Andrea

# North Carolina

# SOLID WASTE MANAGEMENT

# Annual Report

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## JULY 1, 1994 - JUNE 30, 1995

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

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

*Reduce, Reuse, Recycle*

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and

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**JULY 1, 1994 - JUNE 30, 1995**

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# NORTH CAROLINA 1994-1995 SOLID WASTE ANNUAL REPORT

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## EXECUTIVE SUMMARY

This report meets the reporting requirements of G.S. 130A-309, that requires the state to prepare a Solid Waste Management report on the status of solid waste management in North Carolina. Data for this report were derived from solid waste facility reports submitted by operators of permitted facilities, including those of local governments and private industries. Data for recycling and waste management activities are derived from annual reports submitted by local governments.

In fiscal year 1994-95, the state increased the amount of waste disposed despite strong recycling programs in both the public and private sectors. The ratio of 1.08 tons per person is the same today as it was in FY 1991-92, the base year for measuring progress toward the state waste reduction goal. While reduction and recycling programs in North Carolina were expected to lower this rate over the past several years, the relative increase is partly a result of strong growth in North Carolina's economy. This is especially true regarding the construction industry.

There was an increase this year in source reduction programs, but most of these were initiated by local governments "in-house" for their own offices and functions. The state still needs a significant expansion of new source reduction programs with more widespread application.

After several years of continued program expansion, recycling efforts in North Carolina slowed down this year. Curbside and drop-off programs are still the most prevalent types of recycling services offered by local governments. Since no data are collected on private sector recycling, estimates of the state's recycling rate are based on local government efforts and general knowledge of private programs. According to the most recent estimate based on this information, approximately 20 percent of the state's waste is recycled.

The 18 lined landfills that are in operation in North Carolina receive approximately one third of the waste disposed in the state. The remaining 49 unlined landfills are expected to close or be replaced by lined facilities prior to January 1, 1998.

North Carolina continued to export more waste (approximately 250 thousand tons) than was imported (190 thousand tons) this fiscal year.

White goods management is supported by a special tax on white goods. Local governments reported a surplus of funds and the state white goods management account has a surplus. These funds could be used by local government to develop a facility to recycle white goods and clean up white goods previously mismanaged.

The scrap tire disposal account, which is funded from a special tax on tires, has provided for the cleanup of more than 3,000,000 scrap tires from nuisance tire sites across the state.

The special tax on tires has also provided for disposal of in-state scrap tires without charge. However, approximately 2,000,000 out-of-state scrap tires have been disposed free due to lack of oversight and control at North Carolina disposal sites.

The section receives, investigates and responds to more than 100 complaints per month related to solid waste. Each month, these complaints lead to the discovery of as many as 35 previously undocumented open sites. Many sites are closed under a compromise plan, or remain on the books as unclosed cases for lack of a state cleanup program. The section has established a database to track and rank these illegal sites so that future cleanups may be organized by priority.

The potential for groundwater contamination and threat of explosion from buildup of methane gas have prompted a new look at the large number of closed landfills that operated with approval from the state. The section is conducting an inventory of those sites and developing a program to bring them under a level of monitoring consistent with the potential threat. The need for new regulations and additional staff is being examined.

Water quality investigations and assessments will be necessary at nearly all unlined landfills in North Carolina to determine the nature and extent of contamination and to assess the potential risk to public health and the environment by contaminant migration. Such investigations and assessments will permit proper evaluation of corrective action and remediation strategies for these facilities.

The land application of organic wastes expanded in the state during FY 1994-95. Additional food processing wastes were composted rather than disposed in a landfill.

The Solid Waste trust fund made awards of $200,905 to 17 projects. Additional projects promoting waste reduction and research of alternative waste management practices were funded.

North Carolina has initiated a substantial market development effort through its Recycling Business Assistance Center (RBAC). Two separate studies have documented the economic effects of the recycling industry in North Carolina, pointing to the support of more than 8,800 jobs statewide.

## DEPARTMENT RECOMMENDATIONS AND ACTIONS

The department makes the following recommendations and will pursue the following activities to protect public health and the environment through the advancement and improvement of solid waste management programs in North Carolina.

**Fund Illegal Dump Site Cleanup** - The North Carolina General Assembly should investigate sources of funding to support clean up of high priority illegal dump sites. Such support should include the development of a database to track and rank these sites for future cleanup.

**Continue Scrap Tire Disposal Account** - The General Assembly should continue the Scrap Tire Disposal Account to fund cleanup of nuisance tire sites. County scrap tire programs that require additional assistance should also be funded through the Scrap Tire Disposal Account.

**Extend State Disposal Bans to Additional Materials** - The General Assembly should consider statewide disposal bans of additional materials that have established markets for recycling.

**Create Uniform Tire Disposal Fee** - When the free disposal period ends, June 30, 1997, the General Assembly should consider setting a uniform disposal fee for the management of tires.

**Investigate Funding Source(s) to Fully Implement the Solid Waste Management Act** - The General Assembly should investigate methods of funding solid waste programs at both the state and local levels. In particular, funding is needed for the following activities:
- Development and implementation of comprehensive city/county solid waste management plans
- Financing of recycling collection and processing equipment, facilities and site preparation
- Activation of the Solid Waste Revolving Loan Fund
- Development and Implementation of the Used Oil Program
- Establishment of a recycling business grants and loan program
- Research and development of innovative solid waste management technologies and techniques.

**Use of White Goods Account Surplus** - The department will encourage local governments to use their white goods account funds to establish the infrastructure for effective management of white goods and clean-up sites of illegally disposed white goods.

**Upgrade White Goods Processing Areas** - The department will encourage counties to upgrade white goods processing areas and develop self-sustaining scrap metal recycling programs.

**Prevent Illegal Dumping and Improve Enforcement**- The department will provide technical assistance regarding the implementation of dumping prevention and enforcement programs. Programs should be developed to educate local law enforcement agencies, district attorneys, and local public health agencies on the magnitude of the problem and what can be accomplished at a local level.

**Complete Cleanup of Nuisance Scrap Tire Sites** - The department's program for clean-up of nuisance scrap tires will include even the very small sites. The Department will continue to

encourage use of inmate labor from the Department of Correction's Division of Prisons to clean up sites.

**Control Out-of-State Tire Disposal** - The department will promote greater efforts by county solid waste management programs to prevent free disposal of out-of-state tires in North Carolina.

**Identify and Monitor Closed Landfill Sites** - Pending available resources, the department will develop a program to identify and monitor closed, previously permitted landfill sites and to assess their potential for harm to the environment and public health. Critical sites will be identified based on the degree and types of environmental releases, and on locations such as high priority watersheds, and economically disadvantaged or minority communities. Statutes and regulation changes will be reviewed for needed authority to monitor and control these sites at a level consistent with the existing or potential threat.

**Assess Unlined Landfills** - The department will initiate water quality investigations and assessments at all unlined landfills to evaluate corrective action and remediation strategies. Applicable statutes and regulations should be revised accordingly.

**Increase Waste Reduction Efforts in Commercial and Industrial Sectors** - Progress toward the 40 percent waste reduction goal requires increased activity by state and local government. The department will target commercial, industrial and construction and demolition wastes for substantial source reduction and recycling efforts.

**Promote "Pay As You Throw"** - The department will continue to encourage local governments to use unit-based pricing to promote waste reduction.

**Investigate Options for Obtaining Private Sector Recycling Tonnages** - The department will investigate methods to obtain information about private sector recycling rates to increase the accuracy of state recycling estimates.

**Re-evaluate Measurement of Progress Toward Waste Reduction Goal** - The department will examine the use of factors (such as sales tax and employment statistics) in addition to per capita measurement to estimate state and local waste reduction progress.

**Regional Aggregation of Supply of Recyclables** - The department will encourage regional aggregation of recyclable materials and will provide technical assistance to improve the collection and processing of recyclables on a regional basis.

**Evaluation of Success of Mixed Waste Processing** - The department will evaluate the performance of mixed waste processing facilities by comparing total waste managed at the facility (including costs per ton to manage the waste or material) to the percentage of recyclables that are recovered.

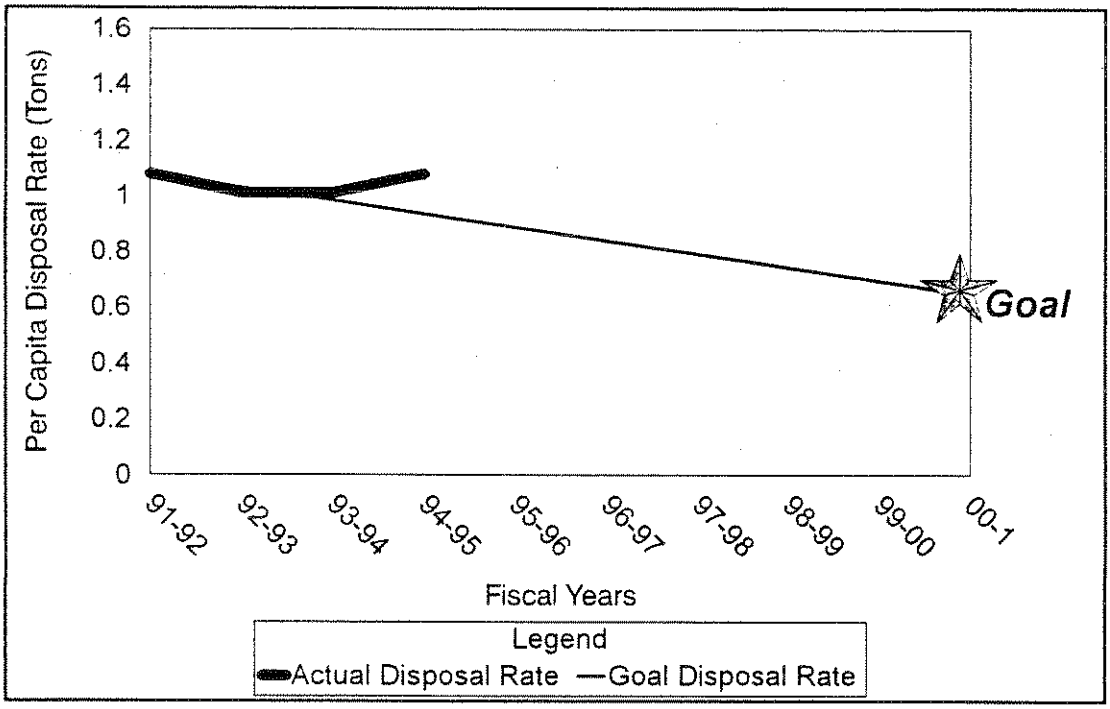
## CHAPTER ONE

## SOLID WASTE DISPOSAL

### State Progress Toward The Waste Reduction Goal

The 1991 amendment to the Act to Improve the Management of Solid Waste established a statewide 40 percent per capita waste reduction goal to be reached by June 30, 2001. Waste reduction is measured 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. The per capita managed rate for the 1991-92 base year was 1.08 tons. In FY 1994-95, the per capita disposal rate was once again 1.08 tons (see **Figure 1-1**). Therefore, no measurable progress toward the goal was made between FY 1991-92 and FY 1994-95.

**Figure 1-1: 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. This reduction in the disposal rate would require that between 2 and 3 million tons of waste currently being disposed would either have to be managed in some other fashion (reused, recycled, composted, or mulched) or not be generated (source-reduced).

**Table 1-1** shows the amount of municipal solid waste (MSW) disposed each year, the state population, and the resulting per capita rates of disposal. 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 92-93 and FY 93-94 before rising again to the baseline level in FY 94-95.

**Table 1-1: NC Per Capita Disposal Rates and Waste Reduction, FYs 1990-91 to 1994-95.**

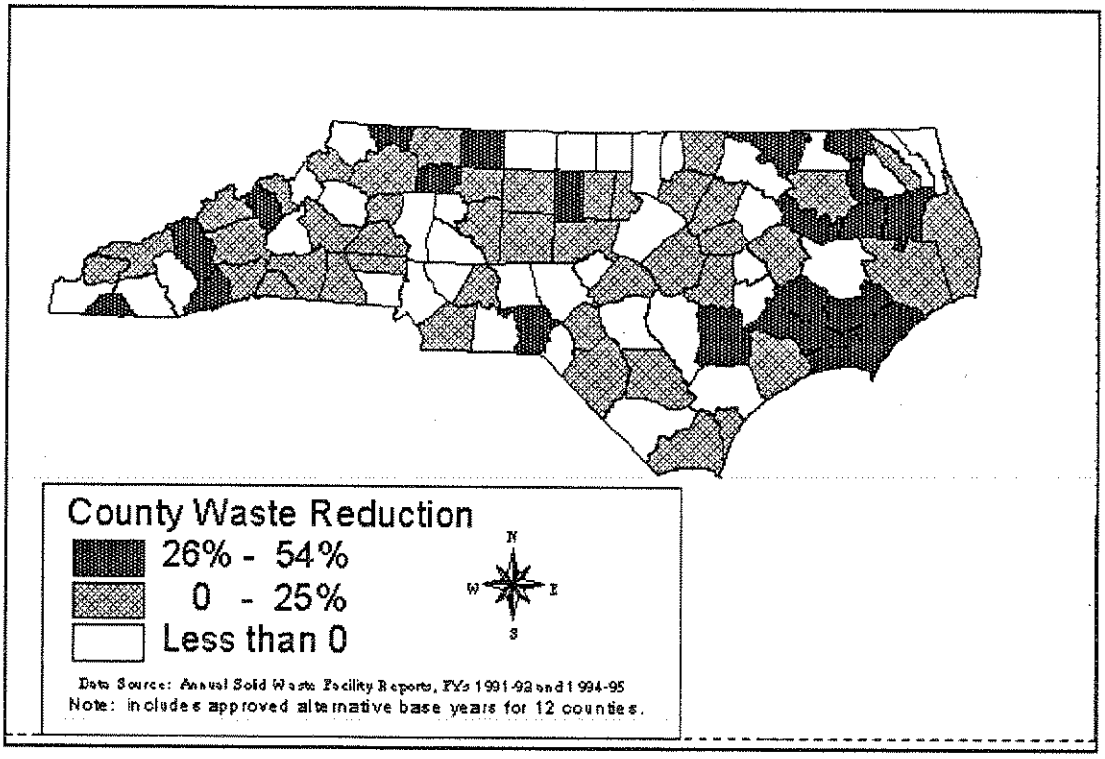
| Fiscal Years | Tons Disposed | Population | Per Capita Disposal Rate | Percent Waste Reduction from Base Year 1991-92 |
|---|---|---|---|---|
| 1994-95 | 7,624,144.85 | 7,064,470 | 1.08 | 0% |
| 1993-94 | 7,038,505.34 | 6,949,095 | 1.01 | 6% |
| 1992-93 | 6,890,818.15 | 6,836,977 | 1.01 | 6% |
| 1991-92 | 7,257,428.09 (managed) | 6,739,959 | 1.08 (Base Year Rate) | |
| 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 order to give credit to counties that began waste reduction programs prior to 1991. Industrial waste managed at private industrial landfills was not included in the calculation.

## County Progress Toward the Waste Reduction Goal

Although in FY 1994-95 the state did not reduce waste disposed, 63 out of 100 North Carolina counties did reduce waste. (See **Figure 1-2**). Twenty-one counties reduced more than 25 percent and 12 reduced more than 40 percent. [**Appendix B-1** lists all county waste reduction rates.]

**Figure 1-2: Waste Reduction by County, FY 1994-95.**




There are various reasons for the waste reduction achieved by counties. Northampton County, for example, switched from unstaffed collection centers to county-wide curbside collection, which gave the county more control over the waste collected. In addition, Northampton's base year waste disposal figures were estimated unusually high. Richmond County increased its tipping fee, which resulted in more wood waste being composted and industrial sludge being land-applied rather than landfilled. Stokes County increased its tipping fee, which provided incentive for landfill users to reduce waste and increase recycling. Stokes also staffed its convenience centers, which reduced out-of-county waste. Craven County's "pay as you throw" program continued to encourage waste reduction.

## Economic Growth Affected Progress Toward the Goal

While some counties achieved substantial waste reduction, others experienced an increase in waste disposed per person. Among the reasons for increased waste disposal, economic growth appears to be a strong influencing factor.

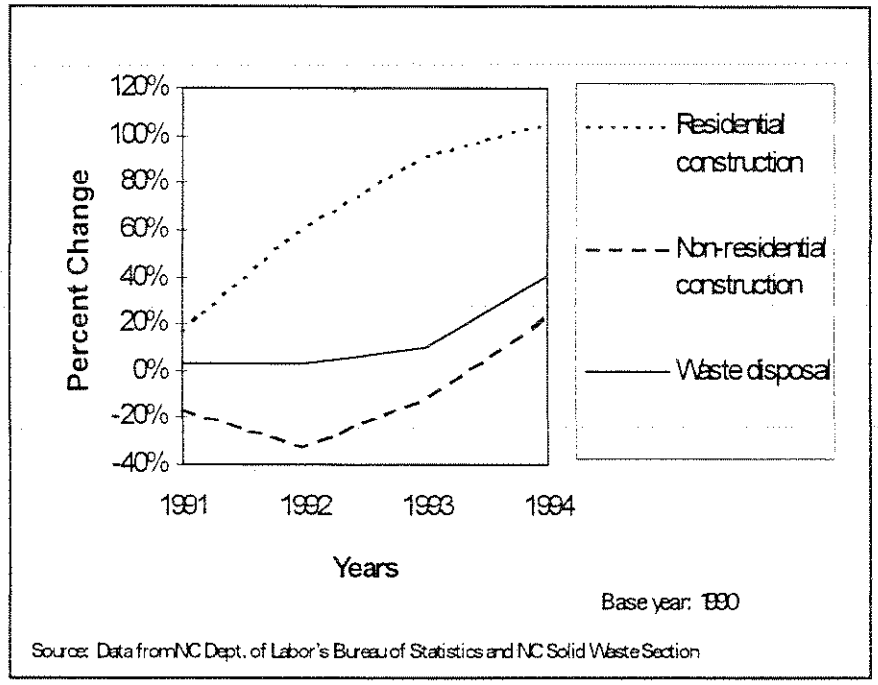
Economic growth appears to have affected local waste disposal, regardless of the presence of a strong waste reduction program. For example, Wake and Mecklenburg counties had increases in waste disposed (particularly construction and demolition waste), though both counties have strong waste reduction programs. Economic growth in these counties, and the state as a whole, can be measured by indicators such as construction starts and retail sales.

Construction Starts

The construction forecasts for new businesses, industry and residential areas increased in North Carolina. As more products are manufactured, there is more by-product and process waste to be disposed. Both construction starts and waste disposal increased annually in North Carolina after 1992.

An examination of individual counties, such as Wake, reflects this trend. The percent change in waste disposed increased at approximately the same rate as construction (see **Figure 1-3**).

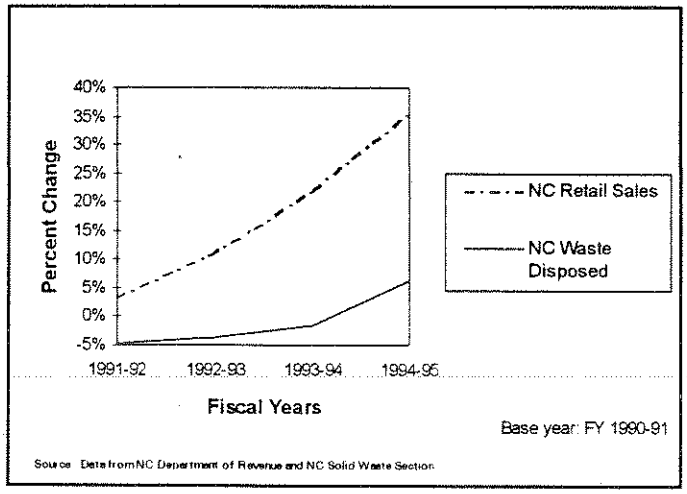
**Figure 1-3: Wake County Percent Change in Construction Starts, 1991-1994.**




Retail Sales

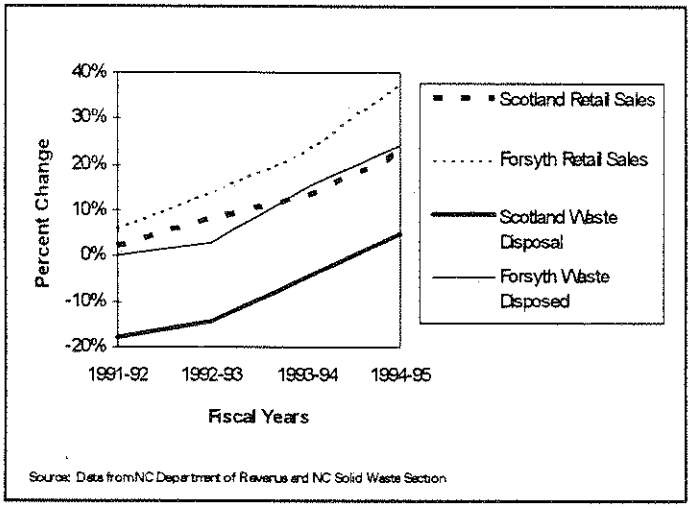
Retail sales, like construction activity, are an indicator of whether or not the economy is strong, and may also be an indicator of increased waste disposal. As products are consumed, more packaging and disposable items are disposed. **Figure 1-4** indicates that the percent change in retail sales was about the same as the percent change in waste disposed in North Carolina over a three year period .

**Figure 1-4: Percent Change in North Carolina Retail Sales, FYs 1991-92 to 1994-95.**




The connection between retail sales and waste disposal is especially clear when individual counties such as Forysth and Scotland are examined (see **Figure 1-5**). Both counties show approximately the same percent change in retail sales as in waste disposed over a four year period.

**Figure 1-5: Forysth and Scotland counties' Retail Sales, FY 1991-92 to 1994-95.**



## Other Factors That Affect Progress Toward the Goal

An increase or decrease in illegal dumping may affect a county's waste reduction rate, especially if construction and demolition waste is involved. For example, in 1994 Montgomery County initiated a strong program for enforcing proper disposal that decreased illegally dumped construction and demolition waste. The county also had an increase in industrial sludge disposed.

Cleanup activities and response to storms or other significant single events in areas of low population can also profoundly affect waste reduction. Lenoir County, for example, managed unusually large quantities of waste in FY 1994-95 as a result of two destructive tornados.

Some counties increased their disposal rate through changes in their solid waste management practices. Rockingham County reduced its construction and demolition waste tipping fee, which encouraged increased landfilling; and a large industrial firm there stopped recycling, adding to waste disposed by landfilling.

Waste shifted from an industrial facility to a local landfill may also affect waste reduction rates. For example, in FY1994-95 the Brunswick County landfill received waste that had been previously been disposed at CP&L's industrial landfill. Conversly, waste previously sent to a local landfill may be shifted to a private industrial landfill - that would artificially increase the local reduction rate.

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

## Municipal Solid Waste Management Facilities

Municipal solid waste in North Carolina is managed in landfills (publicly and privately owned), incinerators, private industrial facilities, and tire monofills (see **Table 1-2**). Some waste is exported.

**Table 1-2: North Carolina Solid Waste Disposal Facilities, FY 1994-95.**

| No. of Facilities | Facility Type | Total Tons Managed* |
|---|---|---|
| 80 | Landfills (MSW and C&D) | 7,151,413.76 |
| 2 | Scrap Tire Monofills | 97,612.72 |
| 2 | Incinerators** | 110,930.00 |
| 26 | Industrial Landfills | 1,782,825.82 |

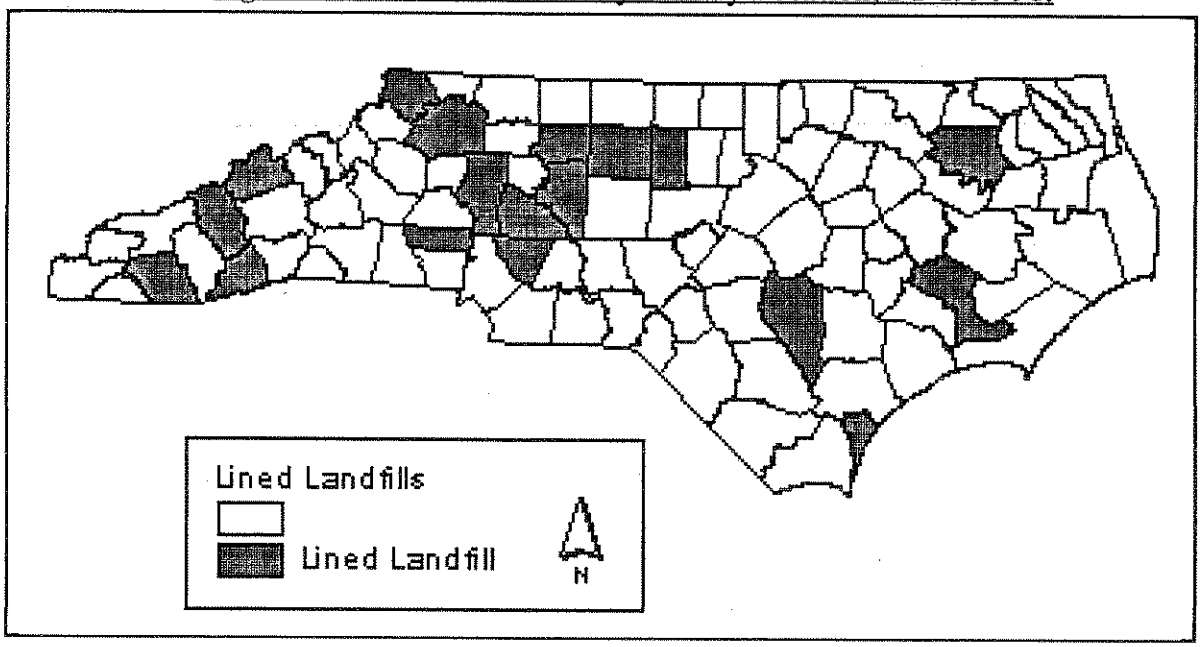
* Includes 118,370.41 tons of waste imported to N.C. landfills and monofills.
**Does not include medical waste incinerators. Net total does not include 55,124 tons of ash.

Landfill disposal continues to be the most prevalent type of waste management. Seventy-eight percent of the waste managed in North Carolina is handled at landfills. Incinerators manage 1 percent, tire monofills handle 1 percent, and private industrial landfills manage almost 20 percent. North Carolina also exported nearly 400,000 tons of waste in South Carolina facilities for management. **Appendix A** lists all permitted disposal facilities that received waste during FY 1994-95 in North Carolina.

Landfills

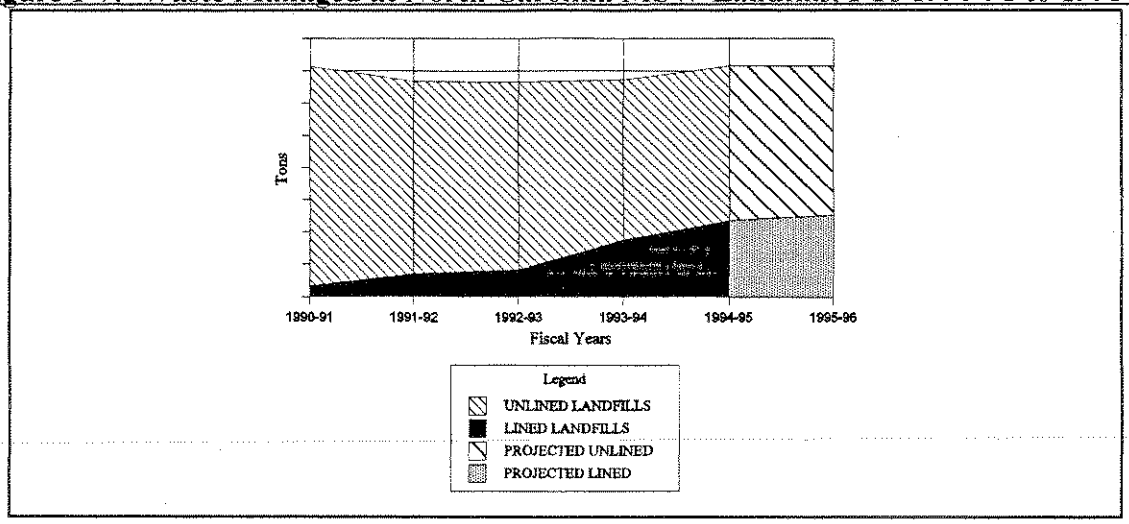
North Carolina communities continued to make the transition from disposing waste in local unlined landfills to transferring waste to more environmentally protective, lined facilities. This was the intent of federal Subtitle D and related North Carolina regulations that require liners in all landfills by January 1, 1998. **Figure 1-6** illustrates the county location of the 18 lined landfills in the state.

