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Recycling in the 1980's

Progress Report and Program Recommendations

October 1984

New Jersey Department of Energy
Leonard S. Coleman, Jr., Commissioner

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New Jersey Department of Environmental Protection
Robert E. Hughey, Commissioner

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RECYCLING
IN THE 1980'S

PROGRESS REPORT AND PROGRAM RECOMMENDATIONS

OCTOBER 1984

NEW JERSEY DEPARTMENT OF ENERGY

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL
PROTECTION

OFFICE OF RECYCLING
101 COMMERCE STREET
NEWARK, NEW JERSEY 07102
201-648-6295

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report is submitted to the Governor and the State Legislature in accordance with the New Jersey Recycling Act of 1981. Its purpose is to outline the State recycling program which has been implemented since the Recycling Act's inception, as well as to provide recommendations for future program measures.

By any measure, recycling in New Jersey is an unqualified success. In July, 1984, 363 of New Jersey's 567 municipalities had recycling programs, compared to 287 in 1982, 175 in 1980, and only 20 in 1970. Perhaps the most telling statistic, though, is the progress the State has made toward achieving the Office of Recycling's ambitious goal of recycling 25 percent of the municipal solid waste stream by 1986. The State passed the one third mark toward this goal at the end of the second year of its five year effort. Much of this success may be traced directly to programs created and funded through the Recycling Act, as well as policies and regulations promulgated through the administration of the program.

The Recycling Act established a fund to provide grants for recycling programs. This fund, which has averaged \$4.6 million annually in each of the past two years, is realized from a 12 cent per cubic yard surcharge placed on all solid waste dumped in New Jersey landfills. In 1983, the fund distributed \$2.03 million among 241 municipalities, based on the amount of material recycled in each community. In addition, the fund awarded \$700,000 to 14 counties, municipalities and non-profit groups to assist them in starting new recycling programs or expanding existing ones. The fund also provides low interest loans to assist recycling industries in purchasing buildings, land, vehicles and professional services. Two million dollars is available for loans of between \$10,000 and \$350,000.

An additional \$600,000 is being used to finance an intensive education campaign on recycling. The campaign, features a professional magician named Mr. R.E. Cycle who performs a magic act with a strong recycling message. The campaign, which also included programs on litter abatement, featured billboards, magazine and newspaper ads, bus and train posters, and radio announcements.

Motorists who change their own motor oil have been recycling their used lubricating oil in record numbers. Last year, nearly 1.7 million gallons of used oil were recycled, compared to 700,000 gallons the previous year. State law now requires persons who change their own motor oil to bring their used oil to designated recycling centers. This program not only conserves a finite energy resource, but also preserves the quality of the environment by preventing the improper disposal of used oils into streams and rivers.

Oil is not the only automotive product subject to recycling. Tires can be recycled, too. Currently, however, less than 10% of the seven million tires sold annually in New Jersey are recycled or reused. The remaining tires are either dumped in landfills or illegally discarded. The State of New Jersey is currently studying several options to increase the number of tires recycled each year.

State Government not only promotes recycling through programs and grants; it promotes it by example, too. Governor Kean signed Executive Order No. 57 on December 2, 1983, directing all State agencies to implement office wastepaper recycling programs. It has been estimated that state agencies generate over 8,000 tons of high grade wastepaper each year. At the current market price for wastepaper of \$65 per ton, the State could earn approximately half a million dollars each year by selling the paper it normally discards. In addition, the State would save about half a million dollars annually in solid waste fees for this paper.

A material can be recycled only when a market for that material exists. Market development for recyclable materials and products is thus an integral part of the State's overall recycling strategy. A number of recycling businesses have cropped up in New Jersey over the past few years, and more are on the drawing boards. Steps are also being taken to encourage State Government and private industry to purchase products made of recycled materials when such products are available.

New Jersey stands proudly as a leader among states in the area of recycling. While much has been done already, there are still many aspects to recycling that remain largely untapped. The State of New Jersey through the implementation of the Recycling Act, will continue to develop programs and policies which conserve finite natural resources, save energy and preserve the quality of the environment.

PROGRESS REPORT

I. BACKGROUND

Recycling efforts have waxed and waned over the years, determined in part by the economic conditions of the times. Perhaps the greatest effort occurred during World War II when industrial expansion and disrupted supply lines created a demand for raw materials.

Most recycling involves the use of waste materials in the manufacturing process. The concentration of large population centers and industrial markets in New Jersey has combined to develop one of the largest secondary materials industries in the nation. Recycling began as a network of street peddlers collecting scrap from homes and small businesses for sale to scrap dealers. Recycling evolved into a system of large scrap companies which buy and sell material for shipment to other parts of the country as well as for export.

It was not until the advent of Earth Day 1970 that recycling in New Jersey began to be practiced by municipalities and volunteer groups. These programs began out of concern for the environment and as a way to earn extra funds. Some floundered and went out of existence and some prospered and expanded into more comprehensive programs.

The 1980's brought New Jersey further into a solid waste management crisis with a steady decline in the number of operating landfills. Recycling in the 80's written in 1980-81 stated that there were 320 operating landfills in the State. The 1984 estimates from the Department of Environmental Protection (DEP) state that there are only 128 operating landfills with 12 of these accepting 90% of all waste dumped in New Jersey. Many of the 12 are at or near capacity. As environmentally secure landfills and resource recovery facilities are planned, the cost of disposal is rising dramatically from an average of \$3.00 per ton in the late 70's to \$12.00 per ton today. A new landfill recently opened at \$26.00 per ton. By the end of the decade, disposal costs are expected to far exceed \$26.00 per ton. Because of this, recycling must be viewed as an integral part of the State's solid waste management system.

In recognition of the need to change the way solid waste is managed, the the Office of Recycling was established within the Department of Environmental Protection and the Department of Energy to administer a statewide recycling program. The primary objective of this office is to achieve the State goal of recycling at a minimum 25% of the municipal solid waste stream by 1986.

At the time of inception, the stated goals of this program were:

1. to develop a data base to determine supply and demand of secondary materials.
2. to develop methods for collecting and marketing recyclable materials.

3. to develop and expand industrial and commercial recycling.
4. to implement State policies, financing mechanisms and incentives affecting recycling.
5. to coordinate with solid waste management districts and municipalities to develop regional and local recycling programs.
6. to develop public education programs on recycling and litter abatement.

In September of 1981 the New Jersey Recycling Act (N.J.S.A. 13:1E-92 et seq.) was passed by the Legislature. The Act established a recycling fund to be administered by the Departments of Energy and Environmental Protection. This fund is financed with a \$0.12 per cubic yard surcharge on all solid waste disposed of in landfills in New Jersey. The tax has generated an average of \$4.6 million in each of the two years (1982 and 1983) that it has been in existence. The fund is dispersed in the following manner:

Not less than 45% of the fund provides grants to municipalities that show an increasing amount of recycling.

Not more than 10% is provided to municipalities, regional recycling coalitions or counties on a competitive basis. These funds may be used for planning recycling programs, or operating expenses for recycling programs.

Not less than 15% is provided for recycling and litter abatement publicity, information, and education programs.

Not less than 20% is available as loans to recycling businesses and industries located in New Jersey.

Not more than 10% is to be used for administrative expenses of the State recycling program.

The N.J. Recycling Act also states that the Department of Energy and the Department of Environmental Protection shall prepare a report to be submitted to the Governor and the Legislature by October 1, 1984. The purpose of the report is to update the Legislature and the Governor on the status of recycling in the State of New Jersey and to make recommendations for changes in the program.

EXHIBIT 1

RECYCLING EXPENDITURES, 1982 - 1984

	<u>1982</u>	<u>1983</u>	<u>1984 (estimated)</u>
Grant Assistance			
Tonnage	-	\$2,029,390	2,344,824
Program Planning	-	350,683	1,000,000
Education	-	248,892	500,000
Loan	-	-	<u>1,974,893</u>
Total Grant Assistance	-	\$2,628,965	\$5,819,717
Special Projects	-	131,007	37,500
Recycling & Anti-Litter Promotional Campaign	-	300,000	300,000
Administration of Program	<u>194,339</u>	<u>348,109</u>	<u>506,317</u>
<u>TOTAL EXPENDITURES</u>	<u>\$194,339</u>	<u>\$3,408,081</u>	<u>\$6,663,534</u>

RECYCLING REVENUES 1982 - 1984

	<u>1982</u>	<u>1983</u>	<u>1984 (estimated)</u>
Total Revenue Collected	\$4,439,889	\$4,662,308	\$4,600,000 Est.
Interest	<u>223,853</u>	<u>548,411</u>	<u>720,000 Est.</u>
Total Revenue Including Interest	<u>4,663,742</u>	<u>5,210,719</u>	<u>5,320,000 Est.</u>

TOTAL ESTIMATED RECYCLING REVENUES AND EXPENDITURES 1982 - 1984

Revenues:
\$15,374,461

Expenditures:
\$10,265,954
5,108,507 (est. 1985)**
\$15,374,461

**Program expenditures occur in the calendar year after revenues are collected, therefore, most of the revenues collected in 1984 are allocated to expenses in 1985. Without any change in the program these expenses are estimated at about \$5,100,000.

II. MUNICIPAL SOLID WASTE IN NEW JERSEY

Solid Waste Quantities

Approximately 700,000 tons of recycled material were reported to the Office of Recycling for 1983, however, the verification process on tonnage documentation has scaled the projected number down to 500,000 tons. This number indicates that New Jersey is more than one third of the way to its goal of recycling 25% of the municipal solid waste stream.

The Office of Recycling estimates that approximately 11.5 million tons of solid waste were disposed of in New Jersey landfills in 1983. It is estimated that municipal solid waste comprises 45% of the total solid waste landfilled or about 5.1 million tons. This figure is somewhat lower than the figure of 6.2 million tons originally used in Recycling in the 80's. These more accurate figures have been developed by surveys conducted by DEP and by an assessment of landfill surcharges collected by the Department of Treasury, Division of Taxation, for the Recycling Fund.

In order to obtain accurate data on the amount of solid waste disposed of in landfills, the "Scales Bill" (N.J.S.A. 13:1E-117 to 122) was enacted in May, 1983 and guidelines for implementation were issued by the DEP, July, 1983. This legislation required all existing landfills and transfer stations accepting more than 31,200 tons annually to install truck scales by November, 1983. All proposed solid waste facilities, including resource recovery plants, which anticipate receiving these amounts are also obligated to install truck scales. It is anticipated that scales will be in place by the end of 1984 providing for more accurate solid waste measurements.

Solid waste composition studies from actual load samplings were conducted by Atlantic, Cape May, Essex, Gloucester, Hudson and Union County between 1980 and 1982. Based on these studies, the Office of Recycling projected the following composite waste analysis for New Jersey:

<u>Material Category</u>	<u>Percentage of MSW Stream</u>
Newspaper	8%
Corrugated	11
Other Paper	27
Glass	8
Ferrous	5
Non-Ferrous	1
Plastic	7
Food waste	8
Yard waste	9
Other	<u>16</u>
Total	100%

It should be kept in mind that these figures are only approximations. They may vary by municipality and may change over time.

III. MUNICIPAL RECYCLING PROGRAMS

Prior to 1970, twenty New Jersey municipalities had developed voluntary recycling programs. By the end of the decade, 175 municipalities had programs, twenty one of which mandated the separation of newspaper from the regular waste collection¹. Appendix A shows the locations of the recycling programs in 1980.

In 1982, a survey was conducted by the Office of Recycling to determine the extent and type of recycling programs in the State. In 1982, 287 of the 567 municipalities had recycling programs, and forty of these programs were mandatory. Six of them mandated separation of more than one material. Three county programs were just beginning operation.

A survey conducted in July of 1984 showed a substantial increase in recycling. Today 363 municipalities have recycling programs, and 82 have enacted mandatory ordinances. Of these programs, thirty collect more than one material. Exhibits 2 and 3 show the increase and distribution of recycling programs. Curbside recycling collection is provided in 201 of these municipalities. Recyclables are collected at drop-off centers by 166 municipalities. Appendix B shows the locations of recycling programs in 1984.

NEW TRENDS

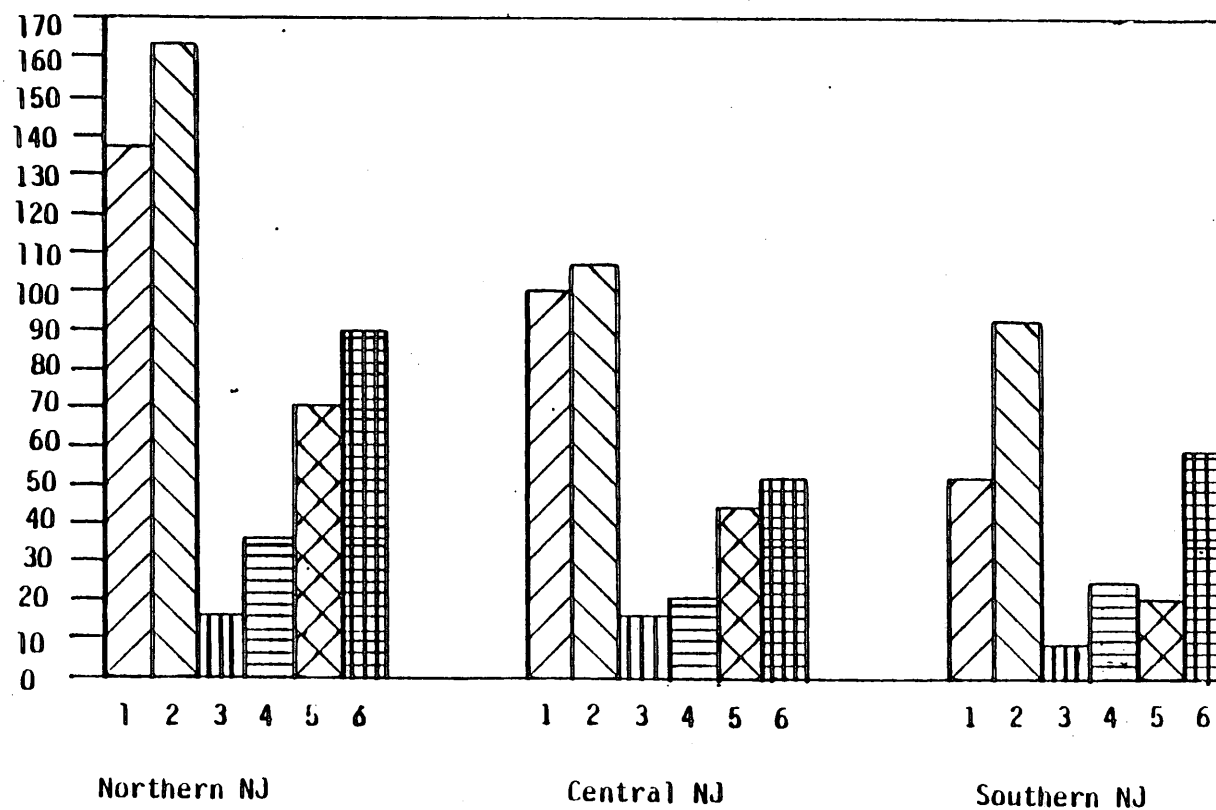
Since 1980, a number of new recycling trends have developed in New Jersey.

Mandatory approach. Some municipalities have passed ordinances mandating recycling. A mandatory ordinance states that each household or business is required to separate all or part of the recyclable materials from the mixed wastes. Mandatory ordinances may be applied to paper, glass, metal containers or yard wastes. The resident usually has the option of leaving the materials at the curb or donating the materials to volunteer organizations. Appendix C shows the distribution of mandatory recycling programs in 1984.

An anti-scavenging ordinance is normally passed at the same time as a mandatory ordinance. This allows the municipality to prohibit unauthorized collectors from collecting recyclables. Anti-scavenging provisions do not apply to residents who make private arrangements with volunteer groups.

