/A	N/A
	HARNETT COUNTY C&D STOCKPILE	0.00	0.00	0.00	0.00	1,969.39	NO	$25.00	YES
	MCDOWELL COUNTY C&D STOCKPILE	0.00	0.00	0.00	0.00	3,961.49	NO	$32.00	YES
	MOORE COUNTY C&D STOCKPILE	0.00	0.00	0.00	0.00	10,425.78	NO	$25.00	NO
	NORTHAMPTON COUNTY C&D STOCKPILE	0.00	0.00	0.00	0.00	438.36	NO	$10.00	NO
	POLK COUNTY C&D STOCKPILE	0.00	0.00	0.00	0.00	1,577.17	NO	$25.00	YES
	TOTAL	6,688,068.05	6,656,613.89	6,707,785.86	7,151,413.76	7,324,742.81			

C&D = Construction and Demolition waste

*CRSWMA = Coastal Regional Solid Waste Management Authority

** permit conditions include acceptance of C&D waste

***C&D Unit data reported separately from MSW landfill beginning FY1995-96

APPENDIX A-2: SCRAP TIRE MONOFILLS, DESCENDING ORDER, FY 1995-96

PERMIT	FACILITY	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONS FY 93-94	TONS FY 94-95	TONS FY 95-96
1303	U S TIRE RECYCLING PARTNERS, LP	15,444.00	17,094.25	17,873.23	31,787.33	38,359.40	28,312.76
4304	CENTRAL CAROLINA TIRE RECYCLING	0.00	2,764.61	4,824.43	18,191.71	31,650.57	27,832.89
	TOTAL TONS*	15,444.00	19,858.86	22,697.66	49,979.04	70,009.97	56,145.64

*Tons landfilled (less tons recycled or reused)

APPENDIX A-3: INCINERATION FACILITIES, DESCENDING ORDER, FY 1995-96

PERMIT	FACILITY	NET TONS FY 91-92	NET TONS FY 92-93	NET TONS FY 93-94	NET TONS FY 94-95	GROSS TONS FY 95-96	ASH TONS 95-96	NET TONS FY 95-96	CERTIFIED OPERATOR FY 95-96
6505	NEW HANOVER CO WTE FACILITY	64,002.68	62,104.40	53,373.00	59,619.00	133,438.97	48,791.00	84,647.97	YES
903	BCH ENERGY GENERATION FACILITY	0.00	0.00	0.00	0.00	65,532.36	17,409.57	48,122.79	YES
6010	NORTHEAST WTE FACILITY	54,136.00	50,585.00	52,757.00	51,311.00	0.00	0.00	0.00	N/A
6506	TOWN OF WRIGHTSVILLE BEACH	3,805.70	2,217.20	0.00	0.00	0.00	0.00	0.00	N/A
	TOTAL TONS	57,941.70	52,802.20	52,757.00	51,311.00	198,971.33	66,200.57	132,770.76	