**Figure 1-6: Lined Landfills by County Location, FY 1994-95.**



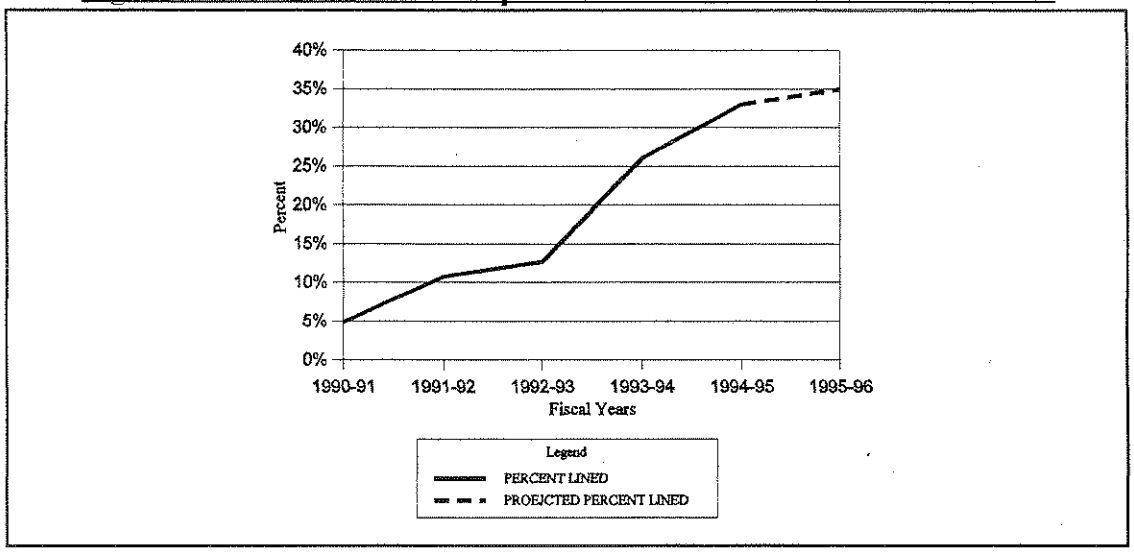

In FY 1994-95, facilities equipped with liners managed 2,349,489 tons of MSW (see **Figure 1-7**). It is expected that an additional 170,000 tons will be managed at lined facilities in FY 1995-96, as two more lined landfills will be operating.

**Figure 1-7: Waste Managed at North Carolina MSW Landfills, FYs 1990-91 to 1995-96.**




The amount of waste managed in lined facilities increased to 33 percent in FY 1994-95, up from the 26 percent in the previous year (see **Figure 1-8**). The next reporting period, FY 1995-96, is expected to show 35 percent of the MSW managed at lined facilities. The increase in waste managed at lined facilities is expected to increase slowly until 1998, when the Subtitle D liner requirement takes effect.

**Figure 1-8: Percent Waste Disposed in North Carolina Lined Facilities.**



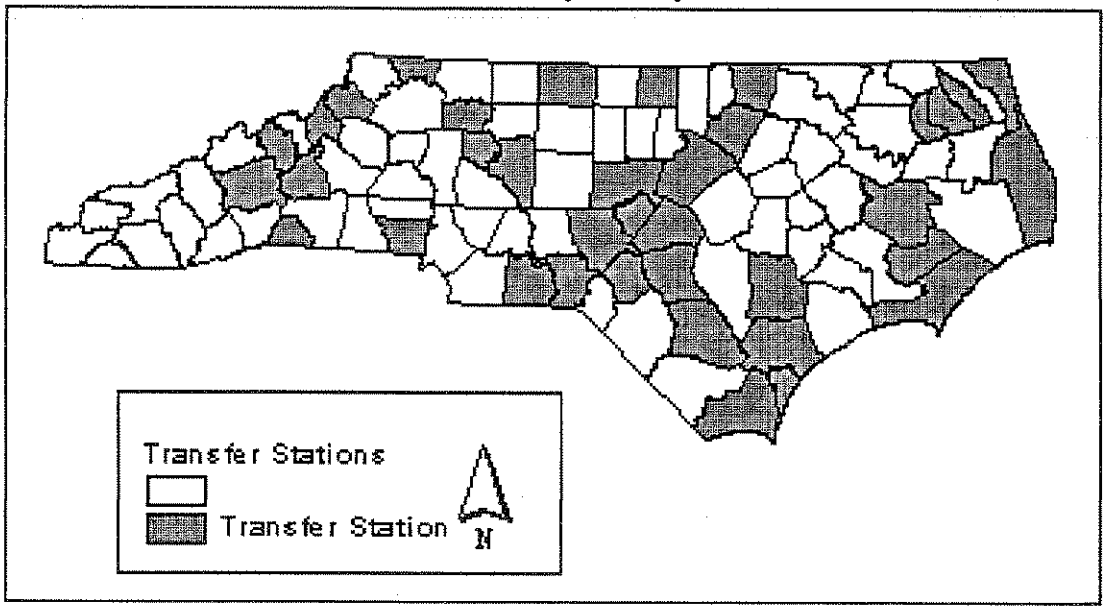
In FY 1989-90, there were 131 MSW landfills, only one of which was lined. The number of lined landfills increased slowly over the next several years because most landfills expanded vertically over the existing landfill footprint to avoid the Subtitle D liner requirements for new landfills. In FY 1992-93, prior to the Subtitle D effective date, there were 119 MSW landfills operating within the state. Following the effective date of the Subtitle D regulations in FY 1994-95, this number dropped to 65, only 16 of which were lined.

It is anticipated that in 1998 only 53 MSW landfills will operate -- all of which will be lined. By 2000, some of the smaller MSW landfills will probably have closed, and the total number of landfills may drop to as few as 50.

Transfer Stations

Many communities that closed a landfill constructed a transfer station in order to transport waste to another landfill. **Figure 1-9** shows the county location of the 40 transfer stations that operated in North Carolina during FY 1994-95. Some counties had several, such as Brunswick County, which operated three transfer stations. A few of the transfer stations received waste while the permit to operate was still pending.

**Figure 1-9: Transfer Stations, by County Location, FY 1994-95.**

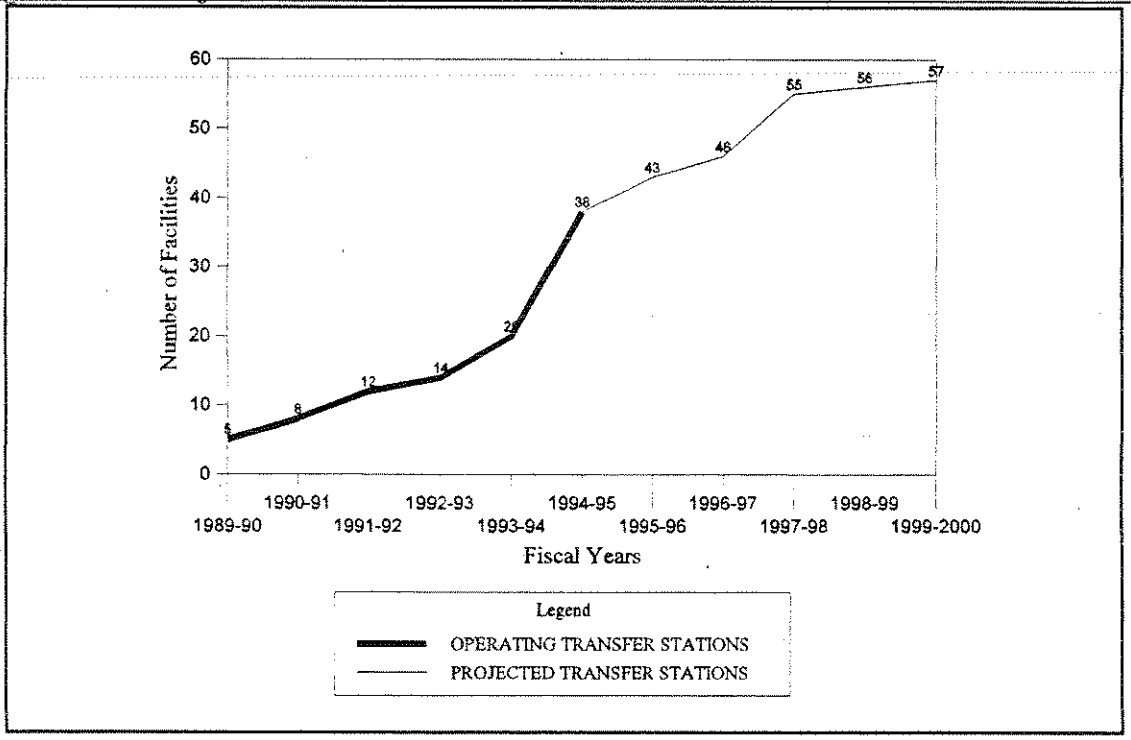



Swain and Caswell counties both used transfer stations that did not have a North Carolina permit. Swain County transported MSW to the Tribal Utilities Transfer Station in the Cherokee Qualla Boundary in Swain County. This tribally-owned facility is not permitted by the state. The Swain County waste was then hauled to the Palmetto Landfill in South Carolina. Caswell County sent waste to the Waste Management of Piedmont Transfer Station in Danville, Virginia. Waste

Management, Inc. then hauled the waste back to North Carolina to the Piedmont Landfill in Kernersville.

The number of future transfer stations can be projected based on past and proposed landfill information. In FY 1989-90, there were five transfer stations - in Carteret County, Town of Cary in Wake County, Cities of Reidsville and Eden in Rockingham County, and Brunswick County (see **Figure 1-10**). Most of the waste transferred from these facilities remained within the county. This number grew to 38 in FY 1994-95, and is expected to grow to 55 by FY 1997-98, and to 57 by 2000. The additional facilities will likely transfer waste to both regional MSW landfills and regional waste-to-energy facilities.

**Figure 1-10: Projected Number of Permitted Transfer Stations, FYs 1989-90 to 1999-2000.**

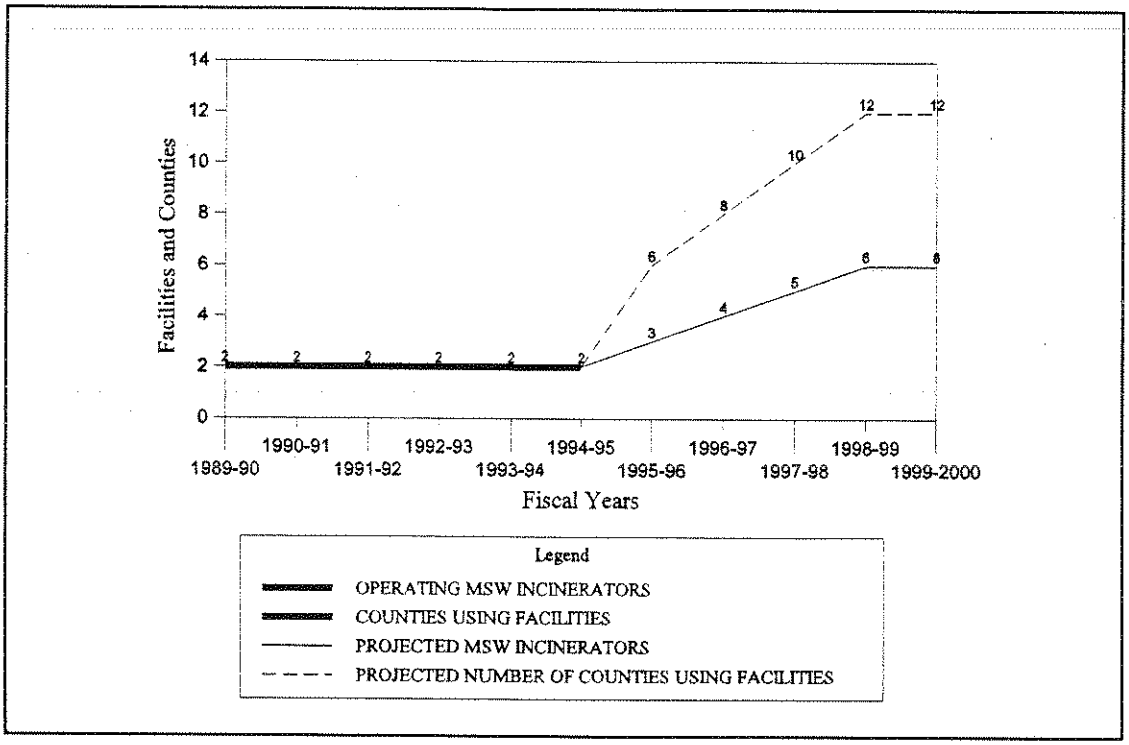


Incinerators

North Carolina had two operating incinerators in FY 1994-95: New Hanover Waste-to-Energy in New Hanover County, and Northeast Waste-to-Energy in Mecklenburg County. Northeast Waste-to-Energy became inactive in the Fall of 1995.

**Figure 1-11** shows the number of MSW incinerators operating and the counties transferring MSW to these facilities over a 10-year period beginning in FY 1989-90. In FY 1995-96, North Carolina's two current MSW waste-to-energy facilities, that have previously received only home-county waste, will be regional and will accept waste from many counties.

**Figure 1-11: Projected Number of Permitted MSW Incinerators, FYs 1989-90 to 1999-2000.**




By the next reporting period, FY 1995-96, there will be 3 MSW waste-to-energy facilities in operation. BCH Energy, in Bladen County, is a refuse derived fuel (RDF) fired energy generation facility. The BCH facility receives RDF from a mixed waste processing facility (in Cumberland County) that receives waste from Bladen, Cumberland, Hoke, and Brunswick counties. Two more RDF incinerators have received permits to construct: Wilson Resources, Ltd and Carolina Energy, Ltd. Both facilities plan to accept materials from Lenoir, Wilson, Pitt, Nash, and Edgecombe counties.

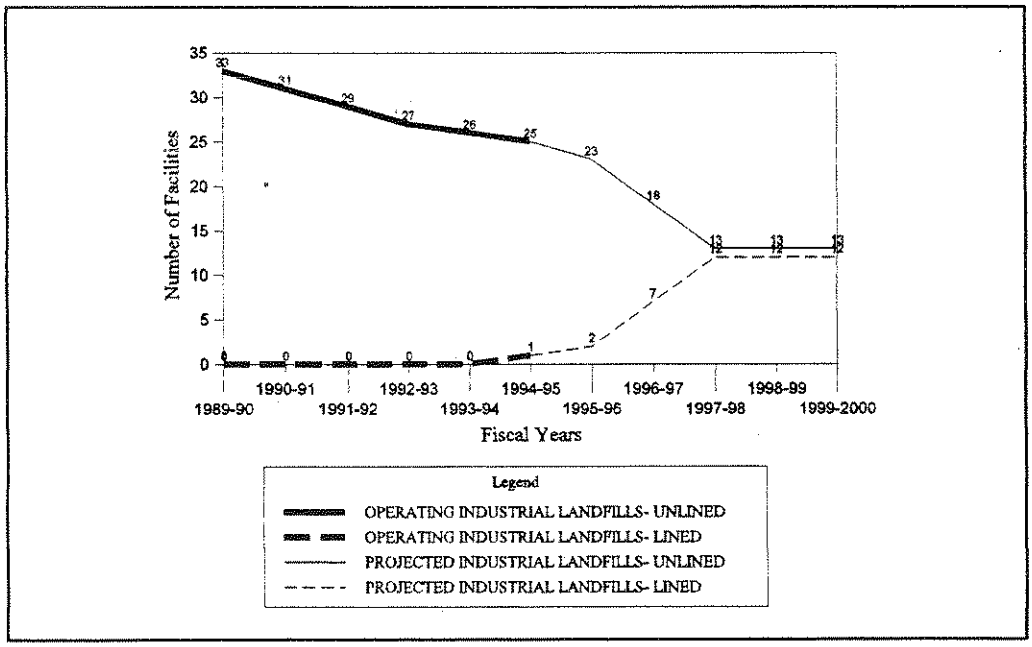
A review of issued and pending permits indicates that five waste-to-energy facilities will be taking waste from 10 counties in 1997-1998. By FY 1999-2000, an estimated six waste-to-energy facilities will be taking waste from 12 counties. (This projection may be high because as of this publication, it is not yet known whether facilities will be required to handle the MSW incinerator ash as hazardous waste.)

Industrial Landfills

In FY 1994-95, 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 will not be exceeded at their compliance boundaries. Landfills that cannot demonstrate their compliance with these requirements by January 1, 1998 must close and their waste must be sent to a lined facility.

**Figure 1-12** shows the number of industrial landfills, both lined and unlined, that have been operating and that can be expected to operate in the future. In FY 1989-90, there were 33 industrial landfills, none of which were lined. In FY 1994-95, there were 26 industrial landfills, one of which was lined. Available groundwater information suggests that at least 10 more of these unlined industrial landfills will become lined or will close by January 1, 1998. Thus, there will be possibly 13 lined and 12 unlined industrial landfills by the end of FY 1997-98.

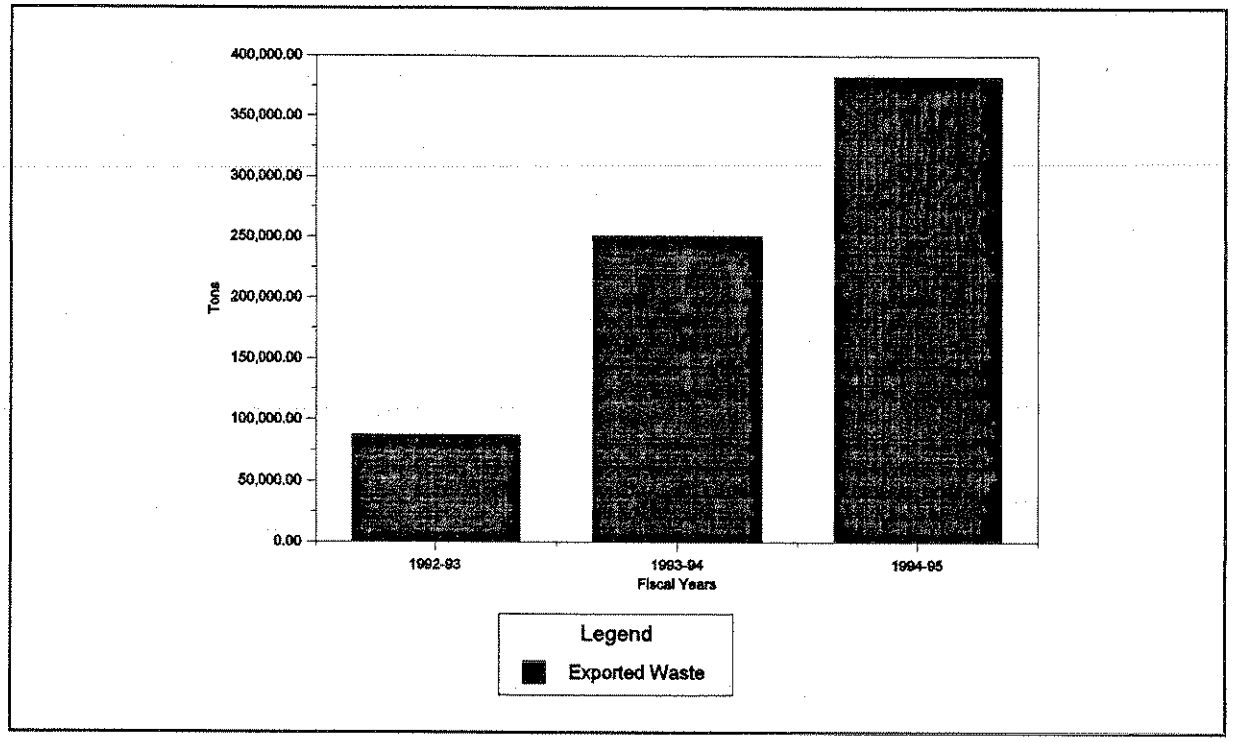
**Figure 1-12: Projected Number of Permitted Industrial Landfills, FYs 1989-90 to 1999-2000.**



## Waste Exports

Not all waste generated in North Carolina is managed at North Carolina facilities. In FY 1994-95, 382,559 tons of MSW were exported to South Carolina (see **Figure 1-13**). In the previous year, North Carolina exported 251,243 tons of waste. In FY 1992-93, 87,000 tons were reportedly exported. In FY 1991-92, a negligible amount of waste may have been exported, though none was recorded.

**Figure 1-13: North Carolina Waste Exported, FYs 1991-92 to 1994-95.**




The majority of the waste exported, 252,109.79 tons, was sent through transfer stations. Most of it went to Waste Management of South Carolina's Palmetto Landfill near Spartanburg, South Carolina (see **Table 1-3**). Approximately one third of the total exported was sent directly by haulers to facilities in South Carolina, rather than through transfer stations. It is possible that more waste may be going to South Carolina by direct haul than is revealed through the state reporting process.

Mecklenburg County, which requires haulers to report direct hauls, reported 126,976.87 tons of waste hauled directly to NorthEast Sanitary Landfill, Inc. in Richland County, SC. Polk County also had MSW hauled directly to South Carolina.

**Table 1-3: North Carolina Waste Exported, FY 1994-95.**

| COUNTY of ORIGIN | TONS | DESTINATION |
|---|---|---|
| Bladen | 162.51 | Lee Co. Recycling/Disp, SC |
| Buncombe | 64,471.00 | Palmetto Landfill, SC |
| Gaston | 92,414.09 | Palmetto Landfill, SC |
| Haywood | 346.45 | Palmetto Landfill, SC |
| Henderson | 15,326.00 | Palmetto Landfill, SC |
| Lincoln | 12,657.19 | Palmetto Landfill, SC |
| Mecklenburg | 37,347.13 | Palmetto Landfill, SC |
| Mecklenburg | 126,976.87* | NorthEast Sanitary LF, SC |
| Mitchell | 9,933.42 | Palmetto Landfill, SC |
| Polk | 6,238.00** | Palmetto Landfill, SC |
| Swain | 5,169.48 | Palmetto Landfill, SC |
| Transylvania | 1,646.07 | Palmetto Landfill, SC |
| Union | 243.22 | Palmetto Landfill, SC |
| Yancey | 9,577.35 | Palmetto Landfill, SC |
| TOTAL | 382,558.78 | |

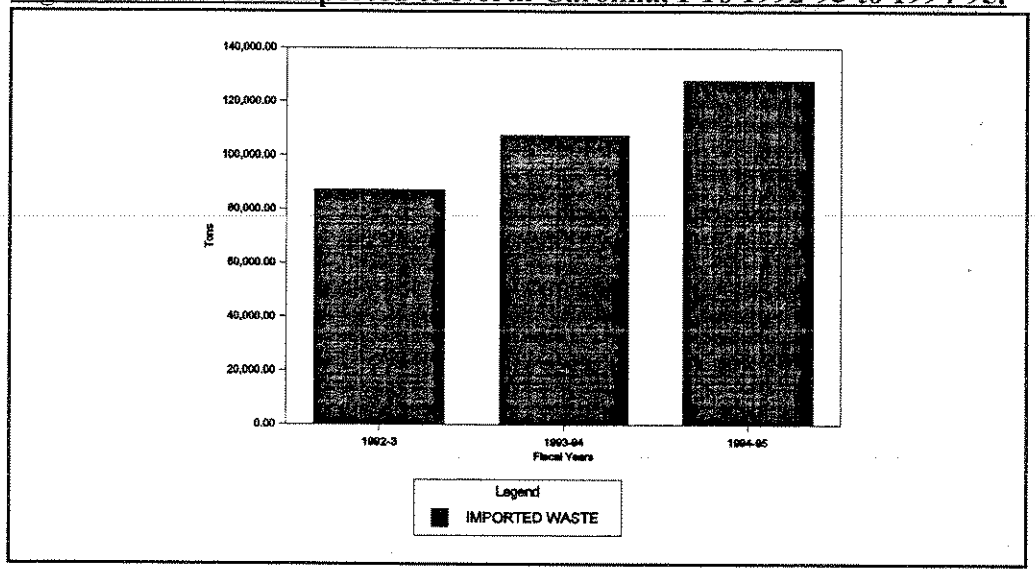
* Direct haul

**Includes 3,472.12 tons transported by direct haul to Palmetto Landfill

## Waste Imports

North Carolina accepted approximately 128,000 tons of waste from other states in FY 1994-1995. (See **Figure 1-14**). This amount represents almost a 19 percent increase over the previous year, in which 107,719 tons were imported.

**Figure 1-14: Waste Imported to North Carolina, FYs 1992-93 to 1994-95.**




North Carolina imported several kinds of waste from 11 states and the District of Columbia (see **Table 1-4**). Eighty percent of the waste was municipal solid waste, 15 percent was scrap tires, 5 percent was medical waste, and less than 1 percent was industrial waste.

**Table 1-4: Waste Imported to North Carolina, FY 1994-95.**

| WASTE TYPE | SOURCE | TONS IMPORTED |
|---|---|---|
| Municipal Solid Waste | SC, TN, VA | 102,039.83 |
| Medical Waste | DC, DE, FL, GA, IL, IN, NY, PA, SC, TN, VA, WV | 6,466.42 |
| Industrial Waste | SC, TN, VA | 477.21 |
| Scrap Tires | GA, SC, TN, VA | 18,916.70 |
| TOTAL | | 127,900.16 |

Imported waste was transported to several different types of facilities. Municipal solid waste was imported from Tennessee, Virginia and South Carolina to the Piedmont Landfill in Forsyth County (87,535 tons), and from South Carolina to the Columbus County Landfill (14,505 tons). Medical waste was incinerated at BFI Medical Systems, Inc. in Alamance County (3,220 tons) and Recovery Corporation of North Carolina in Mecklenburg County (3,246 tons). Industrial sludge was imported to HOH Corporation in Forsyth County for pre-disposal treatment and then sent to the Piedmont Landfill. U.S. Tire Recycling Partners monofill in Cabarrus County, Tire Disposal Service in Union County, and T.I.R.E.S. Inc. in Forysth County received 18,917 tons of tires from other states.

## Waste Management Fees

Tipping fees are still a standard method of paying for waste management services. However, there are many variations to this manner of charging customers. Some local governments charge household fees to cover waste management costs. For example, Madison County residents do not pay a tipping fee. However, all county residents pay an annual fee of $43.00.

Household fees were assessed at both the municipal and county levels (see Chapter Nine). County household fees ranged from $12.00 per year to $180.00 per year. Municipal household fees ranged from $10 per year to over $200.00 per year.

Sometimes a tipping fee charge depended on whether the load was from inside or outside the county. Both the Cherokee County landfill and Sampson County Disposal, Inc. charged in this fashion. Several regional landfills have varying schedules of fees depending on origin and type of waste. Sometimes tipping fees include transportation costs.

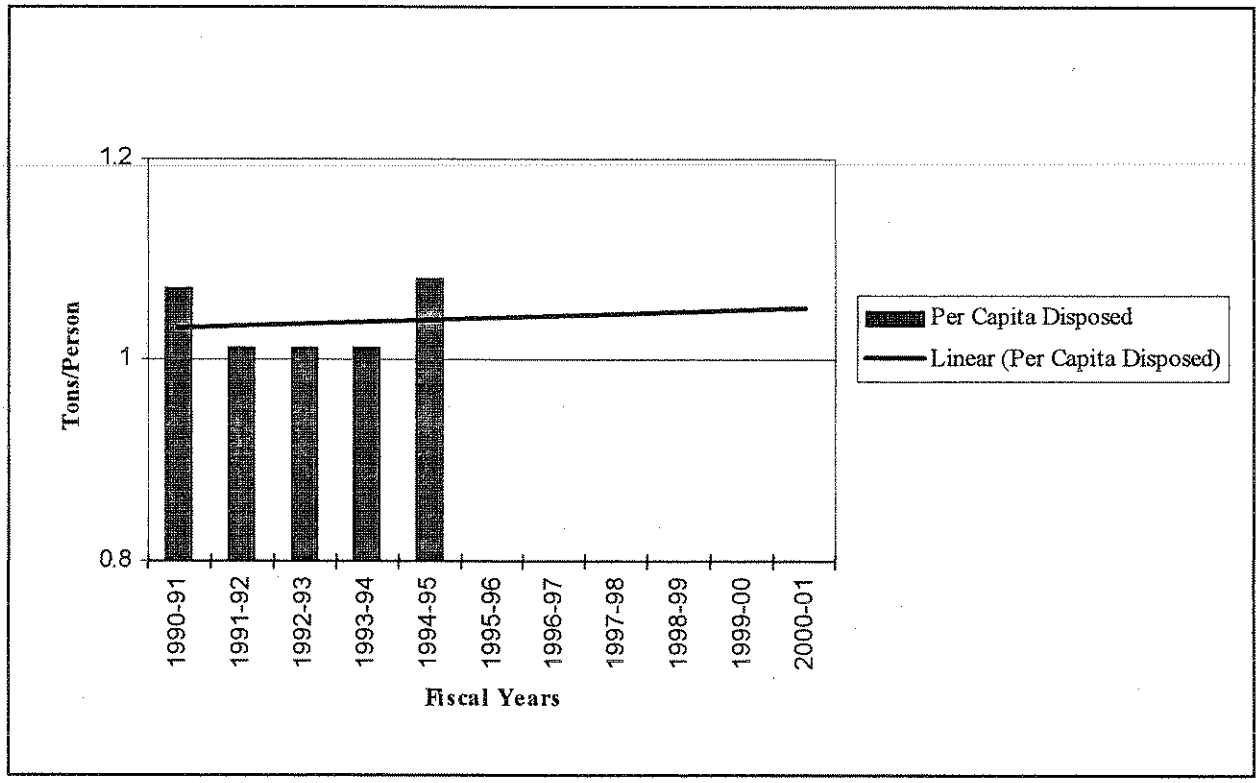
The average tipping fee for public, private, and publically owned/privately operated landfills in FY 1994-95 was $25.29 per ton. When the quantity disposed at each tipping fee is examined, the weighted average for the same landfills was $26.58 per ton.