1. Community Recycling in New Jersey, N.J. Agricultural Experiment Station Research Bulletin No. B-855.

EXHIBIT 2
MUNICIPAL RECYCLING PROGRAMS
BY REGION



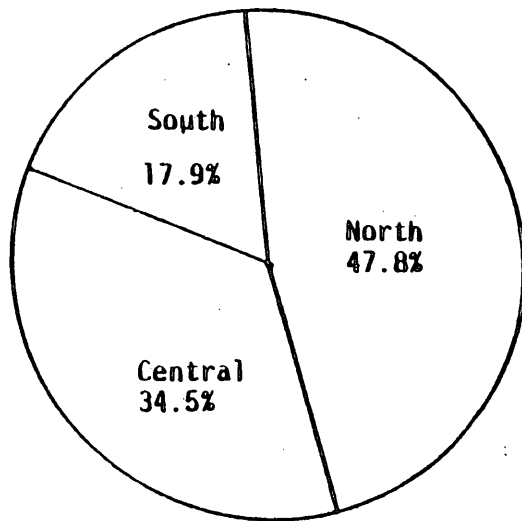
1. Number of municipalities with programs, 1982
2. Number of municipalities with programs, 1984
3. Number of mandatory programs, 1982
4. Number of mandatory programs, 1984
5. Number of curbside programs, 1982
6. Number of curbside programs, 1984

3. Number of mandatory programs, 1982
4. Number of mandatory programs, 1984
5. Number of curbside programs, 1982
6. Number of curbside programs, 1984

EXHIBIT 3

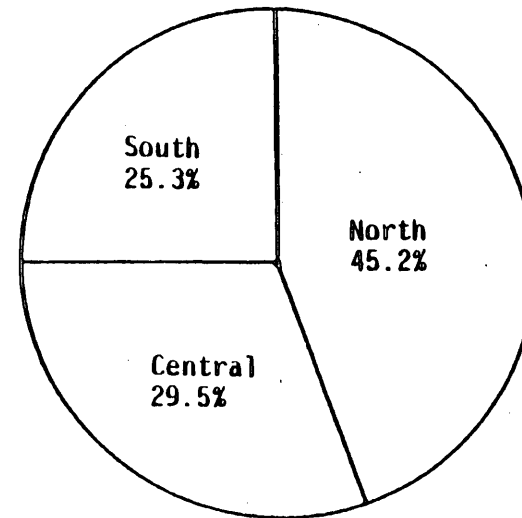
Geographic Distribution of Recycling Programs

1982, 1984



1982

Total programs = 287



1984

Total programs = 363

Southern counties = Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Ocean, Salem

Central counties = Hunterdon, Mercer, Middlesex, Monmouth, Somerset

Northern counties = Bergen, Essex, Hudson, Morris, Passaic, Sussex, Union, Warren

Contract modifications. Many municipalities have modified their solid waste contracts to reflect the savings from recycling programs. There are a number of ways this is done:

A municipality may require its solid waste hauler to pay a rebate for every documented ton of recycled material.

A municipality may separate collection costs from disposal costs. The cost of disposal is paid to the disposal facility by the municipality.

The municipality may exclude from its solid waste contract certain materials such as yard wastes or bulky scrap. The materials are usually separated for recycling.

Contract collection. Many municipalities have developed solid waste contract specifications to include the collection of recyclable materials.

Buy-back Centers. Municipalities are supporting buy-back operations that are oriented primarily to individuals and groups. Some examples of joint municipal-private buy-back programs are:

The Orchard Street Association buy-back center under the sponsorship of the City of Newark and Alcoa Recycling Center.

The operation of a buy-back center as part of a contractual agreement with a private recycler, KSW Recycling Inc. and the Borough of Fair Lawn.

The establishment of a buy-back center by the Boy Scouts and the Department of Public Works of Lacey Township.

IV. COUNTY RECYCLING PROGRAMS

County or regional programs usually operate more cost effectively since fixed costs may be spread over a larger service area. Three counties have implemented county-wide recycling programs.

SUSSEX COUNTY This was the first County owned and operated recycling center. The center collects newspaper, corrugated containers, aluminum, steel and bi-metal cans, white goods (stoves, refrigerators, etc.) and yard waste. A mobile drop-off system to service more distant communities was implemented. This flat bed trailer makes regularly scheduled stops in seven municipalities providing the majority of the citizens with the opportunity for recycling.

BURLINGTON COUNTY This county newspaper recycling program operates in conjunction with the Occupational Training Center (OTC). The County purchased the collection vehicles and leased them to the OTC. Collection service is provided by handicapped and retarded individuals through the OTC. The program serves fifteen municipalities. Plans for expansion include the collection of glass and cans, and extension of the program to another eight communities.

CAPE MAY COUNTY An intermediate processing facility was established and local municipalities were assisted with recycling programs. The collected materials were brought to the facility. Workers were hired from the Jersey Cape Diagnostic Training Center to sort and process the materials and the County delivered them to the markets. In 1984, the County built a new landfill and offered to construct a transfer facility at this site if a majority of the municipalities would agree to use the facility. A rebate on disposal costs at the landfill was offered as an incentive. The municipalities, however, chose to continue recycling on their own. The success of the program was that it provided a strong impetus to municipalities to initiate programs in a county with no previous recycling experience. Since 1982 ten of Cape May's sixteen municipalities have begun recycling programs.

RUTGERS UNIVERSITY The only regional, noncounty program operating in the State which began in 1970 as an all-volunteer effort. The success of the program provided for the hiring of one full-time staff member and four part-time members. In addition to newspaper, glass and aluminum, the program collects high-grade paper, tin cans, bimetal cans and corrugated containers from the five dining halls. Rutgers Recycling maintains 24 multi-material sites and services; not only on the five Rutgers Campuses, but in seven communities surrounding the campuses. The sites are open 24 hours a day, 365 days a year.

V. OFFICE OF RECYCLING PROGRAMS

A. GRANTS

In 1983 the Office of Recycling processed and managed 101 program planning and education grants and 241 tonnage grants. In 1984 the Office is reviewing 291 program planning and education grants and 313 tonnage grants.

1. Recycling Tonnage Grants

The Recycling Act states that not less than 45% of the recycling fund is to be used to provide payments to New Jersey municipalities. These payments are based on the amount of eligible material that is documented as being recycled within municipal borders during the calendar year. In 1983, this amount was \$2,029,390; and in 1984 the amount is \$2,344,824. Eligible materials include paper, glass, ferrous and nonferrous metals, textiles, food, yard materials, plastics, rubber materials and motor oil.

In 1983, payments were made for material recycled during calendar year 1982. A total of 241 applications were received resulting in a documented recycled amount of 262,000 tons. A complete listing of all municipalities receiving grants is given in Appendix D. A complete breakdown of the amounts in each category appears in Exhibit 4.

Applications for the second year of the program covering material recycled in calendar year 1983 were received by the Office of Recycling on March 15, 1984. The documentation for these claims is in final review. This second round of funding attracted a total of 313 applications. This total represents 216 applicants applying for a second year of funding as well as 97 first-time applicants. Applicants applying for a second year of funding must increase tonnage and attain a certain per capita tonnage level to be eligible for a grant. Payments for this second year of funding will be based on the increase in material recycled over the previous year in three separate categories; paper, glass, and other. Tonnage claimed is 700,000 tons, however, the Office of Recycling projects that the documented tonnage for 1983 is approximately 500,000 tons. It is anticipated that payments for 1983 tonnage grants will be issued to municipalities in November, 1984.

2. Program Planning/Education Grants

The Program Planning and Education Grants provide municipalities, counties and nonprofit organizations (Education Grants only) with the funding required to initiate or expand programs. These funds are used to help pay "start-up" costs for new and expanding programs and to foster innovative methods of recycling.

In this first year of grant distribution, fourteen counties, fifty-six municipalities and four nonprofit organizations received \$440,632 in program planning grants and \$269,725 in education grants. In 1983, 230 applicants requested program planning and education grants seeking more than \$3,000,000 in funding, an amount equal to three times the available funds.

These awards have assisted the recipients with a variety of projects. Some examples are: purchasing trucks, trailers, storage bins, "seed money" for program start-ups, expansion of existing programs, publicity, materials, construction of drop-off centers, establishing community anti-littering programs. The promotion of recycling and mandatory recycling and the creation of an artificial tire reef constructed from used scrap tires five miles off the New Jersey coast. A complete listing of grantees is included in Appendix E.

EXHIBIT 4

1982-83 TONNAGE GRANTS, BY MATERIAL

<u>MATERIALS</u>	1982 <u>TONNAGES</u>	PRELIMINARY 1983 <u>TONNAGES</u>
Paper	143,99.6	217,847.7
Glass	14,563.15	22,256.0
Aluminum	491.3025	720.5
Non-ferrous scrap	2,254.29	3,960.1
Ferrous scrap	6,939.203	26,289.9
Automobiles	8,608.52	33,551.3
Tires	265.25	318.8
Yard material	69,704.13	103,999.6
Food Waste	5,164.477	16,409.3
Used Oil	2,430.436	5,659.9
Asphalt	6,723.89	63,146.2
Miscellaneous (includes plastic and textiles)	989.629	1,622.1
<u>TOTAL TONNAGE</u>	<u>262,125.9</u>	<u>495,781.4</u>
<u>TOTAL MUNICIPALITIES REPORTING</u>	<u>241</u>	<u>313</u>

1982 tonnage grants were awarded in 1983
 1983 tonnage grants will be awarded in 1984

The Office of Recycling received and is processing 293 Program Planning and Education Grant applications totaling more than \$8 million in requests for funding assistance. Approximately \$1,000,000 is available statewide in Cycle II of the Program Planning Grants. This money may be used by counties and municipalities for improving existing programs or establishing new programs. Approximately \$500,000 is available for Education Grants to provide funding to counties, municipalities and nonprofit groups for recycling and litter abatement educational and promotional programs.

Cycle II of the Grant Programs are operating under amendments to N.J.A.C. 7:26-15.5 and 15.7, N.J.A.C. 14A:6-1.5 and -1.7 which were adopted in February 1984. These amendments set a minimum of \$5,000 for program planning grants and \$2,000 for education grants. Additionally, the applicant is no longer required to provide matching funds for these grants. The deadline for submission of a grant applications was August 31, 1984.

B. LOAN PROGRAM

Twenty percent of the Recycling Fund is dedicated to encouraging the development and expansion of recycling industries. The New Jersey Economic Development Authority (EDA) and the New Jersey Department of Energy jointly administer the program. In 1984, the first year of the program, \$1,900,000 in low interest loans are available.

The minimum loan is \$10,000 with a maximum of \$350,000 for 1984. The maximum amount allowed for the loan will vary from year to year. A loan may not exceed 90% of the eligible total project cost and 20% of the annual amount in the recycling loan fund.

Low-interest loans may be used for:

Buildings

Land

Equipment and machinery

Trucks and other vehicles

Professional engineering and architectural services

Production and development cost for new products

Projects are reviewed to determine if the projects are consistent with the Recycling Act. If the applications are approved, they will be forwarded to EDA for a determination of the credit worthiness of the applicant. Twelve applications seeking more than \$3 million in loans are currently under review.

C. EDUCATION, RESEARCH AND PROMOTION PROJECTS

1. Essex County Integration of Energy and Materials Study: \$20,000

This study, completed in 1983, examined the potential technical and economic effects of comprehensive recycling on the design and operation of the county's proposed Energy Recovery Facility (ERF). It found that the removal of significant quantities of newspaper, corrugated paper, glass, tin and aluminum cans could improve the fuel value of the remaining wastes by both increasing the heat content (BTU's) and reducing the ash content. Recycling can also reduce the capital cost of the facility by a minimum of \$22 million.

As a result of this study the County is now planning a facility with a 15% reduction in size, and is requiring that all waste coming to the facility contain only negligible amounts of recyclable material. This, in effect, is mandating recycling on a county-wide basis. This action addresses a major issue raised by many recycling industries regarding the availability of steady, market quality supplies of recyclable materials that would be required for supporting any market expansion.

2. Food Waste Recycling: \$69,000

A major component of New Jersey's waste stream which has received very little attention until recently is edible food waste. Edible food waste originates from a variety of sources such as supermarkets, restaurants, institutions with large food services, food processors and households. Edible food waste has been used successfully for many years by the New Jersey swine industry as a livestock feed. A major study has been undertaken for assessing this industry's potential for using larger quantities of edible food waste. This study, conducted by the Department of Agricultural Engineering of Rutgers University, is determining what the potential supply and demand for edible food waste is in New Jersey. Methods to improve and expand food waste swine feeding operations are also being recommended. These include methods to ease unnecessary constraints and to improve collection practices. The study will be complete by end of this year.

3. Leaf Composting Research:

\$22,500

The Department of Environmental Science of Rutgers University, with the assistance of Essex County and the township of Montclair is investigating ways to improve leaf composting operations by reducing the time and space requirements for composting while yielding a high quality compost product. While some compost product is already being used by commercial operations such as greenhouses, nurseries and landscapers, a more widespread commercial acceptance of compost product will be contingent on its material quality. As more municipalities begin composting operations, it is important that the operations be run as efficiently as possible. For this reason, technical assistance is also being provided. A total of nine compost sites with problems will be visited by Rutgers personnel. The sites are being evaluated and recommendations made for improvement.

4. Recycling Curriculum:

\$41,000

A principal element that will contribute to the long-term success of the New Jersey State recycling program is the introduction of comprehensive recycling and solid waste education in the school systems. A recycling, energy and solid waste curriculum for grades K-12 was originally developed by The Conservation and Environmental Studies Center, Inc. in 1982 with the support of the Burlington County CETA program. Funding was provided for the development of a third edition of this Curriculum, entitled HERE TODAY, HERE TOMORROW. This new edition has been expanded through the inclusion of new, updated material in the curriculum and extensive background information for the teachers. Appendix G shows the table of contents for the recycling curriculum.

A copy of this curriculum will be made available to each public school district in New Jersey through county recycling or solid waste coordinators. The remaining copies will be distributed through teacher training workshops that will be held statewide throughout the school year. One hundred and sixty teacher training workshops will be made available for the 1984-85 school year.

5. Camden County Oil Program:

\$15,000

The Camden County Department of Health and Community Services is developing an extensive educational and promotional program for used motor oil recycling.

The program will educate service station and retail oil store personnel as well as the general public to the benefits of recycling used oil. The program will focus on radio and television public service announcements, new brochures and a survey of used oil collection sites to ascertain noncompliance

with used oil regulations. The County will distribute used oil containers in a test area to monitor whether this increases participation in the program.

Camden County will also work with the Muscular Dystrophy Association (MDA) to involve companies in the joint NJDOE/MDA Used Oil Program.

6. Promotion and Advertising Campaign \$600,000 (2 year program)

The Recycling Act recognized the importance of informing the public of the statewide recycling program and its environmental and economic benefits. The Act set aside specific funds to support such a promotion campaign to promote recycling and litter abatement activities was implemented by the Office of Recycling, with the assistance of the public relations and advertising firms of Holt & Ross, Inc. and William J. Kohm Associates. The two year campaign is reaching business and government leaders and the general public with the messages that: "THE MAGIC IS ... RECYCLING PAYS" and "MAKE LITTER DISAPPEAR."

During the first year approximately 2.5 million New Jersey residents, or one-third of the State's total population, have seen one or more of the billboards, magazine ads, bus/train posters, newspaper photographs/press releases, direct mail campaign, grocery bags or heard one or more of the radio spots featured in the promotional campaign. Regular news articles, columns and advertisements for newspapers and magazines were prepared. To date, articles have appeared in at least 24 of the state's 26 dailies; out of state dailies including New York and Pennsylvania, and over 225 of the state's 328 non-weekly newspapers. Features have appeared in newspapers and state and national magazines as well.

The aim of the program is to bring about a general awareness of recycling. The program provides assistance in the form of basic artwork and materials to develop a consistent statewide theme. The State's copyrighted logo has been made available to the media and to county and municipal programs in the form of logo sheets and artwork for bumper stickers and posters. Programs throughout the State are increasingly incorporating the logo into their educational and promotional activities. In addition, a new comprehensive slide tape presentation on New Jersey's recycling program was prepared and has been used extensively around the State with a copy given to each county for their use.

Mr. R.E. Cycle, a professional magician, has been the heart of the campaign. As a working symbol, he uses magic to show that waste doesn't just disappear, but it can be recycled. His magic show illustrates how recycling bottles, cans, papers and leaves can pay in many ways. Mr. R.E. Cycle also incorporates the anti-litter message in his performance by showing how litter can be harmful to

humans and animals alike. The theme and working symbol has caught the attention of the press throughout the region. To date, he has given 45 performances in nineteen counties. Nearly 5,000 municipal/county officials, state legislators and agency officials, business and industry leaders, school children and citizens have participated in one of the "RECYCLING PAYS" magic performances.

Keeping the recycling theme before the public with existing funds for public relations and direct advertising was a challenge. The program's philosophy was to seek as much public service support as possible. The advertising program is a mix of public service advertising and paid advertising on billboards, radio and in magazines. Several New Jersey trade associations and businesses contributed to the success of the 1983-1984 promotional campaign. The positive results of alliance building activity during the past year directly involved: Gannett Outdoor Advertising, the New Jersey Food Council, the New Jersey Recycling Forum, the New Jersey Soft Drink Association, the New Jersey Beer Distributors Association, the American Can Institute, the New Jersey State Chamber of Commerce, the Somerset County Chamber of Commerce, and Jersey Central Power and Light Company. Specifically, this resulted in approximately \$400,000 worth of public service billboard space provided by the N.J. Outdoor Advertising Association, and production of over one half million grocery bags and the airing of radio public service announcements. The hundreds of photos and newspaper articles generated by the public relations aspects of the campaign have greatly increased the public awareness of the state's recycling programs.