WTE = Waste to Energy

APPENDIX A-4: PRIVATE INDUSTRIAL LANDFILLS, DESCENDING ORDER, FY 1995-96

PERMIT	FACILITY	TONS FY 90-91	TONS FY 91-92	TONS FY 92-93	TONS FY 93-94	TONS FY 94-95	TONS FY 95-96
7302	CP&L ROXBORO S E PLANT	DNR	528,486.00	632,421.90	476,730.86	410,668.40	547,749.97
4406	CHAMPION INTERNATIONAL CORP LF NO. 6	DNR	389,689.00	379,899.00	328,233.00	303,310.00	345,674.00
3605	FMC CORPORATION LANDFILL	DNR	184,462.00	154,923.00	166,444.00	190,814.00	185,829.00
1804	DUKE POWER-MARSHALL STEAM STATION LF	DNR	329,457.00	344,543.80	400,874.68	142,886.81	90,924.64
2302	CLEVELAND CONTAINER SERVICE	DNR	67,155.00	73,918.00	124,516.00	91,134.00	75,675.00
2402	INTERNATIONAL PAPER RIEGELWOOD MILL LF	139,375.00	194,929.00	268,341.00	75,116.00	264,689.00	69,833.00
3405	R J REYNOLDS TOBACCO CO LANDFILL	68,019.00	59,576.71	48,997.79	47,683.72	47,185.91	48,881.00
9401	WEYERHAEUSER PAPER CO	DNR	99,732.30	119,283.00	108,960.00	95,330.20	45,534.00
8503	DUKE POWER BELEWS CREEK ASH LANDFILL	DNR	242,268.00	164,675.00	191,070.00	105,680.00	44,830.00
4203	CHAMPION INTERNATIONAL	31,698.00	17,839.10	21,768.80	29,568.10	22,764.70	40,242.60
5404	DUPONT CO - KINSTON SITE	6,442.30	8,227.00	57,011.31	37,737.74	22,072.54	25,595.00
1006	DUPONT	14,147.00	20,767.85	23,852.30	22,078.32	27,946.17	17,961.51
8801	ECUSTA ASH LANDFILL	13,337.00	10,999.70	10,134.90	11,475.80	11,784.30	12,965.30
1102	BASF CORPORATION	23,400.00	25,726.00	20,652.00	45,500.00	17,262.00	12,308.00
2502	WEYERHAEUSER COMPANY	10,252.00	6,633.00	8,249.00	9,979.00	6,506.00	6,506.00
8805	ECUSTA PROCESS WASTE LANDFILL	DNR	7,522.10	7,026.00	6,817.10	6,741.30	5,140.20
5603	COLLINS & AIKMAN SANITARY LANDFILL	DNR	6,846.70	6,440.00	6,618.00	6,603.00	4,747.00
9703	ABTCO, INC.	3,846.00	3,999.00	4,288.00	4,034.40	4,062.30	4,225.80
4503	CRANSTON PRINT WORKS	DNR	DNR	0.00	1,875.00	3,224.00	2,456.00
802	R J REYNOLDS TOBACCO CO	225.20	766.30	702.60	605.00	1,079.50	674.50
7602	EVEREADY BATTERY COMPANY, INC	DNR	612.70	337.80	402.00	465.27	367.52
8806	DUPONT BREVARD PLANT	DNR	490.20	412.00	376.60	428.20	273.90
6004	DUKE POWER-MCGUIRE SITE LANDFILL	101.00	90.80	463.20	23.35	14.40	72.92
9210	CP&L SHEARON HARRIS LF	350.00	176.00	162.33	172.51	49.27	32.41
1001	CP & L BRUNSWICK PLANT SANITARY LANDFI	446.00	194.00	323.00	639.80	15.44	9.98
6603	GEORGIA-PACIFIC	709.00	530.40	816.80	824.06	109.11	0.00
	TOTAL TONS	312,347.50	2,207,175.86	2,349,642.53	2,098,355.04	1,782,825.82	1,588,509.25