In past annual reports, tipping fee averages were calculated only for public MSW landfills. For comparison sake, the average tipping fee for public MSW landfills in FY 1994-95 was $25.77. This can be compared to $26.53 in FY 1993-94 and $23.37 in FY 1992-93. In FY 1991-92, the average tipping fee for public landfills was $21.28/ton. In FY 1990-91, the average tipping fee was $19.03/ton. It is interesting to note that the average tipping fee at public facilities actually declined in FY 1994-95.

## Forecasting North Carolina Waste Disposal

Data from the Annual Solid Waste Management Facility Reports has been collected since 1990. North Carolina per capita disposal rates can be projected using linear regression trend lines with past disposal data. **Figure 1-16** shows a linear trend line that projects the North Carolina per capita disposal rate for FY 2000-01. According to this trend, North Carolina will not reach its waste reduction goal by 2000.

**Figure 1-16: Per Capita Disposal Trends, FYs 1990-91 to 2000-01.**




In summary, the average quantity of waste disposed per capita increased in FY 1994-95. There are several reasons for the increase, including strong economic growth in the state, changes in waste management practices, and reporting errors. Although the state is disposing more waste, more of that waste is being managed at environmentally protective, synthetically lined facilities than in past years. The number of transfer stations in operation continues to increase, which permits more waste to be exported and imported. Clearly, a significant escalation and expansion of waste reduction efforts (source reduction, reuse, recycling, composting and mulching) is needed to move North Carolina towards its 40-percent waste reduction goal.

## CHAPTER TWO

## SOURCE REDUCTION

North Carolina statutes establish waste reduction at the source, or "source reduction," as the first priority in managing solid waste. Source reduction, which is defined as avoiding the creation of waste by reducing the amount or toxicity of waste before it is generated, decreases the quantity of materials that must be collected, processed, or otherwise managed by landfilling, incineration, municipal composting or recycling.

### Total Programs Reported by NC Local Governments

Source reduction methods employed by local governments include those that are implemented "in-house," by local governments themselves, and those that are directed at the public. A total of 287 local governments had some type of source reduction efforts ongoing in FY 1994-95, which is an increase of 135 percent in local government participation over FY 1993-1994. The majority of source reduction efforts by local governments were in-house operations (155), followed by publicly targeted backyard composting programs (92).

**Table 2-1: Local Government Source Reduction Programs, FY1994-95.**

| Program | County | | | | City | | | | Totals | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FY 91-92 | FY 92-93 | FY 93-94 | **FY 94-95** | FY 91-92 | FY 92-93 | FY 93-94 | **FY 94-95** | FY 91-92 | FY 92-93 | FY 93-94 | **FY 94-95** |
| Public Only | 10 | 8 | 33 | **13** | 13 | 3 | 49 | **26** | 23 | 11 | 82 | **39** |
| In-House Only | 9 | 12 | 2 | **30** | 17 | 24 | 15 | **125** | 26 | 36 | 17 | **155** |
| Both | 4 | 13 | 17 | **41** | 7 | 19 | 6 | **52** | 11 | 32 | 23 | **93** |
| **Totals** | 23 | 33 | 52 | **84** | 27 | 46 | 70 | **203** | 60 | 79 | 122 | **287** |

### In-House Programs

In-house programs target solid waste streams generated by local government offices. Some of the types of programs involve computer services (e-mail), reusing or routing envelopes, reformatting forms, and sharing magazines. Examples of in-house source reduction efforts for FY 1994-95 by 248 local governments are included in **Table 2-2**.

**Table 2-2: Local Government In-House Source Reduction Programs, FY1994-95.**

| In-House Reduction Program | Number Local Govts. 93-94 | % of Total NC Local Govts. (620) | Number Local Govts. 94-95 | % of Total NC Local Govts. (620) |
|---|---|---|---|---|
| Duplex copying | 23 | 4% | 154 | 25% |
| Use of Ceramic Mugs (Reusable) | 23 | 4% | 163 | 26% |
| Scratch Pads from single-sided copies | 33 | 6% | 182 | 29% |
| Use of reusable laser toner cartridges | 12 | 2% | 79 | 13% |
| Electronic memos | 5 | 1% | 43 | 7% |
| Route memos | 13 | 3% | 61 | 10% |
| Use of less or non-toxic supplies | 15 | 3% | 82 | 13% |
| Other | 3 | 1% | 8 | 1% |
| Total Local Governments | **40** | **6%** | **248** | **40%** |

Publicly Targeted Programs

A total of 132 local governments sponsored some type of publicly targeted source reduction program in FY 94-95. Seventeen local governments reported spending some staff time on source reduction programs (a total of 38 staff members spending between 5 percent and 10 percent of their time). More local governments (92) have programs to promote backyard composting than any other activity. Other examples of publicly targeted source reduction efforts in FY 1994-95 are included in **Table 2-3**.

**Table 2-3: Local Government Publicly-Targeted Source Reduction Programs, FY 1994-95.**

| Reduction Program | No. of Local Governments with Publicly Targeted Programs 93-94 | No. of Local Governments with Publicly Targeted Programs 94-95 | Percent Local Governments with Programs 94-95 |
|---|---|---|---|
| Backyard Composting | 90 | 92 | 15% |
| Grasscycling | 52 | 49 | 8% |
| Xeriscaping | 10 | 12 | 2% |
| Enviroshopping | 35 | 35 | 6% |
| Promote use of non-toxics | 29 | 38 | 6% |
| Pallet Exchange | 12 | 18 | 3% |
| Paint Exchange | 12 | 17 | 3% |
| Materials Exchange | 14 | 13 | 2% |
| Source Reduction Workshop | 17 | 18 | 3% |
| Bulk Mail Reduction | 16 | 20 | 3% |
| Other | 14 | 11 | 2% |
| **Total Local Governments** | **106** | **132** | **21%** |

Variable Rate Pricing Programs

Although the Local Government Solid Waste Management Annual Report form does not ask questions specifically about variable rate pricing (VRP) of solid waste services, such programs may encourage reduction. VRP programs charge for residential solid waste collection on a volume or weight basis. Because VRP programs charge for the amount disposed rather than charging a flat rate, they offer economic incentives for the reduction of household solid waste. Thus, a VRP program can encourage residents to increase their recycling efforts and to practice such source reduction techniques as purchasing more durable goods, using repair and reuse shops, using thrift stores, and backyard composting.

A community that is interested in implementing a VRP program should consider certain basic questions. For example, a community may need increased enforcement of anti-littering provisions. Officials will have to account closely for solid waste collection and disposal costs to evaluate the community's ability to recover expenses. Multi-family housing may also pose a potential barrier to effectiveness with this type of program. The success of any program depends upon community support, and each community must evaluate the appropriateness of VRP programs. A list of the 22 local governments that currently have VRP programs is available from the Office of Waste Reduction (OWR).

## State Efforts Focusing on Source Reduction

Grants Programs

*Solid Waste Reduction Assistance Grants* (SWRAG) - In the 1995 Solid Waste Reduction Assistance Grant cycle, $40,000 out of $200,000 in available funds was earmarked for the source reduction category. Only $20,750 was requested by five applicants. The following table describes the grant recipients and their projects.

**Table 2-4: Solid Waste Reduction Assistance Grants: 1995 Source Reduction Grants.**

| Applicant | Amount | Project Description |
|---|---|---|
| Craven County | $5,000 | Used paint collection at 7 convenience centers for redistribution |
| Woodbin 2 Project | $4,000 | Discarded lumber diversion from residential building sites for use in kits to "do-it-yourselfers" |
| The Scrap Exchange | $5,000 | Discarded industrial scraps diverted for use in the creative arts |
| Town of Windsor | $1,750 | Purchase of 50 backyard composting bins for distribution to citizens attending compost class |
| NCRA/NC Composting and Organics Recycling Council | $5,000 | Conduct a statewide backyard composting training workshop |

3R Campaign

This statewide campaign provides a unified framework to heighten awareness of the **reduce**, **reuse**, and **recycle** message. A logo has been developed and camera-ready artwork distributed statewide to increase visibility of the program and alternatives to disposal of waste.

Education and Training

*Source Reduction Training Course* - Sixty business and local government representatives attended an intensive two-day source reduction workshop in August 1995. The Office of Waste Reduction, the NC Recycling Association, the NC Cooperative Extension Service, SunShares, Mecklenburg County, and Randolph County collaborated in sponsoring the course. Each participant received a 250-page manual, which included specific examples of programs and case studies as well as a comprehensive look at source reduction.

*Variable Rate Pricing* - OWR offered several workshops in FY 94-95 on variable rate financing as an integrated solid waste management tool. Approximately 30 people attended the NC Recycling Association's Annual Conference in April 1995 on variable rate financing. In addition, OWR, along with the Division of Solid Waste Management, hosted 3 downlink sites for the Environmental Protection Agency's Pay-As-You-Throw and Full Cost Accounting Teleconference. An hour-long presentation by North Carolina local governments that use variable rate programs followed the downlink.

**Conclusion**

Source reduction activities reported by local governments indicate that efforts to reduce waste are ongoing, but are not yet substantial enough to constitute a comprehensive source reduction program. A local government that reports using ceramic mugs and no other activity is counted as having made an effort, just as much as a government that uses reusable laser toner cartridges, routes memos, uses less-toxic cleaning supplies, offers backyard composting education, etc. A comprehensive program would entail multiple activities combined with supporting policy, staff, and budget. Greater source reduction is achieved by targeting bulk mail (junk mail) for reduction, teaching backyard composting of yard and food scraps, implementing variable rate pricing, and offering a waste exchange for local businesses. One activity does not make a program, but it is a start.

Residential curbside recycling programs are estimated to divert 2 percent to 15 percent of the local waste stream. Source reduction and reuse programs may be able to divert as much as 2 percent to 11 percent of the waste stream. However, less than 3 percent of 620 North Carolina local governments report spending staff time on source reduction efforts compared with 42 percent of local governments that offer residential curbside collection programs. Achieving the state's 40 percent solid waste reduction goal will require an increase in local governments' implementation of comprehensive source reduction programs.

## CHAPTER THREE

## RECYCLING

North Carolina counties and municipalities provide the bulk of the documented data on the recovery of recyclables in the state through the Local Government Solid Waste Management Annual Reports. Private sector recycling tonnages probably exceed the amount of materials collected by public sector programs, but the state receives no formal data to substantiate private sector efforts. The recently completed "Assessment of the Recycling Industry and Recycling Materials in North Carolina" (hereafter referred to as 'Market Assessment") does provide calculated estimates of the overall supply and recovery of various commodities in the state waste stream. (Copies of "Market Assessment" are available from the Office of Waste Reduction.)

Fiscal Year 1994-95 was marked by slow growth in recycling efforts by North Carolina local governments, both in terms of program implementation and tonnage collection totals. In fact, local government publicly-targeted recycling programs appear to have reached a plateau in their contribution to the achievement of the state's waste reduction goal. (Most of the increase in local government's diversion of waste is attributable to better reported and more widespread yard waste management programs).

However, if the Market Assessment projection of long-term demand for recyclable commodities is true, expanded local government efforts could contribute a much higher rate of reduction than has been achieved to date. In FY1995-96 and beyond, there may be opportunities for the addition of high volume materials (such as residential mixed paper) to local government programs, for the addition of new recovery programs across the state, and for improved efficiency in participation and collection activity. Local government programs that target commercial, industrial, and construction/demolition wastes could also make a substantial contribution to both local and state waste reduction rates.

In FY1994-95, as domestic mill capacity rose to new all-time high levels and as the export market reached new heights, there were sharp increases in prices paid for many recyclable commodities. As the Fiscal Year came to a close, prices began to fall back to levels near where they were before the increases, but not before many local governments that either market their own material or that had revenue-sharing arrangements with contractors enjoyed an enormous windfall. In FY1995-96, prices have hovered at low levels for many commodities. Gradual increases are projected as mill inventories fall and the export market returns.

In general, the recycling economy seeks a supply-demand equilibrium that will bring more long-term stable pricing. In support of that stability, many paper companies have begun to seek long-term supply arrangements with collectors and processors in North Carolina and in other states. Other developments, such as the introduction of recyclable commodity trading to the Chicago Board of Trade, are expected to contribute to stability by increasing the availability of market information and by encouraging long-term market relationships.

Market developments, such as expanded domestic mill capacity, are gradually changing the face of materials recovery in North Carolina. Some local governments took advantage of these developments in FY1994-95 by adding items such as residential mixed paper and plastic bottle resins (in addition to PETE and HDPE) to curbside and drop-off programs. As the paper industry expanded capacity, strict separation requirements for office and other type papers were relaxed. For example, some local governments were allowed to start mixing magazines and newsprint. This development, as well as increases in marketing opportunities for other commodities, allowed commercial and industrial generators of waste to expand their own recycling efforts.

Local Government Recycling in FY1994-95

Documented recovery levels for certain commodities are available through Local Government Annual Reports. In addition to recyclable materials, local governments also report compost and mulch totals and recovery rates for used motor oil, antifreeze, and household hazardous wastes. Although most local governments are able to provide tonnage figures broken down by individual commodities, some are only able to provide commingled numbers. Overall documented diversion of materials by local governments is provided in **Table 3-1**.

**Table 3-1: Diversion of Materials from Disposal by Local Governments FY 1990-91 Through FY 1994-95.**

| Material | FY1990-91 | FY1991-92 | FY1992-93 | FY1993-94 | FY1994-95 |
|---|---|---|---|---|---|
| Paper | 99488 | 98729 | 151676 | 164806.34 | 185269.65 |
| Glass | 16816 | 25997 | 32611 | 37536.92 | 38087.66 |
| Plastic | 2878 | 6128 | 9264 | 9797.02 | 12339.46 |
| Metal* | 30875 | 34148 | 44302 | 51468.24 | 59482.97 |
| Organics** | 105871 | 267428 | 378516 | 350141.94 | 495034.17 |
| Other*** | N/A | N/A | 4272.23 | 16387.39 | 5986.75 |
| Total | 256108 | 432430 | 620641.23 | 630137.85 | 796200.66 |
| Motor oil | 147816 | 262559 | 356771 | 391178 | 484386 |
| Batteries (No.) | 3338 | 16312 | 21918 | 36637 | 35281 |
| Antifreeze | N/A | N/A | N/A | N/A | 9379 |

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

Although North Carolina has not made any progress toward its waste reduction goals, an examination of the numbers in the above table shows that in FY1994-95, local government diverted over ten percent of the documented waste stream in North Carolina. **Table 3-2** shows collection rates and program for individual commodities.

**Table 3-2: Tonnages And Number of Collection Programs for Individual Commodities.**

| Material | Tons of material recovered | | | Number of programs* | | |
|---|---|---|---|---|---|---|
| | FY1992-93 | FY1993-94 | FY1994-95 | FY1992-93 | FY1993-94 | FY1994-95 |
| Newspaper | 85727.53 | 97534.3 | 109927.22 | 346 | 570 | 410 |
| Cardboard | 27679.33 | 42904.7 | 51464.44 | 204 | 250 | 271 |
| Magazines | 1289.33 | 2738.84 | 2749.48 | 86 | 145 | 93 |
| Office Paper | 13499.73 | 4920.94 | 5777.06 | 140 | 143 | 93 |
| Mixed Paper | 15004.4 | 6972.92 | 12615.99 | 96 | 110 | 113 |
| Other paper | 8475.9 | 9734.63 | 1735.46 | 53 | 44 | 51 |
| Clear Glass | 18580.02 | 21275.9 | 19801.66 | 420 | 462 | 398 |
| Brown Glass | 7611.56 | 8919.8 | 9801.08 | 407 | 440 | 385 |
| Green Glass | 6419.28 | 7341.21 | 8484.92 | 409 | 394 | 382 |
| Alum. cans | 4484.13 | 4208.04 | 4784.88 | 441 | 493 | 443 |
| Steel cans | 3179.4 | 4.288.87 | 6503.73 | 255 | 313 | 277 |
| PETE (#1) | 4856.69 | 5308.29 | 6882.54 | 349 | 394 | 352 |
| HDPE (#2) | 3500.85 | 4117.99 | 5.390.41 | 328 | 367 | 343 |
| All other plastics | 570.81 | 346.92 | 66.51 | 28 (average) | 27 (average) | 28 (avg.) |

*FY 92-93 and FY 93-94 numbers include in-house programs; FY 94-95 numbers represent only public-targeted programs.

As indicated by **Table 3-3**, curbside and drop-off program were by far the predominant collection methods used by local governments in FY1994-95, with drop-off accounting for the majority of recovery. One major drop-off tool used by local governments, especially rural counties, is staffed drop-off centers. A total of 930 such centers were spread across the state in FY1994-95.

**Table 3-3: Recovery of Materials by Program Type.**

| Program Type | Total Tons | Percentage of recovery |
|---|---|---|
| Curbside | 125232.22 | 37% |
| Drop-off | 154258.88 | 46% |
| Mixed Waste Processing | 23974.62 | 7% |
| Other | 31605.15 | 10% |

**Tables 3-4** and **3-5** show specific recycling collection programs reported by local governments in FY1994-95. There were of 582 recycling programs of all types conducted by local governments in the Fiscal Year.

**Table 3-4: County Recycling Programs in FY 1994-95.**

| Type of Program | Number of Programs | Percentage using private contractors | Number of programs targeting specific generation sectors | | |
|---|---|---|---|---|---|
| | | | Residential | Commercial | Industrial |
| Curbside | 18 | 72% | 15 | 10 | 2 |
| Drop-off | 92 | 47% | 92 | 48 | 27 |
| Mixed Waste Proc. | 5 | 100% | NA | NA | NA |
| Buyback | 5 | NA | 5 | 2 | 2 |
| School programs | 20 | NA | NA | NA | NA |
| Material drives | 13 | NA | 12 | 7 | 5 |
| Comm/Ind. prog. | 13 | NA | 0 | All | All |

**Table 3-5: Municipal Recycling Programs in FY 1994-95.**

| Type of Program | Number of Programs | Percentage using contractors | Number of programs targeting specific generation sectors | | |
|---|---|---|---|---|---|
| | | | Residential | Commercial | Industrial |
| Curbside | 240 | 73% | 240 | 108 | 21 |
| Drop-off | 123 | 48% | 121 | 66 | 22 |
| Mixed Waste Proc. | 5 | 100% | NA | NA | NA |
| Buyback | 3 | NA | 3 | 0 | 0 |
| School programs | 14 | NA | NA | NA | NA |
| Material drives | 8 | NA | 5 | 5 | 2 |
| Comm/Ind. prog. | 21 | NA | 0 | All | All |

North Carolina Statewide Recycling Participation Rate.

Local governments provide estimates of participation rates for their various programs in the Annual Reports. Those estimates provide the basis for determining an overall public participation rate for the state. Given curbside and drop-off programs as bases for participation rates, it is estimated that approximately 43 percent of all North Carolinians participated in residential recycling programs across the state in FY 1994-95. Clearly, based on these estimates, there is room for improvement in education, promotion and public involvement in recycling in North Carolina.

Estimated Recovery Rates for Selected Materials

Another way of measuring North Carolina recycling performance is to examine recovery rates for certain commodities. The 1995 Market Assessment provides data on the amount of specific commodities assumed to be present in the state waste stream, as well as estimated recovery rates for those commodities. Much of the estimates of recovery are based on the documented numbers provided in the Local Government Annual Reports; other sources of data come from state agency reports and attachments within local reports that document private sector efforts. The Market Assessment recovery estimates, plus other data on commercial and industrial recycling activities, provide the basis for a calculation of an overall state "recycling rate."

**Table 3-6: Calculated Recovery Rates for Specific Commodities in NC Waste Stream.**

| MATERIAL | Assumed supply in | NC 1995 Market Assessment recovery estimate | |
|---|---|---|---|
| | NC waste stream | Tons | % of supply |
| Newspaper | 275000 | 112098.79 | 41% |
| Cardboard | 734000 | 411000 | 56% |
| Magazines | 57400 | 2976.48 | 5% |
| Office Paper | 200000 | 76000 | 38% |
| Mixed Paper | 624500 | 13565.8 | 2% |
| Clear Glass | 176000 | 19997.66 | 11% |
| Brown Glass | 66000 | 9980.08 | 15% |
| Green Glass | 90000 | 8575.92 | 9% |
| Alum. cans | 43740 | 19683 | 45% |
| Steel cans | 55490 | 6659.99 | 12% |
| PETE (#1) | 23500 | 7005.54 | 30% |
| HDPE (#2) | 34700 | 5470.41 | 16% |
| All other plastics | 132400 | 5066 | 4% |

Note: The Market Assessment assumed that private sector recovered tonnages for Newspaper, Magazines. Mixed Paper, Glass, Steel Cans, and #1 and #2 plastics were minimal. Thus, total recovered tonnages for those commodities were assumed to be equivalent to local government and other documented recovery, including some private sector numbers provided through local government reports and some state agency recovery numbers.

Estimating North Carolina's "Recycling Rate"

North Carolina measures its waste reduction progress on the basis of per capita disposal rates. Other states measure recycling rates. It is difficult to calculate a recycling rate for North Carolina because of the lack of documented private sector recovery. However, given the numbers in **Table 3-6** above, numbers for other commodities included in the Market Assessment

(e.g., pallets, wood wastes, etc.) and other data on the capacity of the private sector recycling industry in North Carolina, this state's "recycling rate" may be estimated between 20 and 24 percent.

Prices for Recycled Materials in FY1994-95

Prices paid for recyclable materials in FY 1994-95 reached unprecedented heights before drifting back down to "normal" or even lower-than normal rates at the end of calendar year 1995. Recycling Times magazine tracks National pricing data. Although the magazine's reported prices are not specific to North Carolina, they do provide a good indicator of price movement. The following table, derived from Recycling Times data, shows prices for some basic recyclable commodities in FY1994-95:

**Table 3-7: National Average Prices Paid for Selected Commodities at End-User Facilities, FY 1994-95.**

| MTH/ YR | Alum. cans $.00//lb. | PETE $.00/lb. | HDPE $.00/lb. | Newspaper $/ton | Magazines $/ton | Cardboard $/ton | Clear Glass $/ton |
|---|---|---|---|---|---|---|---|
| 6/95 | 62-70 | 14-22 | 27-36 | 95-115 | 30-70 | 190-242 | 37-50 |
| 5/95 | 62-70 | 14-22 | 27-36 | 95-115 | 30-70 | 190-242 | 37-50 |
| 4/95 | 60-68 | 7-17 | 22-34 | 80-115 | 10-50 | 140-180 | 37-50 |
| 3/95 | 64-75 | 7-17 | 18-29 | 80-115 | 0-30 | 100-130 | 37-50 |
| 2/95 | 69-80 | 7-17 | 18-29 | 80-120 | 0-10 | 70-110 | 37-50 |
| 1/95 | 64-73.5 | 7-17 | 11-23 | 76-120 | 0-10 | 55-95 | 37-50 |
| 12/94 | 60-71 | 7-17 | 11-23 | 76-120 | 0-10 | 55-90 | 10-25 |
| 11/94 | 59-69 | 7-15 | 6-17 | 70-120 | 0-5 | 55-100 | 10-30 |
| 10/94 | 50-57 | 6-13 | 6-11 | 60-100 | 0-5 | 55-110 | 10-30 |
| 9/94 | 50-57 | 6-13 | 6-11 | 60-100 | 0-5 | 55-110 | 35-65 |
| 8/94 | 50-55 | 6-13 | 6-10 | 20-60 | 0-5 | 55-120 | 45-65 |
| 7/94 | 50-53 | 6-13 | 6-10 | 10-40 | 0-5 | 55-120 | 55-65 |

Source: Recycling Times

Private Sector Recycling

As noted above, measurement of recycling efforts in North Carolina is hampered by lack of mechanisms for assessing the levels of private sector recovery. Still, the level of private sector recycling is assumed to be as high if not higher than public sector recycling. This assumption rests in part on observations of how certain commodities have fared. Corrugated cardboard has consistently been recycled at high levels by the private sector, especially by large generators, such as industrial plants, grocery and retail stores. The recovery of cardboard in North Carolina has been bolstered by disposal restrictions in many counties and by increased demand and value associated with expansions in mill capacity. Office paper has also undergone a dramatic increase in market demand; prices for office paper are expected to remain at relatively high levels, which would drive greater private sector recovery rates. There is growing evidence of the start-up and expansion of companies that provide office paper recycling services. Aluminum

cans are another example of a commodity recycled on a large scale by private citizens and businesses, in part because of the value of cans, but also because a statewide disposal ban is in place.

Industrial recovery of certain "process wastes" is also assumed to be at a high level. Two leading industries in North Carolina, furniture and textiles, have made great strides in diverting their process wastes (e.g., wood, fabric, cones and dye-tubes) from disposal. Burlington Mills announced in FY1994-95 a breakthrough in the recycling of denim wastes that would allow it to divert 50,000 tons of material per year from landfills. A composting firm in Rocky Mount has begun to consume large quantities of tobacco dusts, cotton gin waste, and off-spec pressboard, all of which used to be disposed. In late FY1994-95, a new company began to receive waste gypsum wallboard from manufactured home industry plants. Further, pallet recycling companies have expanded dramatically in the past five years in North Carolina.

The drop in prices paid for recyclable materials may discourage some recycling in North Carolina in FY1995-96. If the 1995 state Market Assessment is correct, there will be future demand for many recyclable commodities in North Carolina and the southeastern United States. Recycling programs would then benefit from a solid price "floor" under those materials, if not substantial price increases. Clearly, improvements and expansions in both public and private sector recovery will be necessary if the state is to make any progress toward its waste reduction goal.

## CHAPTER FOUR

# SPECIAL WASTES
# and
# HOUSEHOLD HAZARDOUS WASTE

Special wastes are defined in G.S. 130A-290 as "solid wastes that can require special handling and management, including white goods, whole tires, used oil, lead-acid batteries, and medical wastes." Such wastes require special handling and management because they present particular hazards to the environment and public health. For example, white goods that contain chlorofluorocarbon refrigerants (CFCs) must be managed in a way that avoids release of these ozone-depleting compounds into the atmosphere. Medical waste poses biological hazards; whole tires create problems of bulk, provide breeding ground for mosquitos and are potential fire hazards; while used oil and lead-acid from batteries are toxic and difficult to contain.

In addition to having special handling requirements, special wastes may be banned from landfilling or require special treatment prior to landfill disposal. Fortunately, some of the special wastes banned from landfills can be recycled. White goods have been successfully recycled for years, though there are occasional periods of reduced market demand.

## White Goods

The term "white goods" includes refrigerators, ranges, water heaters, freezers, unit air conditioners, washing machines, dishwashers, clothes dryers, and other such domestic and commercial appliances. In FY 1994-95, local governments collected 41,296 tons of white goods **(Table 4-1)**.

White goods are managed in a comprehensive program the state initiated to protect stratospheric ozone and provide for resource conservation. The White Goods Management Program requires that chloroflourocarbon refrigerants (CFCs) be removed with special care from discarded appliances such as refrigerators and freezers. Failure to remove CFCs from appliances being disposed is a violation of state law (G.S. 130A-309.84), and is subject to severe penalties.

Appliances such as refrigerators and freezers have been recovered for years by scrap yard dealers and metal recoverers, and counties continue to rely on such contractors for recovery of CFCs. Some metal recyclers are willing to remove white goods from county collection sites and to recover the CFCs at no cost to the county in order to have access to the scrap metal. Thus, counties that have strong white goods recycling markets have sometimes eliminated the cost of disposing white goods properly. Yet, for counties that do not have strong recycling markets or ready access to metals recoverer, the cost of proper management of white goods can become expensive.

Counties are not allowed to charge fees for white goods disposal at their landfills. To provide funding for metal recycling and CFC removal programs, a tax was imposed on the sale of white goods. The tax, effective January 1, 1994, is $10 for white goods that contain CFCs and $5 for white goods that do not contain CFCs. Both the tax and the ban on disposal fees will be discontinued in June 1998.

Seventy-five percent of the tax revenues are distributed directly to the counties on a per capita basis to provide for white goods management and CFC removal. Some counties use the funds to pay for removal equipment, personnel training, labor, transportation and the construction of concrete pads and over-head shelters in areas for processing white goods. Some counties are also using the funds to clean up illegal dump sites of discarded white goods.

Some counties are not using the funds. Between July 1994 and June 1995, 70 counties had reportedly accumulated $2,690,847 in reserve. The Solid Waste Section recommends that counties use these funds to develop an infrastructure that will ensure the continued recycling of white goods without cost to the disposer. Such a measure could significantly reduce the illegal dumping of white goods. The funds should also be used to clean up illegal dump sites.