The litter abatement promotion "MAKE LITTER DISAPPEAR" began with a public transit advertising campaign - in railroad stations, on the outside of buses and on trains during the peak summer months. Placement created "moving billboards" with the message "MAKE LITTER DISAPPEAR". This phase of the campaign resulted in approximately \$7,000 worth of public service advertising. It is important to note that one-half of the revenues of the transit advertising are returned to the State.

During the three months of the program, it is estimated that over half of the state's residents were reached an average of 14 times per month for a total of nearly 70 million individual impressions. In addition to the transit advertising, promotion continues year long with activities and materials. Litter bags and bumper stickers were produced for distribution in parks and at key locations on major highways. Posters were prepared for distribution to county and state locations in cooperation with the N.J. Division of Tourism of the Department of Commerce and the N.J. Turnpike, Garden State Parkway and state and county parks departments.

New Jersey State Library

7. Standardized Recycling Sign Program:

\$4,000

The purpose of this program is to recognize municipalities for contributing to recycling and to use a standardized sign throughout the State. This will make citizens more aware of recycling and increase participation. These signs will be awarded annually.

The program provided free signs to municipalities with recycling programs. Nineteen municipalities applied for the signs, of which, six did not meet the criteria established by the Office of Recycling. Thirteen municipalities with voluntary recycling programs were awarded depot signs, measuring 4' x 5'. These municipalities were also given six directional signs to the collection centers. On-site inspections of the collection centers were made by the Office of Recycling. Curbside signs for towns with mandatory curbside collection programs were awarded to nine municipalities. These signs, measuring 18" x 18", were printed with the municipal name and a recycling message. In order to receive a sign, the following criteria must have been met:

Facilities must be permanent.

At least 3 materials must be accepted.

Facilities must be open weekend or evening hours

Facilities must be designed for adequate traffic flow and kept neat and attractive.

Drop-off bins must be clearly marked.

The center must have the support of the municipality and should expect to remain in operation for at least two years.

Appendix G lists all the municipalities which received these signs.

D. TECHNICAL ASSISTANCE AND REVIEW PROCEDURES

The task of technical assistance is to assist counties, municipalities and businesses with planning and establishing recycling programs. There are different levels of assistance provided. Listed below are various types of assistance:

1. Answering mail, telephone or in-person inquiries: Assistance is provided to teachers, students, public works directors, environmental commissions, mayors and council members. Questions concern markets for materials, types of collection equipment, types of processing equipment, mandatory ordinances, publicity ideas, how to educate recyclers, ways to store materials and how

to set up collection centers. To assist in developing recycling programs a number of publications have been written and published. A complete publication listing is included in Appendix E.

2. On-going planning with municipal and county recycling coordinators. An organized network of county and municipal professionals has been developed. This group meets on a regular basis to exchange new ideas and developments in program management. To date, 18 counties have coordinators who work either full-time or part-time on recycling. The coordinators provide liason between the state and the municipalities. They assist in disseminating information from the State and allow the Office to keep up to date on programs and markets around the State. An up-to-date listing of recycling programs is now kept on computer file. This listing enables recycling businesses to identify potential customers. It also allows municipalities interested in developing programs to locate neighboring towns that may have similar programs.
3. Preparation of detailed technical recycling options for municipalities. As part of this service, staff will observe or participate in the program's operations, collect background information and discuss recycling objectives with municipal officials. On the basis of this information, a set of options regarding routing, program management, collection equipment, ordinances, service contracts or publicity and education techniques will be prepared for the municipality. These options allow program managers to make informed decisions.

From 1982-1984 a quarterly newsletter called "Recycling Roundups" was published. The purpose was to provide information on program and market developments, technical information, recycling issues and the availability of new publications. In 1984, the publication was changed to a monthly newsletter called "Recycle-Gram". This was done in an effort to disseminate more timely information, to meet the demand for such information and the rapid development of recycling in New Jersey. These newsletters are mailed to 4000 recyclers around the State.

The Office of Recycling has also sponsored or participated in courses, workshops and conferences. Conferences have been sponsored on resource recovery, financing municipal recycling, industrial recycling and composting. This spring a statewide business seminar was held to share information on how businesses may become involved in recycling office paper, used oil, glass, corrugated and food waste. In 1981 the first state-sponsored recycling course was held at Cook College, of Rutgers University, in New Brunswick. This seven week course, attended by 100 persons, generated much enthusiasm. Since then, the course has been repeated and held at six different colleges in the State, with between 25-40 people at each session. The majority of the people attending the courses are involved in municipal recycling programs. The courses have

created a network of knowledgeable recyclers throughout the State. Programs have been developed, expanded and improved as a result of these courses.

A directory of markets listing buyers for recyclable materials was first published by the Office of Recycling in 1980. It was updated in early 1982 into a comprehensive listing of markets buying materials ranging from scrap metal to food waste. The guide was updated again in 1984 and is now available on computerized lists. This directory has been widely distributed throughout the State.

In addition, in September 1983, the Office of Recycling in cooperation with Texaco U.S.A. designed a standardized "used oil collection site" sign that is made available to Texaco retailers. The Office of Recycling has also developed a similar sign with Exxon USA and hopes to develop uniform signs with other oil companies located in New Jersey.

Review Procedures

County Solid Waste District Plans and their updates are reviewed by the Office. The plans are evaluated to determine whether they will enable the county to achieve a 25% recovery rate. Recommendations are made for ways to correct deficiencies in their plans.

Applications from the Coastal Area Facilities Review Act (CAFRA) permits are also reviewed. Suggestions are made for ways to include recycling in proposed projects in the coastal zone. The DEP has made these provisions a requirement for approval of the permit. In the beginning, no CAFRA applications considered recycling options as part of their solid waste plans. The Office of Recycling has consistently recommended that developers modify construction designs to permit the segregation, storage and marketing of recyclable materials. Because of this review process and the cooperation of the DEP, Office of Coastal Zone Management, many developers now include recycling options in their permit applications.

The recommendations of the Office and the permit requirements of the DEP, Office of Coastal Zone Management have resulted in the development of recycling programs by the casinos in Atlantic City. In 1983 the Office of Recycling conducted a survey in the Tropicana, the Claridge, Harrah's Marina Casino and Caesar's Boardwalk Regency to determine the types of waste generated in those establishments and the method of collection. A set of recommendations was sent by the Department's of Energy and Environmental Protection to the casinos along with suggestions for markets for their recyclable materials. To date, five casinos are recycling food waste, glass, corrugated, office paper or grease. In addition, casinos are participating in the New Jersey Department of Energy/Muscular Dystrophy Association Used Oil Recycling Program.

VI. MARKET DEVELOPMENT

Market development and expansion is essential to effectively implement a mandatory program. The recycling process is uniquely tied to commercial and industrial activities. A material is recycled only when a market for that material exists. Since commercial or retail demand could be satisfied by products made from virgin or recycled materials (or both), the major thrust of market development is to convince manufacturers as well as consumers that products made with recycled materials can best satisfy this demand with respect to price and quality. Any increase in collection of recyclable materials must take into account the capacity of the market to absorb the material. Therefore, it is essential that market stimulation be considered as an adjunct to expansion of recycling programs.

The enactment of the innovative New Jersey Recycling Law sent a message to industry that the State was committed to changing solid waste management practices. Many industries viewed this as an opportunity for business investments. Mandatory recycling will require an expansion of these activities as well as the development of new markets. These are some examples:

1. Alcoa Aluminum opened a can processing facility in Fairview capable of handling 300,000 cans an hour. They also collect aluminum cans in seven other locations around the State and have installed reverse vending machines in 12 locations. A reverse vending machine accepts aluminum cans and gives cash back to the consumer.
2. The opening of the Owens-Illinois glass processing facility, the largest in New Jersey, in December 1982 in North Bergen.
3. The opening of the Flowen Oil Delaware Valley Company facility in Camden for collecting and reprocessing used oils.
4. The large-scale expansion by Garden State Paper Company of their old newspaper collection system by opening new fixed and mobile buyback operations throughout northern and central New Jersey.
5. General Engines Co., Thorofare, developed a four-compartment recycling trailer which is in use in twenty communities in N.J. They recently developed a two-compartment side dumping trailer for collection of recyclables.
6. Monmouth Recycling, Long Branch, developed from a scrap dealer to a multi-material recycling center collecting glass, aluminum, paper, ferrous and non-ferrous metals.

7. Zozzaro Brothers, Inc., in Clifton, a paper dealer for over 100 years expanded to include collection of glass and aluminum.
8. Two companies started curbside collection businesses. Monarch Recycling operates in Burlington and Mercer Counties and Rainbow Recycling operates in Passaic and Bergen Counties.
9. Harry Raff and Sons, in Cape May Courthouse, expanded from buying scrap metal to buying glass, all grades of paper and aluminum cans.
10. Glass Cycle Systems, in Butler, developed a glass crushing machine and collection system for high-volume bars and restaurants.
11. Pace, Inc., Jersey City, expanded from collection of non-ferrous scrap to collection of glass from municipalities and commercial establishments.
12. Three companies were formed for collection of and development of high grade office paper recycling programs. Pyramid Recycling is located in West Orange, Taradash Recycling is located in Teaneck and American Paper Company is located in Morristown.

A number of other market development actions have been undertaken since the enactment of the N.J. Recycling Act.

1. A law (N.J.S.A. 54: 32B-8.36) to exempt recycling processing equipment from the sales tax went into effect January 1982.
2. Consumer preference for products made from recycled materials was promoted by supporting the "Shopping for the Symbol of the 80's" campaign developed by API. "Recycled Packaging Awareness Week" sponsored by the New Jersey Food Council and the New Jersey State Federation of Women's Clubs was held in March 1983.
3. The N.J. Recycling Forum, Inc. with representatives from industries, nonprofit environmental groups, solid waste haulers, chambers of commerce, N.J. Food Council and government meet monthly to discuss recycling issues and legislation.
4. A series of meetings have been held with representatives of glass manufacturers and glass intermediate processors to discuss some of the problems with supply and demand of cullet for glass recycling.
5. Letters have been sent to companies concerning the recyclability of new product packaging on the market. A meeting was held with Campbell Soup Company in Camden. A meeting was also held with the Board of Directors of the U.S. Brewers Association to discuss product packaging and programs.

6. A meeting was held with representatives of the Rubber Manufacturers Association, and eleven major tire manufacturers to discuss ways of recycling and alleviating the problems of disposal of tires.
7. A seminar is being planned early next year with Rutgers University and the plastic industry to discuss the recycling of plastic material.

VII. RECYCLABLE MATERIALS

It is simpler to understand market development strategies by examining separately each type of recyclable material.

A. PAPER

Paper products are the most commonly recycled materials. Approximately 94% percent of municipalities with recycling programs collect paper. Estimates show that 46% of municipal solid waste consists of paper products.

There are many types of recyclable paper including newsprint, white ledger, computer printouts, corrugated containers and magazines. Many municipal and volunteer programs collect newsprint and many businesses recycle corrugated containers and high grade paper.

A recycling program normally concentrates on collection of one type of paper. Newsprint and corrugated are probably the most commonly collected types of paper. Traditionally, municipal programs and volunteer programs have started with collection of newsprint.

The prices paid for recyclable paper vary according to the demand for products made from recyclable materials, the export market, the cost of using secondary versus virgin material and especially the state of the economy. One way to minimize fluctuations is to guarantee delivery of a steady supply of well-prepared, sorted paper to the markets.

Recycled newsprint and corrugated is used by board mills to manufacture insulation, wall board, roofing and siding. One of the largest consumers of used newsprint is mills which produce new newsprint. Fine paper manufacturers use white ledger, computer printout and computer cards to manufacture high grade paper. Tissue and toweling manufacturers use high grade paper to manufacture napkins, facial tissue and paper towels.

The Department of Energy and the Department of Environmental Protection have supported the 1976 Federal Resource Conservation and Recovery Act (P.L. No. 94-580) which encourages state agencies to purchase recycled products. In addition, the departments prepared amendments to Assembly Bill A-53 to encourage the passage of

legislation which mandates State purchase of recycled paper products and other recycled materials.

There are 12 paper mills in the State which use post consumer waste paper in their manufacturing process. They are Celotex, Perth Amboy; The Davey Co., Jersey City; Flintkote Co., Camden; Garden State Paper Co., Garfield; Georgia Pacific, Delair; Homosote Co., West Trenton; Lowe Paper Co., Ridgely; Millen Industries, Garwood; Marcal Paper Mills, Inc., Elmwood Park; Newark Boxboard, Newark; and U.S. Gypsum, Camden and Clark. In addition, there are at least 59 dealers who buy secondary paper from the public.

OFFICE WASTEPAPER

State agencies, local governmental agencies and other institutions generate significant amounts of office wastepaper. As much as 93% of office building waste can be paper. White ledger wastepaper and computer paper (high-grades) which represents over 50% of the waste stream from offices.

State employees generate approximately 8000 tons of high-grade wastepaper annually. Assuming a market price of approximately \$65 per ton, it is projected that \$520,000 in revenues could be received annually by the State. Potential hauling and disposal savings would also accrue from not landfilling this material. At a rate of \$70 per ton to collect and dispose of this material, an additional \$560,000 could be saved by not landfilling this material.

Several high-grade office paper recycling programs have already been implemented in State facilities. To date, the following state departments and agencies have implemented office paper programs:

- Department of Agriculture
- Department of Banking
- Board of Public Utilities
- Capital Complex
- Department of Civil Service
- Department of Defense
- Department of Energy
- Department of Education
- Department of Environmental Protection
- Governor's Management Improvement Program
- Department of Health
- Department of Insurance
- Department of Labor
- Department of Law & Public Safety (Divisions of System and Communications, Motor Vehicles, and Election Law Enforcement Commission)
- N.J. Transit
- Department of Treasury (Divisions of Taxation and Management and Budget)

Over 10,000 state employees have recovered approximately 120 tons of high grade paper in State facilities. With the ongoing implementation of Governor Kean's Executive Order 57, issued in December of 1983, this number should increase dramatically.

The Executive Order mandates State agencies, departments, offices and other instrumentalities of the State including State universities and colleges to implement office paper recycling programs. The Office of Recycling assists state agencies to implement office paper recycling programs and will implement the second phase of the Order to recover other recyclable materials from state agencies.

B. GLASS

Glass which makes up 8% of the municipal solid waste in New Jersey is the second most commonly recycled item. 58% of the programs in New Jersey collect glass.

Cullet or crushed glass is used by glass plants to make new glass containers. Recycled glass should be sorted into green, amber and clear (flint) and must be free of contaminants such as stones, ceramics or metal rings and caps. In most cases, very little colored glass can be mixed in with flint while some degree of color mixing is allowed for green or amber glass. This is because container manufacturers can not tolerate variances in glass color. Highly mixed colored glass is normally used for other applications such as the manufacture of fiberglass insulation.

Glass recycling has recently been effected by:

- Container manufacturer's switch to plastic for new beverage containers.

- An influx of green and amber cullet from container deposit states and foreign manufacturers.

- A drop in the price of raw materials used in manufacture of glass causing a greater reliance on virgin materials.

Because of these problems, the relatively steady price of glass has recently dropped.

Cullet melts at a lower temperature than raw materials thus the use of cullet saves energy and money. New Jersey plants are presently using between 25% and 40% in their glass manufacturing process. This percentage could be raised to as much as 50-70%.

There are six glass recycling plants in New Jersey. They are Brockway Glass, Freehold; Thatcher Glass, Wharton; Ball Glass,

Carteret; Foster-Forbes, Millville; Anchor Glass Container, Salem and Midland Glass, Aberdeen. In addition, there are 18 processors collecting glass.

C. METALS

Metals are usually classified as ferrous or nonferrous. Ferrous materials are steel, cast-iron, tin-plated steel cans, white goods (stoves or refrigerators), or bimetal cans (beverage containers with an aluminum top and steel sides). Although ferrous metals constitute only 5% of the solid waste generated in New Jersey they can be bulky and difficult to handle. Many municipalities arrange for bulky scrap to be picked up at the curb.

Although markets are limited, some programs collect bimetal and ferrous cans. Ferrous cans must be washed, have the labels and ends removed, and be flattened. Bimetal cans are normally collected with aluminum cans and can be separated by use of a magnet.

Nonferrous metals are aluminum, brass and copper. The metal commonly collected by municipalities is aluminum. Aluminum is a valuable commodity because the U.S. must import bauxite, the raw material from which aluminum is extracted. Also, it takes 95% less energy to produce aluminum from recycled metals than from raw materials. The primary source of recyclable aluminum is beverage containers, but other recoverable forms include foil trays, broken furniture supports or frames, house gutters and storm doors.

Aluminum cans may be differentiated from bimetal cans because they are nonmagnetic. Aluminum cans can be stored in barrels or plastic bags.

There are two steel minimills located in New Jersey, Raritan River and Structural Steel Company. In addition, there are at least 64 scrap dealers buying ferrous and nonferrous metals.