DNR = DID NOT REPORT

APPENDIX A-5: TRANSFER STATIONS, PERMIT ORDER, FY 1995-96

PERMIT	TRANSFER STATION	TIPPING FEE FY 95-96	TONS FY 95-96	DISPOSAL DESTINATION AND PERMIT NUMBER FY 95-96	DESTINATION LINED FY 95-96
303	ALLEGHANY COUNTY TRANSFER FACILITY	22.50	7,318.10	PIEDMONT LANDFILL (FORSYTH)(3406)	YES
402	ANSON COUNTY TRANSFER STATION	35.00	17,909.14	MONTGOMERY CO. LF/UWHARRIE ENV. (6201)	NO
602	AVERY COUNTY TRANSFER STATION	23.00	15,711.00	BFI CHARLOTTE MOTOR SPEEDWAY V (1304)	YES
703	ARS-BEAUFORT TRANSFER STATION	44.00	41,261.89	EAST CAROLINA REGIONAL LANDFILL (BERTIE)(803)	YES
904	BLADEN COUNTY TRANSFER STATION	28.00	20,941.73	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
1001	BRUNSWICK CO TRANSFER/SOUTHPORT	0.00	8,421.00	BRUNSWICK CO. LANDFILL (1007)	NO
			2,403.00	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
1008	BRUNSWICK CO TRANSFER/LELAND	0.00	4,031.00	BRUNSWICK CO. LANDFILL (1007)	NO
			2,403.00	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
1009	BRUNSWICK CO TRANSFER/OCEAN ISLE BEACH	0.00	8,033.00	BRUNSWICK CO. LANDFILL (1007)	NO
			2,393.00	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
1104	WASTE MANAGEMENT OF ASHEVILLE	28.00	67,548.82	PALMETTO LANDFILL, SPARTANBURG, SC	YES
			11,584.00	HENDERSON CO LANDFILL (4501)	NO
			689.10	HAYWOOD CO LANDFILL (4407)	YES
			241.55	BUNCOMBE CO LANDFILL (1101)	NO
1604	CARTERET COUNTY TRANSFER STATION	57.50	56,261.00	CRSWMA INTERIM REGIONAL LANDFILL (2504)	YES
1903	ARS, INC TRANSFER STATION (CHATHAM)	34.25	24,935.10	PIEDMONT LANDFILL (FORSYTH)(3406)	YES
3002	DAVIE COUNTY TRANSFER STATION	45.00	16,128.98	CITY OF WINSTON-SALEM LANDFILL (3402)	NO
3102	DUPLIN COUNTY TRANSFER STATION	45.00	27,590.45	BFI SAMPSON CO. LANDFILL (8201)	YES
3502	FRANKLIN COUNTY TRANSFER STATION	15.00	29,840.63	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
3608	WASTE MANAGEMENT OF CAROLINAS	30.22	142,804.67	PALMETTO LANDFILL, SPARTANBURG, SC	YES
4305	HARNETT COUNTY TRANSFER STATION	25.00	881.03	HARNETT CO. LANDFILL (4302)	NO
4602	HERTFORD COUNTY TRANSFER STATION	40.00	3,483.34	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
4702	HOKE COUNTY TRANSFER STATION	46.00	15,706.27	BCH ENERGY MRF (2605)	N/A
5304	ARS, INC TRANSFER STATION (LEE)	34.25	99,072.06	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
5602	McDOWELL CO TRANSFER FACILITY	32.00	29,291.41	BURKE CO. LANDFILL (1203)	NO
6302	UWHARRIE ENV INC/MOORE CTY TS	29.42	31,126.90	MONTGOMERY CO. LF/UWHARRIE ENV. (6201)	NO
			17,179.57	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
			11,590.79	UWHARRIE ENV. REG. LANDFILL (MONTGOMERY) (620	YES
6508	WASTE MANAGEMENT OF WILMINGTON	30.00	6,121.30	NEW HANOVER CO. INCINERATOR (6505)	N/A
6903	PAMLICO COUNTY TRANSFER STATION	57.50	5,612.00	CRSWMA INTERIM REGIONAL LANDFILL (2504)	YES
7003	PASQUOTANK CO. TRANSFER STATION	52.00	28,988.83	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
7103	PENDER COUNTY TRANSFER STATION	54.00	8,836.22	BFI SAMPSON CO. LANDFILL (8201)	YES
			2,686.51	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
			337.26	NEW HANOVER CO. INCINERATOR (6505)	N/A

APPENDIX A-5: TRANSFER STATIONS, PERMIT ORDER, FY 1995-96

PERMIT	TRANSFER STATION	TIPPING FEE FY 95-96	TONS FY 95-96	DISPOSAL DESTINATION AND PERMIT NUMBER FY 95-96	DESTINATION LINED
7202	PERQUIMANS-CHOWAN-GATES TRANSFER ST.	45.00	17,353.63	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
7303	PERSON COUNTY TRANSFER STATION	35.00	19,787.18	PIEDMONT LANDFILL (FORSYTH)(3406)	YES
7404	PITT COUNTY TRANSFER STATION	36.00	122,738.24	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
7503	POLK COUNTY TRANSFER STATION	45.00	3,035.71	PALMETTO LANDFILL, SPARTANBURG, SC	YES
7703	RICHMOND COUNTY TRANSFER STATION	31.00	37,579.46	MONTGOMERY CO. LF/UWHARRIE ENV. (6201)	NO
7902	REIDSVILLE, CITY OF TRANSFER FACILITY	21.00	5,408.82	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
7903	EDEN, CITY OF TRANSFER STATION	0.00	10,769.00	ROCKINGHAM CO. LANDFILL (7904)	YES
8004	EAST SPENCER WASTE TRANSFER FACILITY	33.00	33,868.68	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
9211	CARY, TOWN OF - TRANSFER STATION	0.00	10,550.83	BFI SAMPSON CO. LANDFILL (8201)	YES
			7,148.92	SOUTH WAKE CO./FELTONSVILLE LANDFILL (9203)	NO
9215	WASTE MANAGEMENT OF RAL-DUR	39.50	24,061.30	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
			24,061.29	BFI SAMPSON CO. LANDFILL (8201)	YES
9302	WARREN COUNTY TRANSFER STATION	57.00	9,489.00	EAST CAROLINA REGIONAL LANDFILL (BERTIE) (803)	YES
9503	WATAUGA COUNTY TRANSFER FACILITY	37.00	31,796.68	PIEDMONT LANDFILL (FORSYTH) (3406)	YES
9903	YADKIN COUNTY TRANSFER FACILITY	40.00	13,747.61	BFI CHARLOTTE MOTOR SPEEDWAY V (1304)	YES
10003	YANCEY-MITCHELL TRANSFER STATION	40.00	16,741.04	PALMETTO LANDFILL, SPARTANBURG, SC	YES
*	BRUNSWICK COUNTY LF TRANSFER STATION	0.00	19,853.00	BCH ENERGY MRF (CUMBERLAND) (2605)	N/A
*	CURRITUCK CO. (ALBEMARLE REG. SWM AUTH.)	46.00	16,580.65	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
*	DARE CO. (ALBEMARLE REG. SWM AUTH.)	46.51	40,633.08	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
*	TOWN OF EDENTON	0.00	5,010.36	EAST CAROLINA ENVIRONMENTAL (BERTIE) (803)	YES
TOTAL TONS TRANSFERRED			1,239,578.13		