White Goods Management Account

The white goods management account is a special fund set up to assist counties that incur costs that exceed their normal share of the disposal tax revenue. The account receives 20 percent of the revenue from the white goods disposal tax. Grants from this fund of $48,616 were distributed to six counties for losses incurred between July and December 1994; and $123,089.67 was distributed to seven counties for losses incurred between January and June 1995.

Eligibility for grants is based on factors such as a county's financial ability to manage white goods and the severity of the white goods disposal problem in that area.

For a more detailed presentation of the status of North Carolina's white goods management, see the "White Goods Management Report" prepared by the Solid Waste Section. This comprehensive report is submitted every October to the Environmental Review Commission.

## Used Oil

Used oil has been recovered and used as fuel for many years. Processors who collect and market used oil as a fuel recover the bulk of their product from service stations and fleet operations, such as bus and trucking companies. Some of these private facilities and companies also cooperate with local governments to offer collection services to "do-it-yourself" [DIY] citizens (individuals who change their own oil).

Approximately 60 percent of the 21 million gallons of oil sold for light trucks and automobiles in North Carolina is sold to DIY people each year. In FY 1994-95, local governments collected 484,386 gallons of used oil from DIY collection site facilities. This amount is still far short of the millions of gallons that are recoverable, yet represents a 24 percent increase in the amount collected by local governments the previous fiscal year. Since the ban has been in effect for several years now, the continuing increase in cooperation indicates that the program is growing in strength.

North Carolina's regulations on used oil were adopted from the regulations of the Environmental Protection Agency, and are administered by the Hazardous Waste Section of the Division of Environmental Management. Hazardous waste staff have worked for the past several years with the North Carolina State Cooperative Extension Service. The Service conducts county-wide training workshops to educate homeowners and farmers.

## Medical Waste

Medical waste is any solid waste that is generated in the diagnosis, treatment, or immunization of human beings or animals. Medical waste subject to regulation in North Carolina includes pathological waste (such as body parts), microbiological waste (such as cultures and stocks), and bulk blood.

The North Carolina Medical Waste Management Regulations designate incineration as an acceptable treatment for regulated medical waste, which is a small portion (about 10 percent to 15 percent) of the total medical waste stream. The waste that is typically incinerated is mostly nonregulated medical waste, such as used gloves, tubing, sharps, bloody gauze and dressings.

About 23 North Carolina hospitals own and operate medical waste incinerators and treat waste generated on site. Hospitals that treat their waste on-site are not required to have a solid waste permit or to submit an annual report to the state, but all medical waste incinerators must have an emissions permit and comply with EPA air quality standards.

### Permitted Medical Waste Treatment Facilities

Medical waste treatment facilities in North Carolina must receive solid waste permits to treat waste generated off site. **Table 4-1** shows the tonnage treated at North Carolina's permitted medical waste treatment facilities, all of which treat waste from both in and outside the state. Biomedical Waste of North Carolina, Inc, [BMWNC] operates a medical waste incinerator in Matthews. This facility, previously known as "Recovery Corporation," was not in operation from January 1 through June 30, 1995, which accounts, in part, for the low volume recorded. Browning Ferris Industries [BFI] operates a medical waste incinerator in Haw River. SafeWaste Corporation has operated a microwave treatment facility near Asheville since January 1995.

**Table 4-1: Tonnage of Medical Waste Incinerated by Permitted Medical Waste Treatment Facilities in FY 1994-95.**

TONS

| Incinerator | Waste from North Carolina | Waste from Out-of-State | Total |
|---|---|---|---|
| BMWNC, Inc. | 2937 | 3246 | 6,183 |
| BFI | 6863 | 3220 | 10,083 |
| SafeWaste Corp. | 74 | 0 | 74 |
| **Total (Tons)** | **9874** | **6466** | **16340** |

Fourteen states shipped medical waste to North Carolina incinerators in FY 1994-95. Roughly 40 percent (6,466 tons) of the medical waste incinerated in North Carolina (16,340 tons) originated out-of-state.

Incineration has traditionally been the preferred means of treating medical waste in North Carolina hospitals, but it remains a controversial method for many members of the public. Recent US EPA studies have identified medical waste incinerators as the largest known sources of dioxin and mercury emissions. Other emissions of concern are nitrogen oxides (which contribute to ozone smog), sulfur dioxide, lead, cadmium and particulate matter. As a result, the EPA has proposed tougher, more protective regulations. If the new regulations are enacted, approximately 80 percent of existing medical waste incinerators will probably be unable to meet the higher standards, and will consequently have to close over the next three years. Many small incinerators have already closed in recent years due to inability to meet current EPA air quality standards for incinerator operation.

Innovative Medical Waste Treatment Technologies

New technologies for the treatment of medical waste are receiving increased attention at North Carolina medical facilities. A new steam sterilization process is used at the High Point Regional Medical Center in High Point. This sterilizer draws a vacuum in the initial stage of the cycle. This feature helps overcome the problem of incomplete steam penetration that occurs in standard autoclaves. To avoid air emissions, the steam is condensed and discharged into the sanitary sewer.

Forsyth Hospital in Winston-Salem and Moore Regional Hospital in Pinehurst use microwave treatment to treat medical waste generated on-site. The treatment process uses microwave energy to generate moist heat. This heat decontaminates the waste, which is shredded to ensure uniform treatment. The Forsyth unit has been used to treat approximately 500 tons per year since 1990.

A mobile microwave unit provides treatment of hospital medical waste on-site at the following hospitals: Memorial Mission Hospital and St. Joseph's Hospital in Asheville; Presbyterian Hospital, Mercy Hospital, and Carolinas Medical Center in Charlotte; Lincoln County Hospital in Lincolnton; Presbyterian Matthews Hospital in Matthews; Cabarrus Memorial Hospital in Concord; and Iredell Memorial Hospital in Statesville.

Technical Reviews and Approval of Innovative Technologies

Innovative technologies can be used in North Carolina to treat regulated medical waste only after obtaining state approval, as specified in 15A NCAC 13B .1203 (b). The approval process requires a review of the validity of experimental data submitted to describe the unit's ability to deactivate microorganisms. The review includes:

- Microbiology review - Adequacy of the experimental design of the lab studies is evaluated. The materials and methods used are compared with standard procedures used in microbiological studies. The data is reviewed and the appropriateness of conclusions drawn from the data is evaluated.

- Review of environmental discharges. Vendors are referred to the appropriate agency if air or water discharge permits are needed.

- Review of worker safety and operator training. Aspects such as venting are reviewed. Parts of the equipment to be serviced should undergo decontamination procedures prior to being accessed by workers.

- Review of the waste stream to be treated and applicable regulations.

Technical Review and Approval of Innovative Medical Waste Treatment Technologies

Medical waste treatment technologies that are currently used or are under review for approval in North Carolina are shown in **Tables 4-2** through **4-4**. Eleven companies have obtained approval to use technologies such as microwave treatment, far-infrared heat treatment, and use of chemical disinfectants and sterilants. Six other technologies are under review.

**Table 4-2: Medical Waste Treatment Technologies Approved for Use in North Carolina.**

| COMPANY | EQUIPMENT NAME | TYPE OF TECHNOLOGY |
|---|---|---|
| Spintech, Inc | TAPS | Thermal treatment |
| Winfield Environ Corp | Winfield Condor | Shred/Chemical treatment (chlorine dioxide) |
| Mediclean Tech, Inc | IWP-1000 | Shred/Chemical (chlorine dioxide) |
| Ecomed Company | Ecomed | Shred/Chemical (iodophor) |
| Medical Safetec, Inc. | Medical Safetec | Shred/Chemical (sodium hypochlorite) |
| Medifor-X Corporation | Dispoz-All 2000 | Infra-red heat treatment |
| Isolyzer Company | Sharps Disposal System | Chemically treat/solidify |
| D.O.C.C. Inc. | Demolyzer | Thermal treatment |
| Steris Corporation | Steris 20/EcoCycle 10 | Shred/Chemical sterilant (peracetic acid) |
| MedAway, International | MedAway 1 | Dry heat sterilization |
| Bioconversion, Inc | Bioconversion | Shred/Enzyme treatment(bioremediation) |

**Table 4-3: Medical Waste Treatment Technologies under Review for Approval.**

| | | |
|---|---|---|
| Tempico, Inc | Rotoclave | Shred/Steam sterilize |
| Thermal Equipment Corp | Mediclave | Steam sterilization |
| Medical Materials and Technology | MMT | Dry chemical sterilant |
| ThermoKill, Inc | Model 1001 | Dry heat sterilization |
| Bio-Oxidation, Inc | Bio-Oxidizer | Pyrolysis |
| Vance IDS, Inc | Incandescent Disposal System | Plasma arc furnace |

**Table 4-4: Technologies That Do Not Require State Approval When Used as Specified in Regulations.**

| | | |
|---|---|---|
| GTH Roland North America, Inc | ZDA-M3 | Shred/Steam sterilize |
| San-i-pak, Inc | San-i-pak | Steam sterilize |
| Medivators, Inc | DSI System 2000 | Thermal treatment of sharps |

## Scrap Tires

Scrap tires present complex disposal problems and create unique threats to the environment and public health. Piles of scrap tires are a known hazard for fires that are difficult to extinguish, and that put carcinogens into the air and groundwater. Further, the presence of illegal tire dumps around the state has resulted in the introduction and potential establishment of the Asian Tiger Mosquito (Aedes albopictus). This mosquito, that carries a disease dangerous to humans and animals was identified by researchers at NC State University in 29 of 38 sites sampled in 1993.

In 1989, a 1 percent scrap tire disposal tax was imposed on the sale of new tires and a program to clean up scrap tire piles was required in each county. In October 1993, the tax was temporarily increased to 2 percent, and counties were prohibited from charging disposal fees for scrap tires that were generated in North Carolina. The increased tax revenue has not only added roughly 40 percent to the annual per capita funding for county scrap tire management programs (which manage current generation tires), but has also funded the Scrap Tire Disposal Account.

The Scrap Tire Disposal Account provides for grants to counties to reimburse them for costs of their current generation tire program that exceeds revenues already available from the state (See **Tables 4-5 and 4-6)**. The account has also made $1.5 million available annually for nuisance tire site clean-ups (See **Table 4-7** and discussion below).

### Scrap Tire Disposal Account Grants

Twenty-five percent of the funds in the Scrap Tire Disposal Account are used for grants to counties that did not receive sufficient funds to operate their scrap tire management program. These grants are available to reimburse losses incurred by counties during the six-month period preceding the application. Grants of $281,455.01 were awarded to 34 counties to reimburse losses incurred during April - September 1994; and grants of $257,244.93 were awarded to 34 counties to assist with losses incurred during October 1994 - March 1995.

Some counties have unique difficulties in tire disposal - a fact that makes the availability of grants from this fund critical. Three examples of special circumstances and situations are described below:

*Geography*
Shipping distance to tire recyclers is a key factor in cost. Counties in the extreme east and west portions of the state typically incur higher costs than the more central counties.

*Presence of specialty tire dealers*
Counties such as Pasquotank and Alamance host tire dealership companies that specialize in large equipment tires and provide service to several adjacent counties. These companies are able to replace tires on farm tractors and other heavy equipment in the

field and then transport the old tires back to their facilities. The provision of such a disposal service has resulted in deficits for these counties' tire programs.

*Presence of special industries*
Washington County has a large logging industry and receives a volume of large equipment and truck tires from about 12 logging companies. Such tires are bulky and expensive to dispose, and the distance of the county from disposal facilities adds hauling costs.

A North Carolina Department of Transportation shop in Perquimans County disposes equipment tires. Perquimans recently reported that the volume of tires from this source increased considerably when the county was required to provide free disposal.

For a more detailed presentation, see the "Scrap Tire Management Report" prepared by the Solid Waste Section.

Nuisance Tire Site Clean-ups

The Solid Waste Section is near completion of an effort to clean up nuisance tire sites in the state. By fall 1996, more than 90 percent of the estimated 4 million tires at 245 known nuisance tire sites in North Carolina will have been cleared.

In order to minimize cost and simplify the cleanup process, the Solid Waste Section has coordinated efforts with state and local officials and responsible parties (individuals who are legally liable) to set up a program for cleanup activities in the counties containing the largest sites. The Scrap Tire Disposal Account was set up to manage funds for these efforts.

**Table 4-5: Scrap Tire Disposal Account Funding for Cleanups.**

| TOTAL FUNDS AVAILABLE MARCH 1, 1996 | | | | $3,637,296.69 |
|---|---|---|---|---|
| Program Projects/Contracts | 45 Month Estimated Total Budget | Funds Collected To Date | Funds Allocated To Projects | Funds Expended |
| 8 State Contract Sites | $2,500,000.00 | $2,500,000.00 | $1,247,281.54 | $1,252,718.46 |
| Small sites | $3,533,196.69 | $1,137,196.69 | $367,391.10 | $364,859.14 |
| TOTALS | $6,033,196.69 | $3,637,196.69 | $1,614,672.64 | $1,617,577.60 |

The program consists of state contracts covering each of the eight largest sites and state funding for county arrangements to clean up smaller sites. The state contracts require nuisance tires to be recycled into reusable products like crumb rubber, civil engineering materials and tire-derived fuel. State-funded county efforts for cleanup use minimum security prison inmate labor under agreements with the Division of Solid Waste Management, each affected county and the NC Department of Correction.

Since the largest sites pose the greatest health risk to the public, they are given highest priority for cleanup. Cleanup of the two largest nuisance tire sites began November 1994 in Richmond and Pender counties. The Pender site cleanup, which is complete, resulted in the clearance of more than 538,000 nuisance tires. The Richmond County site has been cleared of about 490,000, with approximately 30,000 remaining.

Six other high priority sites under state contract for cleanup are located in Greene, Harnett, Brunswick, Chatham and Iredell counties, and collectively contain approximately 1.4 million tires. Twenty additional nuisance sites are being addressed by state-funded county efforts. Fourteen smaller sites are being cleaned up by responsible parties.

Seventy-seven nuisance tire sites have been discovered across the state since January 1994,. The most recently identified sites are in Pasquotank County (approximately 20,000 tires), and Orange County (approximately 10,000 scrap tires).

**Table 4-6: Nuisance Tire Site Cleanup Status 1994-1996.**

| | Number sites | Total Known Tires | Percent Total | Cleared Tires |
|---|---|---|---|---|
| Total | 245 | 3876278 | 100 | N/A |
| Cleaned Up | 116 | 1314378 | 33.91 | 1314378 |
| Contracted for Cleanup | 40 | 2184600 | 56.36 | 875610 |
| Other Ongoing Cleanups | 13 | 161800 | 4.17 | 14494 |
| Remaining | 76 | 215500 | 5.56 | N/A |

The elimination of the tipping fee on January 1, 1994 seems to have discouraged indiscriminate dumping, since no fresh sites have been reported since then (all sites discovered since January 1994 were in existence prior to that time). The ban on charging tipping fees for scrap tires will be eliminated along with the temporary tire disposal tax increase in July 1997. Illegal dumping may be expected to increase if tipping fees are reinstated.

The numbers of tires managed by the counties has increased steadily since the scrap tire program began in 1990. In fact, by 1993, the number of tires managed by counties overtook the number estimated to have been generated in state. The trend continues. North Carolina

generated approximately 7.0 million scrap tires or 1.0 per capita in FY 1994-95. For the same fiscal year, counties reported managing about 9.3 million tires, which is an amount over 100 percent of the total generated. In addition, tire recyclers reported receiving about 900,000 tires directly from disposers who did not participate in any county program. Part of the increase in numbers of disposed tires is due to illegal disposal of out-of-state tires at county collection sites.

The Solid Waste Section is encouraging counties to implement policies to avoid receipt of out-of-state tires. Recommended policies include:

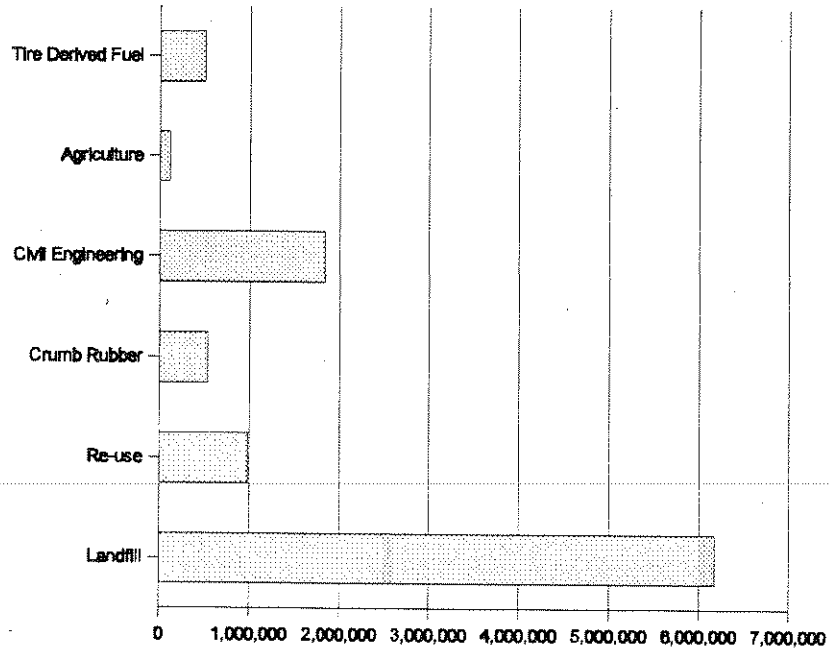
- improve screening of tire loads by requiring complete scrap tire certifications, which provide details on the origin of each load;
- visit generators to discuss tire program requirements; and
- make spot checks of loads by calling to verify the origin and size of loads brought by haulers.

The increased number of illegally disposed tires is also, in part, a reflection of the success of the tire program. Cooperation and reporting by affected parties has increased as awareness and implementation of the program has become more widespread.

Tire Recycling

Approximately 4.2 million scrap tires or about 37 percent of the scrap tires disposed in North Carolina were diverted from landfills for various uses in FY 1994-95 **(Fig 4-1)**.

**Fig 4-1: End Use of Disposed Scrap Tires During FY 1994-95**




The scrap tire program requires that scrap tire haulers register with the Solid Waste Section and obtain a scrap tire hauler identification number. Tire retailers who haul their own tires are exempt from this requirement.

## HOUSEHOLD HAZARDOUS WASTE

Household Hazardous Waste (HHW) is not specifically included within the definition of "special waste" under North Carolina law, but it can require special handling and management and can present particular hazards to the environment and public health. For this reason, the Solid Waste Section encourages the establishment of permanent HHW collection facilities at permitted solid waste management facilities. HHW is considered a "solid waste" and is subject to the regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA).

In FY 1994-95, the number of permitted permanent HHW collection facilities increased from two to six. New facilities are in Cumberland, Wake, Chatham, Guilford and Orange counties. Requirements to obtain a permit for a permanent HHW collection facility include an approved environmental assessment and an approved permit application that contains site plans, floorplans and an operational plan that meets the requirements in Section Policy Memorandum #15.

In addition to permanent HHW collection facilities, the Section encourages temporary HHW collection days. The Section assigns temporary HHW identification numbers for tracking the collection, treatment, disposal and recycling of HHW in the State. The application required to obtain a temporary HHW identification number requires information such as the material to be collected, the address and contact person for the agency collecting the HHW, and the address and contact person for the transportation and disposal facility or facilities.

In FY 1994-95, HHW was collected on 11 household hazardous waste collection days. The 10 hosts for these collection days were the counties of Buncombe, Wake, Gaston, Scotland, Lee, Ashe, New Hanover and the cities of Raleigh, Winston-Salem, and Reidsville. The items most frequently collected and either recycled or re-used from these HHW collection days included used motor oil, latex paints, oil-based paints, propane tanks and cylinders, and aerosol cans.

## CHAPTER FIVE

## PERMITTING

Permitting activities during FY 1994-95 were driven by two dates: October 9, 1993, when the new Subtitle D rules for municipal solid waste landfills (MSWLFs) became effective; and January 1, 1998, when all operating MSWLFs must be equipped with liners. Accordingly, the majority of permitting activity during FY 1994-95 was the permitting of lined MSWLFs, facilities that transfer waste to lined landfills, or alternate solid waste management facilities, such as incinerators.

### Municipal Solid Waste Landfills, FY 1994-95.

Landfill permits and renewals of landfill permits are issued in phases for construction and for operation. Before either permit may be obtained, the suitability of a site for a landfill must be established.

Site Suitabilities Issued for new MSWLFs:
- Johnston Co. LF
- South Wake County LF
- Camp LeJeune LF, Onslow County

Permits Issued to Construct at Existing Lined Landfills
- East Carolina Environmental LF, Bertie Co. (Addington)
- Piedmont LF, Forsyth Co., (Waste Management Inc.)
- Davidson Co. LF
- Charlotte Motor Speedway (CMS), Cabarrus Co., (Browning Ferris Industries)

Permits Issued to Operate New Phases of Existing Lined Landfills
- Sampson Co. Disposal Inc. LF (Browning Ferris Industries)
- Lincoln Co. LF
- East Carolina Environmental LF, Bertie Co. (Addington)
- Piedmont LF, Forsyth Co. (Waste Management, Inc.)
- Davidson Co. LF
- East Carolina Environmental L
- Rockingham Co. LF
- Orange Co. LF

Permits to Construct - New Landfills
- Uwharrie Environmental Landfill, Montgomery Co. (Addington)
- North Wake L in Wake Co.

Permits to Operate - New MSWLFs
(These landfills are county-owned and operated, and meet all Subtitle D requirements.)
- Rockingham County
- Davidson County
- Orange County

**Transfer of Solid Waste**

Twelve permits to construct and operate transfer facilities were issued during FY 1994-95. All but 2 of these facilities (both in Brunswick Co.) are moving waste to a regional landfill or incinerator.

Permits to Construct and Operate Transfer Facilities, FY 1994-95
- Brunswick County (two facilities)
- Perquimans-Gates-Chowan
- WMI, Rowan County
- McDowell County
- Bladen County
-Yancey-Mitchell Counties
- Franklin County
- Beaufort County
- Person County
- WMI, Wake County
- Allegheny County

**Mixed Waste Processing and Energy Generation, FY 1994-95 Permits**

Mixed Waste Processing Facilities (MWPFs) recover paper, plastic, metal and other recyclables from the waste stream and convert non-recyclable materials to products such as refuse-derived fuel (RDF). Such facilities may supply RDF to Energy Generation Facilities (EGFs), which use a fluidized bed boiler to burn the RDF and supply steam for electric power generation. For example, the Bladen-Cumberland-Hoke MWPF, which was permitted in 1993, recovers material from the waste stream that is collected from surrounding counties. The RDF that is produced is then transferred to the Bladen-Cumberland-Hoke EGF, which in turn supplies steam to the DuPont plant in Bladen County.

Permit to Operate - (New) Mixed Waste Processing Facilities
Uwharrie Environmental, Montgomery County

Permits to Construct - (New) Mixed Waste Processing Facilities
- Wilson Resources (Wilson Co.)
- East Carolina Regional (Bertie Co.)

Permits to construct- Energy Generation Facilities
- Wilson Resources (Wilson County)
- Carolina Energy (Bertie County)

Permit to Operate - Mixed Waste Processing Facility
Uwharrie Environmental, Montgomery County.
Bladen-Cumberland-Hoke (BCH), Cumberland County

**Construction and Demolition**

Although many counties are transferring their municipal solid waste to a lined regional landfill, construction/demolition waste does not require disposal in a lined landfill and is not transferred. In FY 1994-95, permits to construct and operate were issued for five construction/demolition landfills, bringing the total operating in North Carolina to 13.

Permits to Construct and Operate C&D landfills in FY 1994-95
- Yancey-Mitchell Co. L
- Sampson Co. Disposal LF
- Martin Co. LF
- Charlotte Motor Speedway LF, Cabarrus Co. (BFI)
- Davie Co. LF

## CHAPTER SIX

## SOLID WASTE ENFORCEMENT AND FIELD OPERATIONS

The compliance and enforcement responsibilities of the Solid Waste Section cover a wide range of concerns. A significant amount of staff time is spent providing technical assistance to the regulated community and the public. Technical assistance is provided by the Solid Waste Section on all aspects of integrated solid waste management. This includes planning, waste reduction, recycling and composting programs, operational requirements, remediation, and Solid Waste Management Rules and Law. Technical assistance demands approximately one-third of field operations staff time and is a major tool to promote compliance and make best use of existing disposal capacity.

### Tax Certification Program

The Section evaluated approximately 135 business facilities in FY 1994-95 to determine eligibility for special tax treatment under the Tax Certification Program. This program allows tax credits and property tax exemptions on recycling equipment, facilities and land to encourage solid waste resource recovery and recycling. Certification of a facility or equipment for this special tax treatment, in most cases, requires on-site inspections to verify that they qualify.

In FY 1994-95, the Section developed an application form and an assistance package that provide more specific information and guidance, provide examples of qualifying and non-qualifying situations, and improve central data collection quality. These measures improve efficiency in the certification program by making the application process easier and decreasing the number of applications that have to be returned for insufficient information.

In recent years, the growth of the recycling industry and increased awareness of the tax certification program has led to a growth in the number and complexity of applications. As part of its effort to meet this growth, the Section plans to evaluate the program's effect on local government tax revenues and its value as an incentive to businesses.

### Illegal Dumping

Since the passage of comprehensive solid waste legislation in 1989, major changes have taken place in solid waste management. There has been increased emphasis on developing comprehensive solid waste management programs, including recycling and waste reduction components. Landfills are subject to more stringent design, operation, and closure requirements. These changes have driven up the cost of solid waste management significantly, and have had direct effect on the state's solid waste regulatory program.

Illegal dumping, particularly of construction and demolition waste, is a rapidly growing problem in North Carolina due to increased tipping fees, fewer permitted facilities, and a lack of sufficient facility capacity to receive construction and demolition waste. Field operations staff receive, investigate and respond to more than 100 solid waste related complaints per month. Each month, these complaints lead to the discovery of as many as 35 previously undocumented open sites.

The problem of increased illegal dumping is compounded by inadequate resources for state enforcement and cleanup. Likewise, illegal dumping, or littering - a local government responsibility - are also being reported more frequently. The range of illegally disposed materials reported through complaints includes tires, septage, land clearing debris, construction and demolition waste (including asbestos), household garbage, medical waste, waste oil and commercial and industrial waste. The vast majority of illegal disposal sites are actively operated by construction and demolition contractors.

The responsibility for prevention, investigation, enforcement, and cleanup is divided between the state (Solid Waste Section) and local governments. The state assumes responsibility for dump sites that do not have permits and are operated for economic gain. Local governments, through health departments and solid waste enforcement officers, address littering and illegal dumping that occur without the permission or control of the landowner.

The Section has established a database to track these illegal sites. It is currently developing a ranking system so that future cleanup of illegal sites will be ranked according to certain criteria (potential danger to public health and environment, size of the site, proximity to receptors, and types of waste disposed). A key area for joint efforts between state and local governments will be education of groups that play a role in illegal dumping, and the development of strategies to eliminate any advantage of illegal disposal over approved practices.

**Compliance Assurance**

Monitoring permitted facilities to assure compliance with construction and operational requirements within the Solid Waste Management Rules is another critical activity performed by the Solid Waste Section. Currently, there are 68 MSW (municipal solid waste) landfills, 26 industrial waste landfills, 197 land clearing and inert debris landfills, seven incinerators, 20 yard waste comporting facilities, 11 mixed waste processing facilities (including C&D), 41 transfer stations (temporary and permitted), 94 scrap tire collection sites, 212 septage management sites and 375 septage firms. Regional staff evaluate an average of 73 permitted sites monthly to meet official inspections goals of semi-annual inspections. In addition, there are 151 yard waste and 85 LCID (land clearing inert debris) sites permitted by notification. These sites are inspected on a discretionary basis as time allows.

A computer-based compliance tracking system was initiated in 1995. This system has increased program efficiency by easing the regional staff's' monthly reporting tasks, and has improved the effectiveness of tracking compliance activity.

The Section has the responsibility of bringing violators into compliance with the Solid Waste Management Rules through enforcement. Technical assistance often eliminates the need for formal enforcement actions, and is the preferred approach to improvement of compliance at permitted facilities with good compliance histories. Some circumstances require Warning Letters, Notices of Violation (NOVs), Compliance Orders (with or without penalties) or Consent Agreements to bring a site into compliance. The Section has revised standard operating procedures to improve its level of consistency in applying the rules and compliance tools.

Central enforcement tracking and penalty computation procedures are currently under review. **Table 6-1** shows the types of compliance orders issued this past fiscal year, along with the fines assessed for each violation.