D. PLASTICS

According to the Society of the Plastics Industry, the general definition of plastics is a group of materials in combinations of carbon with oxygen, hydrogen, nitrogen, and other organic and inorganic elements; which at some point in its manufacturing stage is made liquid, and thus is capable of being formed into various shapes through the application of heat or pressure.

Crude oil and natural gas are the raw materials from which plastics are manufactured. Many plastics are recyclable. The most commonly recycled plastic at the post-consumer level is the polyethylene terephthalate (PET) one or two liter beverage container.

These containers are usually shredded and used as fiber fill for jackets, pillows and sleeping bags, as a fiber in carpet construction, and as a filter media. Additional uses include the manufacture of industrial strapping, wall tile, flooring and tail light lenses.

There are a number of problems which must be overcome before the recycling of plastic becomes a commercially viable program:

There are difficulties in differentiation of plastic type. In order for scrap to be used in the manufacturing process, the plastics must be source-separated into homogeneous streams.

Contamination by other materials. Plastic containers are sometimes made of a combination of materials. In order to recycle the plastic, the contaminants must be removed.

High volume to weight ratio. Because plastic containers are bulky and light they are difficult to store and transport. Some type of compaction is usually necessary.

There are presently only five markets in the State which accept post-consumer plastic for recycling. These markets tend to be sporadic and demand high volume deliveries of materials to make collection, processing and storage economically efficient.

D. USED OIL

It is estimated that 24 million gallons of used motor oils are generated each year in New Jersey. Approximately 10 - 12 million gallons are used as a fuel or fuel supplement; 3 - 4 million in asphalt mixtures; and at least 11 million gallons are unaccounted for. The improper disposal of used oils are not only harmful to the environment but is a waste of a valuable resource.

In September 1980, the NJDOE adopted regulations governing the collection, disposal and recycling of used motor oils. The regulations, N.J.A.C. 14A:3-11 et seq., are designed primarily to provide individuals who change their own engine oil a convenient and safe location to recycle that material. The regulations also designate "used oil collection sites" such as service stations, motor vehicle re-inspection stations and oil retailers. These sites are required to accept used motor oils from the public and to sell it to licensed haulers/collectors. They are also required to post a sign stating that they are collection sites.

Many municipalities have expanded their programs to include the collection of used motor oil at depots and at the curb. Such efforts have enhanced the collectability and recyclability of used oils from the public. In 1983, municipalities submitted Tonnage Grant

Applications indicating 2,430 tons (or 694,285 gallons) of used motor oil were recycled. In 1984, municipalities submitted Tonnage Grant Applications indicating 5,660 tons (or 1,616,000 gallons) were recycled.

The Office of Recycling developed a cooperative program with the Muscular Dystrophy Association (MDA) to increase the quantity of used oil recycled in New Jersey. The program encourages companies and municipalities to recycle used motor oil and donate the proceeds from the sale of the oil to the MDA. All revenues donated to MDA are used to help residents of New Jersey fight neuromuscular diseases. The N.J. program is recognized by MDA as a model program for other states to emulate.

F. ASPHALT

Recycling of asphalt pavement reduces the quantity of high quality aggregates and asphalt used in the construction, rehabilitation and maintenance of roadways. Recycling of existing paving materials is beneficial due to the growing scarcity and expense of virgin materials. Recycled asphalt pavement requires 75% less new asphaltic materials than virgin paving materials and virtually eliminates the necessity for the landfill disposal of discarded pavements.

The importance and benefits of recycling asphalt pavements has been recognized by many municipalities. In 1982 municipalities submitted Tonnage Grant applications totaling 6700 tons of asphalt recycled. However in 1983, municipalities documented 63,000 tons of asphalt recycled.

In addition to asphalt recycling, the inclusion of recycled materials such as crumb rubber (from tires), ash (from resource recovery facilities) and glass has been shown to benefit asphalt pavement durability. The Federal Surface Transportation Assistance Act of 1982 (STAA) encourages the mixture of recycled materials into asphalt. Section 142 of the Act provides an increase in the State funding share for road projects which incorporate recycled materials into asphalt, as well as expanding and establishing markets for crumb rubber, ash and glassy aggregates.

G. TIRES

Each year New Jersey generates approximately 7 million waste tires, of which, nearly 90% are either buried in landfills or illegally dumped thus less than 10% are reused. One method for recycling tires is retreading.

The benefits of retreading tires are three-fold:

Each retreaded automobile tire conserves four gallons of oil in the manufacturing process.

Purchasing retreaded tires saves money.

Advanced retread construction produces tires that are safe and dependable and provide the same extended wear benefits as new tires.

The Office of Recycling has been working with the New Jersey State Tire Dealers Association to develop a statewide comprehensive collection and recycling program for scrap tires. The program could provide a system to collect scrap tires from municipalities and tire dealers so that more tires are retreaded.

Another method of recycling and reusing tires is as artificial reefs. A joint program between the Ocean County Planning Board, NJ DOE, NJ DEP and JCP&L has been established to collect and slice old tires, bind them together and selectively place them 5 miles off the coast. The artificial tire reefs have been very successful in improving fish populations and habitats and enhancing commercial and sport fishing. The Office of Recycling estimates that several hundred thousand tires could be reused in this manner. The Ocean County project will be observed to determine opportunities for expansion..

In addition to retreading and tire reefing, the majority of scrap tires must be processed either by controlled incineration or pyrolysis. In an effort to develop a state tire recycling project, the Office of Recycling has worked with the U.S. Department of Energy (USDOE) and the Rubber Manufacturers Association (RMA) to implement such a plan. Present discussions include federal funding to assist the private sector in the construction and operation of a high technology waste to energy system. RMA proposes to provide engineering and technical assistance for this State project.

H. YARD WASTE

Yard waste, through a natural process called composting, can be broken down into a rich material called humus. This material is similar to topsoil. As much as 10% of a municipality's total solid waste stream is organic material or yard waste. If the average household accumulates approximately 600 lbs of yard waste a year, a community of 10,000 will need to dispose of as much as 950 tons of yard waste annually. Composting, therefore, can result in considerable savings to a municipality.

Some of the economic benefits include the avoidance of landfill tipping fees, and avoidance of costs for hauling to landfills. Leaf composting also creates a useful end-product. This product may be used for erosion prevention, roadside maintenance, land reclamation,

and top dressing for parks and public areas. The leaf compost can be mixed with top soil and used over the final cover of landfills for supporting vegetative growth.

Municipalities recognize the advantages of composting. In 1982, 80 communities had compost sites registered with the DEP; by 1984, this number increased to 132. In 1983, 69,704 tons of yard waste were reported in applications. In 1984, 156,374 tons were reported by municipalities.

RECOMMENDATIONS

PROPOSED RECOMMENDATIONS FOR THE STATE RECYCLING PROGRAM

I. THE NEW JERSEY RECYCLING ACT (N.J.S.A.13:1E-92 et seq.)

Proposed Legislative Changes:

A. Mandatory Recycling

Recycling should be mandated on a statewide level to increase the effectiveness of existing material recovery programs and to conserve the State's remaining landfill capacity. Legislation should be enacted outlining the materials to be included in a recycling mandate and provisions for market development. In order to carry out this mandate each solid waste management district should develop a recycling plan as an amendment to their district solid waste management plan.

1. This plan should address:

- a. Recycling of leaves, used oil, newspaper, glass, metal and plastic beverage and food containers from residential, commercial and institutional premises.
 - b. Recycling of high grade office paper, corrugated paper, glass, metal and food waste from commercial, industrial and institutional premises.
 - c. Procurement of recycled products by county and municipal agencies.
 - d. The collection of recyclable materials.
 - e. The designation of a recycling coordinator
2. All solid waste facilities such as resource recovery plants, landfills and transfer stations should be required to incorporate the District recycling plan goals in their proposed project.
 3. All land use proposals of 100 residential units or more should be required to develop a solid waste plan that includes a recycling option. All land use proposals for large commercial and industrial projects should be required to include projected waste compositions and generation rates and a recycling plan. This plan should be reviewed by the County for coordination with their solid waste management plan.
 4. Municipalities should be responsible for adopting and enforcing mandatory ordinances to carry out the goals of the district plan and statewide mandate to recycle.

B. Landfill Surcharge

The requirements of a statewide recycling mandate would exceed the available State financial resources provided through the New Jersey Recycling Act. Greater demands would be placed on the educational, technical assistance, research and market development services that would be needed for inaugurating and sustaining a mandatory statewide recycling system. The following amendments should therefore be made to the funding provisions of the New Jersey Recycling Act:

1. Section 13:IE-95:

There is levied upon the owner or operator of every sanitary landfill facility a recycling tax of \$.36 per cubic yard of all solid waste accepted for disposal on or after January 1, 1985; delete [except that any solid waste accepted for disposal on or after January 1, 1986 shall be taxed at the rate of \$.06 per cubic yard].

(See Exhibit 5 for a draft budget for the proposed surcharge increase.)

2. Section 13:IE-95: Expiration Note

delete: [Section 4 of this act shall expire on December 31, 1986.] Add: Section 4 of this act shall expire on December 31, 1990.

Implementing a statewide mandatory recycling program will require substantial initial investments by local governments for labor and equipment for collecting, storing, processing and marketing recovered materials. An expansion in the funding base for the program planning grant program will be necessary to provide the financial assistance that will be needed over the next five years by local governments. The program implementation grant program would also be used to encourage the development of a cooperative purchasing and marketing program. The intent of this program would be to reduce the marketing and contractual obligations of municipal governments through the offering of cooperative purchasing and marketing contracts by the counties. Program planning grant funds would also be made available to support the construction and operation of intermediate processing facilities.

A successful mandatory state recycling program will also be contingent upon a comprehensive expansion of public information and education programs on recycling by the State as well as by local governments. This is especially true with respect to any market development actions that are to be taken. First, consumers and businesses will have to become better informed

EXHIBIT 5

PROPOSED RECYCLING PROGRAM BUDGET (in millions)
(assumption: 36¢/c.y. landfill surcharge)

1. <u>Tonnage Grants:</u>		\$4.14
2. <u>Low Interest Loans</u> <u>and Market Development:</u>		
a. Collection, Storage & Processing Equipment:	\$1.675	
b. Intermediate Processing Facility Development:	1.325	
c. Research & Market Development:	<u>1.830</u>	
Subtotal:		\$4.83
3. <u>Program Implementation Grants:</u>		
a. Cooperative Marketing	\$.624	
b. Collection, Storage and Processing:	<u>1.170</u>	
Subtotal:		\$1.794
4. <u>Education Programs:</u>		
a. Recycled Product Prom.	\$.10	
b. Professional education	.10	
c. Statewide publicity	.60	
d. Education grants	<u>1.27</u>	
Subtotal:		\$2.07
5. <u>Administration</u>		
a. Additional personnel and Support staff:		
*Market Development: (3)		
*Education: (3)		
*Grant and Loans: (3)		
*Technical Assist.: (3)		
Subtotal:		<u>\$.966</u>
<u>BUDGET TOTAL:</u>		<u>\$13.8</u>

about the availability and quality of recycled products. Increased demand for recycled products cannot occur if this is not done. Second, the demand for recyclable materials by industrial end-users can be increased if a reliable and sufficient supply of good quality materials is available. The development of a supply system that will satisfy the production demands of recycling industries will require professional education programs aimed at public works officials, solid waste industry and business managers on recycling program management. Finally, a sustained, high quality advertising and promotion campaign must be conducted to enhance public awareness of the need for recycling and the channels available for recycling through public or private programs.

C. Tonnage Grants

The requirement that tonnage grant payments to municipalities be based on the increase in material recycled over the previous year does not promote continued recycling in municipalities that already have achieved high recovery rates. A payment based on the total amount recycled in the reporting period would reward both beginning programs and well established programs.

In addition, the division of the tonnage grant portion of the Recycling Fund into the three categories of paper, glass and other materials has presented inequities in the distribution of funds between categories and makes the program more difficult to administer. The elimination of the three categories will allow a more equitable payment rate to be established.

It is proposed that 13:IE-96(b)(1) & (4) of the Recycling Act be amended as follows:

1. Not less than 30% of the estimated annual balance of the fund shall be used for the annual expenses of a program for recycling grants to municipalities. The amount of these grants shall be calculated on the basis of the total number of tons of materials annually recycled from residential and commercial sources within that municipality.
2. An additional bonus payment to municipalities that reach a high level of recovery of their solid waste is also necessary to encourage municipalities to achieve and maintain high recovery rates. It is proposed that the following addition be made to the Recycling Act to accomplish this.

The Department may allocate a portion of the grant fund outlined in 15-IE-96(b)(1) for a bonus payment to municipalities that achieve a recycling level as stipulated in department guidelines or regulations

3. Not less than 10% of the estimated annual balance of the fund shall be used for county and municipal planning and implementation grants.

The decrease in the percentage of the Recycling Fund dedicated to tonnage grant payments will be more than offset by the proposed increase in surcharge revenues. It is estimated under the proposed surcharge outlined above, revenues available for tonnage grant payments will approximately double from \$2.10 to \$4.14 million. These grants have also provided an invaluable form of financial support for necessary capital and operational improvements in municipally sponsored recycling programs. For these reasons, an augmented tonnage grant program will provide a viable foundation for sustaining a mandatory state recycling system.

D. Additional Revisions of Funding Provisions

The following supplemental changes in the funding levels provided in section 13:IE-96(b) should be made:

1. The portion of the Recycling Fund to be used for providing low interest loans and loan guarantees for recycling businesses and industries should be increased from 20% to 35% with the additional funds to be used for recycling research and market development and financial incentive programs.

Any serious recycling market development program must undertake the following actions:

Encourage existing manufacturers to substitute virgin materials with recyclable materials through an extensive marketing program.

Encourage industries which use recyclable materials to increase their consumption of these materials.

Attract new recycling industrial capacity to this State.

Assist New Jersey manufacturers of recycled products in locating new markets for their products.

A comprehensive program of advertising, direct mail solicitations, distribution of printed and audio-visual promotional materials, exhibitions at trade shows and market research in conjunction with appropriate trade organizations should be undertaken. These actions would be conducted in concert with the Office of Industrial Development, Small Business Assistance and the Division of International Trade within the Department of Commerce and Economic Development.

Another function of the low interest loan program would be to support the development over a five year period of an extensive multi-material intermediate processing system by New Jersey's private recycling businesses and industries. Intermediate processing facilities would provide a place where municipalities could deposit mixed contaminated recyclables for upgrading to industrial specifications. This would help to simplify their collection and marketing responsibilities as well as provide a supply of materials that is acceptable for use by recycling industries. The major cost components of an intermediate processing facility system are:

- Site acquisitions and improvements.

- Facility construction

- Processing equipment.

The intermediate processing facilities needed in New Jersey must be designed to accept, process and market newspapers, corrugated containers, glass, metal cans and plastic containers. It is estimated that a statewide processing capacity of approximately 1700 tons per day would be required.

The last major purpose of the loan and market development fund would be to sponsor recycling research and development. Determining new applications for waste materials will contribute to a diversification of marketing opportunities for New Jersey local governments. This could have the following beneficial results:

- Increase overall demand for waste materials.

- Resist a deterioration in market demand due to technological changes or economic conditions.

- Serve as a stimulus for economic development.

It is difficult at this point to be specific on what R & D activities should be supported with State funds. This will be determined through market studies, the advice of industrial trade organizations, the track record of previous R & D work supported by Federal or private funds and by consulting knowledgeable experts in the scientific and engineering community. It is anticipated that new applications will be sought in the following areas:

- Construction materials (glass cullet, ash, plastics, mixed papers).

- Consumer products (tires, plastics, mixed papers).

- Agricultural production (food and yard wastes).

- Industrial fuels (tires, plastics and mixed papers).

- Industrial chemical feedstocks (tires, plastics, organic wastes, mixed papers).

II. OTHER LEGISLATIVE ACTIONS

A. LITTER CONTROL LEGISLATION

Current litter abatement activities are hampered by the legislative restrictions of the Recycling Act. The Act only allows direct support to educational and informational litter abatement activities. Funds for direct grants for enforcement, litter prevention and cleanup activities are not available under the recycling legislation. To implement an effective anti-litter program, funding is necessary to develop education, enforcement and clean up programs.

It is recommended that legislation be developed to include a comprehensive litter control program.

Such legislation should include adequate funding to implement a viable program. It is estimated that a fund of at least \$15 million is required. Programs in states that have litter control legislation have been funded by a tax on materials that are usually found in the litter stream. To assure sufficient funding, it is recommended that the New Jersey Division of Taxation conduct a detailed study to determine the potential revenues generated by any proposed legislation.