*was unpermitted, permit-pending, or temporary in FY 1995-96

APPENDIX B-1: COUNTY WASTE REDUCTION, DESCENDING ORDER, FY 1995-96

COUNTY	% WASTE REDUCTION FY 95-96	COUNTY	% WASTE REDUCTION FY 95-96	COUNTY	% WASTE REDUCTION FY 95-96
RICHMOND	58%	PENDER	20%	NEW HANOVER*	-3%
TRANSYLVANIA	52%	ALEXANDER	19%	HERTFORD	-4%
NORTHAMPTON	50%	CATAWBA*	16%	CAMDEN	-4%
ALLEGHANY	47%	WARREN	15%	GRAHAM	-4%
STOKES	47%	ONSLOW	15%	BUNCOMBE*	-5%
MITCHELL	44%	PASQUOTANK*	15%	IREDELL	-5%
CLAY	43%	ROBESON	13%	SWAIN	-6%
CRAVEN*	42%	WATAUGA	13%	CURRITUCK	-6%
BLADEN	41%	DAVIDSON	13%	GASTON	-8%
GATES	41%	PERQUIMANS	10%	LENOIR	-9%
PITT*	40%	BURKE	10%	ROWAN	-9%
CARTERET	40%	GUILFORD	10%	MCDOWELL	-10%
JONES	39%	SURRY	10%	DURHAM*	-10%
DUPLIN*	38%	ASHE	10%	CALDWELL	-11%
ALAMANCE*	37%	DARE	9%	MACON	-11%
ORANGE	37%	CLEVELAND*	9%	SAMPSON	-11%
TYRRELL	37%	CHOWAN	8%	CUMBERLAND	-12%
PAMLICO	37%	CHEROKEE	8%	VANCE	-13%
HAYWOOD	36%	MOORE	8%	BEAUFORT	-14%
MARTIN	35%	MADISON	8%	GRANVILLE	-14%
HOKE	33%	EDGECOMBE	7%	PERSON	-14%
HALIFAX	32%	RANDOLPH	6%	ROCKINGHAM	-15%
RUTHERFORD	31%	JOHNSTON	5%	BERTIE	-16%
YANCEY	31%	CABARRUS	5%	BRUNSWICK	-17%
WILKES	30%	LINCOLN	4%	MECKLENBURG*	-20%
WASHINGTON	29%	FRANKLIN	4%	UNION	-20%
YADKIN	28%	WILSON	3%	AVERY	-24%
POLK	28%	HARNETT	-1%	HYDE	-24%
GREENE	27%	NASH	-1%	DAVIE	-28%
STANLY	22%	LEE	-1%	ANSON	-29%
WAYNE*	21%	FORSYTH*	-1%	SCOTLAND	-31%
CHATHAM*	21%	COLUMBUS	-3%	JACKSON	-37%
HENDERSON	21%	WAKE*	-3%	MONTGOMERY	-52%
*county used alternative base year				CASWELL	-70%