**TABLE 6-1: Compliance Orders Issued for FY 1994-95 through January 16, 1996.**

| N.C. Fiscal Year | Category Type | Violation | Penalty Totals |
|---|---|---|---|
| 1994 - 95 | 12-Non-conforming | No Permit | $78,250.00 |
| 1994 - 95 | 5-Permitted Landfill | Operational Requirements | $64,200.00 |
| 1994 - 95 | 5- Nuisance Tire Sites | Non-conforming Scrap Tire | $20,500.00 |
| 1994 - 95 | 6-Septage Sites | Illegal Disposal of Septage | $94,400.00 |
| July 1, 1995 - January 16, 1996 | 1-Permitted Facility | Operational Requirements | $43,000.00 |
| July 1, 1995 - January 16, 1996 | 4-Non-conforming | No Permit | $28,750.00 |
| July 1, 1995 - January 16, 1996 | 4-Nuisance Tire Sites | Non-conforming Scrap Tires | $78,500.00 |
| July 1, 1995 - January 16, 1996 | 1-Septage Sites | Illegal Disposal of Septage | $2,500.00 |
| July 1, 1995 - January 16, 1996 | 1-Notification Site | Operational Conditions | $39,000.00 |
| | | **TOTAL** | $1,135,050.00 |

## Closure and Post Closure

The Financial Assurance Rule, 15A NCAC 13B, .1628 became effective April 9, 1994. This rule requires the owners and operators of municipal solid waste landfills to provide assurance that sufficient funds will be available for proper closure and post-closure care of existing facilities. The financial assurance program provides for a review of required documentation to ensure compliance with the rule. Private facilities' use of captive insurance policy as a means of insuring closure and post-closure obligations is being evaluated by the Section.

A matter of current concern is the large number of landfills that operated with approval from the Section in the past but which closed before current requirements for long-term maintenance and monitoring were in place. Such facilities may present problems in terms of groundwater contamination and threat of explosion from methane gas build-up. The Section is planning a program designed to bring these facilities under some level of monitoring consistent with the potential hazard posed. The need is also being examined for new regulations and additional staff resources to protect public health and the environment from hazards posed by these facilities .

The Section is completing a list of these closed facilities, development of an inspection protocol, and definition of the criteria for ranking sites. An initial focus will be to identify critical sites based on the degree and types of environmental releases and their location in high priority watersheds or in economically disadvantaged or minority communities.

The Section began working this year in cooperation with the Division of Environmental Management's (DEM's) Water Quality Section under the Non-Point Source Program. The objective of the program is to evaluate the condition of old sites, including illegal dumps and previously approved landfills, and to collect data on any escape of contaminants from these sites into surface and groundwater. In cooperation with DEM, the Section is logging relevant data into GIS databases and is developing management strategies for those sites that contribute significantly to nutrient loading and oxygen depletion in critical watershed areas.

## GROUNDWATER MONITORING AND REMEDIATION

The Solid Waste Management Rules require water quality monitoring at solid waste management facilities. Key objectives of the Solid Waste Section Groundwater Compliance Program are to:

1. Monitor the effect of the disposal facility on the ground and surface water quality in the area;
2. Monitor the effectiveness of the design and operation of the monitoring system to detect contaminants leaving the landfill or other solid waste management unit;
3. Develop and use programs for assessing groundwater facilities where contamination has been detected;
4. Rank facilities for remedial action based on groundwater data and monitor remediation activities; and
5. Evaluate the proper reporting of methane monitoring data and the appropriateness of methane corrective action plans.

In recent years, federal regulations have required significant changes in the groundwater monitoring program for active municipal solid waste landfill units. [See EPA, RCRA 40 CFR Part 248, Solid Waste Disposal Facility Criteria (Subtitle D)]. These changes include increased frequency in sampling; routine detection monitoring for a more extensive constituent list, including volatile organic analysis, statistical analysis of water quality data, and, if warranted by the routine monitoring, an automatic elevation to Phase II assessment monitoring. The new rules for MSWLF units also include more formal procedures for groundwater assessments and corrective action, and at least 30 years of post-closure monitoring.

All permitted sanitary landfills in North Carolina have been required since 1989 to monitor groundwater quality. Groundwater monitoring is presently being conducted at closed sanitary landfills, open sanitary landfills, industrial landfills, municipal solid waste landfills, and several non-conforming open dump sites. Groundwater monitoring is also required at recently permitted construction and demolition landfills. There are more than 1,000 groundwater monitoring wells. 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. The Groundwater Unit has revised its "Water Quality Monitoring Guidance Document for Solid Waste Management Facilities" in an effort to keep pace with the changing rules and the regulated community's needs for technical assistance.

Although unlined MSWLFs are being phased out, 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

groundwater 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 that have wells close to the waste boundaries of permitted areas.

The detection monitoring systems are designed to provide an early warning of groundwater contamination so that any water quality problems can be solved before there is any threat to public health. Because most landfill facilities are located in relatively remote areas near groundwater discharge features, the potential groundwater threat to public health is minimal. There has been no significant degradation of surface water quality off site in the streams that serve as discharge features.

Water quality investigations and assessments may be necessary at nearly all of the unlined landfill to determine the nature and extent of contamination, if any, and to assess the risk to public health and the environment. Such investigations and assessments will evaluate the corrective action and remediation strategies that are required to protect public health and the environment.

Water quality assessments or groundwater investigations began February 1996 at 26 unlined landfill sites. Fifteen of these water quality assessments are being conducted with approval of the Solid Waste Section under administrative consent agreements. The remaining 11 water quality assessments are being conducted without administrative consent agreements.

The Section is providing oversight and technical guidance to 36 Subtitle D facilities that have groundwater compliance violations and that are conducting assessment monitoring in preparation for correction action. Additionally, the Section is managing two remediation projects at solid waste facilities and assisting with the development of standards for remediation at previously and currently permitted facilities.

Currently, the Solid Waste Section requires preliminary groundwater investigations at nine landfills. Site specific geographic and geologic information, more frequent sampling, and sampling for additional chemical constituents have been necessary at some or all of these facilities.

## CHAPTER SEVEN

# COMPOSTING AND LAND APPLICATION

### Septage Management

The Septage Management Program was established to ensure that septage is managed in a safe and consistent manner statewide. Septage includes domestic septage (the sewage solids, liquids, and sludges of human or domestic origin removed from septic tanks); material pumped from grease traps; certain sludges; industrial septage, and the waste from portable toilets and certain marine toilets. Septage responsibilities include permitting septage management firms on a calendar year basis; permitting sites for the land application of septage; permitting septage treatment and detention facilities; providing technical assistance to site operators; and inspecting vehicles used in septage management. Waste management specialists are assisted with some complaint investigations and are provided technical assistance on cleanup methods at illegal disposal sites.

Three hundred seventy-seven septage management firms in calendar year 1995, were permitted to operate in North Carolina. That number increased from 355 in 1994.

Forty-one septage land application sites were permitted in calendar year 1995. Two hundred twenty-seven sites were permitted as of December 31, 1995. Land application sites for septage are located in 61 counties across the state, with sites per county ranging from 1 to 13. Approximately 3,000 acres are permitted to receive septage in the state.

In 1995, 506 pump vehicles were inspected. The number of vehicles per firm ranges from 1 (for most firms) to as many as 24.

Only eight Notices of Violation were issued by the Composting and Land Application Branch for site management problems. The Field Operations Branch now has responsibility for site inspections and issuance of related NOVs. See **Table 7-1** below:

**Table 7-1 Notices of Violation FY 1994-95**

| Notices of Violation | Reason |
|---|---|
| 99 | Non Payment of Permit Fees |
| 1 | Failure to Complete Permit Application |
| 43 | Vehicle Inspections |
| 8 | Site Management |
| 1 | Operating Site Without a Permit |

Domestic septage and portable toilet waste are accepted for treatment and disposal at 93 wastewater treatment plants across the state. Many of these plants, however, will not accept material pumped from grease traps. Nine counties: Avery, Clay, Greene, Hyde, Jones, Mitchell, New Hanover, Tyrrell and Yancey do not have a permitted septage land application site or a wastewater treatment plant that accepts septage. Septage pumped in these counties is transported to sites or plants in adjacent counties. In a few cases, septage is transported to disposal facilities out of state. Lack of treatment capacity and operator reluctance are the primary reasons many plants will not accept septage.

Septage Management Rules were revised in 1995 to reflect changes in septage management required under federal law (40 CFR 503). One of the new requirements is that land application site operators grow and harvest crops on their sites. Growth and harvesting of crops will expedite nutrient removal; that will help prevent the build-up of metals in the soils and the contamination of groundwater caused by the movement of nitrogen through the soil.

## Yard Waste Management

Yard waste is banned from MSW landfills in North Carolina. As a result many counties and municipalities have established facilities for composting or producing mulch from yard waste. Yard waste facilities processing less than 6,000 cubic yards of waste per quarter are not required to be permitted as a yard waste facility, but are required to notify the Solid Waste Section of their operation. Site location, site operator, types of waste to be received, amount of waste processed the previous year, composting process to be used and the intended distribution of the finished product must be indicated on the notification form.

Yard waste facilities process a variety of waste for mulch or compost including leaves, grass, limbs and brush, stumps, pallets, and untreated wood waste. Animal waste may be included as a nitrogen source to promote the compost process. Solid Waste Management Annual Report forms indicate that local governments managed 586,501 tons (approximately 2,932,505 cubic yards) of yard waste in FY 1994-95. **Table 7-2** indicates the yard waste management methods and the amounts handled by each method in FY 1994-95.

**Table 7-2: Yard Waste Management Methods.**

| Method | Amount Handled (tons) |
|---|---|
| Direct distribution to farmers or homeowners | 55719 |
| County mulch/compost facilities | 382020 |
| Municipal facilities | 59987 |
| Private facilities | 45829 |
| LCID facilities | 42946 |



include private facilities

Yard waste that has been processed into mulch or compost is available to private citizens and landscapers, and for public works projects. The N.C. DOT uses compost in some of its roadside plantings. **Table 7-3** indicates the reported distribution of processed yard waste from local government facilities in FY 1994-95.

**Table 7-3: Distribution of Processed Yard Waste Reported from Local Government Facilities, FY 1994-95**

| Distribution Method | Percentage |
|---|---|
| Stockpiled on site | 33% |
| Given to Individuals | 36% |
| Sold | 14% |
| Used by Public Agencies | 13% |
| Given to professional Users | 4% |
| Total | 100% |

Forty three of the local government facilities report charging for their mulch or compost. Charges range from 50 cents per yard to $7.50 per yard.

## Solid Waste Composting

Composting is a means by which organic elements of the solid waste stream can be converted into a material with application in the agriculture and horticulture industries. Properly used, compost can improve the physical, chemical, and biological characteristics of the various soil mixes used in horticulture.

Rules governing municipal solid waste (MSW) went into effect December 1, 1991. The rules address minimum criteria for, siting, design, and operation of solid waste compost facilities and establish standards for the classification and use of the compost product.

Compost pilot or demonstration projects are approved by the Solid Waste Section. These projects give people, businesses, and units of government an opportunity to evaluate the feasibility of composting without having to strictly adhere to all the rules and bear the expense of plan preparation. Applications do not have to bear the seal of an engineer and generally do not require the submission of detailed drawings. Variances, depending on the waste type, may be given for certain site preparation, monitoring, and product testing requirements. Variances are seldom granted for siting requirements. Project approvals generally last for one year.

Compost pilot or demonstration approvals continue to be issued to individuals interested in composting. Food processing wastes, kitchen and restaurant wastes, poultry wastes, textile wastes, manures, and waste wood products are among the materials being composted at demonstration projects.

**Table 7-4: Waste Quantities Managed at Compost Demonstration Facilities.**

| Waste | Amount (tons) |
|---|---|
| Zoo Manures | 171 |
| Trout Processing Waste | 174 |
| Seafood processing Waste | 1550 |
| Fruit Processing Waste | 400 |
| Chicken Litter | 1000 |
| Mixed Paper | 30 |

The process of revising the Municipal Solid Waste Compost Rules was started in FY 1995. Individuals from local government, NC State University, North Carolina Department of Agriculture, private composting companies, consultants, and the NC Composting and Organic Recycling Council are on the revision committee. The primary goal of the committee is to encourage composting by making the rules less restrictive on small facilities and on those composting organics separated by source.

## Land Application

Land application is recognized by the Solid Waste Section as a viable alternative to disposing certain wastes in a landfill. The Composting and Land Application Branch is responsible for reviewing and approving proposals to land-apply wastes.

Primary emphasis is placed on wastes which, if surface applied, will not create an environmental or public health hazard and will provide some benefit to soil or to crops grown on the land. Approvals have been given for the land application of wood ash, tobacco dust, coal dust and ground wallboard. Wood ash acts as a liming agent, tobacco dust is a source or nitrogen and potassium, and ground wallboard is a source of calcium. Wastes are applied at agronomic rates for the nutrients they contain. In FY 1994-95, land application of wood ash from previous approvals totaled 14,680 tons. The wood ash was applied to private crop or timber lands.

Almost 4700 tons of tobacco dust were land-applied to agricultural land in FY 1994-95. If the nitrogen, phosphorus and potassium in the tobacco dust had been purchased as fertilizer, the cost would have been over $30,000. Thus, this land application resulted in savings to the farmer as well as to the company processing the tobacco.

## CHAPTER EIGHT

## THE SOLID WASTE MANAGEMENT TRUST FUND -FY 1994-95

This chapter reports for FY 1994-95 the activities and expenditures of the Solid Waste Management Trust Fund. For a copy of a more detailed analysis on the trust fund, please contact the Office of Waste Reduction. The trust fund was created by the passage of the Solid Waste Management Act of 1989 ("SB 111") and is funded by a fee on the sale of new tires, a tax on virgin newsprint and an advance disposal fee on white goods (appliances). The purpose of the trust fund is to provide funding for a wide range of solid waste management activities, including technical assistance to local governments, businesses and others on solid waste issues; solid waste educational activities; research and demonstration projects; and recycling market development activities (G.S. 130A- 309.12). The following tables summarize Trust Fund expenditures and sources for FY 1994-95:

**Table 8-1: Trust Fund Expenditures FY 1994-95**

| | Total FY 94-95 |
|---|---|
| Beginning Balance | $ 763,295 |
| Revenue | $ 799,609 |
| Expenditures | $ 717,909 |
| Ending Balance | $ 844,995 |
| Encumbrances | $ 369,035 |
| "Uncommitted" funds as of 6/30/95 | $ 475,960 |

**Table 8-2: Breakdown of Sources FY 1994-95**

| Revenue Source | Total FY 95 |
|---|---|
| Tire Tax | $ 399,058 |
| White Goods ADF | $ 364,173 |
| Newsprint Tax | $ 1,378 |
| Appropriations | $ 0 |
| Private Sector Contributions | $ 35,000 |
| Total Revenues | $ 799,609 |

### Trust Fund Revenue Sources FY 1994-95

**2% Tire Tax** - Revenues generated as a result of the tax on the sale of new tires, $399,058 accounted for 49.9 percent of the total Trust Fund Revenues during FY 1994-95, up slightly ($37,932) from the previous year's tire tax revenue of $361,126.

**White Goods Tax** - On January 1, 1994, the advance disposal fee on white goods (appliances) went into effect, a result of the passage of Senate Bill 60 during the 1993 Legislative Session.

Surprisingly, revenues from the tax on white goods generated $364,173 or approximately 45.5 percent of the total revenues in FY 1994-95.

**Virgin Newsprint Tax** - Newspaper publishers in the state that fail to meet the required purchasing goals for recycled content newsprint are obligated to pay a tax on the virgin newsprint they consume at the rate of $15 per ton. During FY 1994-95, $1,378 in revenue was received from the virgin newsprint tax. During the three years the tax has been in effect, the revenues generated have varied greatly ranging from a high of $2,518 in FY 1992-93 to zero in FY 1993-94, and finally, $1,378 in FY 1994-95.

**General Appropriations** - When the trust fund was first established in 1989, a one-time appropriation of $300,000 was allocated to provide an initial fund balance. Since then, there have been no further appropriations to the trust fund.

**Private Sector Contributions to the Trust Fund** - The American Plastics Council was the sole private sector contributor to the Solid Waste Management Trust Fund during FY 1994-95. The council contributed $35,000 to be used for recycling infrastructure development through the Recycling Assistance Grants Program.

**Trust Fund Expenditures - FY 1994-95**

As depicted **Table 8-1**, in FY 1994-95, the Solid Waste Management Trust Fund received $799,609 in revenues for an average of $199,902 per quarter. OWR expended $717,909 of the Trust Fund in the same period. The ending balance on June 30, 1995 was $844,995, yet $369,035 had been encumbered for projects in FY 1995-96. For example, $200,905 was encumbered during June 1995 for the 1995 Recycling Assistance Grants, which were awarded August 1995. After encumbrances, only $475,960 of "uncommitted" funds remained at the end of the fiscal year. A portion of the "uncommitted" funds, however, have been earmarked for expenditure during FY 1995-96 for annual projects such as the Recycling Coordinators Training Course, the "3R" Campaign, and other waste reduction education and training projects to be carried out during FY 1995-96.

Items funded through the trust fund include grants, educational and research projects, and staff support, including sponsorship of two student interns each year. The following describes the projects completed and the ongoing activities of the Trust Fund during FY 1994-95:

**Grants**

Grants given the first two years of the trust fund's existence were for "innovative and unique" demonstration projects capable of being repeated throughout the state. Subsequently, cities and

counties requested smaller, less restrictive grants for very basic solid waste management needs such as equipment purchase and funding for recycling coordinators. Hence in 1992, the Recycling Assistance Grants Program was established. While the original demonstration projects were generally $25,000 each, the recycling assistance grants are typically $15,000 each, which enables a wider distribution of funds to a greater number of grant recipients. In order to ensure full support of a grant by the administering agency and its decision-making body, a 50 percent match is required of the grantee. Additionally, to encourage inter-governmental cooperation, regional projects (e.g., two or more local governments) are now eligible for up to $30,000.

Completed Recycling Assistance Grants

The following Recycling Assistance Grant projects were completed during FY 1994-95. Detailed information on each grant is available from OWR.

1. *Ashe County* - ($15,000) - "Ashe County Recycling Project"

2. *Town of Andrews* - ($15,000) - "Andrews Solid Waste Reduction"

3. *Town of Butner* - ($11,900) - "GREAT Plastics Recycling Project"

4. *Burke County* - ($15,000) - "CFC Recycling Center"

5. *Camden County* - ($7,467) - "Complete and Update Recycling Centers"

6. *Caldwell County* - ($15,000) - "Project Recycle"

7. *Cape Fear (Region O) Council of Governments* ($31,798) - "Region O Integrated Solid Waste Management Program"

8. *Edgecombe County* - ($15,000) - "Gay Road Staffed Convenience Recycling Center"

9. *Town of Faison* - ($2,410) - "A Solution for Unloading: Town of Faison Recycling Ramp"

10. *Northampton County* - ($5,000) - "Plastic Pesticide Container Recycling"

*11. Mecklenburg County* - ($7,825) - "Pass it On Video"

12. *Town of Princeville* - ($15,000) - "Recycling Around Princeville: RAP"

13. *Stanly County* - ($15,000) - "Recycling Program Expansion"

14. *Town of Wallace* - ($15,000) - "Corrugated Cardboard Recycling Program"

Ongoing Recycling Assistance Grant Projects

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

1. *Pasquotank and Camden Counties* - ($30,500) - Collection of Recyclables from Commercial, Industrial, and Institutional Establishments

2. *Burke County* - ($8,600) "The Right Things" Educational Program.

3. *Durham, Durham County, and SunShares* - ($50,000) - Bull Durt - Creation of a Local Market for Mixed Paper Waste

4. *Perquimans-Chowan-Gates Solid Waste Management*- ($45,000)- Paper Collection and Recycling.

5. *Madison County and Mars Hill* - ($42,110) Compost Project for Madison County and the Town of Mars Hill.

6. *Martin County and Martin Enterprises* - ($50,000) - Corrugated Waste Reduction, Martin County.

7. *Gaston County* - ($23,655) - Cornerstone Christian Center/Gaston County Recycling Partnership.

8. *Minorities in Recycling and Environmental Management* - ($50,000) - Public Housing Recycling Project.

9. *Pamlico County and Pamlico County Towns*- ($50,000) - Mixed paper Market and Improved White Goods Recycling.

10. *Farmville* - ($15,000) - Backyard Composting and Office Paper Recycling.

11. *The Scrap Exchange* - ($8,500) - Expand collection of clean industrial discards.

12. *Town of Windsor* - ($2,500) - Recycling Program

13. *Triangle J Council of Governments* - ($49,520) - Regional Household Hazardous Waste Collection Program.

14. *Tri-County Solid Waste Management Authority* - ($25,900) - Recycling and Processing Equipment.

15. *City of Wilmington* - ($3500) - Wilmington Housing Project Recycling Program.

16. *Rowan County* - ($15,000) - "Baling" Away.

17. *New Hanover County* - ($4,667) - Backyard Composting Program.

18. *Coastal Regional Solid Waste Management Authority* - ($50,000) - Co-Composting Facility.

19. *City of Rocky Mount* - ($14,500) - Addition of Plastic Compactors to Recycling Trucks.

**1995 Recycling Assistance Grants**

The request for proposals for Recycling Assistance Grants was sent to all 100 counties, more than 500 municipalities and the 18 regional councils of government in February 1995. OWR received 39 grant proposals. The total amount awarded for the 17 projects chosen was $200, 905. Below is a description of the successful proposals:

General Category Grants

1. *Albemarle Regional Solid Waste Management Authority - ($13,750).* Implementation of a household hazardous waste education program, paint swap, and antifreeze recycling program. The Authority will design and implement a household hazardous waste education program and construct two antifreeze collection sites for residents at staffed sites in six counties. Contact: Jerry L. Parks (919) 297-3300.

2. *Cleveland County /Towns of Shelby and Kings Mountain - ($30,000).* Construction of Waste Reduction Centers. Cleveland County and 13 municipalities are consolidating reduction and recycling programs. Residents and businesses will have access to recycling collection services for scrap metal/white goods, yard waste, newsprint, plastic, cardboard, used oil, and aluminum cans. Contact: Irvin M. Allen (704) 484-5295.

3. *McDowell County - ($8,270).* McDowell County will construct two staffed convenience centers to consolidate solid waste centers in the county and expand recycling collection services for county residents. A site for collection of corrugated cardboard and a backyard composting demonstration are included. Contact: Alan Silver (704) 652-7121

4. *City of King/Stokes County - ($30,000).* The City of King and Stokes County will jointly develop a staffed convenience center within city limits to facilitate recycling by approximately 15,000 residents in southern Stokes County. Contact: Jay Kinney (910) 593-2811

5. *Brunswick County/Town of Long Beach - ($10,900).* Brunswick County and the Town of Long Beach will begin implementation of a blue bag recycling program. Prior to program implementation, an attitude survey will assess participant perceptions. Results of the survey will be used to evaluate and design educational brochures for community outreach and workshops for haulers, realtors, and property managers. Contact: Heather E. Sandner (910) 253-4488.

6. *Alexander County - ($10,905)* - Alexander County proposes to upgrade its six convenience centers to collect used oil and to more efficiently manage the collection of aluminum cans. Contact: Kim James (704) 632-1101.

7. *Caswell County - ($15,000)* - Caswell County proposes to develop a materials recovery facility (M.R.F.) at its old landfill site. The county, the Caswell County schools, and the Cooperative Extension Service will also conduct education campaigns to encourage recycling. Contact: Paul C. Tax (910) 694-4193

8. *New Hanover County - ($8,330)* - New Hanover County will construct a storage bunker for recyclable glass in conjunction with construction of a new construction and demolition (C&D) processing facility. The facility will serve as a buy-back center for public and private haulers. Contact: Geof Little (910) 341-4373

9. *Davie County - ($15,000)* - Davie County proposes to upgrade its materials recovery facility (MRF) by widening an existing conveyor floor area and by installing a steel magnet over the conveyor line. Contact: Gerald Card (910) 998-8262

Source Reduction Category

10. *Craven County - ($5,000).* Implementation of a paint exchange program. Contact: Bobbi Waters (919) 636-6600.

11. *Woodbin 2 Project - ($4,000).* Woodbin 2 Project, a non-profit organization in Cary, proposes to divert construction materials discarded from building sites from disposal through the

development of children's playhouse kits. Contact: Bill Murdaugh (919) 233-7390.

12. *The Scrap Exchange - ($5,000).* The Scrap Exchange, a non-profit organization in Durham, proposes to purchase a new van with grant money and matching funds to collect industrial scrap discards that are then used for creative arts and other educational purposes. Contract: Patricia Hoffman (919) 286-2559.

13. *Town of Windsor - ($1,750).* Purchase of backyard composting bins. The Town of Windsor will purchase 50 backyard composting bins to give to citizens who attend a composting class. Contact: David Overton (919) 794-2331

14. *North Carolina Recycling Association/ NC Composting and Organics Recycling Council - ($5,000).* The NC Composting and Organics Recycling Council (NCCORC), a council of the NC Recycling Association (NCRA) proposes to conduct a statewide backyard composting workshop that targets recycling coordinators, extension agents, and other professionals who administer backyard composting programs. Contact: Cindy Salter (919) 544-5324

Commercial/Industrial Category

15. *Martin County/Martin Enterprises - $25,000.* A paneled truck and a skidder loader will be purchased for collections and management of cardboard at the recycling facility. Contact: Donnie Pittman (919) 792-1901

16. *Randolph County - $10,000.* Initiation of a waste reduction program targeting the county's textile industry. Contact: Victoria D. Prevo (910) 318-6608

17. *Burke County - $3,000.* Development of a waste reduction information and referral service for businesses. Contact: Thomas S. Rhodes (704) 433-9500.

Education/Training/Research Projects

In addition to providing funding for waste reduction grants, the trust fund enables OWR to fund special education/training programs, research projects and publications. These special projects allow for a greater effect than individual grant projects, which are relevant to only a restricted area of the state. While some of the education and/or research projects are initiated by OWR staff for a given segment of the population (e.g. school teachers/administrators), or on a given commodity (e.g. glass), in many cases, the project is proposed by an outside party. Funding requests, which are reviewed on a case-by-case basis, are evaluated for consistency with overall state waste reduction goals and demonstrated need for the proposed project. Below is a description of the educational or other special projects funded during FY 1994-95.

1. *State of North Carolina Recycling Coordinators Training Course ($ 14,740)* - For the fourth year in a row, OWR conducted its nationally-recognized Recycling Coordinators Training Course. During FY 1994-95, the course was modified to attract private sector participants, in addition to the traditional city and county attendees. A total of 92 individuals completed the training course offered in Fayetteville and Morganton during the month of November 1994. As of June 1995, more than 309 recycling coordinators had completed the course.

2. *Mixed Paper as Bedding in Poultry Operations - ( $16,000*) - In October 1994, OWR contracted with NC State University's Cooperative Extension Poultry Science to explore the use of ground mixed paper as bedding in chicken houses. This study could help create additional markets for mixed waste paper, particularly mixed paper that is unsuitable for marketing to traditional outlets (e.g. paper mills).

3. *Chatham County Tire Aggregate Study ($ 72,500)* - This two-year study examines the potential for shredded tires to be used as an aggregate in septic systems. The first year entails bench studies at NC State University to determine leaching characteristics of the tire chips. The second year of the study will involve actual field testing in Chatham County in at least three different soil types.

4. *School Waste Reduction Guide ($14,978 )* - The Environmental Resource Program at UNC-Chapel Hill was asked to produce a manual, "Beyond Recycling: A Waste Reduction Manual for Schools," which highlights successful school waste reduction programs in North Carolina. The manual provides information on how to set up programs that address source reduction (waste prevention) recycling, reuse and composting in a school setting. The manual has been targeted for correlation with state educational curricula by the NC Department of Public Instruction.

5. *Jobs Through Recycling Study ($1,500)* - OWR contracted with the UNC Department of Environmental Sciences and Engineering to conduct a recycling jobs study. The study concluded that approximately 8,700 jobs in North Carolina can be attributed to the recycling industry. Eighty-seven percent of the recycling jobs are in the private sector and 13 percent are in the public sector (state and local government positions).

7. *Recyclable Materials Markets Update Report - ($44,000)* - OWR contracted with SCS Engineers in December 1994 to conduct this statutorily required study. The study analyzed the supply and demand for 36 commodities and developed a list of priority materials that could improve the market situation in North Carolina. The project was completed in August 1995.

8. *NC Recycling Business Study - ($9, 980)* - OWR and the Self-Help Credit Union conducted a study of the capital demands of the state's recycling companies as a potential market for commercial lending. Kirkworks, a Durham-based recycling and economic development firm

conducted the study for the Credit Union. This effort complemented the *Jobs Through Recycling* study (above) by assessing employment, financing needs and technical assistance needs of the state's active 474 recycling companies. Nearly two-thirds of the companies responding to the study expect additional capital demands of more than $100,000 in the next three years, with the average financing need estimated at $ 356,000.

Staff Support:

While the majority of trust fund expenditures are for grants or educational projects to support waste reduction efforts, a portion of the trust fund is used to support full-time staff positions in the Office of Waste Reduction and the Solid Waste Section of the Division of Solid Waste Management. During FY 1994-95, a total of $141,832 was expended to pay for salaries, benefits and some limited operational support. These three positions are: Recycling Market Development Specialist (OWR); Educational Specialist (OWR); and Nuisance Tire Site Clean-up Coordinator (SWS).