Proposed use of funds include:

1. A comprehensive litter composition and distribution study which would identify the amount, location and type of litter at sites such as recreation areas and along roadways, as well as the generation rates in these areas. Such a study has never been conducted in New Jersey and would:
 - a. provide basic planning information for local and state agencies for both cleanup and maintenance.
 - b. indicate the progress of any State funded litter program once it was put in place.
 - c. indicate areas where the program is effective.
 - d. assist municipalities in planning recycling programs in coordination with litter cleanup efforts.
2. Technical assistance to municipalities, industries and counties for development and implementation of litter-abatement programs for litter reduction, cleanup and enforcement programs.
3. Statewide educational programs to effect changes in attitudes and behavior towards proper management of solid waste.

4. Financial assistance for comprehensive enforcement and litter abatement programs in municipalities, counties, other government agencies and in recreation areas such as parks.

B. LOCAL PUBLIC CONTRACTS LAW (N.J.S.A. 40 A:11-1 et seq.)

The provisions of New Jersey Local Public Contracts Law do not take into consideration the contracting requirements of municipal or county sponsored recycling programs. Local Public Contracts Law should be amended to clarify the permitted roles and responsibilities of local governments. The following amending language should be considered to allow local governments to operate buy-back centers and to simplify the process for selling their collected recyclable materials:

1. The following definition of recyclable materials should be incorporated into the Local Public Contracts Law:

Recyclable material means any material of organic or inorganic composition or both that is source separated from solid waste by the waste generator or by the operator of an intermediate processing facility for the purpose of recycling.

2. 40A:11-3 : Any purchase, contract or agreement for the performance of any work or the furnishing or hiring of materials or supplies, or for the purchase of recyclable materials from any one individual, group or business as part of a recycling program sponsored by a contracting unit...does not exceed the total sum of \$2,500.00 in the fiscal year may be made, negotiated or awarded by a contracting unit when so authorized by resolution of the governing body of the contracting unit without public advertising for bids; provided, however, that any purchase, contract or agreement involving recyclable materials purchased from any one individual, group or business as part of a recycling program shall not exceed \$4,500 for each such purchase, contract or agreement in the fiscal year.
3. 40A:11-36 : Any contracting unit by resolution of its governing body may authorize the sale of its personal property not needed for public use including recyclable materials recovered through a recycling program sponsored by the contracting unit.
(1) If the estimated fair value of the property to be sold in any one sale or the recyclable materials to be sold in any one sale or within the fiscal year exceeds \$2500(in any one sale)...shall be sold at public sale to the highest bidder.

4. The development of a cooperative marketing program by a county government on behalf of its municipalities or a municipal coalition would help to reduce the cost and effort of following required bidding procedures by local governments. In addition, cooperative marketing could have the following benefits:

- a. Reduce the cost of marketing recyclable materials recovered by local governments to recycling industries.
- b. Increase the marketing opportunities available to local governments, especially to distant industrial purchasers.
- c. Improve the prices that are received by local governments for recovered materials through the marketing of larger quantities of materials.

Sections 40A:11-10 through 40A:11-12 of Local Public Contracts Law makes references only to the joint purchasing of work, materials and supplies by local governments. The scope of these sections must be expanded to accommodate the need for cooperative marketing by including language specifically permitting local governments to enter joint agreements for the purpose of selling recyclable materials.

C. SOLID WASTE UTILITY CONTROL ACT (N.J.S.A. 48:13A-1 et seq.)

The participation of New Jersey's solid waste industry, is necessary to the attainment of the State recycling objectives.

Municipalities which have their own solid waste collection system can account for disposal savings from their recycling programs. These savings are normally reflected in the tax bills of the residents. Municipalities which contract for solid waste collection have sometimes been successful in modifying their contracts to reflect savings from recycling programs. This may be achieved by requiring a rebate for every ton of materials separated for recycling, by separating collection costs from disposal costs and by excluding materials such as yard waste or bulky scrap from the solid waste contract.

However, in approximately one third or 188 of the municipalities in New Jersey, residents are billed directly by the solid waste hauler for collection and disposal services. These service rates are determined by the Board of Public Utilities (BPU). Residents often pay a flat rate per household to have a certain number of containers (e.g. up to five) of solid waste collected per week. Residents who place less than their limit of solid waste containers out for collection still pay the same rates.

In addition, solid waste haulers who service these residents are economically and administratively deterred from offering recycling collection services under the prevailing regulatory system. Haulers are uncertain over how the revenues gained

through the sale of recyclable materials will affect the BPU's evaluation of their solid waste tariffs. These haulers are also uncertain over how to design a recycling tariff that will minimize the frequency of rate change requests that must be made before the BPU.

The deregulation of the collection tariffs charged by solid waste haulers should be considered in order to encourage the solid waste industry to collect recyclables as well as to permit economic incentives to be offered to the homeowner who recycles. This would allow the haulers to develop innovative collection practices for recyclable materials without the uncertainty of how this would affect their revenues, or their rate requests. Municipalities or counties could offer, as an incentive, collection franchises to those haulers who provide comprehensive recycling collection services.

If the above proposal for the economic deregulation of the solid waste collection is considered impractical by the Legislature, then the BPU should be required to set all solid waste collection tariffs on a per container basis in order to provide economic incentives to recycle. The Board should also consider providing franchises to the haulers who provide recycling collection service.

III. ADMINISTRATIVE ACTIONS AND REGULATORY REVISIONS

It is recommended that the State implement the following regulatory and administrative proposals:

A. PROGRAM PLANNING AND EDUCATION GRANTS

Under Chapter 326 of the Solid Waste Management Act, counties, as solid waste districts, are required to plan for the management of solid waste generated in their district. To provide consistency to the C. 326 planning effort, all municipal recycling and solid waste management programs should be coordinated through the county solid waste office. Therefore it is recommended that the regulations applicable to program planning and education grants (N.J.S.A. 14A:6-1.7) be revised to allow only counties to apply for these grants. This revision to the grant program will:

1. Strengthen the county role in recycling.
2. Reduce the cost of administering the grant program
3. Expedite the review and grant award process.
4. Encourage regional solutions to collecting, processing and marketing materials.

In the case where the solid waste district (county) does not apply for a grant or does not submit an acceptable application, the municipalities in that district will then be eligible to apply for program planning and education grants. It is also recommended that nonprofit groups continue to be eligible for education grants but that such applications must be regional in scope and provide for education programs in at least five or more municipalities.

Thus, the following revisions to the Recycling Regulations are proposed.

14A:6-1.7(7:26-15.7)

Application and Award
Procedures for Implementation
and Program Grants and
Education Grants.

The following shall be eligible to apply for and receive either or both Program and Planning Grants and Education Grants.

Counties, provided that the county has a recycling coordinator during the grant period;

Municipalities, provided that that the county in which the municipality is located did not submit an application, or submitted an unacceptable application.

The following are also eligible to apply for Education Grants.

Nonprofit Organizations, provided that the proposed projects are regional in scope and provide assistance to at least five municipalities.

B. PERMITTING AND LICENSING

In addition to the proposed legislative changes on the Solid Waste Utility Control Act (see page 40), there are a number of regulatory processes which could be changed to encourage solid waste haulers to become involved in recycling collection.

1. Collection of Recyclables:

Solid waste haulers who are issued a DEP permit for collecting municipal and commercial solid waste should be required to provide recycling collection services. The hauler would be exempt if this service is already provided to his customers or if the District Solid Waste Plan provides for a different method of collection.

2. Experimental Facilities:

Landfill alternatives involving new energy or materials recovery need to be developed. The current permitting procedures make no distinction between facilities that will be operating for a long time period (e.g. 20 years) and facilities that will operate only for a brief time period (6 months-2 years). This regulatory process deters the siting of experimental facilities to determine their commercial feasibility. An expedited permitting procedure for experimental solid waste facilities, especially those stressing materials or energy recovery, should be developed by DEP.

3. Mixed Recyclables Collection:

Under current DEP solid waste regulations recyclable materials (e.g. mixtures of cans and bottles) which have been comingled to simplify collection are considered solid waste. As a result, only registered solid waste haulers are permitted to collect comingled recyclable materials. In order to expand the potential number of recycling collectors, the DEP should permit the exemption of comingled recyclables (excluding putrescible materials) from its definition of solid waste.

IV. STATE PROCUREMENT AND UTILIZATION OF RECYCLED MATERIALS AND PRODUCTS

One of the goals of the recycling program is to develop and expand markets for all types of recycled materials. The supply side of the equation will be stimulated through mandatory recycling. The State can stimulate the demand side by purchasing and using recycled products wherever the opportunity presents itself. As the demand for finished recycled products increases the recycling potential for waste material will also expand. Government can help develop a stable market for recycled products without interfering with private industry by increasing procurement of recycled materials. The Office of Recycling uses only recycled bond, copy and offset paper. Many county and municipal recycling departments also have started purchasing recycled paper. The accumulated experience has been that recycled paper products are of the same quality as comparable products made from nonrecycled materials. The cost is equally competitive.

To achieve this broad goal, the following is recommended:

- A. State Use Industries should investigate the feasibility of specifying the use of recycled materials in the products it manufactures. One example would be the manufacture of fencing materials from mixed thermoplastic and wood wastes.

- B. All State purchasing specifications should be reviewed by Treasury to determine where appropriate revisions may be made to include the purchase of recycled products.
- C. A recycled product procurement program would assist in expanding the demand for recycled paper products. Therefore legislation should be enacted which requires that by 1987, 50% of the paper products purchased by the State must be products manufactured from a minimum of 25% post-consumer recycled fiber.

V. RECOMMENDATIONS BY MATERIALS

A. ASPHALT

1. Statement:

New Jersey Department of Transportation (NJDOT) Guidelines For Pavement Recycling limit the use of reclaimed asphalt pavement to 10% in non-surface portions of the roadway. In addition, the New Jersey Department of Transportation presently restricts the use of reclaimed asphalt pavement in the surface course of roadways on an experimental basis only.

New Jersey Department of Transportation presently does not encourage the use of secondary materials such as crumb rubber, fly ash and cullet into asphalt pavement mixtures.

2. Proposed Regulatory/Policy Changes:

- a. NJDOT Guidelines should be revised to permit quantities greater than 10% reclaimed asphalt in non-surface roadways. According to the Federal Highway Administration, in some states up to 70% reclaimed asphalt has been successfully used on the construction of non-surface roadways.
- b. NJDOT should revise their guidelines to encourage the use, up to 10%, of reclaimed asphalt pavements in surface course roadways.
- c. NJDOT should develop guidelines to encourage the use of secondary materials in asphalt pavement mixtures.
- d. Bid preference should be given to vendors who are willing to incorporate secondary materials and use increasing quantities of reclaimed asphalt in surface and non-surface roadway construction.

B. FOOD WASTE

1. Statement:

The recycling of edible food waste from commercial and institutional sources as livestock feed has been effectively practiced by New Jersey swine farmers for many years. A recent report by Rutgers University funded through the State Recycling Fund indicates that this industry is capable of increasing its demand for food waste by 31,200 tons per year. To achieve this increased recycling rate, local activities restricting expansion must be addressed.

2. Proposed Legislative Changes:

a. Some municipalities have passed ordinances which prevent many existing swine farm operations from expanding or selling their license to another farmer. To address this problem, the Department of Agriculture should determine how these ordinances may be relaxed in a manner that is consistent with the Right To Farm Act (N.J.S.A. 4:1C-1 et seq) and the municipality's right to regulate economic activities within its jurisdiction.

b. The Farmland Assessment Act of 1964 specifies that farmland is to be assessed based on its income potential rather than its fair market value. However, improvements such as livestock shelters and equipment sheds are taxed at fair market rates. This creates a considerable tax burden for the swine farmer due to the heavy investment in improvements required to develop modern and efficient feeding operations. A tax exemption for new or improved farm structures should be considered to encourage swine farmers who recycle food waste to make new investments in improved livestock facilities.

3. Proposed Regulatory/Policy Changes:

- a. The New Jersey Cooperative Extension Service should hire a livestock specialist to provide technical assistance on nutrition, housing and other modern farm management practices to food waste feeding swine farmers.
- b. The implementation of food waste recycling practices should be required at all state institutions with significant food service activities in accordance with the provisions of Executive Order 57, 1983.
- c. Counties in the southern region of New Jersey should adopt policies in support of food waste recycling practices as part of their district solid waste management plans.

C. OFFICE WASTE PAPER

1. Statement:

White ledger paper is about 50% of the waste stream from most offices. While Governor Kean's Executive Order #57, 1983, mandates office paper recycling programs in all State facilities, much needs to be done to encourage and expand other office paper recycling programs.

3. Proposed Regulatory/Policy Changes:

- a. To encourage the participation of employees and to pay for the cost of administering the State office paper recycling program, a portion of the revenues derived from the sale of recovered high-grade paper should be returned to the State agencies and institutions that implement office paper programs. The remaining money should be returned to the Office of Recycling to improve and expand office paper programs in State government. The funds resulting from the sale of State office waste paper are presently deposited in the general treasury.
- b. The lease agreements of all buildings occupied by State agencies should be revised to include an agreement by the lessor to assist in the implementation of office paper recycling programs as required by Executive Order #57, 1983.
- c. All State owned facilities should take into consideration the existence of recycling programs when calculating contracts for solid waste collection and disposal.

D. PLASTICS

1. Statement:

Many plastics are recyclable. However, a high degree of post-consumer plastic recycling will become feasible only if an effective and reliable collection and processing system for recovering this material is developed.

New Jersey local governments have encountered formidable obstacles in their efforts to recover plastic containers from solid waste. All plastic containers possess a low material density and a low intrinsic value. While this property is very desirable for product distribution, it also serves to undermine municipal attempts to recycle empty plastic containers by making their collection through depot or curbside programs very expensive. For example, a very small quantity of whole plastic PET containers can very easily overwhelm the capacity of even a

large recycling collection vehicle. For these reasons, the few municipalities that have tried to collect used plastic containers for recycling have been forced for economic reasons to abandon this practice. No New Jersey municipality currently collects plastic containers either through a curbside or depot program.

It is clear that the primary roadblock to an effective plastics recycling program is the economic aggregation of large material quantities. The placement of refundable deposits on plastic containers is currently the only proven method for aggregating sufficiently large enough quantities to justify the investment in equipment for densifying and shipping this material to industrial markets. The deposit mechanism works by shifting onto the consumer the cost of transporting plastic containers to a central receiving point. If deposits are placed on plastic containers due to the lack of a viable alternative, it is recommended that deposit redemption centers should be integrated within public or privately operated recycling or intermediate processing facilities. This is to eliminate the cost of double handling that would occur if the conventional deposit model of using retail food establishments as redemption centers is followed.

Since there has been much discussion on deposit legislation in New Jersey. The above recommendation will immediately raise the question if a deposit is suggested for plastics why not extend it to all beverage containers?

To answer this question, the Office of Recycling reviewed the collection data from four well organized mandatory curbside collection programs in New Jersey. This review showed total glass container recovery rates ranging from 46% to 70%. These are higher recovery rates for glass than most state deposit systems report. On the average, deposit states claim an 80% recovery return rate for beer and carbonated beverages containers. Since these containers are only 50% of the total glass containers estimated to be in the waste stream, the recovery rate for glass thru a deposit system is reduced to an average of 40%.

Unlike plastics, glass containers possess a much higher material density which makes their recovery through curbside or depot programs economical. On the other hand, while aluminum cans possess a very low material density similar to plastics, their intrinsic market value is high enough to justify their recovery by a well established network of independent can collectors and processors.

The objective of a mandatory state recycling program will be to require each municipality to incorporate recycling within its solid waste management system. Data from the tonnage grant program demonstrates that well designed and managed municipal recycling programs working in concert with private recyclers can achieve substantial recovery rates.

2. Proposed Regulatory/Policy Changes:

- a. A committee representing the plastics packaging industry should be formed to work with the Office of Recycling to develop a post-consumer plastic materials collection system. In addition, this committee should also design a coding system that would help the consumer to identify recyclable plastics.
- b. If an industry sponsored collection program has not been instituted by July, 1986, the Legislature should examine the feasibility of a refundable deposit system for plastic containers. Consideration should be given to a deposit on all plastic food and beverage and other onetime use containers (including alcoholic beverages). The deposit should be graduated from \$.10 to \$.25 depending on the size of the container and a portion of the deposit (\$.05 per container) should be returned to the State for a plastic recycling and processing program. In addition all unclaimed deposits should be returned to the State for recycling activities.
- c. Polyvinyl Chloride Plastics (PVC)

All types of plastics are rapidly increasing in the waste stream. These materials have limited recycling markets and often replace recyclable material in product packaging. Although plastics do have an energy value, products made from polyvinyl chloride and polyvinylethene chloride result in the release of hydrochloric acid emissions when burned. Polyvinyl chloride and polyvinylethene chloride are two materials that are increasing in product packaging such as vegetable oil bottles, liquor bottles and packaging wrap. It is therefore recommended that the manufacturers of PVC packaging products develop a program for recycling these materials by July, 1986, if such a program is not implemented the State should consider imposing a ban on the use of this material for products that have a short life and that are frequently disposed of, such as food, beverage and other types of one time use containers and packaging.