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1995-96

COUNTY	POPULATION FY 95-96 Jul-95	MSW MANAGED FY 91-92	MSW TONS DISPOSED FY 92-93	MSW TONS DISPOSED FY 93-94	MSW TONS DISPOSED FY 94-95	MSW TONS DISPOSED FY 95-96	BASE YEAR PER CAPITA FY 91-92	PER CAPITA RATE FY 95-96	% WASTE REDUCTION FY 95-96**
ALAMANCE*	115,295	99,301.89	77,599.29	74,841.82	82,613.45	79,538.43	*	*	*
ALEXANDER	30,168	25,716.32	20,712.00	21,477.00	21,671.04	22,096.90	0.90	0.73	19.01%
ALLEGHANY	9,618	14,130.83	7,730.65	8,344.81	7,181.03	7,367.21	1.45	0.77	47.15%
ANSON	23,828	14,229.30	15,703.82	14,428.79	17,920.67	18,837.06	0.61	0.79	-28.58%
ASHE	22,992	18,089.13	18,056.01	18,481.43	18,620.54	16,689.38	0.81	0.73	9.96%
AVERY	15,186	11,130.09	2,952.16	12,688.37	14,338.05	14,009.34	0.74	0.92	-23.88%
BEAUFORT	43,330	41,796.03	47,546.61	52,044.49	51,972.27	48,679.11	0.99	1.12	-14.00%
BERTIE	20,638	17,371.98	16,864.00	18,155.55	16,659.85	20,635.57	0.86	1.00	-16.00%
BLADEN	29,790	25,048.21	28,330.00	26,195.87	22,369.31	15,083.65	0.86	0.51	41.25%
BRUNSWICK	60,739	78,123.11	80,805.94	76,830.64	80,980.60	104,972.33	1.48	1.73	-16.63%
BUNCOMBE*	188,736	159,040.21	152,762.69	152,397.96	167,000.46	179,570.04	*	*	*
BURKE	81,440	78,005.51	68,540.36	69,574.69	72,894.30	74,197.31	1.02	0.91	10.31%
CABARRUS	110,338	95,215.19	83,841.32	92,507.75	105,525.94	99,325.79	0.94	0.90	4.63%
CALDWELL	73,726	65,531.52	67,461.78	68,831.52	76,733.08	75,402.89	0.92	1.02	-10.72%
CAMDEN	6,316	1,850.16	1,991.60	2,070.64	1,989.37	2,024.97	0.31	0.32	-3.75%
CARTERET	57,612	86,894.30	78,481.53	54,908.51	52,101.29	56,284.75	1.62	0.98	39.60%
CASWELL	21,372	5,136.12	4,818.11	7,081.54	7,703.53	8,976.26	0.25	0.42	-70.33%
CATAWBA*	126,240	151,559.31	136,462.83	144,538.66	149,404.28	161,181.09	*	*	*
CHATHAM*	42,914	33,235.13	30,109.23	31,919.95	31,710.37	29,882.71	*	*	*
CHEROKEE	21,824	16,020.17	17,623.89	16,708.00	17,487.30	15,643.09	0.78	0.71	8.29%
CHOWAN	14,031	13,691.72	13,182.67	12,349.10	15,071.80	12,722.99	0.99	0.91	8.30%
CLAY	7,732	4,172.34	3,425.00	2,467.65	2,358.60	2,514.77	0.57	0.33	43.13%
CLEVELAND*	89,136	73,137.50	68,606.32	66,913.66	72,500.29	71,221.49	*	*	*
COLUMBUS	51,268	45,199.16	45,361.11	68,512.34	51,884.72	47,690.31	0.91	0.93	-2.70%
CRAVEN*	85,816	86,549.01	69,274.99	54,861.07	55,259.42	60,277.04	*	*	*
CUMBERLAND	294,010	227,301.67	218,485.71	227,883.25	249,848.17	267,923.92	0.81	0.91	-12.25%
CURRITUCK	15,818	13,792.48	15,001.00	13,358.78	16,186.33	16,676.63	1.00	1.05	-5.82%
DARE	25,758	51,299.83	50,260.74	43,207.43	53,332.92	52,124.97	2.23	2.02	9.29%
DAVIDSON	136,604	139,616.85	122,370.71	118,453.76	123,067.45	128,618.69	1.08	0.94	12.58%
DAVIE	29,735	19,348.40	18,380.80	18,108.64	21,979.93	25,997.45	0.68	0.87	-28.31%
DUPLIN*	42,772	33,309.90	30,709.73	31,306.58	32,021.07	32,334.70	*	*	*
DURHAM*	192,906	218,971.80	195,038.13	209,860.73	223,293.51	278,241.28	*	*	*
EDGECOMBE	56,811	71,471.38	78,894.52	74,322.38	73,729.66	65,975.79	1.25	1.16	7.09%
FORSYTH*	279,904	304,289.69	286,079.05	320,279.19	345,804.57	380,873.73	*	*	*
FRANKLIN	41,649	28,701.81	32,477.41	29,113.80	29,404.00	30,461.39	0.76	0.73	3.84%
GASTON	178,442	165,099.79	163,093.42	168,278.11	177,660.88	179,627.62	0.93	1.01	-7.82%
GATES	9,798	5,896.67	5,832.71	4,058.43	3,368.86	3,614.59	0.63	0.37	41.22%
GRAHAM	7,466	4,508.08	4,741.00	4,631.00	4,438.60	4,847.96	0.62	0.65	-4.30%