Graduate Intern Program:

Through a contract with the UNC (Chapel Hill) Department of City and Regional Planning ($23,423), OWR obtains the services of two student interns for a full year. Student projects throughout the year included the development of a promotional package on the aluminum can ban, assistance with data analysis on the local government annual solid waste management reports, original research on state solid waste financing mechanisms and assistance with some of the Office's education and training programs. For the third year in a row, a student intern subsequently entered the work force in the solid waste management field.

## CHAPTER NINE

## LOCAL GOVERNMENT SOLID WASTE PROGRAM FUNDING

Data from the Local Government Solid Waste Management Annual Reports provides an overview of municipal and county funding of solid waste programs in FY 1994-95. Municipalities and counties report funding sources and budgetary totals for three different types of services: solid waste collection, disposal, and waste reduction (including source reduction, recycling and composting). Many local governments, including those that operate enterprise funds for their solid waste systems, use multiple funding sources. The most popular revenue sources continue to be tipping fees, ad valorem (property) taxes, and household fees.

Many local governments have difficulty assigning program costs to the three categories of services (collection, disposal, reduction). Complicating factors include the structure of existing contracts and the lack of internal cost assignment accounting systems that meet the intent of the report questions. Such reporting inaccuracies hinder the effective evaluation or comparison of programs and the conducting of any full cost analysis.

Local governments' ability to plan financing for future programs is complicated by issues such as: flow control; the possible implementation of variable rate pricing of solid waste collection; the projection and inclusion of revenues from the sale of recyclables; and the determination of true costs for waste disposal and waste reduction.

### Funding of County Solid Waste Programs

**Table 9-1** shows funding sources for solid waste disposal, collection and recycling services provided by North Carolina counties in FY 1994-95.

**Table 9-1: Number of Counties Using Specific Funding Sources for Specific Solid Waste Services in FY 1994-95**

| Funding Source | Disposal | Collection | Waste Reduction |
|---|---|---|---|
| Tipping fees | 69 | 22 | 29 |
| Property taxes | 44 | 47 | 31 |
| Household charges | 31 | 41 | 21 |
| Volume/weight-based fees | 8 | 9 | 3 |
| Sale of recyclables | 20 | 16 | 36 |
| Grants | 14 | 13 | 16 |
| Tire tax refunds | 49 | 14 | 29 |
| White goods tax | 37 | 15 | 32 |
| Other | 24 | 21 | 12 |

Of the 69 counties that used tipping fees for disposal revenues, 14 relied on the fees to provide 100 percent of funding, and six used tipping fees to fund more than 90 percent of disposal costs. Of 44 counties that used property taxes to support disposal costs, six relied on them as the sole source of revenue and six used them to finance more than 90 percent of disposal costs.

No counties used tipping fees as their sole funding source to cover solid waste collection service costs. The most popular source of funding for solid waste collection was property taxes. Thirteen counties used property taxes as the sole revenue source, and six relied on them for 90 percent of collection financing. The second most popular source of funds for solid waste collection was household fees, with six counties using them as their sole revenue source and six more using the fees for 90 percent or more of collection funding.

Fifty-three counties used enterprise funds for solid waste management in FY 1994-95.

## Funding of Municipality Solid Waste Programs

**Table 9-2** shows funding sources for solid waste disposal, collection and recycling services provided by North Carolina municipalities in FY 1994-95.

**Table 9-2: Number of Municipalities Using Specific Funding Sources for Specific Solid Waste Services in FY 1994-95**

| Funding Source | Disposal | Collection | Waste Reduction |
|---|---|---|---|
| Tipping fees | 6 | N/A | 5 |
| Property taxes | 166 | 298 | 156 |
| Household charges | 104 | 177 | 98 |
| Volume/weight-based fees | 14 | 20 | 3 |
| Sale of recyclables | 4 | 7 | 29 |
| Grants | 0 | 0 | 3 |
| Tire tax refunds | N/A | N/A | N/A |
| White goods tax | N/A | N/A | N/A |
| Other | 12 | 15 | 8 |

The two most important sources of funding to cover the costs of municipal waste management in FY 1994-95 were property taxes and household charges. Ninety-one of 166 cities and towns covered disposal charges exclusively with their property tax revenues and 59 of 104 used household fees to cover 100 percent of disposal costs. Property taxes were even more important in covering solid waste collection services: 190 municipalities relied on them to fund 100 per cent of collection costs and another 11 used taxes to cover more than 90 percent of costs. Household fee revenues were used exclusively to fund solid waste collection costs by 80 municipalities. Finally, 98 municipalities paid for waste reduction services using only property taxes as the revenue source, while 49 cities and towns used household fees to fund 100 percent of waste reduction costs.

**Trends in Local Government Financing**

Various financing issues - including flow control, variable rate financing, recycling revenues, and full cost determination -are consistent concerns of local government decision-makers. Although there were wide expectations that Congress would resolve the flow control controversy in FY 1994-95, the issue bogged down as various interested parties sought compromise. Meanwhile, local governments in North Carolina continued to examine the possibility of implementing residential variable rate pricing systems in their solid waste collection services. The increasing interest in such systems was underscored by the high attendance of an EPA teleconference downlink co-sponsored by the Division of Solid Waste Management and the Office of Waste Reduction at three North Carolina locations. OWR maintains a comprehensive list of North Carolina local governments that have instituted variable rate programs, and continues to encourage consideration of such systems by municipalities and counties.

OWR has also encouraged local governments to seek recycling revenue-sharing arrangements with their contract haulers. Although prices for many commodities dropped dramatically from all-time highs in early 1994, recycling revenues can still be a significant part of waste reduction financing and offer an effective means of contract performance evaluation. Local governments that collect, process, and market their own material are in the best position to enjoy the fruits of any future rises in prices.

Finally, the importance of conducting full cost analyses (FCA) of programs appears to gaining more attention. The National Recycling Coalition has begun to advocate FCA as a significant program evaluation tool. Experiences in other states and a study conducted on behalf of OWR by a Duke University graduate student, Chris Benjamin, indicate the usefulness of such analyses. FCA may become an increasingly important means for evaluating and planning local integrated waste management systems.

## CHAPTER TEN

## SOLID WASTE EDUCATION IN NORTH CAROLINA FY 1994-95

Public education is essential to the success of any solid waste program. This section covers local government education programs, state educational efforts, and the efforts of non-profit solid waste and recycling associations in North Carolina.

### Educational Efforts of Local Governments

Current solid waste management reports from counties and municipalities indicate that local governments in North Carolina are slowing down their efforts on behalf of solid waste education programs. Many local governments with a waste reduction program fail to include an extensive public education program. **Tables 10-1** through **10-3** show the status of local government education programs in FY 1994-95.

**Table 10-1: County and Municipal Educational Programs**

| Methods or Media Used | County Programs 79 total | | Municipal Programs 98 total | |
|---|---|---|---|---|
| Radio | 29 | 37% | 19 | 19% |
| Television | 15 | 19% | 17 | 17% |
| Newspaper | 55 | 70% | 40 | 41% |
| Mass Mailings | 17 | 22% | 29 | 30% |
| Direct Mail | 20 | 25% | 28 | 29% |
| Indirect Mail (utility bills, etc.) | 12 | 15% | 39 | 40% |
| Special Events | 37 | 47% | 22 | 22% |
| Take Home Items | 53 | 67% | 56 | 57% |
| Telephone "Hotline" | 19 | 24% | 9 | 9% |
| Workshops, Forums, or Conferences | 30 | 38% | 14 | 14% |
| Public School Programs | 58 | 73% | 40 | 41% |
| Volunteer Programs | 32 | 41% | 19 | 19% |
| Other Activities | 12 | 15% | 14 | 14% |

**Table 10-2: Number of County and Municipal Programs and Targeted Audience**

| Target Audience | County Programs 79 total | | Municipal Programs 98 total | |
|---|---|---|---|---|
| School Children | 63 | 80% | 45 | 46% |
| Industries | 42 | 53% | 15 | 15% |
| Small Business | 45 | 57% | 44 | 45% |
| Residential Participants | 66 | 84% | 87 | 89% |
| Elected Officials | 31 | 39% | 26 | 27% |
| Institutions (schools, hospitals, etc.) | 30 | 48% | 18 | 18% |
| Government Employees | 40 | 51% | 31 | 32% |
| News and Editorial Media | 33 | 42% | 17 | 17% |
| Environmental, Civic, and Neighborhood Groups | 48 | 61% | 32 | 33% |
| Trade and Professional Associations | 18 | 23% | 5 | 5% |
| Other | 3 | 4% | 2 | 2% |

**Table 10-3: Number of County and Municipal Programs with Priority Waste Reduction Topics**

| Waste Reduction Topics | County Programs 79 total | | Municipal Programs 98 total | |
|---|---|---|---|---|
| Residential Source Reduction | 49 | 62 | 43 | 44% |
| Industrial/Commercial Source Reduction | 40 | 51% | 15 | 15% |
| Reuse | 47 | 59% | 33 | 34% |
| Recycling | 78 | 99% | 97 | 99% |
| Buying Products Made from Recycled Materials | 38 | 48% | 26 | 27% |
| Backyard Composting | 40 | 51% | 31 | 32% |
| MSW Composting | 5 | 6% | 4 | 4% |
| Incineration | 6 | 8% | 0 | 0% |
| Landfilling | 46 | 58% | 23 | 23% |
| Household Hazardous Waste | 25 | 32% | 16 | 16% |
| Other | 6 | 8% | 7 | 7% |

## Educational Efforts by State Government

The Office of Waste Reduction (OWR) coordinates a wide variety of solid waste educational efforts in North Carolina. Through training sessions, workshops, conferences, and the development and distribution of educational materials, the staff of OWR educate businesses, industries, local governments, citizen's groups and other agencies in ways to achieve waste reduction. Participation from all these groups is critical to the state's waste reduction effort.

### Recycling Assistance Grants Targeting Education

OWR administers the Recycling Assistance Grants (RAG) program, which is funded through the Solid Waste Management Trust Fund. In FY 1994-95 a total of $200,905 was awarded to 17 applicants of waste reduction proposals. Nine of these recipients have strong educational components to their projects.

1. **Albemarle Regional Solid Waste Management Authority** - household hazardous waste reduction presentations for 17 schools.
2. **McDowell County** - a speakers bureau, a backyard composting demonstration site, a video for residents, and a skit entitled "The Mystery of the Cast Off Capers" for schools.
3. **Alexander County** - educational support to citizens on used oil recycling.
4. **Caswell County** - a coordinated educational campaign to encourage recycling.
5. **The Scrap Exchange** - teacher and children's workshops and "Events by the Truckload" to reduce the quantity of clean, reusable industrial materials going to the landfill.
6. **Town of Windsor** - workshops on backyard composting, at which participants receive a backyard composting container.
7. **NC Recycling Association (NCRA)** - statewide training for on-site organic management with the North Carolina Composting and Organic's Recycling Council.
8. **Randolph County**- a workshop for local companies to discuss recyclable marketing.

9. **Burke County** - a waste reduction information and referral service for businesses.

North Carolina Reduce, Reuse, Recycle (NC 3R) Campaign

A committee of state agency representatives organized by the Office of Waste Reduction has developed a marketing logo and strategy for carrying out North Carolina's commitment to reducing waste. The message to "Reduce, Reuse and Recycle," (the "3Rs") was highlighted and promoted to the general public at events in FY 1994-95, such as Earth Day celebrations, the NC Recycling Association Conference, and the Take Pride in North Carolina Awards Program , due to this committee's efforts. An information packet, including a brochure, stickers, logo sheets, and a letter of support from Governor Hunt, was sent to local governments; and thousands of bumper stickers, brochures, small stickers, and lapel pins promoting the program were distributed to North Carolina residents and state employees. A video for state employees is being developed that will highlight the 3Rs in state agencies.

Source Reduction Workshops

In conjunction with the NC Recycling Association, SunShares, NC Cooperative Extension Service, and Mecklenburg County, OWR presented two source reduction workshops during the fall 1994. The workshops were held August 10 - 11 in New Bern, and October 4 - 5 in Charlotte. The first day of the two-day session focused on commercial source reduction; the second day concentrated on residential source reduction. A total of 102 people attended the two courses.

Recycling Coordinators Training Course

The Recycling Coordinators Training Course (RCTC) provides information about integrated solid waste management techniques to local government recycling coordinators and other solid waste management professionals. In 1994, the RCTC was presented on October 25-27 in Morganton and again on November 1-3 in Fayetteville to a total of 92 attendants. Each participant received an updated manual that covered legislation, program planning, source reduction, financing, recyclable materials recovery and processing, marketing, education and promotion, policy options, private and public sector involvement, and yard waste management. This course, which was first offered in 1991, has to date attracted 409 participants from all parts of the state.

Local Government Commercial and Industrial Workshops

In FY 1994-95, OWR contributed to workshops on commercial and industrial waste reduction sponsored by government agencies. In addition to working with the agencies to develop the workshops, staff from OWR made presentations at each on ways to reduce waste in commercial and industrial enterprises. General commercial and industrial workshops that OWR assisted were held in Davie, Cumberland, Cleveland, Gaston and Guilford counties. OWR also provided staff and resources to hotel and restaurant workshops sponsored by the Albemarle Solid Waste Authority and the Cape Fear Council of Governments.

Publications

The Office of Waste Reduction has developed a series of publications that range from waste reduction tips and fact sheets to in-depth technical handbooks. OWR also maintains a library that has numerous publications, brochures, fact sheets, and guidance documents. These materials are made available to North Carolina local governments, institutions, businesses, industries, and interested citizens. Documents produced by OWR include:

- "Beyond Recycling: A Waste Reduction Manual for Schools"
  OWR produced this manual with the Environmental Resource Program at UNC-Chapel Hill. In addition to noting successful school waste reduction programs in North Carolina, the manual provides a comprehensive discussion of waste reduction and information on how to set up programs for source reduction, recycling, reuse, and composting in a school setting. The manual, which was published in March 1995, was presented at the Environmental Educators Conference in RTP, the Conference of Principals in Wilmington, and the Nutrition Directors and Supervisors Conference in New Bern.

- Waste Reduction Fact Sheets
  OWR develops fact sheets on timely waste reduction issues, waste management methods, technology overviews, and contacts for further resources or service referrals. Some of these publications are jointly published with the Division of Solid Waste Management, the Division of Environmental Management, and other regulatory divisions.

Aluminum Can Ban

On July 1, 1994, a statewide ban on the disposal of aluminum cans in landfills and incinerators went into effect. OWR collaborated with the Solid Waste Section in the development of a packet of information to explain the implementation of the ban and respond to commonly asked questions. The packets, which included aluminum can market lists, fact sheets, posters and promotional clip-art, were distributed to local governments and other interested parties.

## North Carolina Association Efforts

The North Carolina Recycling Association (NCRA) sponsored the following activities in solid waste educational projects in FY 1994-95

- Triangle Market Development Project,
- Fifth Annual Recycling Conference and Trade Show,
- Green Building Design Charette,
- Initiative Program and Conference,
- Source Reduction Workshop (participation)
- the Regional Planners Coalition Workshops,
- Collegiate Recyclers Coalition Annual Conference,
- a Composting in the Carolinas Conference

- a Waste Reduction and Recycling Financing Forum.

The Solid Waste Association of North America

In June 1994, the NC Solid Waste Association of North America (NC SWANA) held its annual business meeting and technical seminar in Asheville. Among the issues discussed or examined at this seminar were:

- a preview of the Manager of Landfill Operations Training and Certification program;
- the effects of the Clean Air Act on municipal solid waste landfills, leachate recirculation and landfill reclamation;
- the proposed solid waste management planning regulations;
- special waste handling; and
- household hazardous waste collection programs.

## CHAPTER ELEVEN

## RECYCLING MARKETS AND MARKET DEVELOPMENT

While recycling has long been recognized as an environmentally friendly activity, its potential to provide an economic advantage to a society competing in a world market is fast gaining recognition. The process of collecting, processing, and remanufacturing recyclable material contributes to the growth of industry, the creation of a wide range of job opportunities, and expansion of the tax base. This chapter summarizes state government's efforts to develop recycling markets in North Carolina for FY 1994-95 and beyond.

### The North Carolina Recycling Business Assistance Center (RBAC)

In July 1994, North Carolina was one of four states to be awarded an 18-month grant by the US Environmental Protection Agency to develop a Recycling and Reuse Business Assistance Center (RBAC). RBAC, which is currently administered by the Office of Waste Reduction, is now North Carolina's lead agency in conducting the state's market development activities.

#### Demonstration Projects - Description and Update

Four demonstration projects are being developed as part of the RBAC grant. The demonstration projects are:

1. A feedstock conversion project demonstrating how a business can replace virgin feedstock with recycled material.

***Feedstock Conversion Demonstration Project:*** Wellmark, Inc., Asheboro, NC, $20,000. Wellmark manufacturers and recycles polypropylene dye tubes from the textile industry. With RBAC assistance, Wellmark is in the process of expanding its plastics recycling operation. This will result in the reclamation of approximately 6.75 million pounds of polypropylene resin per year, the creation of an additional 20 jobs and require a capital investment of $665,000.

2. A capacity expansion project to increase the amount of feedstock needed in production. Such expansion would result in increased capacity available to existing public and private recycling collection operations, while at the same time solidifying the market position of these "home grown" North Carolina companies.

***Capacity Expansion Demonstration Project:*** P & R Environmental Industries, Youngsville, NC, $20,000. P & R employs high-tech sorting of commingled plastic bottles from throughout the east coast, processing close to 1,000 tons of feedstock per month into post-consumer flake.

With RBAC's assistance, P & R has expanded its operation to process an additional 9,000 tons of feedstock per year, which will create an additional 25 jobs and a capital investment of $550,000.

3. An industrial recruitment project to identify and locate in North Carolina a company using recycled feedstock;

***Industrial Recruitment Demonstration Project:*** OWR, in conjunction with the NC Department of Commerce, is currently working on a number of industrial recruitment projects across the state. The primary demonstration project under this section will be based upon the results of the Assessment of the Recycling Industry and Recycling Materials in North Carolina - 1995 Update, which is described later in this chapter.

OWR spearheaded a project to assist in the start up of a gypsum wallboard recycling operation in North Carolina This facility, owned by Waste Reduction Products Corporation will employ up to 150 people and process 50,000 tons of material per year. RBAC has provided both business development and technical assistance in the development of this project.

4. A regional aggregation project to "bridge the gap" between end users or intermediate processors and local supply of materials to decrease transportation and/or processing costs.

***Regional Aggregation Demonstration Project:*** OWR has released a request for proposals to both the private and public sectors.

**Training Workshops**

As part of the grant, five separate training courses/educational seminars are being conducted to better acquaint economic development professionals with recycling, recycling market development and solid waste management issues and solid waste professionals on economic development issues. Two of the five are targeted specifically at professionals:

> *Solid Waste Professionals Training Workshop.* On April 3, 1995, through a contract with the RBAC, the UNC Small Business and Technology Development Center conducted the training workshop for 54 participants in conjunction with the Fifth Annual NC Recycling Association (NCRA) Conference and Trade Show in Greensboro, NC.
>
> *Economic Development Professionals Training Workshop.* In December 1995, two workshops were conducted by the NC Recycling Association and RBAC staff for economic development professionals. The first, held in Cashiers, NC, provided training to approximately 15 staff member from the Small Business and Technology Development Center. The second, held in Raleigh, provided training for approximately 30 professionals from the NC Department of Commerce.

In addition to the workshop, RBAC staff presented information on the services the RBAC can provide to recycling businesses throughout North Carolina during a market development general session on April 5, 1995 at the NCRA conference.

## North Carolina Market Assessment

The Assessment of the Recycling Industry and Recycling Materials in North Carolina - 1995 Update, better known as the NC Market Assessment, was prepared for OWR by SCS Engineers of Reston, Virginia, in association with Kirkworks of Durham, NC. The project assessed the current and potential future supply of various recyclable materials generated in the state. Current and potential future demand for recyclable materials by intermediate processors and end-users was examined and analyzed to determine the potential for successful recycling of each material. The analysis, in which both short and long-term trends were identified, included:

- Materials identified as best matching supply and demand;
- Materials that could be efficiently collected in significant quantities (supply) but have problematic market availability (demand); and
- Materials that show promising demand trends but which have undergone limited collection efforts to date.

The Markets Assessment Report is being used to select commodities for more intensive work, including the development of commodity work plans. Nine major categories were selected for analysis including glass, plastics, metal, paper, wood, textiles, special wastes, construction and demolition waste, and compost. Based on these major categories, a total of 36 commodities were examined at one of three levels of analysis and geographic scope covering a time period from 1994 to 2001. To date, four categories of material have been selected (plastic, paper, organics, and construction and demolition wastes) as those which have the greatest potential for increasing recycling tonnages.

## Electronic Bulletin Board

OWR's computer databases have been updated and are being prepared for distribution to the public via the INTERNET.

## RBAC Publications

*Recycling Works* -RBAC's newsletter, *Recycling Works,* has been developed to publicize recycling industry success stories along with the economic potential of collecting and reusing recyclable commodities. Current circulation is 2000.

*Directory of Markets for Recyclable Materials* -This fourth edition lists approximately 435 markets for recycled materials. It provides a link among businesses, industries, and local governments that are searching for markets for their recyclables and the companies that accept the materials for reprocessing and reuse.

*North Carolina Recycling Business Study* - This study documents employment, capital demands, and technical assistance needs in the recycling industry.

*The Impact of Recycling On Jobs in North Carolina* - This report presents major findings from a study that researched the effects of recycling on employment in North Carolina.

**Buy-Recycled Campaign**

North Carolina's Buy-Recycled campaign was initiated in July 1992 by the Governor's Office, the North Carolina Department of Administration, Department of Commerce, DEHNR, and the Department of Transportation. In support of this campaign, OWR implemented the following projects:

- DEHNR/Environmental Defense Fund (EDF) Buy-Recycled Media Project. OWR contracted with the Environmental Defense Fund to produce television, radio, and print public service announcements (PSAs) to promote the purchase of recycled products.
- Buy-Recycled Presentations During FY 94-95, Buy-Recycled presentations were given to the Carolinas Association of Governmental Purchasers, the North Carolina Recycling Association, the North Carolina Department of Administration's Division of Purchase and Contract, the North Carolina Collegiate Recycling Coalition, and other local and regional organizations.
- Buy-Recycled Brochures and Bulletins published by OWR

  An information bulletin entitled *"Setting Up a Buy-Recycled Program"* highlights buy-recycled policies and resolutions passed by North Carolina local governments.

  *"North Carolina Manufacturers of Recycled Products"* notes manufacturers in the state who use recycled materials in their products.

  A brochure entitled *"Buying Recycled Products through NC State Contracts,"* (co-published by the Purchase and Contract Division of the Department of Administration) provides an overview of recycled products available from the various state contracts.

APPENDIX A-1 MUNICIPAL SOLID WASTE LANDFILLS (PUBLIC and PRIVATE), DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY 93-94 | TONS FY 94-95 | LINED LANDFILL FY 94-95 | TIPPING FEE FY 94-95 | CERTIFIED OPERATOR FY 94-95 |
|---|---|---|---|---|---|---|---|---|---|
| 1304 | CHARLOTTE MTR SPEEDWAY LF | 359,918.00 | 404,978.70 | 493,962.61 | 536,526.51 | 548,442.00 | YES | $30.78 | NO |
| 3406 | PIEDMONT SANITARY LANDFILL | 128,148.00 | 142,067.36 | 146,847.90 | 350,508.77 | 507,123.30 | YES | $29.00 | YES |
| 3402 | WINSTON-SALEM LF (FORSYTH | 229,531.00 | 210,246.46 | 216,125.79 | 258,632.45 | 300,571.34 | NO | $23.00 | YES |
| 9201 | RALEIGH, CITY OF - LF (WAKE C | 276,652.00 | 258,796.00 | 267,984.00 | 268,428.00 | 288,370.95 | NO | $28.00 | YES |
| 803 | EAST CAROLINA REGIONAL LF | 0.00 | 0.00 | 0.00 | 154,583.16 | 282,654.49 | YES | $34.49 | NO |
| 4103 | GREENSBORO LF (GUILFORD CO) | 322,946.00 | 327,574.00 | 283,000.00 | 285,068.45 | 277,940.86 | NO | $26.25 | YES |
| 3201 | DURHAM LF (DURHAM CO) | 217,020.00 | 208,360.00 | 194,281.00 | 206,575.00 | 206,381.00 | NO | $39.50 | NO |
| 9214 | HOLLY SPRINGS DISPOSAL, INC | 0.00 | 0.00 | 0.00 | 87,176.52 | 196,607.12 | NO | $22.00 | NO |
| 6013 | NORTH MECKLENBURG C&D LF | 0.00 | 0.00 | 0.00 | 110,881.33 | 195,345.10 | NO | $18.00 | NO |
| 2601 | ANN ST LF (CUMBERLAND CO) | 174,445.00 | 160,880.67 | 179,920.67 | 178,479.98 | 186,366.00 | NO | $32.00 | YES |
| 4204 | HALIFAX CO LF | 60,000.00 | 52,309.79 | 52,036.12 | 49,887.82 | 165,160.44 | NO | $20.00 | YES |
| 8201 | SAMPSON CO LF | 36,000.00 | 33,234.59 | 34,975.86 | 97,003.97 | 163,174.54 | YES | $26.00 | YES |
| 1803 | CATAWBA CO LF | 131,201.00 | 129,948.00 | 136,459.00 | 144,450.00 | 148,852.00 | NO | $30.00 | YES |
| 6201 | MONTGOMERY CO LF | 18,096.00 | 28,800.00 | 42,542.43 | 94,875.75 | 138,041.07 | NO | $24.00 | YES |
| 4903 | IREDELL CO. SANITARY LF | 0.00 | 0.00 | 0.00 | 85,180.65 | 125,741.55 | YES | $27.00 | YES |
| 6801 | ORANGE CO REGIONAL LF | 95,123.00 | 121,318.00 | 125,452.00 | 121,345.00 | 124,611.00 | NO | $25.00 | YES |
| 9801 | WILSON CO LF | 108,637.00 | 117,112.00 | 121,419.00 | 123,875.12 | 112,522.65 | NO | $19.00 | YES |
| 2504 | CRSWMA* INT. REG. LF | 0.00 | 0.00 | 0.00 | 69,184.92 | 110,797.99 | YES | $42.00 | YES |
| 9209 | WAKE CO LF | 156,958.00 | 150,967.70 | 122,444.10 | 119,382.59 | 110,378.52 | NO | $31.00 | YES |
| 9203 | FELTONSVILLE LF (WAKE CO) | 89,035.00 | 92,433.74 | 100,764.82 | 97,259.43 | 106,524.22 | NO | $31.00 | YES |
| 8003 | ROWAN CO LF | 87,159.00 | 85,708.00 | 88,639.00 | 97,180.00 | 105,367.00 | YES | $31.00 | YES |
| 1101 | BUNCOMBE CO LF | 192,476.00 | 141,928.01 | 143,267.00 | 96,753.33 | 102,185.39 | NO | $28.00 | YES |
| 7401 | PITT CO LF | 142,110.00 | 124,008.00 | 119,270.00 | 125,313.00 | 101,769.00 | NO | $30.00 | NO |
| 2401 | COLUMBUS CO LF | 35,880.00 | 44,536.31 | 45,361.11 | 88,446.90 | 100,015.14 | NO | $22.00 | NO |
| 1203 | BURKE CO LF | 54,509.50 | 64,619.00 | 68,081.55 | 72,669.35 | 99,953.51 | NO | $23.00 | YES |
| 4104 | HIGH POINT (GUILFORD CO) | 0.00 | 0.00 | 0.00 | 83,750.71 | 98,794.81 | YES | $30.00 | NO |
| 7803 | ROBESON CO | 84,066.00 | 91,048.50 | 80,676.70 | 80,588.00 | 92,548.35 | NO | $22.50 | NO |
| 9601 | WAYNE CO | 111,083.00 | 97,386.32 | 101,716.09 | 92,544.75 | 86,820.38 | NO | $20.00 | YES |
| 6401 | NASH CO LF | 78,495.00 | 79,402.87 | 78,454.78 | 81,645.51 | 80,908.32 | NO | $21.00 | NO |
| 6504 | NEW HANOVER CO LF | 123,538.00 | 80,575.58 | 83,273.11 | 82,189.00 | 80,786.00 | YES | $30.00 | YES |
| 3606 | GASTON CO LF | 149,198.00 | 153,105.00 | 161,864.00 | 130,097.00 | 80,204.00 | NO | $22.00 | YES |
| 1007 | BRUNSWICK CO LF | 70,836.00 | 76,560.00 | 80,477.00 | 76,005.31 | 79,917.00 | NO | $0.00 | YES |
| 6705 | ONSLOW CO LF | 74,195.00 | 63,530.27 | 69,992.56 | 76,450.22 | 79,105.84 | NO | $38.50 | YES |
| 5403 | LENOIR CO LF | 60,347.00 | 67,323.66 | 74,062.00 | 71,568.70 | 77,319.43 | NO | $20.00 | YES |
| 9001 | UNION CO LF | 105,570.00 | 71,787.37 | 79,465.89 | 84,001.19 | 77,257.39 | NO | $30.00 | NO |
| 104 | AUSTIN QUARTER SWM FACILIT | 0.00 | 0.00 | 0.00 | 23,169.68 | 77,253.44 | YES | $30.67 | YES |