E. TIRES

1. Statement:

Every year an estimated 7,000,000 waste tires are generated in New Jersey. At least 6,000,000 of these are either landfilled or improperly disposed. Technology has been developed for methods of proper disposal of tires. However, little effort has been made to develop tire recycling facilities in New Jersey.

2. Proposed Legislative Changes:

A State Tire Research and Development Fund should be established. Financial assistance for the fund would be derived from the major tire manufacturers and federal funding. The purpose of this fund would be to develop practical disposal alternatives such as tire reef building, rubberized asphalt mixtures, increased retreading and mass-burning or pyrolysis systems.

If the above program for tire recycling is not successfully implemented by July, 1986, the Legislature should examine the feasibility of imposing a deposit on all tires sold in New Jersey to establish a tire recycling and research fund. The deposit should be a minimum of \$2.00 per tire, 50% should be returned to the consumer and 50% allocated to the tire recycling fund.

3. Proposed Regulatory/Policy Changes:

- a. A New Jersey Car Care Council should be established to promote the proper care and maintenance of tires as well as promote the purchase of retreads.
- b. The Division of Purchase & Property and the New Jersey Department of Transportation should revise bid specifications to encourage the purchase of retreaded passenger and truck tires for state vehicles. Effective 1985, 10% of all tires should be retreads, increasing to 20% by 1986 and 30% by 1988.
- c. Scrap tires can be granulated into crumb rubber and incorporated into asphalt mixtures. Studies conducted by the Federal Highway Administration and by other states indicate that varying quantities of crumb rubber and asphalt mixtures reduce cracking, improve overall roadway durability and decrease maintenance costs. If the state and private sector actively made use of crumb rubber in new pavements and construction projects, significant quantities of scrap tires could be recycled. The State could assist in establishing a market by developing bid specifications that encourage the use of reclaimed materials, such as crumb rubber, fly ash and glassy aggregate, in all new State and roadway reconstruction projects. The use of reclaimed materials in road pavement not only would expand markets for these secondary materials and reduce maintenance costs, it would also make the State eligible for supplemental federal highway funding. The Surface Transportation Assistance Act of 1982 allows states a 5% financial incentive from the Federal Highway Trust Fund if the state highway department incorporates reclaimed materials in asphalt pavement.

F. USED MOTOR OIL

1. Statement:

The N. J. DOE regulations (N.J.A.C. 14A: 3-11 et seq.) govern the collection, disposal and recycling of used motor oil in the State. There is a need to improve the program to bring about greater compliance with the regulations and to increase public awareness.

2. Proposed Regulatory/Policy Changes:

a. Driver training manuals should be revised to include test information on the proper methods for recycling used motor oil.

b. The used oil recycling regulations cited above require motor vehicle reinspection stations to accept and collect used motor oil from the public. Compliance with these regulations has been unsatisfactory. The Division of Motor Vehicles should make compliance with these regulations a condition for issuance or renewal of reinspection station permits.

c. N.J.A.C. 14A:3-11.5 requires that designated used oil collection sites post 11 inch by 15 inch signs identifying the sites as oil collection depots. Compliance with this section of the regulations has been unsatisfactory. It is therefore recommended that oil companies marketing products in New Jersey for sale at facilities designated as used oil collection sites be required to provide or make provisions for the placement of permanent signs at oil collection sites.

G. YARD WASTES

1. Statement:

Yard waste can be a significant solid waste burden to the average municipality. While many municipalities have discovered the advantage of composting yard waste, a more aggressive program needs to be developed to keep yard waste out of landfills.

2. Proposed Regulatory/Policy Changes:

a. Counties should seek to develop suitable sites for regional composting programs. Municipalities with substantial quantities and no suitable acreage for composting sites could use the the county facility.

- b. Most municipalities recycle their leaf compost by giving it to residents or selling it to landscapers or nurseries. However, some municipalities have difficulty marketing all their final compost material, it is therefore necessary to expand the markets for this material, the New Jersey Department of Environmental Protection can assist in market expansion by:

adopting policies to require, where practical the use of compost products for supporting vegetative growth on final landfill cover.

procuring municipal compost material for use in landscaping the State's parks.

- c. Counties should also work with their Agricultural Extension Services to develop and expand the demand for compost products by agricultural, horticultural and landscaping industries.

VI. MARKET DEVELOPMENT ACTIONS

TAX PROPOSALS

As stated throughout the report, market development and expansion is critical to the success of a statewide mandatory recycling program. It is therefore recommended that the Legislature examine the feasibility of tax incentives for recycling. Specifically, the Legislature should look at the following types of incentives.

A. Incentives for Manufacturing Industries

Consideration could be given to a reduction in the Public Utilities Gross Receipt and Franchise Tax (N.J.S.A. 54: 30A-49 et seq.).

This could be structured so that manufacturers of products made from post-consumer recycled materials be given a partial credit against that portion of their utility bill which is applied to the gross receipts and franchise tax. This credit could be based on the percentage of post-consumer waste materials used in the manufacturing process. In order to be eligible the industry could be required to use at least 50% post-consumer material in the manufacturing process. At least 50% of this material (or 25% of total material used) should be generated from New Jersey residential, institutional, or commercial sources.

The credit could equal 50% of the cost of utility services applicable to the gross receipts and franchise tax. However, if a manufacturer increases the percentage of post-consumer waste from N.J. sources, the tax credit could correspondingly increase but not exceed 75% of the cost of the gross receipts and franchise tax.

Approximately 13% of the cost of gas and electricity paid by New Jersey industries is allocated by the utility companies to the gross receipts and franchise tax. Recycling manufacturers taking advantage of the above tax credit could potentially reduce their utility bills by 9.75%.

The certification process to document the portion of post-consumer material used and the percentage generated from sources in New Jersey would also have to be examined. If certification is determined to be possible, the utility companies could then provide a credit to the eligible industries on a periodic basis. It is recommended that a time limitation should be placed on any tax credit .

B. Sales Tax Exemption

Consideration should be given to a sales tax exemption on products or products packaged in materials labeled and certified to contain 50% or more post consumer material.

C. Corporate Business Tax (N.J.S.A. 54:10A-1 et seq.)

The State Corporate Business Tax uses a two step assessment procedure for corporations:

1. Net worth assessment

The net worth of a corporation is multiplied by a rate set by a graduated net worth schedule. Under the provisions of N.J.S.A. 54: 10A-5, the net worth section of the Corporation Business Tax will be completely eliminated by July 1, 1986.

2. Net Income

This tax is assessed on corporations at the rate of 9% on their net income minus adjustments.

The Legislature should study the feasibility of the following incentives that may encourage the expansion of the market for recyclable materials:

1. A 20% recycling investment tax credit against the net income assessment of the Corporation Business Tax for those New Jersey industries that.....

a. invest in recycling transportation, processing, and manufacturing equipment and structures. If such a credit is provided it should be eligible to be carried forward for a period not to exceed five years or until the full cost of the credit is used by an industry, whichever time period is less.

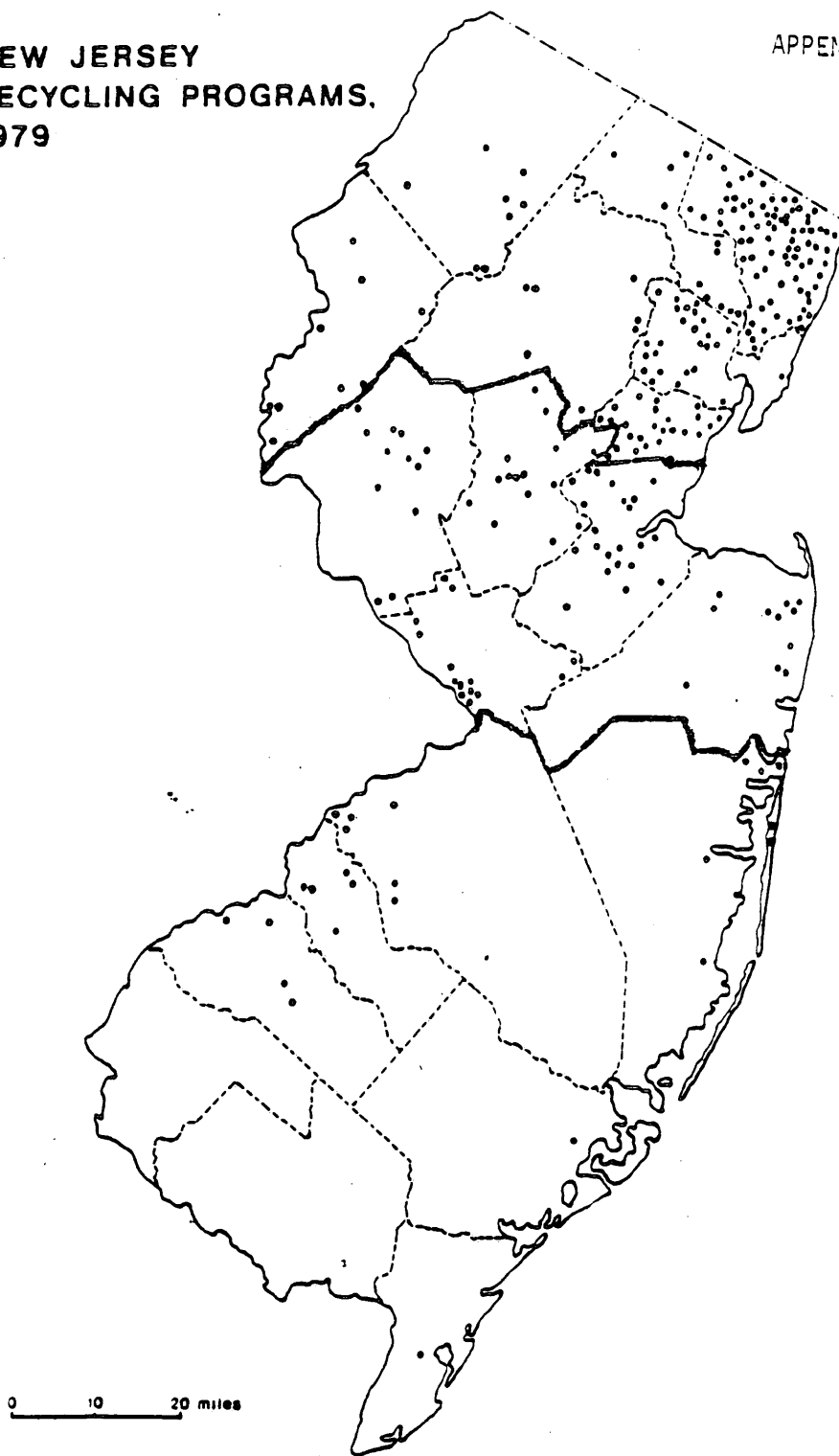
b. produce finished products certified to contain 50% or more post-consumer recycled material. Corporations such as newspapers could be eligible.

The above investment tax credits offer the potential to not only stimulate investment in the development or expansion of recycling industries but also the market for the products manufactured by those industries.

APPENDICES

**NEW JERSEY
RECYCLING PROGRAMS.
1979**

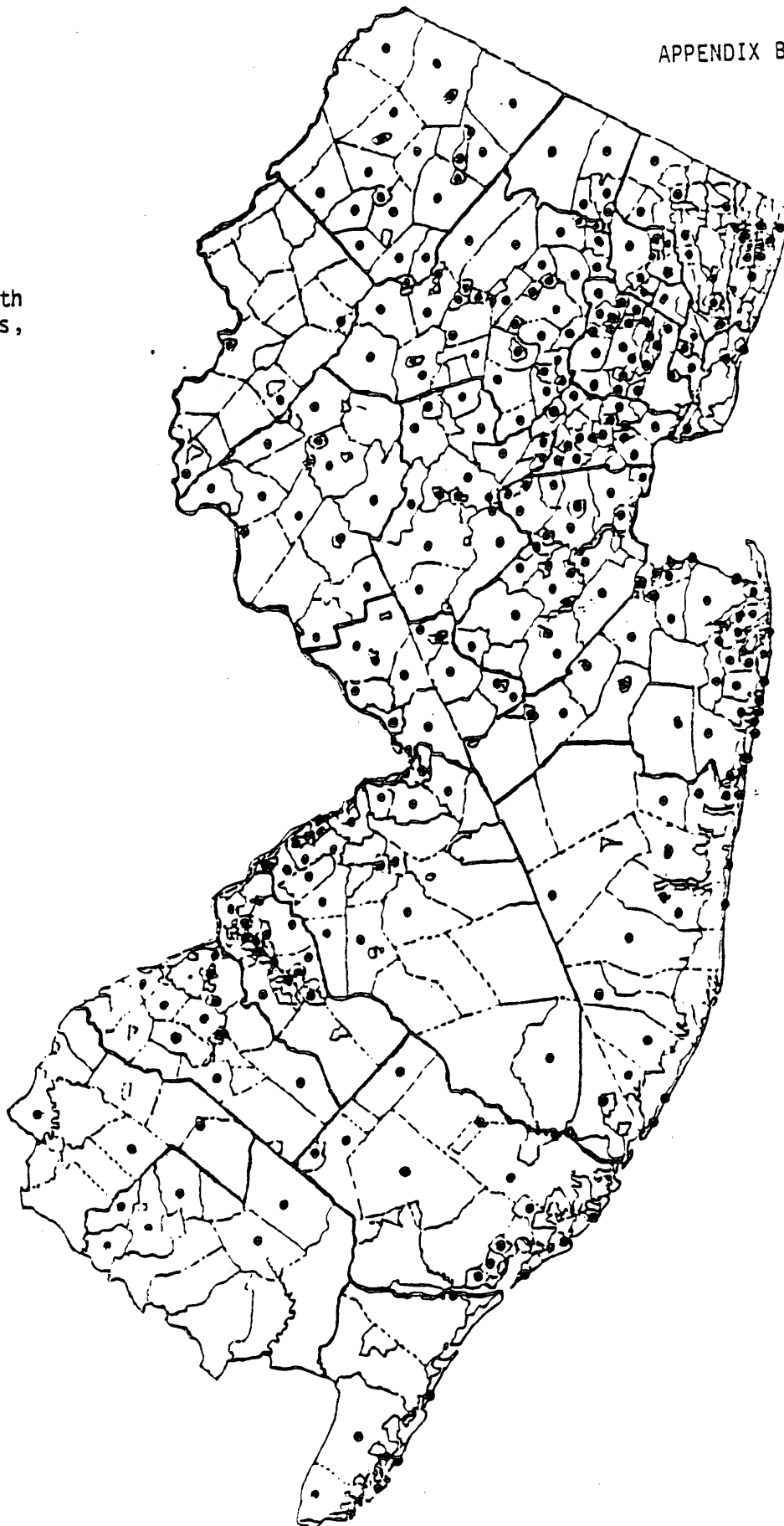
APPENDIX A



Source: Community Recycling in New Jersey, N.J. Agricultural
Experiment Station Research Bulletin N. B-855.