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1995-96

COUNTY	POPULATION FY 95-96 Jul-95	MSW MANAGED FY 91-92	MSW TONS DISPOSED FY 92-93	MSW TONS DISPOSED FY 93-94	MSW TONS DISPOSED FY 94-95	MSW TONS DISPOSED FY 95-96	BASE YEAR PER CAPITA FY 91-92	PER CAPITA RATE FY 95-96	% WASTE REDUCTION FY 95-96**
GRANVILLE	41,130	54,547.90	58,759.72	63,980.07	66,524.74	65,266.93	1.39	1.59	-14.04%
GREENE	16,794	13,917.46	9,342.85	10,422.02	10,627.79	10,968.74	0.90	0.65	27.04%
GUILFORD	372,097	471,540.90	452,645.06	435,861.01	447,544.04	449,957.22	1.35	1.21	10.30%
HALIFAX	57,468	54,906.78	52,265.76	50,407.88	166,059.54	38,206.45	0.98	0.66	32.01%
HARNETT	76,960	69,073.39	62,479.25	64,193.35	70,166.48	78,257.95	1.01	1.02	-0.52%
HAYWOOD	49,946	57,841.80	85,470.47	52,355.33	35,082.40	38,630.05	1.21	0.77	36.12%
HENDERSON	76,250	81,497.83	77,761.09	71,569.86	75,896.02	68,950.07	1.14	0.90	21.02%
HERTFORD	22,468	14,288.00	14,819.00	13,691.24	16,958.58	14,719.28	0.63	0.66	-3.72%
HOKE	27,334	18,331.15	19,173.39	12,424.99	16,777.51	14,719.21	0.80	0.54	32.77%
HYDE	5,211	2,761.59	2,850.50	2,218.23	2,078.80	3,221.47	0.50	0.62	-23.91%
IREDELL	103,462	114,539.18	124,812.55	116,650.27	134,919.73	129,140.26	1.19	1.25	-5.03%
JACKSON	28,798	18,660.87	19,711.49	20,189.21	24,296.36	26,812.60	0.68	0.93	-36.73%
JOHNSTON	95,413	74,169.34	69,416.75	75,205.59	74,231.56	79,822.25	0.88	0.84	5.28%
JONES	9,502	4,360.00	2,878.00	3,932.28	2,825.60	2,684.63	0.47	0.28	39.43%
LEE	46,014	48,341.02	45,474.19	47,838.07	52,115.04	53,663.74	1.16	1.17	-0.95%
LENOIR	59,083	67,692.88	74,556.23	72,578.21	78,945.21	75,268.19	1.17	1.27	-8.58%
LINCOLN	55,592	44,442.34	45,067.93	46,610.00	47,288.79	46,343.92	0.87	0.83	4.40%
MACON	26,284	19,738.31	21,312.55	21,033.76	23,157.77	23,888.42	0.82	0.91	-10.79%
MADISON	17,778	11,676.23	10,548.13	10,269.47	10,996.98	11,190.07	0.68	0.63	7.99%
MARTIN	25,842	30,111.58	30,690.00	20,300.58	20,265.70	20,021.85	1.19	0.77	35.08%
MCDOWELL	37,244	29,179.96	30,279.63	33,038.60	33,049.92	33,499.39	0.82	0.90	-10.20%
MECKLENBURG*	577,479	677,573.24	617,277.17	747,434.81	847,896.57	964,911.03	*	*	*
MITCHELL	14,838	15,768.10	11,567.00	12,745.33	11,994.80	9,242.50	1.11	0.62	43.76%
MONTGOMERY	23,828	28,873.00	21,588.14	26,561.77	41,156.86	44,494.81	1.23	1.87	-51.82%
MOORE	66,660	74,061.56	58,488.88	73,877.63	82,804.85	75,485.53	1.23	1.13	8.13%
NASH	83,966	84,593.77	78,454.78	81,695.17	80,925.39	92,311.58	1.09	1.10	-0.94%
NEW HANOVER*	139,577	157,646.89	151,075.83	165,651.48	181,652.04	202,913.54	*	*	*
NORTHAMPTON	20,726	19,527.80	14,515.70	7,461.99	8,957.47	9,643.72	0.94	0.47	50.40%
ONSLOW	147,912	158,344.22	154,526.10	124,749.30	115,187.02	130,246.38	1.04	0.88	14.99%
ORANGE	105,821	131,067.45	125,766.70	122,147.09	126,309.52	90,396.89	1.36	0.85	37.23%
PAMLICO	11,869	8,541.24	8,196.50	5,390.22	4,898.83	5,613.00	0.75	0.47	36.56%
PASQUOTANK*	33,290	30,150.34	29,647.20	27,507.88	28,046.19	28,997.63	*	*	*
PENDER	34,671	18,187.76	17,444.49	15,833.43	21,295.16	16,679.83	0.60	0.48	20.07%
PERQUIMANS	10,650	7,519.55	7,394.93	8,785.66	4,787.00	6,947.03	0.73	0.65	10.42%
PERSON	32,139	24,249.07	25,251.59	27,816.48	27,090.47	29,373.68	0.80	0.91	-14.13%
PITT*	117,420	132,896.09	120,058.98	125,864.94	124,337.51	116,768.78	*	*	*
POLK	15,743	9,327.33	7,515.49	6,884.75	7,996.88	7,203.42	0.63	0.46	27.86%
RANDOLPH	115,548	78,663.37	77,711.28	80,297.26	82,229.09	79,281.28	0.73	0.69	5.85%