APPENDIX A-1 MUNICIPAL SOLID WASTE LANDFILLS (PUBLIC and PRIVATE), DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY 93-94 | TONS FY 94-95 | LINED LANDFILL FY 94-95 | TIPPING FEE FY 94-95 | CERTIFIED OPERATOR FY 94-95 |
|---|---|---|---|---|---|---|---|---|---|
| 1401 | CALDWELL CO LF | 45,866.00 | 62,112.59 | 66,951.53 | 68,029.87 | 75,670.80 | NO | $35.00 | NO |
| 7601 | RANDOLPH CO LF | 74,700.00 | 75,533.00 | 77,660.00 | 74,677.00 | 75,658.00 | NO | $24.00 | YES |
| 2906 | DAVIDSON CO LINED LANDFILL | 0.00 | 0.00 | 0.00 | 0.00 | 73,652.58 | YES | $33.00 | NO |
| 3301 | EDGECOMBE CO LF | 64,079.00 | 71,037.00 | 78,894.52 | 73,759.15 | 73,225.00 | NO | $25.00 | YES |
| 5101 | JOHNSTON CO LF | 72,048.00 | 70,045.00 | 68,578.00 | 74,151.00 | 72,960.64 | NO | $27.00 | YES |
| 2301 | CLEVELAND CO LF | 74,096.00 | 64,749.87 | 67,888.77 | 65,878.77 | 71,298.20 | NO | $23.00 | NO |
| 8103 | CENTRAL LF (RUTHERFORD CO) | 48,208.00 | 52,047.64 | 64,894.31 | 77,057.00 | 69,039.85 | NO | $17.00 | YES |
| 4302 | HARNETT CO LF | 59,804.00 | 54,770.00 | 49,985.00 | 55,254.25 | 68,063.69 | NO | $25.00 | YES |
| 4501 | HENDERSON CO LF | 89,488.00 | 77,763.00 | 77,501.00 | 56,091.00 | 59,925.00 | NO | $26.00 | YES |
| 9704 | WILKES CO MSWLF | 0.00 | 0.00 | 0.00 | 32,924.56 | 53,892.00 | YES | $35.00 | NO |
| 8602 | SURRY CO LF | 49,296.00 | 45,907.00 | 51,518.00 | 52,260.00 | 53,341.00 | NO | $18.00 | NO |
| 1302 | CABARRUS CO LF | 59,832.00 | 59,335.70 | 57,641.70 | 61,247.98 | 52,691.21 | NO | $28.00 | YES |
| 8301 | SCOTLAND CO LF | 46,800.00 | 43,041.84 | 45,668.00 | 50,062.00 | 48,654.00 | NO | $26.00 | YES |
| 8401 | ALBEMARLE LF (STANLY CO) | 62,328.00 | 67,498.00 | 69,503.00 | 54,627.00 | 48,187.00 | NO | $23.00 | YES |
| 7901 | ROCKINGHAM CO LF | 60,155.00 | 37,377.46 | 60,661.85 | 77,891.04 | 47,175.36 | NO | $24.00 | YES |
| 9101 | VANCE CO LF | 46,954.00 | 40,053.06 | 38,242.34 | 43,603.47 | 45,826.74 | NO | $35.00 | NO |
| 3901 | OXFORD LF (GRANVILLE CO) | 32,246.00 | 36,341.03 | 39,190.64 | 46,242.50 | 45,697.88 | NO | $28.00 | YES |
| 2602 | FORT BRAGG SANITARY LF | 80,000.00 | 39,996.00 | 36,000.00 | 34,954.00 | 45,238.00 | NO | $0.00 | NO |
| 4407 | HAYWOOD CO WHITE OAK LF | 0.00 | 0.00 | 0.00 | 22,451.00 | 34,735.95 | YES | $23.00 | YES |
| 5503 | LINCOLN CO LF | 51,450.00 | 42,297.00 | 44,194.64 | 40,873.00 | 34,090.00 | YES | $32.00 | YES |
| 6703 | CAMP LEJEUNE SANITARY LF | 59,403.00 | 83,823.43 | 83,823.43 | 46,532.51 | 33,636.04 | NO | $0.00 | YES |
| 2001 | CHEROKEE CO LF | 15,840.00 | 15,926.00 | 17,610.69 | 18,374.00 | 24,617.50 | NO | $36.00 | NO |
| 5002 | JACKSON CO LF | 16,833.00 | 16,703.00 | 19,309.07 | 20,033.57 | 24,296.36 | NO | $50.00 | NO |
| 8603 | ELKIN AREA LF (SURRY CO) | 32,760.00 | 26,726.00 | 21,604.00 | 22,191.00 | 22,110.81 | NO | $18.00 | NO |
| 201 | ALEXANDER CO LF | 28,880.00 | 25,182.00 | 20,712.00 | 21,477.00 | 21,671.04 | NO | $27.00 | NO |
| 3902 | GRANVILLE CO LF | 14,090.00 | 17,915.14 | 19,320.50 | 17,585.40 | 20,457.35 | NO | $28.00 | YES |
| 5703 | MACON CO LANDFILL | 0.00 | 3,648.70 | 16,645.53 | 17,108.79 | 18,779.02 | YES | $20.00 | YES |
| 2803 | DARE CO C&D LF | | | | | 16,649.39 | NO | $10.00 | NO |
| 8807 | TRANSYLVANIA CO LF | 0.00 | 3,220.00 | 16,384.00 | 18,874.00 | 16,451.60 | YES | $40.00 | YES |
| 501 | ASHE CO LF | 16,389.00 | 17,756.20 | 18,000.17 | 17,946.35 | 15,993.26 | YES | $30.00 | NO |
| 6301 | MOORE CO LF | 72,690.00 | 70,706.43 | 58,114.30 | 27,225.61 | 12,290.55 | NO | $25.00 | NO |
| 5803 | MADISON CO LF | 0.00 | 0.00 | 0.00 | 7,411.37 | 10,773.30 | YES | $23.50 | YES |
| 4002 | GREENE CO LF | 14,064.00 | 6,815.28 | 8,729.64 | 9,669.16 | 10,177.63 | NO | $20.00 | NO |
| 702 | BEAUFORT CO LF | 37,200.00 | 38,748.17 | 44,531.19 | 18,175.96 | 9,573.00 | NO | $15.00 | NO |
| 7301 | ROXBORO LF (PERSON CO) | 42,996.00 | 22,528.99 | 25,251.59 | 23,281.29 | 7,041.93 | NO | $32.00 | YES |
| 5601 | MCDOWELL CO LF | 28,900.00 | 27,460.96 | 30,279.63 | 26,484.07 | 4,460.53 | NO | $27.00 | YES |

APPENDIX A-1 MUNICIPAL SOLID WASTE LANDFILLS (PUBLIC and PRIVATE), DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY 93-94 | TONS FY 94-95 | LINED LANDFILL FY 94-95 | TIPPING FEE FY 94-95 | CERTIFIED OPERATOR FY 94-95 |
|---|---|---|---|---|---|---|---|---|---|
| 5704 | MACON CO LANDFILL | 0.00 | 0.00 | 0.00 | 2,625.46 | 4,378.75 | NO | $20.00 | YES |
| 5301 | LEE CO LF | 45,981.00 | 46,750.83 | 43,398.70 | 13,548.46 | 3,893.33 | NO | $18.00 | NO |
| 2 | YANCEY/MITCHELL C&D LF | 0.00 | 0.00 | 0.00 | 0.00 | 3,253.91 | NO | $0.00 | NO |
| 5901 | MARTIN CO LF | 25,956.00 | 30,086.00 | 30,690.00 | 8,398.51 | 1,935.63 | NO | $20.00 | NO |
| 9902 | YADKIN CO LF | 25,800.00 | 20,487.33 | 22,529.86 | 8,214.95 | 1,687.81 | NO | $40.00 | NO |
| 7502 | POLK CO LF | 9,318.00 | 8,808.86 | 7,515.49 | 6,062.57 | 1,556.60 | NO | $25.00 | YES |
| 4303 | ANDERSON CRK LF (HARNETT C | 10,355.00 | 13,691.00 | 11,841.00 | 7,586.19 | 578.47 | NO | $25.00 | YES |
| 6601 | NORTHAMPTON CO LF | 12,384.00 | 18,890.00 | 14,435.18 | 2,715.23 | 315.91 | NO | $10.00 | NO |
| 1 | YANCEY/MITCHELL CO LF | 31,296.00 | 30,915.00 | 21,072.00 | 18,259.54 | 0.00 | NO | N/A | NO |
| 101 | ALAMANCE CO LF | 98,552.00 | 89,089.64 | 76,632.91 | 21,076.80 | 0.00 | NO | N/A | NO |
| 302 | ALLEGHANY CO LF | 17,060.00 | 13,995.00 | 7,684.00 | 6,615.35 | 0.00 | NO | N/A | NO |
| 401 | ANSON CO LF | 14,831.00 | 13,942.30 | 15,702.29 | 10,786.60 | 0.00 | NO | N/A | NO |
| 601 | AVERY CO LF | 16,060.00 | 10,800.00 | 2,830.00 | 3,560.00 | 0.00 | NO | N/A | NO |
| 801 | BERTIE CO LF | 12,600.00 | 17,255.30 | 16,864.00 | 5,944.10 | 0.00 | NO | N/A | NO |
| 901 | BLADEN CO | 47,110.00 | 24,810.00 | 28,330.00 | 20,944.18 | 0.00 | NO | N/A | NO |
| 1602 | CARTERET CO LF | 105,358.00 | 84,433.00 | 78,281.00 | 22,808.00 | 0.00 | NO | N/A | NO |
| 1701 | CASWELL CO LF | 5,807.60 | 5,102.43 | 4,818.11 | 5,554.57 | 0.00 | NO | N/A | NO |
| 1901 | CHATHAM CO LF | 31,910.00 | 30,552.00 | 29,805.00 | 9,372.66 | 0.00 | NO | N/A | NO |
| 2201 | CLAY CO LF | 4,720.00 | 3,965.60 | 3,425.00 | 1,806.65 | 0.00 | NO | N/A | NO |
| 2503 | CRAVEN CO LF | 97,232.00 | 77,108.17 | 68,675.15 | 19,658.86 | 0.00 | NO | N/A | NO |
| 2701 | CURRITUCK CO LF | 14,569.00 | 13,721.00 | 15,001.00 | 4,589.00 | 0.00 | NO | N/A | NO |
| 2802 | EAST LAKE LF (DARE CO) | 48,613.00 | 50,101.00 | 52,052.36 | 20,851.53 | 0.00 | NO | N/A | NO |
| 2902 | DAVIDSON CO LF | 117,211.00 | 132,258.00 | 121,503.00 | 31,388.89 | 0.00 | NO | N/A | NO |
| 2904 | THOMASVILLE LF (DAVIDSON CO | 7,502.00 | 0.00 | 0.00 | 0.00 | 0.00 | NO | N/A | NO |
| 3001 | DAVIE CO LF | 19,070.00 | 15,109.98 | 18,284.35 | 9,174.70 | 0.00 | NO | N/A | NO |
| 3101 | DUPLIN CO LF | 48,900.00 | 31,571.92 | 29,913.64 | 8,745.48 | 0.00 | NO | N/A | NO |
| 3501 | FRANKLIN CO LF | 25,881.00 | 27,887.46 | 32,477.41 | 22,325.72 | 0.00 | NO | N/A | NO |
| 3801 | GRAHAM CO LF | 4,710.00 | 4,422.96 | 4,741.00 | 3,566.00 | 0.00 | NO | N/A | NO |
| 4101 | HIGH POINT LF (GUILFORD CO) | 118,968.00 | 118,118.30 | 126,083.78 | 19,335.44 | 0.00 | NO | N/A | NO |
| 4403 | HAYWOOD CO LF | 40,560.00 | 39,240.00 | 50,878.47 | 12,434.28 | 0.00 | NO | N/A | NO |
| 4404 | CANTON LF (HAYWOOD CO) | 95,735.00 | 13,957.00 | 34,592.00 | 17,470.05 | 0.00 | NO | N/A | NO |
| 4601 | HERTFORD CO LF | 12,475.00 | 14,269.00 | 14,819.00 | 11,531.30 | 0.00 | NO | N/A | NO |
| 4701 | HOKE CO LF | 20,306.00 | 17,515.04 | 19,150.05 | 2,149.76 | 0.00 | NO | N/A | NO |
| 4901 | IREDELL CO LF | 148,500.00 | 110,357.00 | 124,625.00 | 31,226.80 | 0.00 | NO | N/A | NO |
| 5001 | WESTERN CAROLINA UNIV. LF | 612.00 | 430.45 | 402.42 | 108.34 | 0.00 | NO | N/A | NO |

APPENDIX A-1 MUNICIPAL SOLID WASTE LANDFILLS (PUBLIC and PRIVATE), DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY 93-94 | TONS FY 94-95 | LINED LANDFILL FY 94-95 | TIPPING FEE FY 94-95 | CERTIFIED OPERATOR FY 94-95 |
|---|---|---|---|---|---|---|---|---|---|
| 5201 | JONES CO LF | 3,648.00 | 4,360.00 | 2,878.00 | 2,734.45 | 0.00 | NO | N/A | NO |
| 5701 | MACON CO LF (FRANKLIN CO) | 28,215.00 | 9,531.32 | 1,011.49 | 0.00 | 0.00 | NO | N/A | NO |
| 5702 | HIGHLANDS LF (MACON CO) | 7,365.00 | 4,267.04 | 3,655.53 | 1,299.51 | 0.00 | NO | N/A | NO |
| 5802 | MADISON CO LF | 12,090.00 | 11,154.00 | 10,404.59 | 2,706.34 | 0.00 | NO | N/A | NO |
| 6001 | MECKLENBURG CO LF | 221,124.00 | 150,603.00 | 0.00 | 25,246.00 | 0.00 | NO | N/A | NO |
| 6902 | PAMLICO CO LF | 11,083.00 | 10,600.00 | 11,895.54 | 2,044.42 | 0.00 | NO | N/A | NO |
| 7002 | PASQUOTANK CO LF | 34,478.00 | 30,004.99 | 31,638.80 | 22,915.18 | 0.00 | NO | N/A | NO |
| 7101 | PENDER CO LF | 18,133.00 | 17,875.79 | 17,277.29 | 10,606.33 | 0.00 | NO | N/A | NO |
| 7201 | PERQUIMANS CHOWAN GATES L | 24,508.00 | 24,700.00 | 26,410.31 | 8,547.00 | 0.00 | NO | N/A | NO |
| 7702 | RICHMOND CO LF | 47,662.00 | 60,103.48 | 36,885.79 | 4,855.66 | 0.00 | NO | N/A | NO |
| 8102 | CLIFFSIDE SOUTH LF (RUTHERFO | 12,051.00 | 31,228.58 | 3,184.21 | 0.00 | 0.00 | NO | N/A | NO |
| 8501 | STOKES CO LF | 16,896.00 | 16,784.00 | 16,671.26 | 7,633.04 | 0.00 | NO | N/A | NO |
| 8701 | SWAIN CO LF | 4,663.00 | 5,521.30 | 6,152.27 | 4,859.24 | 0.00 | NO | N/A | NO |
| 8803 | TRANSYLVANIA CO LF | 26,740.00 | 25,620.00 | 0.00 | 0.00 | 0.00 | NO | N/A | NO |
| 9204 | SORRELLS SANITARY LANDFILL | DNR | 37,530.00 | 50,138.00 | DNR | 0.00 | NO | N/A | NO |
| 9301 | WARREN CO LF | 13,490.00 | 10,968.00 | 8,976.00 | 6,571.00 | 0.00 | NO | N/A | NO |
| 9402 | WASHINGTON CO LF | 11,773.00 | 13,233.05 | 14,735.51 | 4,225.78 | 0.00 | NO | N/A | NO |
| 9502 | WATAUGA CO LF | 32,206.00 | 32,881.82 | 35,208.00 | 27,438.50 | 0.00 | NO | N/A | NO |
| 9701 | WILKES CO LF | 83,832.00 | 55,722.00 | 55,832.00 | 9,584.70 | 0.00 | NO | N/A | NO |
| 9702 | ROARING RIVER LF (WILKES CO) | 9,146.00 | 1,637.00 | 6,501.00 | 0.00 | 0.00 | NO | N/A | NO |
| | | | | | | | | | |
| | TOTAL | 7,125,613.10 | ~~5,972,752.39~~ 6,681,578.33 | 6,656,613.89 | 6,707,785.86 | 7,151,413.76 | | | |

LF = Landfill

*CRSWMA = Coastal Regional Solid Waste Management Authority

APPENDIX A-2: SCRAP TIRE MONOFILLS, DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY 93-94 | TONS FY 94-95 |
|---|---|---|---|---|---|---|
| | | | | | | |
| 1303 | U S TIRE RECYCLING PARTNERS, LP | 15,444.00 | 17,094.25 | 17,873.23 | 45,410.47 | 59,014.46 |
| 4304 | CENTRAL CAROLINA TIRE RECYCLING | 0.00 | 2,764.61 | 4,824.43 | 24,255.61 | 38,598.26 |
| | TOTAL TONS | 15,444.00 | 19,858.86 | 22,697.66 | 69,666.08 | 97,612.72 |

APPENDIX A-3: INCINERATION FACILITIES, DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | NET TONS FY 90-91 | NET TONS FY 91-92 | NET TONS FY 92-93 | NET TONS FY 93-94 | NET TONS FY 94-95 | TIPPING FEE FY 94-95 | CERTIFIED OPERATOR FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 6505 | NEW HANOVER CO WTE FACILITY | 16,975.00 | 64,002.68 | 62,104.40 | 53,373.00 | 59,619.00 | $30.00 | YES |
| 6010 | NORTHEAST WTE FACILITY | 55,663.00 | 54,136.00 | 50,585.00 | 52,757.00 | 51,311.00 | $29.70 | YES |
| 6506 | TOWN OF WRIGHTSVILLE BEACH | 4,590.40 | 3,805.70 | 2,217.20 | 0.00 | 0.00 | N/A | N/A |
| | TOTAL TONS | 60,253.40 | 121,944.38 | 114,906.60 | 106,130.00 | 110,930.00 | | |

WTE = Waste to Energy

APPENDIX A-4: PRIVATE INDUSTRIAL LANDFILLS, DESCENDING ORDER, FY 1994-95

| PERMIT | FACILITY | TONS FY 90-91 | TONS FY 91-92 | TONS FY 92-93 | TONS FY93-94 | TONS FY 94-95 |
|---|---|---|---|---|---|---|
| 7302 | CP&L ROXBORO S E PLANT | DNR | 528,486.00 | 632,421.90 | 476,730.86 | 410,668.40 |
| 4406 | CHAMPION INT'L CORP LF NO. 6 | DNR | 389,689.00 | 379,899.00 | 328,233.00 | 303,310.00 |
| 2402 | FEDERAL PAPER BOARD COMPANY, INC | 139,375.00 | 194,929.00 | 268,341.00 | 75,116.00 | 264,689.00 |
| 3605 | FMC CORPORATION LF | DNR | 184,462.00 | 154,923.00 | 166,444.00 | 190,814.00 |
| 1804 | DUKE POWER-MARSHALL STEAM STATION LF | DNR | 329,457.00 | 344,543.80 | 400,874.68 | 142,886.81 |
| 8503 | DUKE POWER BELEWS CREEK ASH LF | DNR | 242,268.00 | 164,675.00 | 191,070.00 | 105,680.00 |
| 9401 | WEYERHAEUSER PAPER CO | DNR | 99,732.30 | 119,283.00 | 108,960.00 | 95,330.20 |
| 2302 | CLEVELAND CONTAINER SERVICE | DNR | 67,155.00 | 73,918.00 | 124,516.00 | 91,134.00 |
| 3405 | R J REYNOLDS TOBACCO CO LF | 68,019.00 | 59,576.71 | 48,997.79 | 47,683.72 | 47,185.91 |
| 1006 | E I DUPONT | 14,147.00 | 20,767.85 | 23,852.30 | 22,078.32 | 27,946.17 |
| 4203 | CHAMPION INT'L CORP | 31,698.00 | 17,839.10 | 21,768.80 | 29,568.10 | 22,764.70 |
| 5404 | E I DUPONT CO - KINSTON SITE | 6,442.30 | 8,227.00 | 57,011.31 | 37,737.74 | 22,072.54 |
| 1102 | BASF CORPORATION | 23,400.00 | 25,726.00 | 20,652.00 | 45,500.00 | 17,262.00 |
| 8801 | ECUSTA PAPER LF (SLUDGE) | 13,337.00 | 10,999.70 | 10,134.90 | 11,475.80 | 11,784.30 |
| 8805 | ECUSTA PAPER LF | DNR | 7,522.10 | 7,026.00 | 6,817.10 | 6,741.30 |
| 5603 | COLLINS & AIKMAN SANITARY LF | DNR | 6,846.70 | 6,440.00 | 6,618.00 | 6,603.00 |
| 2502 | WEYERHAEUSER COMPANY | 10,252.00 | 6,633.00 | 8,249.00 | 9,979.00 | 6,506.00 |
| 9703 | ABTCO, INC. | 3,846.00 | 3,999.00 | 4,288.00 | 4,034.40 | 4,062.30 |
| 4503 | CRANSTON PRINT WORKS | DNR | DNR | 0.00 | 1,875.00 | 3,224.00 |
| 802 | R J REYNOLDS TOBACCO CO, AVOCA DIV | 225.20 | 766.30 | 702.60 | 605.00 | 1,079.50 |
| 7602 | UNION CARBIDE/EVEREADY BATTERY COMPANY, INC | DNR | 612.70 | 337.80 | 402.00 | 465.27 |
| 8806 | DUPONT BREVARD PLANT | DNR | 490.20 | 412.00 | 376.60 | 428.20 |
| 6603 | GEORGIA-PACIFIC | 709.00 | 530.40 | 816.80 | 824.06 | 109.11 |
| 9210 | CP&L SHEARON HARRIS LF | 350.00 | 176.00 | 162.33 | 172.51 | 49.27 |
| 1001 | CP & L BRUNSWICK PLANT SANITARY LF | 446.00 | 194.00 | 323.00 | 639.80 | 15.44 |
| 6004 | DUKE POWER-MCGUIRE SITE LF | 101.00 | 90.80 | 463.20 | 23.35 | 14.40 |
| | | | | | | |
| | **TOTAL TONS** | 312,347.50 | 2,207,175.86 | 2,349,642.53 | 2,098,355.04 | 1,782,825.82 |
| DNR = DID NOT REPORT | | | | | | |

APPENDIX A-5: TRANSFER STATIONS, FY 1994-95

| PERMIT | TRANSFER STATION | TIPPING FEE FY 94-95 | TONS FY 94-95 | DISPOSAL DESTINATION AND PERMIT NUMBER FY 94-95 | DESTINATION LINED FY 94-95 |
|---|---|---|---|---|---|
| 3 | YANCEY-MITCHELL TRANSFER STATION* | $0.00 | 19,510.77 | PALMETTO LANDFILL, SPARTANBURG, SC | YES |
| 0303 | ALLEGHANY COUNTY TRANSFER FACILITY | $22.50 | 7,054.45 | PIEDMONT LANDFILL (FORSYTH)(3406) | YES |
| 402 | ANSON COUNTY TRANSFER STATION* | $35.00 | 17,909.59 | MONTGOMERY CO. LF/UWHARRIE ENV. (6201) | NO |
| ** | AVERY COUNTY | $23.00 | 14,028.00 | BFI CHARLOTTE MOTOR SPEEDWAY V (1304) | YES |
| 703 | ARS/BEAUFORT TRANSFER STATION* | $40.00 | 42,216.52 | EAST CAROLINA REGIONAL LANDFILL (BERTIE)(803) | YES |
| 0904 | BLADEN COUNTY TRANSFER STATION | $28.00 | 21,310.36 | MONTGOMERY CO. LF/UWHARRIE ENV. (6201) | NO |
| | | | | LEE CO. SOUTH CAROLINA | YES |
| | | | | COLUMBUS CO. LANDFILL (2401) | NO |
| 1001 | SOUTHPORT/BRUNSWICK CO TRANSFER | $0.00 | 8,898.00 | BRUNSWICK CO. LANDFILL (1007) | NO |
| 1008 | LELAND/BRUNSWICK COUNTY TRANSFER | $0.00 | 5,878.00 | BRUNSWICK CO. LANDFILL (1007) | NO |
| 1009 | OCEAN ISLE BEACH/BRUNSWICK CO | $0.00 | 8,031.00 | BRUNSWICK CO. LANDFILL (1007) | NO |
| 1104 | WASTE MANAGEMENT OF ASHEVILLE | $28.00 | 81,789.52 | PALMETTO, SPARTANBURG SC | YES |
| 1604 | CARTERET COUNTY TRANSFER STATION | $54.50 | 51,956.45 | CRSWMA INTERIM REGIONAL LANDFILL (2504) | YES |
| 1903 | ARS, INC TRANSFER STATION (CHATHAM) | $34.25 | 27,084.09 | PIEDMONT LANDFILL (FORSYTH)(3406) | YES |
| ** | TOWN OF EDENTON | $43.00 | 5,671.96 | PERQUIMANS TRANSFER STATION (EAST CAROL 803) | YES |
| ** | CURRITUCK CO. (ALBEMARLE REG. SWM AUTH.) | $46.00 | 16,186.33 | EAST CAROLINA REGIONAL LANDFILL (BERTIE) 803 | YES |
| ** | DARE CO. (ALBEMARLE REG. SWM AUTH.) | $45.22 | 40,746.96 | EAST CAROLINA REGIONAL LANDFILL (BERTIE) 803 | YES |
| ** | DAVIDSON COUNTY | $33.00 | 23,257.48 | BFI-CHARLOTTE MOTOR SPEEDWAY (1304) | YES |
| 3002 | DAVIE COUNTY TRANSFER STATION | $45.00 | 21,507.09 | CITY OF WINSTON-SALEM LANDFILL (3402) | NO |
| 3102 | DUPLIN COUNTY TRANSFER STATION* | $30.00 | 27,811.04 | BFI SAMPSON CO. LANDFILL (8201) | YES |
| 3502 | FRANKLIN COUNTY TRANSFER STATION* | $41.00 | 28,803.51 | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 3608 | WASTE MANAGEMENT OF CAROLINAS | $26.50 | 145,728.51 | PALMETTO LANDFILL, SPARTANBURG SC | YES |
| 4305 | HARNETT COUNTY TRANSFER STATION | $25.00 | 1,028.44 | HARNETT CO. LANDFILL (4302) | NO |
| 4702 | HOKE COUNTY TRANSFER STATION* | $35.00 | 18,222.60 | MONTGOMERY CO. LF/UWHARRIE ENV. (6201) | NO |
| | | | | COLUMBUS CO. LANDFILL (2401) | NO |
| 5304 | ARS, INC TRANSFER STATION (LEE) | $34.25 | 50,612.41 | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 5602 | McDOWELL CO TRANSFER FACILITY* | $27.00 | 34,358.70 | BURKE CO. LANDFILL (1203) | NO |
| 6302 | UWHARRIE ENV INC/MOORE CTY TS | $27.50 | 59,667.66 | MONTGOMERY CO. LF/UWHARRIE ENV. (6201) | NO |
| | | | | EAST CAROLINA ENVIRONMENTAL (BERTIE) 803) | YES |
| 6508 | WASTE MANAGEMENT OF WILMINGTON | $30.00 | 35,328.48 | BFI SAMPSON CO. LANDFILL (8201) | YES |
| 6903 | PAMLICO COUNTY TRANSFER STATION | $54.50 | 4,898.83 | CRSWMA INTERIM REGIONAL LANDFILL (2504) | YES |
| 7003 | PASQUOTANK CO. TRANSFER STATION* | $52.00 | 30,109.19 | EAST CAROLINA ENVIRONMENTAL (BERTIE) (803) | YES |
| 7103 | PENDER CO TRANSFER STATION | $54.00 | 11,145.42 | BFI SAMPSON CO. DISPOSAL, INC. (8201) | YES |
| | | | | NEW HANOVER CO. INCINERATOR (6505) | N/A |