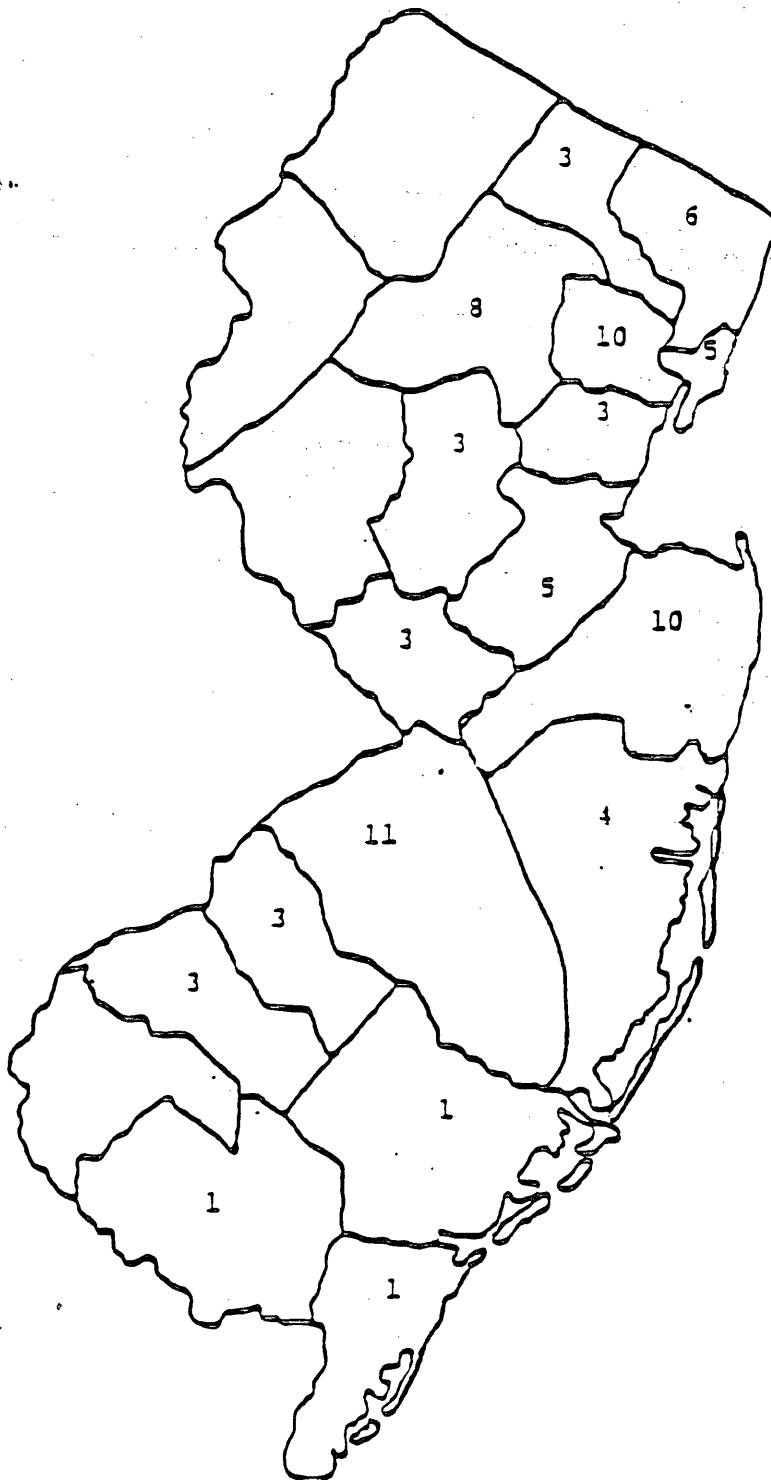
APPENDIX B

Municipalities with
recycling programs,
July 1984



APPENDIX C

Mandatory Programs
July, 1984



APPENDIX D

1982 TONNAGE GRANTS AWARDED IN 1983

County	Municipality	Total Tonnage	Total Amount
Atlantic	Buena	281.20	\$2,274.06
Atlantic	Egg Harbor City	196.78	\$1,591.36
Atlantic	Egg Harbor Twp	516.11	\$4,173.78
Atlantic	Galloway Twp	50.25	\$406.37
Atlantic	Hamilton Twp	70.65	\$571.35
Atlantic	Hammonton	1023.90	\$8,280.26
Atlantic	Linwood	1374.48	\$11,115.42
Atlantic	Somers Point	1532.56	\$12,393.81
Bergen	Allendale Boro	911.59	\$7,272.03
Bergen	Bergenfield Boro	847.67	\$6,855.11
Bergen	Closter Boro	576.71	\$4,663.85
Bergen	Emerson Boro	212.98	\$1,722.37
Bergen	Dumont	589.00	\$4,763.24
Bergen	Englewood	5150.33	\$41,650.72
Bergen	Fair Lawn	2727.49	\$22,057.21
Bergen	Franklin Lakes	881.67	\$7,130.07
Bergen	Glen Rock Boro	4355.63	\$35,223.98
Bergen	Harrington Park	224.84	\$1,818.23
Bergen	Haworth Boro	1860.50	\$15,045.86
Bergen	Hillsdale Boro	1193.05	\$9,648.20
Bergen	Leonia Boro	755.93	\$6,113.21
Bergen	Little Ferry	622.74	\$5,036.10
Bergen	Lyndhurst	180.40	\$1,458.89
Bergen	Mahwah Twp	275.00	\$2,223.93
Bergen	North Arlington	178.00	\$1,439.49
Bergen	Oradell Twp	367.86	\$2,974.88
Bergen	Palisades Park	230.00	\$1,860.01
Bergen	Park Ridge Boro	164.00	\$1,326.27
Bergen	Ramsey Twp	426.00	\$3,445.06
Bergen	Ridgefield	270.85	\$2,190.36
Bergen	Ridgewood Village	7287.75	\$58,936.03
Bergen	River Edge	2178.33	\$17,616.32
Bergen	River Vale	433.50	\$3,505.71
Bergen	Rutherford Boro	303.00	\$2,450.36
Bergen	Saddle Brook	207.88	\$1,681.13
Bergen	Teaneck Twp	2646.44	\$21,401.76
Bergen	Waldwick Boro	1209.79	\$9,783.57
Bergen	Washington Twp	933.29	\$7,547.52
Bergen	Woodcliff Lake	139.90	\$1,131.37
Burlington	Burlington Twp	946.61	\$7,655.24
Burlington	Cinnaminson Twp	728.09	\$5,888.06
Burlington	Delran Twp	116.40	\$941.33
Burlington	Evesham Twp	824.71	\$6,669.43
Burlington	Florence Twp	228.20	\$1,845.45
Burlington	Medford Lakes	172.00	\$1,390.96
Burlington	Moorestown Twp	139.53	\$1,128.38

Burlington	Mt. Holly Twp	208.20	\$1,683.71
Burlington	Willingboro Twp	829.56	\$6,708.65
Camden	Audubon	970.83	\$7,851.10
Camden	Berlin Twp	876.93	\$7,091.73
Camden	Cherry Hill Twp	6254.06	\$50,576.58
Camden	Haddonfield	1211.35	\$9,796.19
Camden	Haddon Heights	245.39	\$1,984.47
Camden	Merchantville	111.88	\$904.77
Camden	Somerdale Boro	97.32	\$787.03
Camden	Waterford Twp	158.06	\$1,278.23
Cape May	Avalon	26.91	\$217.62
Cape May	North Wildwood	143.83	\$1,163.15
Cape May	Ocean City	288.31	\$2,335.61
Cape May	Sea Isle City	56.78	\$459.18
Cape May	Stone Harbor	316.44	\$2,559.05
Cumberland	Bridgeton City	962.70	\$7,785.35
Cumberland	Hopewell Twp	54.50	\$440.74
Cumberland	Vineland City	17457.20	\$141,176.38
Essex	Belleville	1286.00	\$10,399.88
Essex	Bloomfield Twp	1815.66	\$14,683.24
Essex	Caldwell Boro	251.37	\$2,032.83
Essex	Cedar Grove	1337.30	\$10,814.75
Essex	East Orange	857.00	\$6,930.56
Essex	Essex Fells Twp	155.71	\$1,259.23
Essex	Fairfield Twp	479.07	\$3,874.24
Essex	Glen Ridge Twp	131.49	\$1,063.36
Essex	Irvington Twp	3907.78	\$31,602.22
Essex	Livingston	175.11	\$1,416.11
Essex	Maplewood	4630.85	\$37,449.68
Essex	Millburn	6039.82	\$48,843.93
Essex	Montclair	3753.79	\$30,356.90
Essex	Newark City	13451.73	\$108,784.14
Essex	No. Caldwell Twp	192.03	\$1,552.95
Essex	Nutley	588.00	\$4,755.16
Essex	Orange City	461.56	\$3,732.64
Essex	Roseland Boro	876.00	\$7,084.21
Essex	S. Orange Vil. Twp	769.56	\$6,223.43
Essex	Verona	715.55	\$5,786.65
Essex	West Orange	4087.46	\$33,055.29
Gloucester	Mantua	184.93	\$1,495.53
Gloucester	Monroe	639.81	\$5,174.14
Gloucester	Washington Twp	628.00	\$5,078.64
Gloucester	Wenonah Boro	86.00	\$695.48
Gloucester	Westville Boro	214.03	\$1,730.86
Gloucester	Woodbury City	3369.84	\$27,251.90
Hudson	Bayonne City	2243.50	\$18,143.18
Hudson	Guttenberg	22.71	\$183.66
Hudson	Jersey City	6543.14	\$52,914.37
Hudson	Kearny	453.00	\$3,663.41
Hudson	North Bergen	4615.52	\$37,325.71

Hudson	Union City	913.75	\$7,389.50
Hudson	West New York	191.30	\$1,547.04
Hunterdon	Bethlehem Twp	55.00	\$444.79
Hunterdon	Clinton	395.30	\$3,196.79
Hunterdon	Clinton Twp	40.90	\$330.76
Hunterdon	Flemington	243.00	\$1,965.14
Hunterdon	Franklin Twp	123.75	\$1,016.94
Hunterdon	Frenchtown	26.47	\$214.06
Hunterdon	High Bridge	120.00	\$970.44
Hunterdon	Holland Twp	57.30	\$463.39
Hunterdon	Labanon	78.60	\$635.64
Hunterdon	Readington Twp	133.86	\$1,082.53
Mercer	East Windsor Twp	1859.42	\$15,037.13
Mercer	Ewing	1251.27	\$10,119.02
Mercer	Hopewell Twp	230.42	\$1,863.41
Mercer	Lawrence Twp	1626.63	\$13,154.56
Mercer	Princeton Twp	392.00	\$3,170.10
Middlesex	East Brunswick Twp	3859.67	\$31,213.15
Middlesex	Edison Twp	2229.70	\$18,031.58
Middlesex	Highland Park	330.70	\$2,836.11
Middlesex	Metuchen	938.80	\$7,592.08
Middlesex	Middlesex Boro	1493.11	\$12,074.78
Middlesex	New Brunswick	1267.40	\$10,249.46
Middlesex	North Brunswick	1686.96	\$13,642.45
Middlesex	Old Bridge Twp	793.89	\$6,420.19
Middlesex	Perth Amboy	1170.11	\$9,462.68
Middlesex	Piscataway Twp	3624.78	\$29,748.60
Middlesex	Sayreville	853.82	\$6,921.02
Middlesex	South Amboy	223.00	\$1,803.40
Middlesex	South Brunswick	1719.22	\$13,903.33
Middlesex	South Plainfield	182.53	\$1,476.12
Middlesex	South River	241.20	\$1,950.58
Middlesex	Spotswood	373.43	\$3,019.93
Middlesex	Woodbridge	3732.97	\$30,188.53
Monmouth	Aberdeen Twp	561.91	\$4,544.17
Monmouth	Atlantic Highlands	409.25	\$3,309.60
Monmouth	Belmar Boro	321.75	\$2,601.99
Monmouth	Eatontown Boro	207.71	\$1,679.75
Monmouth	Englishtown	12.28	\$99.31
Monmouth	Freehold Twp	856.95	\$6,930.15
Monmouth	Hazlet	1711.79	\$13,843.25
Monmouth	Holmdel	427.26	\$3,453.25
Monmouth	Howell	1191.82	\$9,638.25
Monmouth	Keyport	195.49	\$1,580.93
Monmouth	Long Branch	448.85	\$3,629.85
Monmouth	Manasquan	350.26	\$2,832.55
Monmouth	Matawan	299.90	\$2,425.29
Monmouth	Middletown Twp	6484.25	\$52,438.13
Monmouth	Monmouth Beach	23.00	\$186.00
Monmouth	Neptune Twp	2707.28	\$21,893.77
Monmouth	Ocean Twp	511.00	\$4,132.46
Monmouth	Rumson	142.81	\$1,154.90

Monmouth	Sea Girt	83.00	\$671.22
Monmouth	Shrewsbury Boro	428.94	\$3,468.84
Monmouth	Spring Lake Hgts	562.25	\$4,546.92
Monmouth	Tinton Falls	782.35	\$6,326.86
Monmouth	Union Beach	171.90	\$1,390.16
Morris	Boonton Town	689.60	\$5,576.80
Morris	Butler	65.29	\$528.00
Morris	Chatham Boro	256.71	\$2,076.01
Morris	Chatham Twp	519.83	\$4,203.87
Morris	Chester Boro	147.81	\$1,195.34
Morris	Chester Twp	28.97	\$234.28
Morris	Denville	277.28	\$2,242.36
Morris	Dover Town	156.57	\$1,266.18
Morris	Florham Park	344.71	\$2,787.67
Morris	Hanover Twp	738.07	\$5,968.77
Morris	Harding	150.40	\$1,216.28
Morris	Jefferson Twp	259.00	\$2,094.53
Morris	Kinnelon	616.04	\$4,981.92
Morris	Lincoln Park	1315.58	\$10,637.10
Morris	Madison	549.53	\$4,444.05
Morris	Mendham Boro	282.39	\$2,283.69
Morris	Mine Hill	95.69	\$773.85
Morris	Montville	2664.87	\$21,550.80
Morris	Mountain Lakes	112.72	\$911.57
Morris	Mount Olive	821.74	\$6,645.41
Morris	Parsippany-Troy	1459.94	\$11,806.53
Morris	Passiac Twp	613.77	\$4,963.56
Morris	Pequannock Twp	1403.75	\$11,352.13
Morris	Randolph Twp	4560.33	\$36,879.39
Morris	Rockaway Twp	231.07	\$1,868.66
Morris	Roxbury Twp	762.07	\$6,162.86
Morris	Washington Twp	240.57	\$1,945.49
Morris	Wharton Boro	179.50	\$1,451.62
Ocean	Barnegat Twp	81.92	\$662.49
Ocean	Berkeley Twp	1099.00	\$8,887.61
Ocean	Brick Twp	1565.75	\$12,662.22
Ocean	Dover Twp	3455.68	\$27,946.08
Ocean	Lakewood Twp	1465.67	\$11,852.87
Ocean	Manchester Twp	1659.46	\$13,420.05
Ocean	Pt Pleasant Boro	578.33	\$4,676.95
Ocean	Pt Pleasant Beach	353.94	\$2,862.31
Passaic	Bloomington	33.79	\$273.26
Passaic	Clifton	5567.79	\$45,026.72
Passaic	Haledon	39.36	\$318.30
Passaic	North Haledon	80.10	\$647.77
Passaic	Ringwood	382.46	\$3,092.95
Passaic	Wayne Twp	2078.01	\$16,804.87
Passaic	West Milford	267.72	\$2,165.05
Salem	Pennsville	233.60	\$1,889.12
Somerset	Bedminster	216.34	\$1,749.54
Somerset	Bernardsville	485.71	\$3,927.94

Somerset	Bridgewater	653.04	\$5,281.13
Somerset	Franklin Twp	1699.11	\$13,740.70
Somerset	Manville Boro	791.93	\$6,404.34
Somerset	Montgomery Twp	58.62	\$474.06
Somerset	North Plainfield	884.35	\$7,151.74
Somerset	Peapack-Gladstone	59.84	\$483.93
Somerset	Somerville	898.35	\$7,264.96
Somerset	South Bound Brook	86.23	\$697.34
Somerset	Warren Twp	58.66	\$474.38
Sussex	Byram Twp	34.89	\$282.16
Sussex	Frankford Twp	27.70	\$224.01
Sussex	Franklin Boro	116.40	\$941.33
Sussex	Green Twp	70.85	\$572.96
Sussex	Hampton Twp	56.83	\$459.58
Sussex	Hardyston Twp	16.23	\$131.25
Sussex	Hopatcong	340.56	\$2,752.49
Sussex	Lafayette	159.72	\$1,291.66
Sussex	Montague	11.63	\$94.05
Sussex	Newton	1919.00	\$15,518.95
Sussex	Ogdensburg	47.18	\$381.54
Sussex	Sparta	628.61	\$5,083.57
Sussex	Stanhope	137.76	\$1,114.07
Sussex	Stillwater	127.23	\$1,028.91
Sussex	Sussex Boro	48.73	\$394.08
Sussex	Vernon	136.20	\$1,101.45
Sussex	Wantage	40.93	\$331.00
Union	Berkeley Heights	719.56	\$5,819.08
Union	Cranford	4420.46	\$35,748.26
Union	Fanwood	250.19	\$2,023.29
Union	Garwood	95.62	\$773.28
Union	Kenilworth	179.00	\$1,447.57
Union	Linden	147.75	\$1,194.85
Union	New Providence	995.05	\$8,046.97
Union	Plainfield	907.72	\$7,340.73
Union	Roselle Park	608.21	\$4,918.59
Union	Scotch Plains	217.32	\$1,757.47
Union	Springfield	654.64	\$5,294.07
Union	Summit	2678.57	\$21,661.60
Union	Union Twp	2415.82	\$19,536.74
Union	Westfield	2578.09	\$20,849.01
Warren	Independence Twp	0.45	\$3.64
Warren	Pohatcong	78.25	\$632.81

APPLICA

Atlanti

Burlingt

Camden C

Cape May

Essex Co

Gloucester

Hunterdon

Middlesex

Morris Co

APPENDIX E

DESCRIPTION OF GRANT AWARDS 1983 PROGRAM PLANNING AND EDUCATION GRANTS

COUNTY APPLICANTS

<u>APPLICANT</u>	<u>GRANT CATEGORY</u>	<u>AMOUNT</u>	<u>PURPOSE</u>
Atlantic County	PP	53,630.00	To purchase eleven recycling trailers to be used by municipalities within the county.
	ED	6,000.00	To conduct a county-wide recycling publicity program.
Burlington County	PP	33,000.00	To purchase equipment for expansion of the county's curbside collection program.
Camden County	PP	10,064.00	To fund the county recycling coordinator.
	ED	6,325.00	To fund a county-wide promotional program.
Cape May County	PP	14,400.00	To purchase equipment to handle corrugated paper products recycled by municipal programs in the county.
	ED	15,000.00	To finance a comprehensive education effort.
Essex County	ED	29,049.00	To hire a public information specialist and a media consultant for a county wide recycling program.
Gloucester County	ED	15,000.00	To hire a consultant to promote the county's recycling efforts.
Hunterdon County	PP	6,100.00	To fund county recycling coordinator.
	ED	4,000.00	To fund a county wide recycling education program.
Middlesex County	ED	3,000.00	To develop materials for a municipal recycling workshop.
Morris County	PP	9,000.00	To fund a county recycling coordinator.