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1995-96

COUNTY	POPULATION FY 95-96 Jul-95	MSW MANAGED FY 91-92	MSW TONS DISPOSED FY 92-93	MSW TONS DISPOSED FY 93-94	MSW TONS DISPOSED FY 94-95	MSW TONS DISPOSED FY 95-96	BASE YEAR PER CAPITA FY 91-92	PER CAPITA RATE FY 95-96	% WASTE REDUCTION FY 95-96**
RICHMOND	45,404	60,752.03	58,619.57	42,434.05	30,209.74	25,972.03	1.35	0.57	57.78%
ROBESON	110,990	104,700.17	88,563.88	98,287.51	98,943.97	96,165.91	0.99	0.87	12.90%
ROCKINGHAM	88,334	71,480.71	75,228.09	80,752.35	86,255.92	83,975.90	0.83	0.95	-14.58%
ROWAN	118,875	90,081.47	89,479.30	104,974.78	107,014.02	104,234.25	0.80	0.88	-9.24%
RUTHERFORD	59,082	89,175.34	68,322.46	77,716.87	70,327.74	63,090.93	1.56	1.07	31.35%
SAMPSON	50,523	33,545.35	32,492.71	34,821.71	37,058.10	39,221.27	0.70	0.78	-10.99%
SCOTLAND	34,718	39,867.42	38,645.81	43,191.56	47,544.66	52,860.87	1.17	1.52	-30.66%
STANLY	53,784	69,288.07	70,276.73	57,644.01	57,412.72	55,460.80	1.32	1.03	22.10%
STOKES	41,071	17,976.32	18,354.91	13,182.17	9,783.13	10,387.56	0.47	0.25	46.70%
SURRY	65,076	73,595.30	73,187.82	75,074.52	75,459.60	69,035.39	1.18	1.06	10.07%
SWAIN	11,568	5,650.66	6,152.27	6,668.64	5,582.48	6,168.33	0.50	0.53	-5.60%
TRANSYLVANIA	27,168	30,072.05	16,482.27	19,161.63	18,372.28	15,012.72	1.16	0.55	52.33%
TYRRELL	3,812	2,984.83	1,742.86	1,561.61	1,777.18	1,912.47	0.79	0.50	36.72%
UNION	98,192	77,842.49	79,870.19	84,243.75	78,317.58	106,582.23	0.90	1.09	-20.47%
VANCE	40,041	43,266.86	38,242.34	43,724.35	48,175.44	49,965.17	1.11	1.25	-12.75%
WAKE*	518,271	569,621.89	542,427.42	575,618.80	733,521.30	747,268.01	*	*	*
WARREN	18,137	10,978.00	8,976.00	11,878.43	9,369.46	9,728.31	0.63	0.54	15.33%
WASHINGTON	13,766	11,699.36	12,992.65	10,415.26	8,490.66	8,194.28	0.84	0.60	29.41%
WATAUGA	40,133	36,755.38	35,360.04	34,265.17	30,680.23	34,694.28	0.99	0.86	12.75%
WAYNE*	111,018	106,149.38	102,716.65	94,724.72	99,109.98	92,474.68	*	*	*
WILKES	62,056	58,817.60	62,581.61	43,375.52	54,627.82	42,323.69	0.97	0.68	29.99%
WILSON	67,839	120,870.35	121,443.14	124,457.17	113,711.70	120,307.84	1.82	1.77	2.51%
YADKIN	33,672	20,778.78	22,529.86	11,906.31	15,880.40	16,140.30	0.67	0.48	28.45%
YANCEY	16,143	15,576.12	9,725.43	10,955.66	11,158.02	11,262.67	1.01	0.70	30.89%
TOTAL	7,194,238	7,257,428.09	6,890,818.15	7,038,505.34	7,624,144.85	7,770,226.45	1.08	1.08	-0.31%