APPENDIX A-5: TRANSFER STATIONS, FY 1994-95

| PERMIT | TRANSFER STATION | TIPPING FEE FY 94-95 | TONS FY 94-95 | DISPOSAL DESTINATION AND PERMIT NUMBER FY 94-95 | DESTINATION LINED |
|---|---|---|---|---|---|
| 7202 | PERQUIMAUS-CHOWAN-GATES TRANSFER ST.* | $43.00 | 18,871.88 | EAST CAROLINA ENVIRONMENTAL (BERTIE) (803) | YES |
| 7303 | PERSON COUNTY TRANSFER STATION* | $32.00 | 19,560.96 | PIEDMONT LANDFILL (FORSYTH)(3406) | YES |
| 7503 | POLK COUNTY TRANSFER STATION* | $45.00 | 2,815.88 | PALMETTO LANDFILL, SPARTANBURG SC | YES |
| 7703 | RICHMOND COUNTY TRANSFER STATION | $35.00 | 28,215.17 | MONTGOMERY CO. LF/UWHARRIE ENV. (6201) | NO |
| 7902 | CITY OF REIDSVILLE TRANSFER FACILITY | $0.00 | 11,000.24 | ROCKINGHAM CO. LANDFILL (7901) | NO |
| | | | | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 7903 | CITY OF EDEN TRANSFER STATION | $0.00 | 10,018.00 | ROCKINGHAM CO. LANDFILL (7901) | NO |
| | | | | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 9211 | TOWN OF CARY TRANSFER STATION | $0.00 | 16,441.26 | SOUTH WAKE CO./FELTONSVILLE LANDFILL (9203) | NO |
| 9215 | WASTE MANAGEMENT OF RAL-DUR | $39.50 | 26,562.30 | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 9302 | WARREN COUNTY TRANSFER STATION* | $55.00 | 9,150.78 | EAST CAROLINA REGIONAL LANDFILL (BERTIE) (803) | YES |
| 9503 | WATAUGA CO BALING FACILITY | $35.00 | 35,612.78 | PIEDMONT LANDFILL (FORSYTH) (3406) | YES |
| 9903 | YADKIN COUNTY TRANSFER FACILITY | $40.00 | 14,022.00 | BFI CHARLOTTE MOTOR SPEEDWAY V (1304) | YES |
| | | | | | |
| TOTAL TONS TRANSFERRED | | | 1,053,022.61 | | |

*was unpermitted, permit-pending, or temporary in FY 1993-94

**is unpermitted, permit-pending, or temporary in FY 1994-95

APPENDIX B-1: COUNTY WASTE REDUCTION, DESCENDING ORDER, FY 1994-95

| COUNTY | % WASTE REDUCTION FY 94-95 |
|---|---|
| NORTHAMPTON | 53.67% |
| RICHMOND | 50.50% |
| STOKES | 48.66% |
| ALLEGHANY | 48.45% |
| CRAVEN* | 45.71% |
| CLAY | 45.48% |
| GATES | 44.89% |
| PAMLICO | 44.21% |
| CARTERET | 43.11% |
| TRANSYLVANIA | 41.39% |
| TYRRELL | 41.22% |
| HAYWOOD | 40.93% |
| DUPLIN* | 37.66% |
| JONES | 36.22% |
| MARTIN | 34.83% |
| ALAMANCE* | 34.05% |
| CHOWAN | 32.07% |
| YANCEY | 30.86% |
| YADKIN | 27.88% |
| WASHINGTON | 27.43% |
| MITCHELL | 25.10% |
| ONSLOW | 24.43% |
| RUTHERFORD | 22.89% |
| WATAUGA | 21.34% |
| HOKE | 21.31% |
| HYDE | 20.94% |
| CATAWBA* | 20.39% |
| STANLY | 19.28% |
| ALEXANDER | 19.18% |
| POLK | 18.50% |
| PASQUOTANK* | 17.62% |
| WARREN | 17.22% |
| DAVIDSON | 15.23% |
| CHATHAM* | 14.64% |
| BLADEN | 11.95% |
| HENDERSON | 11.72% |
| PITT | 11.42% |
| ORANGE | 11.33% |
| DURHAM* | 10.65% |
| NASH | 10.25% |
| BURKE | 9.90% |
| ROBESON | 9.47% |
| GUILFORD | 9.19% |
| WAYNE | 8.99% |
| MADISON | 8.65% |
| WILKES | 8.46% |
| JOHNSTON | 8.20% |
| UNION | 7.87% |
| WILSON | 7.35% |
| HARNETT | 7.32% |
| FORSYTH* | 6.70% |
| BRUNSWICK | 6.61% |
| BERTIE | 5.71% |
| NEW HANOVER* | 4.42% |
| FRANKLIN | 4.34% |
| GRAHAM | 3.92% |
| SWAIN | 3.89% |
| CLEVELAND | 3.65% |
| DARE | 3.62% |
| BUNCOMBE* | 1.27% |
| LINCOLN | 0.93% |
| SURRY | 0.59% |
| RANDOLPH | 0.08% |
| LEE | -0.66% |
| ASHE | -0.76% |
| MOORE | -3.40% |
| CAMDEN | -3.48% |
| CABARRUS | -4.28% |
| EDGECOMBE | -4.64% |
| CHEROKEE | -4.97% |
| PENDER | -5.34% |
| WAKE* | -5.39% |
| CUMBERLAND | -5.45% |
| CURRITUCK | -5.48% |
| SAMPSON | -6.25% |
| GASTON | -6.96% |
| PERSON | -7.97% |
| MECKLENBURG* | -8.59% |
| VANCE | -9.12% |
| DAVIE | -9.96% |
| MCDOWELL | -10.25% |
| MACON | -10.83% |
| COLUMBUS | -12.32% |
| IREDELL | -12.65% |
| CALDWELL | -13.67% |
| ROWAN | -14.08% |
| LENOIR | -14.64% |
| SCOTLAND | -17.81% |
| GRANVILLE | -18.11% |
| ROCKINGHAM | -18.58% |
| HERTFORD | -19.70% |
| ANSON | -21.40% |
| BEAUFORT | -21.97% |
| JACKSON | -25.57% |
| AVERY | -27.76% |
| GREENE | -34.39% |
| PERQUIMANS | -36.05% |
| MONTGOMERY | -41.28% |
| CASWELL | -47.22% |
| HALIFAX | -197.00% |

*county used alternative base year

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1994-95

| COUNTY | POPULATION FY 94-95 Jul-94 | MSW MANAGED FY 91-92 | MSW TONS DISPOSED FY 92-93 | MSW TONS DISPOSED FY 93-94 | MSW TONS DISPOSED FY 94-95 | BASE YEAR PER CAPITA FY 91-92 | PER CAPITA RATE FY 92-93 | PER CAPITA RATE FY 93-94 | PER CAPITA RATE FY 94-95 | % WASTE REDUCTION FY 94-95** |
|---|---|---|---|---|---|---|---|---|---|---|
| ALAMANCE* | 113,670 | 99,301.89 | 77,599.29 | 74,841.82 | 82,613.45 | * | * | * | * | * |
| ALEXANDER | 29,649 | 25,716.32 | 20,712.00 | 21,477.00 | 21,671.04 | 0.90 | 0.74 | 0.74 | 0.73 | 19.18% |
| ALLEGHANY | 9,610 | 14,130.83 | 7,730.65 | 8,344.81 | 7,181.03 | 1.45 | 0.78 | 0.88 | 0.75 | 48.45% |
| ANSON | 24,009 | 14,229.30 | 15,703.82 | 14,428.79 | 17,920.67 | 0.61 | 0.67 | 0.60 | 0.75 | -21.40% |
| ASHE | 22,924 | 18,089.13 | 18,056.01 | 18,481.43 | 18,620.54 | 0.81 | 0.80 | 0.82 | 0.81 | -0.76% |
| AVERY | 15,070 | 11,130.09 | 2,952.16 | 12,688.37 | 14,338.05 | 0.74 | 0.20 | 0.84 | 0.95 | -27.76% |
| BEAUFORT | 43,237 | 41,796.03 | 47,546.61 | 52,044.49 | 51,972.27 | 0.99 | 1.11 | 1.22 | 1.20 | -21.97% |
| BERTIE | 20,498 | 17,371.98 | 16,864.00 | 18,155.55 | 16,659.85 | 0.86 | 0.82 | 0.89 | 0.81 | 5.71% |
| BLADEN | 29,478 | 25,048.21 | 28,330.00 | 26,195.87 | 22,369.31 | 0.86 | 0.99 | 0.89 | 0.76 | 11.95% |
| BRUNSWICK | 58,518 | 78,123.11 | 80,805.94 | 76,830.54 | 80,980.60 | 1.48 | 1.48 | 1.35 | 1.38 | 6.61% |
| BUNCOMBE* | 185,810 | 159,040.21 | 152,762.69 | 152,397.96 | 167,000.46 | * | * | * | * | * |
| BURKE | 79,646 | 78,005.51 | 68,540.36 | 69,574.69 | 72,894.30 | 1.02 | 0.89 | 0.89 | 0.92 | 9.90% |
| CABARRUS | 107,216 | 95,215.19 | 83,841.32 | 92,507.75 | 105,525.94 | 0.94 | 0.81 | 0.88 | 0.98 | -4.28% |
| CALDWELL | 73,079 | 65,531.52 | 67,461.78 | 68,831.52 | 76,733.08 | 0.92 | 0.94 | 0.95 | 1.05 | -13.67% |
| CAMDEN | 6,221 | 1,850.16 | 1,991.60 | 2,070.54 | 1,989.37 | 0.31 | 0.33 | 0.34 | 0.32 | -3.48% |
| CARTERET | 56,624 | 86,894.30 | 78,481.53 | 54,908.51 | 52,101.29 | 1.62 | 1.42 | 0.98 | 0.92 | 43.11% |
| CASWELL | 21,221 | 5,136.12 | 4,818.11 | 7,081.54 | 7,703.53 | 0.25 | 0.23 | 0.33 | 0.36 | -47.22% |
| CATAWBA* | 123,913 | 151,559.31 | 136,462.83 | 144,538.66 | 149,404.28 | * | * | * | * | * |
| CHATHAM* | 41,959 | 33,235.13 | 30,109.23 | 31,919.95 | 31,710.37 | * | * | * | * | * |
| CHEROKEE | 21,452 | 16,020.17 | 17,623.89 | 16,708.00 | 17,487.30 | 0.78 | 0.85 | 0.79 | 0.82 | -4.97% |
| CHOWAN | 13,993 | 13,691.72 | 13,182.67 | 12,349.10 | 9,399.84 | 0.99 | 0.94 | 0.89 | 0.67 | 32.07% |
| CLAY | 7,564 | 4,172.34 | 3,425.00 | 2,467.65 | 2,358.60 | 0.57 | 0.48 | 0.33 | 0.31 | 45.48% |
| CLEVELAND | 87,766 | 73,137.50 | 68,606.32 | 66,913.66 | 72,500.29 | 0.86 | 0.80 | 0.77 | 0.83 | 3.65% |
| COLUMBUS | 51,000 | 45,199.16 | 45,361.11 | 68,512.34 | 51,884.72 | 0.91 | 0.90 | 1.36 | 1.02 | -12.32% |
| CRAVEN* | 84,410 | 86,549.01 | 69,274.99 | 54,861.07 | 55,259.42 | * | * | * | * | * |
| CUMBERLAND | 291,849 | 227,301.67 | 218,485.71 | 227,883.25 | 249,848.17 | 0.81 | 0.77 | 0.78 | 0.86 | -5.45% |
| CURRITUCK | 15,402 | 13,792.48 | 15,001.00 | 13,358.78 | 16,186.33 | 1.00 | 1.03 | 0.91 | 1.05 | -5.48% |
| DARE | 24,804 | 51,299.83 | 50,260.74 | 43,207.43 | 53,332.92 | 2.23 | 2.16 | 1.80 | 2.15 | 3.62% |
| DAVIDSON | 134,802 | 139,616.85 | 122,370.71 | 118,453.76 | 123,067.45 | 1.08 | 0.93 | 0.91 | 0.91 | 15.23% |
| DAVIE | 29,336 | 19,348.40 | 18,380.80 | 18,108.54 | 21,979.93 | 0.68 | 0.64 | 0.63 | 0.75 | -9.96% |
| DUPLIN* | 41,990 | 33,309.90 | 30,709.73 | 31,306.58 | 32,021.07 | * | * | * | * | * |
| DURHAM* | 191,148 | 218,971.80 | 195,038.13 | 209,860.73 | 223,293.51 | * | * | * | * | * |
| EDGECOMBE | 56,372 | 71,471.38 | 78,894.52 | 74,322.38 | 73,729.66 | 1.25 | 1.39 | 1.31 | 1.31 | -4.64% |
| FORSYTH* | 276,172 | 304,289.69 | 286,079.05 | 320,279.19 | 345,804.57 | * | * | * | * | * |
| FRANKLIN | 40,417 | 28,701.81 | 32,477.41 | 29,113.80 | 29,404.00 | 0.76 | 0.84 | 0.74 | 0.73 | 4.34% |
| GASTON | 177,902 | 165,099.79 | 163,093.42 | 168,278.11 | 177,660.88 | 0.93 | 0.92 | 0.95 | 1.00 | -6.96% |
| GATES | 9,740 | 5,896.67 | 5,832.71 | 4,058.43 | 3,368.86 | 0.63 | 0.61 | 0.43 | 0.35 | 44.89% |
| GRAHAM | 7,420 | 4,508.08 | 4,741.00 | 4,631.00 | 4,438.60 | 0.62 | 0.67 | 0.63 | 0.60 | 3.92% |

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1994-95

| COUNTY | POPULATION FY 94-95 Jul-94 | MSW MANAGED FY 91-92 | MSW TONS DISPOSED FY 92-93 | MSW TONS DISPOSED FY 93-94 | MSW TONS DISPOSED FY 94-95 | BASE YEAR PER CAPITA FY 91-92 | PER CAPITA RATE FY 92-93 | PER CAPITA RATE FY 93-94 | PER CAPITA RATE FY 94-95 | % WASTE REDUCTION FY 94-95** |
|---|---|---|---|---|---|---|---|---|---|---|
| GRANVILLE | 40,479 | 54,547.90 | 58,759.72 | 63,980.07 | 66,524.74 | 1.39 | 1.48 | 1.59 | 1.64 | -18.11% |
| GREENE | 16,396 | 7,427.74 | 9,342.85 | 10,422.02 | 10,527.79 | 0.48 | 0.58 | 0.66 | 0.64 | -34.39% |
| GUILFORD | 365,572 | 471,540.90 | 452,645.06 | 435,861.01 | 447,544.04 | 1.35 | 1.28 | 1.21 | 1.22 | 9.19% |
| HALIFAX | 57,183 | 54,906.78 | 52,265.76 | 50,407.88 | 166,059.54 | 0.98 | 0.92 | 0.88 | 2.90 | -197.00% |
| HARNETT | 74,834 | 69,073.39 | 62,479.25 | 64,193.35 | 70,166.48 | 1.01 | 0.88 | 0.88 | 0.94 | 7.32% |
| HAYWOOD | 49,051 | 57,841.80 | 85,470.47 | 52,355.33 | 35,082.40 | 1.21 | 1.77 | 1.07 | 0.72 | 40.93% |
| HENDERSON | 75,096 | 81,497.83 | 77,761.09 | 71,569.86 | 75,896.02 | 1.14 | 1.08 | 0.98 | 1.01 | 11.72% |
| HERTFORD | 22,430 | 14,288.00 | 14,819.00 | 13,691.24 | 16,958.58 | 0.63 | 0.67 | 0.61 | 0.76 | -19.70% |
| HOKE | 26,618 | 18,331.15 | 19,173.39 | 12,424.99 | 16,777.51 | 0.80 | 0.81 | 0.51 | 0.63 | 21.31% |
| HYDE | 5,270 | 2,761.59 | 2,850.50 | 2,218.23 | 2,078.80 | 0.50 | 0.53 | 0.41 | 0.39 | 20.94% |
| IREDELL | 100,786 | 114,539.18 | 124,812.55 | 116,650.27 | 134,919.73 | 1.19 | 1.29 | 1.18 | 1.34 | -12.65% |
| JACKSON | 28,414 | 18,660.87 | 19,711.49 | 20,189.21 | 24,296.36 | 0.68 | 0.72 | 0.73 | 0.86 | -25.57% |
| JOHNSTON | 91,552 | 74,169.34 | 69,416.75 | 75,205.59 | 74,231.56 | 0.88 | 0.80 | 0.85 | 0.81 | 8.20% |
| JONES | 9,498 | 4,360.00 | 2,878.00 | 3,932.28 | 2,825.60 | 0.47 | 0.30 | 0.42 | 0.30 | 36.22% |
| LEE | 44,818 | 48,341.02 | 45,474.19 | 47,838.07 | 52,115.04 | 1.16 | 1.05 | 1.09 | 1.16 | -0.66% |
| LENOIR | 58,695 | 67,692.88 | 74,556.23 | 72,578.21 | 78,945.21 | 1.17 | 1.28 | 1.24 | 1.35 | -14.64% |
| LINCOLN | 54,740 | 44,442.34 | 45,067.93 | 46,610.00 | 47,288.79 | 0.87 | 0.87 | 0.88 | 0.86 | 0.93% |
| MACON | 25,471 | 19,738.31 | 21,312.55 | 21,033.76 | 23,157.77 | 0.82 | 0.86 | 0.84 | 0.91 | -10.83% |
| MADISON | 17,598 | 11,676.23 | 10,548.13 | 10,269.47 | 10,996.98 | 0.68 | 0.61 | 0.60 | 0.62 | 8.65% |
| MARTIN | 26,058 | 30,111.58 | 30,690.00 | 20,300.58 | 20,265.70 | 1.19 | 1.19 | 0.80 | 0.78 | 34.83% |
| MCDOWELL | 36,727 | 29,179.96 | 30,279.63 | 33,038.60 | 33,049.92 | 0.82 | 0.84 | 0.91 | 0.90 | -10.25% |
| MECKLENBURG* | 561,223 | 677,573.24 | 617,277.17 | 747,434.81 | 847,896.57 | * | * | * | * | * |
| MITCHELL | 14,458 | 15,768.10 | 11,567.00 | 12,745.33 | 11,994.80 | 1.11 | 0.80 | 0.88 | 0.83 | 25.10% |
| MONTGOMERY | 23,684 | 28,873.00 | 21,588.14 | 26,561.77 | 41,156.86 | 1.23 | 0.92 | 1.14 | 1.74 | -41.28% |
| MOORE | 64,969 | 74,061.56 | 58,488.88 | 73,877.63 | 82,804.85 | 1.23 | 0.95 | 1.18 | 1.27 | -3.40% |
| NASH | 82,788 | 84,593.77 | 78,454.78 | 81,695.17 | 80,925.39 | 1.09 | 0.99 | 1.01 | 0.98 | 10.25% |
| NEW HANOVER* | 134,970 | 157,646.89 | 151,075.83 | 165,651.48 | 181,652.04 | * | * | * | * | * |
| NORTHAMPTON | 20,611 | 19,527.80 | 14,515.70 | 7,461.99 | 8,957.47 | 0.94 | 0.70 | 0.36 | 0.43 | 53.67% |
| ONSLOW | 147,144 | 158,344.22 | 154,526.10 | 124,749.30 | 115,187.02 | 1.04 | 1.07 | 0.83 | 0.78 | 24.43% |
| ORANGE | 104,668 | 131,067.45 | 125,766.70 | 122,147.09 | 126,309.52 | 1.36 | 1.26 | 1.20 | 1.21 | 11.33% |
| PAMLICO | 11,779 | 8,541.24 | 8,196.50 | 5,390.22 | 4,898.83 | 0.75 | 0.72 | 0.47 | 0.42 | 44.21% |
| PASQUOTANK* | 33,287 | 30,150.34 | 29,647.20 | 27,507.88 | 28,045.19 | * | * | * | * | * |
| PENDER | 33,588 | 18,187.76 | 17,444.49 | 15,833.43 | 21,295.16 | 0.60 | 0.56 | 0.49 | 0.63 | -5.34% |
| PERQUIMANS | 10,558 | 7,519.55 | 7,394.93 | 8,785.66 | 10,458.96 | 0.73 | 0.71 | 0.83 | 0.99 | -36.05% |
| PERSON | 31,332 | 24,249.07 | 25,251.59 | 27,816.48 | 27,090.47 | 0.80 | 0.82 | 0.90 | 0.86 | -7.97% |
| PITT | 116,088 | 132,896.09 | 120,058.98 | 125,864.94 | 124,337.51 | 1.21 | 1.06 | 1.09 | 1.07 | 11.42% |
| POLK | 15,471 | 9,327.33 | 7,515.49 | 6,884.75 | 7,996.88 | 0.63 | 0.50 | 0.46 | 0.52 | 18.50% |
| RANDOLPH | 112,926 | 78,663.37 | 77,711.28 | 80,297.26 | 82,229.09 | 0.73 | 0.71 | 0.71 | 0.73 | 0.08% |

APPENDIX B-2: COUNTY WASTE REDUCTION, ALPHABETICAL ORDER, FY 1994-95

| COUNTY | POPULATION FY 94-95 Jul-94 | MSW MANAGED FY 91-92 | MSW TONS DISPOSED FY 92-93 | MSW TONS DISPOSED FY 93-94 | MSW TONS DISPOSED FY 94-95 | BASE YEAR PER CAPITA FY 91-92 | PER CAPITA RATE FY 92-93 | PER CAPITA RATE FY 93-94 | PER CAPITA RATE FY 94-95 | % WASTE REDUCTION FY 94-95** |
|---|---|---|---|---|---|---|---|---|---|---|
| RICHMOND | 45,041 | 60,752.03 | 58,619.57 | 42,434.05 | 30,209.74 | 1.35 | 1.30 | 0.95 | 0.67 | 50.50% |
| ROBESON | 109,876 | 104,700.17 | 88,563.88 | 98,287.51 | 98,943.97 | 0.99 | 0.83 | 0.91 | 0.90 | 9.47% |
| ROCKINGHAM | 87,672 | 71,480.71 | 75,228.09 | 80,752.35 | 86,255.92 | 0.83 | 0.87 | 0.93 | 0.98 | -18.58% |
| ROWAN | 116,860 | 90,081.47 | 89,479.30 | 104,974.78 | 107,014.02 | 0.80 | 0.79 | 0.91 | 0.92 | -14.08% |
| RUTHERFORD | 58,628 | 89,175.34 | 68,322.46 | 77,716.87 | 70,327.74 | 1.56 | 1.18 | 1.34 | 1.20 | 22.89% |
| SAMPSON | 49,868 | 33,545.35 | 32,492.71 | 34,821.71 | 37,058.10 | 0.70 | 0.67 | 0.71 | 0.74 | -6.25% |
| SCOTLAND | 34,630 | 39,867.42 | 38,645.81 | 43,191.56 | 47,544.66 | 1.17 | 1.13 | 1.27 | 1.37 | -17.81% |
| STANLY | 53,727 | 69,288.07 | 70,276.73 | 57,644.01 | 57,412.72 | 1.32 | 1.33 | 1.09 | 1.07 | 19.28% |
| STOKES | 40,152 | 17,976.32 | 18,354.91 | 13,182.17 | 9,783.13 | 0.47 | 0.48 | 0.34 | 0.24 | 48.66% |
| SURRY | 64,348 | 73,595.30 | 73,187.82 | 75,074.52 | 75,459.60 | 1.18 | 1.17 | 1.19 | 1.17 | 0.59% |
| SWAIN | 11,504 | 5,650.66 | 6,152.27 | 6,668.64 | 5,582.48 | 0.50 | 0.55 | 0.59 | 0.49 | 3.89% |
| TRANSYLVANIA | 27,041 | 30,072.05 | 16,482.27 | 19,161.63 | 18,372.28 | 1.16 | 0.63 | 0.71 | 0.68 | 41.39% |
| TYRRELL | 3,814 | 2,984.83 | 1,742.86 | 1,561.61 | 1,777.18 | 0.79 | 0.45 | 0.41 | 0.47 | 41.22% |
| UNION | 94,352 | 77,842.49 | 79,870.19 | 84,243.75 | 78,317.58 | 0.90 | 0.91 | 0.93 | 0.83 | 7.87% |
| VANCE | 39,892 | 43,266.86 | 38,242.34 | 43,724.35 | 48,175.44 | 1.11 | 0.98 | 1.10 | 1.21 | -9.12% |
| WAKE* | 496,578 | 569,621.89 | 542,427.42 | 575,618.80 | 733,521.30 | * | * | * | * | * |
| WARREN | 17,866 | 10,978.00 | 8,976.00 | 11,878.43 | 9,369.46 | 0.63 | 0.51 | 0.67 | 0.52 | 17.22% |
| WASHINGTON | 13,875 | 11,699.36 | 12,992.65 | 10,415.26 | 8,490.66 | 0.84 | 0.93 | 0.76 | 0.61 | 27.43% |
| WATAUGA | 39,364 | 36,755.38 | 35,360.04 | 34,265.17 | 30,680.23 | 0.99 | 0.94 | 0.89 | 0.78 | 21.34% |
| WAYNE | 109,083 | 106,149.38 | 102,716.65 | 94,724.72 | 99,109.98 | 1.00 | 0.96 | 0.87 | 0.91 | 8.99% |
| WILKES | 61,257 | 58,817.60 | 62,581.61 | 43,375.52 | 54,627.82 | 0.97 | 1.04 | 0.71 | 0.89 | 8.46% |
| WILSON | 67,464 | 120,870.35 | 121,443.14 | 124,457.17 | 113,711.70 | 1.82 | 1.82 | 1.85 | 1.69 | 7.35% |
| YADKIN | 32,871 | 20,778.78 | 22,529.86 | 11,906.31 | 15,880.40 | 0.67 | 0.71 | 0.37 | 0.48 | 27.88% |
| YANCEY | 15,986 | 15,576.12 | 9,725.43 | 10,955.65 | 11,158.02 | 1.01 | 0.62 | 0.70 | 0.70 | 30.86% |
| | | | | | | | | | | |
| TOTAL | 7,064,470 | 7,257,428.09 | 6,890,818.15 | 7,038,505.34 | 7,624,144.85 | 1.08 | 1.01 | 1.01 | 1.08 | -0.23% |

*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 1994-95

| COUNTY | ALTERNATIVE BASE YEAR TONNAGE | MSW TONS DISPOSED FY 90-91 | MSW TONS DISPOSED FY 91-92 | MSW TONS DISPOSED FY 92-93 | MSW TONS DISPOSED FY 93-94 | MSW TONS DISPOSED FY 94-95 | ALTERNATIVE BASE YEAR PER CAPITA | PER CAPITA RATE FY 94-95 | % WASTE REDUCTION FY 94-95 |
|---|---|---|---|---|---|---|---|---|---|
| ALAMANCE (FY89-90) | 117,861.83 | 99,742.00 | 90,510.91 | 77,599.29 | 74,841.82 | 82,613.45 | 1.10 | 0.73 | 34.05% |
| BUNCOMBE (FY88-89) | 157,660.00 | 192,476.00 | 142,041.61 | 152,762.69 | 152,397.96 | 167,000.46 | 0.91 | 0.90 | 1.27% |
| CATAWBA (FY89-90) | 179,351.00 | 131,201.00 | 129,948.00 | 136,462.83 | 144,538.66 | 149,404.28 | 1.51 | 1.21 | 20.39% |
| CHATHAM (90-91) | 34,315.00 | 33,100.00 | 31,209.00 | 30,109.23 | 31,919.95 | 31,710.37 | 0.89 | 0.76 | 14.64% |
| CRAVEN (FY90-91) | 98,536.00 | 97,402.00 | 77,355.31 | 69,274.99 | 54,861.07 | 55,259.42 | 1.21 | 0.65 | 45.71% |
| DUPLIN (FY90-91) | 48,900.00 | 48,900.00 | 32,213.65 | 30,709.73 | 31,306.58 | 32,021.07 | 1.22 | 0.76 | 37.66% |
| DURHAM (FY88-89) | 224,196.00 | 218,210.00 | 210,104.06 | 195,038.13 | 209,860.73 | 223,293.51 | 1.31 | 1.17 | 10.65% |
| FORSYTH (FY88-89) | 357,474.00 | 278,242.00 | 278,824.06 | 286,079.05 | 320,279.19 | 345,804.57 | 1.34 | 1.25 | 6.70% |
| MECKLENBURG (89-90) | 695,214.00 | 650,910.00 | 601,055.45 | 617,277.17 | 747,434.81 | 847,896.57 | 1.39 | 1.51 | -8.59% |
| NEW HANOVER (88-89) | 168,504.00 | 159,849.00 | 149,582.43 | 151,075.83 | 165,651.48 | 181,652.04 | 1.41 | 1.35 | 4.42% |
| PASQUOTANK (FY90-91) | 32,081.00 | 32,081.00 | 28,236.53 | 29,647.20 | 28,031.72 | 28,045.19 | 1.02 | 0.84 | 17.62% |
| WAKE (FY 88-89) | 544,520.00 | 523,880.00 | 539,817.04 | 542,427.42 | 575,618.80 | 733,521.30 | 1.40 | 1.48 | -5.39% |
| | | | | | | | | | |
| TOTAL | 2,114,092.83 | 1,942,113.00 | 1,771,081.01 | 1,776,036.14 | 2,536,742.77 | 2,878,222.23 | 1.29 | 1.26 | |