	ED	1,058.00	To publish a quarterly newsletter on recycling.
Ocean County	PP	8,500.00	To build an artificial fishing reef from old tires in the Atlantic Ocean.
	ED	3,000.00	To provide public education materials and information on a county wide basis about recycling.
Passaic County	PP	6,665.00	To fund a county recycling coordinator to assist municipalities developing recycling programs.
	ED	5,000.00	For a county wide recycling educational program.
Sussex County	PP	6,150.00	To purchase a metal separator to more efficiently process aluminum and bi-metal cans.
	ED	3,000.00	To continue to provide recycling information to the citizens of Sussex County.
Union County	PP	10,193.00	To fund the Union County recycling coordinator and part time secretary.

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DESCRIPTION OF GRANT AWARDS 1983
PROGRAM PLANNING AND EDUCATION GRANTS
MUNICIPAL/NON-PROFIT

<u>APPLICANT</u>	<u>GRANT CATEGORY</u>	<u>AMOUNT</u>	<u>PURPOSE</u>
<u>ATLANTIC COUNTY</u>			
Buena Vista	PP	8,000.00	To purchase a vehicle for a new curbside collection program
	ED	3,000.00	To publicize the proposed program.
Egg Harbor Township	PP	9,849.00	To purchase a vehicle for a new curbside collection program.
Hamilton	ED	1,500.00	To promote a new municipal recycling program.
<u>BERGEN COUNTY</u>			
Bergenfield	ED	2,000.00	To develop public awareness regarding the need to control litter and to participate in recycling efforts.
Englewood	PP	20,000.00	To develop a permanent recycling center for glass, metals and paper, and to assess the feasibility of collecting glass curbside. They will also hire a recycling coordinator.
	ED	5,000.00	Development of comprehensive education campaign using both print and audio-visual materials.
Ken Rock	PP	3,900.00	To expand the recycling depot, and hire an attendant and materials handler.
	ED	3,000.00	To develop a recycling publicity drive to encourage newspaper and glass source separation.
Lintonia	ED	1,600.00	To promote a mandatory drop-off program for recycling.
Little Ferry	PP	7,829.00	To develop a new curbside collection program for newspapers, glass and aluminum.
	ED	2,000.00	To publicize recycling within the boro.

iver Edge	PP	11,400.00	To purchase a trailer for curbside collection.
	ED	4,000.00	To publicize the borough's recycling program.
<u>URLINGTON</u>			
vesham	PP	12,000.00	To purchase vehicles and containers for use for a curbside collection program.
	ED	2,500.00	To publicize the town's recycling program.
<u>AMDEN</u>			
addon Heights	ED	1,125.00	To publicize the municipal recycling program.
addonfield	PP	9,000.00	To purchase a trailer and pickup truck and for expansion of the municipality's curbside collection program.
erchantville	ED	3,000.00	To increase public awareness of recycling in the boro.
<u>CAPE MAY COUNTY</u>			
cean City	ED	2,998.00	To publicize the municipal recycling program.
<u>UMBERLAND COUNTY</u>			
airfield	ED	4,380.00	To establish a community anti-litter program.
illville	PP	23,000.00	To implement a new multi-material curbside collection program.
	ED	7,000.00	To develop a comprehensive recycling education program emphasizing how to recycle and why.
<u>SSEX</u>			
aldwell	ED	2,000.00	To publicize the community recycling program.
edar Grove	PP	5,030.00	To build a new drop-off center sponsored by the township.
	ED	1,700.00	To promote recycling among township residents.

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GLOUCES

Monroe

Woodbur

HUDSON

Bayonne

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Lebanon

Montclair	PP	5,000.00	To purchase a pickup truck with hydraulic lift tailgate for white goods collection.
Newark	PP	11,000.00	To hire a recycling coordinator and develop a recycling plan of action in Newark.
	ED	5,000.00	To promote recycling and support the city's litter abatement program.
Occupational Center	ED	3,000.00	To promote and publicize the center's glass recycling program.
Orange	PP	15,000.00	For site preparation of a new multi-material recycling depot to be operated by the Occupational Center of Essex County.
West Orange	PP	6,000.00	To hire one recycling coordinator for a recycling program.
	ED	3,805.00	For a townwide litter abatement program.
<u>GLOUCESTER COUNTY</u>			
Monroe	PP	5,000.00	To purchase a new vehicle for their curbside collection program.
	ED	3,000.00	To promote awareness of recycling among township residents.
Woodbury	PP	9,252.00	To purchase two trailers to improve their pioneering curbside collection program and reduce labor costs.
	ED	5,193.00	To hire a full-time recycling coordinator.
<u>HUDSON COUNTY</u>			
Bayonne	PP	28,000.00	To promote the recycling program
<u>HUNTERDON COUNTY</u>			
Flemington	PP	2,500.00	To build bins for storage of cans, bottles and paper.
Lebanon	ED	2,010.00	To publicize the local recycling program.

MERCER COUNTY

Ewing	ED	2,000.00	To publicize voluntary recycling programs within the township.
Trenton	PP	21,000.00	To license recycling scavengers in each of the city's solid waste areas for paper and glass pickup, and to construct a municipal recycling center.
	ED	19,600.00	To hire two education aides to organize and supply local clean up committees throughout the city and to publicize the proposed recycling program.

MIDDLESEX COUNTY

East Brunswick	ED	3,000.00	To promote awareness of local recycling program.
Highland Park	PP	1,350.00	To build a second "Rutgers Recycling Center" and to study the feasibility of a multi-material curbside program.
	ED	2,000.00	To publicize the recycling program in Highland Park.
Metuchen	PP	5,400.00	To implement curbside collection of glass using handicapped workers from the Hand-in-Hand organization.
New Brunswick	ED	2,000.00	To assist local community groups which organize neighborhood clean-up drives.
North Brunswick	PP	8,500.00	To expand the number of materials handled by the town's curbside collection program by purchasing a truck and trailer.
	ED	4,000.00	For publicizing township recycling efforts.
Rutgers Recycling	ED	2,680.00	To produce a cable TV film on recycling.
Stswood	PP	2,000.00	To establish a drop-off center for glass and aluminum.
	ED	2,500.00	To publicize their new program expansion.

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MONMOUTH COUNTY

Long Branch	ED	5,000.00	To publicize a proposed curbside recycling program.
Ocean Township	ED	2,000.00	To publicize the existing recycling programs.

MORRIS COUNTY

Lincoln Park	ED	962.00	To increase awareness of present and future curbside programs.
Morristown Beautiful	ED	5,000.00	To reestablish a litter abatement program in Morristown.
Mountain Lakes	PP	720.00	To expand the existing depot to a multi-material recycling center.
Mtn. Lakes Jr. Women's Club	ED	500.00	To promote local recycling depot.
Rockaway	ED	5,000.00	To educate the public about recycling and to reinforce the municipality's recycling ordinance.
Roxbury	ED	2,500.00	To educate the public about recycling.
Wharton	PP	6,500.00	To purchase an additional truck for its curbside program.
	ED	1,350.00	To publicize recycling among local residents.

OCEAN COUNTY

Pt. Pleasant Boro.	PP	12,000.00	To purchase a trailer for use in an expanded mandatory curbside recycling program.
	ED	1,430.00	To increase public awareness of recycling and encourage their participation in the municipal program.
Seaside Park	ED	2,000.00	To develop a comprehensive litter abatement program.

PASSAIC COUNTY

Clifton	ED	2,550.00	To research why people recycle and to use the findings as a basis for restructuring their educational strategies.
Wayne	ED	4,000.00	To promote participation in Wayne's recycling program.

SOMERSET COUNTY

Franklin	PP	1,300.00	To expand the number of recycling depots in the township.
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SUSSEX COUNTY

Stanhope	PP	2,400.00	To build a permanent recycling depot.
	ED	1,500.00	To develop and distribute educational and promotional materials to support the proposed permanent drop-off center.

UNION COUNTY

Cranford	ED	1,710.00	To deliver magnets and an annual newsletter giving recycling update.
Plainfield	PP	13,400.00	To purchase a van for pickup of materials.
	ED	3,200.00	To conduct workshops on recycling programs and an educational program in school systems.
Roselle Park	PP	14,000.00	To purchase a truck and trailer for use by the curbside recycling program.

WARREN COUNTY

Hackettstown	ED	2,500.00	To purchase billboard displays to promote the local recycling depot.
Association of New Jersey Environmental Commissions	ED	20,000.00	To provide environmental commissioners with educational and promotional material in 15 communities.

APPENDIX F

HERE TODAY, HERE TOMORROW A RECYCLING-ENERGY-SOLID WASTE CURRICULUM

TABLE OF CONTENTS

TITLE PAGE AND ACKNOWLEDGMENTS

TEACHER BRIEFS

- ←-2 This consists of 59 activity cards in 3 units including coloring, games and multiple choice questions for beginning and non-readers. Skills in language arts and mathematics are emphasized. The focus is on trash, litter and recycling.

K-Kindergarten: The Trash Tree

- Unit 1 - The Classroom Trash Tree
- 2 - The Home Trash Tree
- 3 - Let's Use It Again Tree
- 4 - What Do I Feel?

1-First Grade: Trash Is Better Than Litter

- Unit 1 - Everyone Makes Trash-Some People Make Litter
- 2 - All Trash Goes Somewhere

2-Second Grade: Recycling-Naturally

- Unit 1 - Recycling Leaves
- 2 - Recycling Paper

- 3-4 This contains 3 units, each containing 3-5 activity cards directed to the students. The activities are teacher-led.

Unit A. PEOPLE AND GARBAGE

- 1. What's Garbage?
- 2. Who Makes Garbage?
- 3. Where Does Garbage Go?
(A play to be read or performed by entire class)
- 4. Wasting Food
- 5. A Home Without a Garbage Truck?

Unit B. RECYCLING AND RE-USE

- 1. Reuse Your Trash
- 2. Exploring Recycling
- 3. Recycling Relay Game

Unit C. LITTERLY SPEAKING

- 1. Make a Litter Map
- 2. Litterbug Reporter
- 3. Litter Posters
- 4. Actions Speak Louder Than Words

- 5-6 This consists of 6 units, each containing 5-6 student directed activity cards.

Unit A. WHAT DO WE THROW AWAY?

- 1. Dissect a Trashcan
- 2. Solid Wastes Were Once Part of the Earth
- 3. Who Makes Solid Wastes?
- 4. Litter and Litterbugs
- 5. Ouch!
- 6. How Much?

Unit B. WHERE DOES IT GO?

- 1. Open Dumps and Sanitary Landfills
- 2. Garbage to Ashes
- 3. Garbage to Soil
- 4. To Sea Or Not to Sea?
- 5. Caution: Air, Soil and Water at Stake!

6 (Continued)

Unit C. ONCE IS NOT ENOUGH

1. Natural Recycling in Soil and Water
2. Re-using Your School's Wastes
3. Recycling By Man
4. Too Many Wrappings
5. Visiting a Recycling Center

Unit E. TRASH N' CASH

1. How Much to Move Your Trash?
2. Cleaning Up Your Block
3. Scrambled Eggs
4. Turning Trash Into Cash
5. Garbage Power

Unit D. MANY FACES OF ENERGY

1. Energy Makes Things Go
2. An Energy Use Mural
3. Where Does the Energy We Use Come From?
4. How Energy is Changed to Make it Useful
5. Trashpower

Unit F. ECO-ACTION

1. Make Trash Live Again
2. Start a Litter Campaign
3. Learning To See Litter
4. Take Pictures For a Litter Campaign
5. Write Letters For a Litter Campaign

9 This consists of 4 units, each containing 4-6 activity cards.

Unit A. SOLID WASTE IN HISTORY

1. Digging Up the Past
2. Ask Someone Who Remembers
3. Visiting an Antique Show
4. A Day In the Life Of
5. 1980's: What Lies Ahead?

Unit B. LANDFILLS

1. Introducing the Sanitary Landfill
2. Midnight Dumpers
3. Out of Space
4. What Good Is an Old Landfill?
5. Everybody's Problem
6. Do You Know Where Your Trash Is?

Unit C. HAZARDOUS WASTES

1. Hazardous Waste Is . . .
2. Home Hazardous Wastes
3. Disposal Dilemma
4. Hazardous Wastes: Harmful or Healthy?
5. Lethal Litter - Who Pays?
6. What Can You Do?

Unit D. WHAT IF WE . . . ?

1. Return to Returnables or Recycle Glass?
2. Source Separate?
3. Recycle Steel, Aluminum and Glass?
4. Burn Garbage for Energy?

12 This contains 10 envelope style student-centered activities. The activities are designed for different subject teachers and classes.

EARTH SCIENCE

- A. Leachate on the Rocks

CHEMISTRY-PHYSICS

- B. Non-fuel Use of Oil
C. Resource Recovery

BIOLOGY

- D. Visit a Wastewater Plant

SOCIAL STUDIES-ECONOMICS

- E. Land That I Love
F. The Disposal Award
G. Source Separation
H. Getting Involved
I. School Recycling Project

ART

- J. Junk Art

APPENDIX G

MUNICIPAL SIGN RECIPIENTS, 1984

Depot signs were awarded to:

Galloway Township, Atlantic County
Ramapo College, Bergen County
Lyndhurst Township, Bergen County
Pitman Borough, Gloucester County
Readington Township, Hunterdon County
Franklin Township, Hunterdon County
East Brunswick Township, Middlesex County
South Brunswick Township, Middlesex County
Middlesex Borough, Middlesex County
Tinton Falls Borough, Monmouth County
Passaic Township, Morris County
City of Clifton, Passaic County
City of Plainfield, Union County

Curbside signs were awarded to:

Merchantville Borough, Camden County
Lindenwold Borough, Camden County
Haddon Heights Borough, Camden County
Audubon Borough, Camden County
Monroe Township, Gloucester County
Washington Township, Gloucester County
Wharton; Borough, Morris County
Boonton Township, Morris County
Roselle Park Borough, Union County

APPENDIX H

PUBLICATIONS WRITTEN BY THE OFFICE OF RECYCLING

Case Studies of Selected New Jersey Recycling Programs - 1984
Contracting For Recycling Collection Services
Don't Throw Leaves Away: a Guide to Composting
Getting the Word Out: A Publicity and Education Guide
How to Obtain a Composting Permit
Municipal Survey of Recycling Programs
New Jersey Directory of Markets for Recyclable Materials
Recycling in the 1980's: The New Jersey State Recycling Plan
Recycle Your Tires: Buy Retreads
Steps in Organizing a Municipal Recycling program
Used Oil: It's Easy To Recycle

Fact Sheets

Guide to Marketing Recyclable Materials
Guide to Recycling Commercial Waste
Improving Recovery Rates
New Jersey Recycling Act
Questions and Answers About Buying Recycled Paper
Some Answers and Questions About Municipal Recycling Ordinances

GLOSSARY

GLOSSARY OF TERMS

ANTI-SCAVENGING ORDINANCE	This ordinance declares municipal ownership over separated materials left at the curb. This allows the municipality to prohibit unauthorized collectors from collecting recyclables.
BUY-BACK CENTERS	This is a recycling center which gives cash to the citizens in return for the recyclables brought to the center.
INTERMEDIATE PROCESSING FACILITY	A facility to process recyclable materials to meet recycling industry's specifications. This includes separation of materials by type, grade or color, crushing, shredding, or baling and removal of contaminants.
MANDATORY ORDINANCE	This ordinance states that each household or business is required to separate all or part of the recyclable materials from the mixed wastes. The resident usually has the option of leaving the materials at the curb or donating the materials to volunteer organizations.
MUNICIPAL SOLID WASTE	The combines residential and commercial waste materials generated in a given municipal area. Municipal solid waste includes mixed household wastes, commercial wastes and street refuse.
POST-CONSUMER WASTE	This is a material which has been used by final consumers and separated from the solid waste stream for recycling. It does not include manufacturing or demolition waste.

RECYCLING

An activity whereby a secondary material is introduced as a raw material into a process in which it is transformed into a new product in such a manner that its original identity is essentially lost.

RESOURCE RECOVERY FACILITY

A facility where energy and/or materials are recovered from the municipal solid waste stream.