*see list of counties using alternative base year

**Waste reduction formula: (base year per capita minus current year per capita) divided by base year per capita

APPENDIX B-2 cont.: COUNTIES USING APPROVED ALTERNATIVE BASE YEARS, FY 1995-96

COUNTY	POPULATION FY 95-96	ALTERNATIVE BASE YEAR TONNAGE	MSW TONS DISPOSED FY 91-92	MSW TONS DISPOSED FY 92-93	MSW TONS DISPOSED FY 93-94	MSW TONS DISPOSED FY 94-95	MSW TONS DISPOSED FY 95-96	PER CAPITA RATE FY 95-96	% WASTE REDUCTION FY 95-96
ALAMANCE (FY89-90)	115,295	117,861.83	90,510.91	77,599.29	74,841.82	82,613.45	79,538.43	0.69	37.40%
BUNCOMBE (FY88-89)	188,736	157,660.00	142,041.61	152,762.69	152,397.96	167,000.46	179,570.04	0.95	-4.52%
CATAWBA (FY89-90)	126,240	179,351.00	129,948.00	136,462.83	144,538.66	149,404.28	161,181.09	1.28	15.69%
CHATHAM (90-91)	42,914	34,315.00	31,209.00	30,109.23	31,919.95	31,710.37	29,882.71	0.70	21.35%
CLEVELAND (FY90-91)	89,136	74,096.00	65,533.73	68,606.32	66,913.66	72,500.29	71,221.49	0.80	8.61%
CRAVEN (FY90-91)	85,816	98,636.00	77,355.31	69,274.99	54,861.07	55,259.42	60,277.04	0.70	41.75%
DUPLIN (FY90-91)	42,772	48,900.00	32,213.65	30,709.73	31,306.58	32,021.07	32,334.70	0.76	38.20%
DURHAM (FY88-89)	192,906	224,196.00	210,104.06	195,038.13	209,860.73	223,293.51	278,241.28	1.44	-10.32%
FORSYTH (FY88-89)	279,904	357,474.00	278,824.06	286,079.05	320,279.19	345,804.57	380,873.73	1.36	-1.39%
MECKLENBURG (89-90)	577,479	695,214.00	601,055.45	617,277.17	747,434.81	847,896.57	964,911.03	1.67	-20.10%
NEW HANOVER (88-89)	139,577	168,604.00	149,582.43	151,075.83	165,651.48	181,652.04	202,913.54	1.45	-3.24%
PASQUOTANK (FY90-91)	33,290	32,081.00	28,236.53	29,647.20	28,031.72	28,045.19	28,997.63	0.87	14.83%
PITT (FY89-90)	117,420	177,390.00	124,372.19	120,058.98	125,864.94	124,337.51	116,768.78	0.99	40.03%
WAKE (FY 88-89)	518,271	544,520.00	539,817.04	542,427.42	575,618.80	733,521.30	747,268.01	1.44	-2.87%
WAYNE (FY90-91)	111,018	111,167.00	97,852.09	102,716.65	94,724.72	99,109.98	92,474.68	0.83	21.45%