

A Non-Incineration Alternative for Mercer County, New Jersey

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for

Mercer Citizens for Public Accountability

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INTRODUCTION

The Mercer County Board of Chosen Freeholders is currently considering amending its solid waste management plan to incorporate the following modifications in order to move forward with building a 1,667 ton-per-day waste incinerator:

1. **Contracts for Participation in Voluntary System.** In the absence of flow control, municipalities and commercial entities (such as trash haulers) sign 20-year contracts with the Mercer County Improvement Authority (MCIA) committing a specified tonnage of waste per year to the incinerator at a specified fee (slated at \$47 per ton in 1999, the first year of operation and escalating thereafter). The County needs at least 115,000 tons per year of in-county solid waste. The plan amendment simply formalizes this "voluntary participation" strategy.
2. **Determination and Payment for "Stranded Investment."** Regardless of whether or not a municipality, trash hauler, or other waste generator elects to become a "voluntary participant," all in-county generators will be required to pay a per-ton "user charge" to cover costs already incurred by the County for its solid waste systems. These costs, referred to as "Stranded Investments" in the plan amendment, include debt service on bonds issued, transfer station construction and operation, planning and consulting fees for the incinerator, and recycling program costs. The plan amendment formalizes this requirement and lays out how the per-ton user charge will be determined—all generators will be required to cross-over MCIA weigh scales in order to assess the amount of solid waste, which would form the basis of allocating the cost of Stranded Investments in each year.
3. **Voluntary System Services.** Municipalities choosing to participate in the existing county-wide recycling program have to pay a fee based on each ton of waste delivered to the MCIA scales. The costs of the programs would be spread over the participants and charged as a separate fee apart from the charge for Stranded Investments. Municipalities must also choose whether or not to "contract for participation in voluntary system" and commit to delivering specified tonnages at locked-in tipping fees for two decades. Municipalities unwilling to commit to this county strategy are left to procure their own disposal capacity.
4. **Enforcement Program Activities.** In order to assure that generators pay their share of the Stranded Investment costs and that all solid waste generated by "voluntary participants" is delivered to the incinerator, the proposed plan amendment establishes the MCIA as the entity empowered to undertake all required enforcement activities and prosecution of contract violations. The plan amendment does not specify enforcement program activities.
5. **Facility Capacity.** The proposed plan amendment modifies the current plan to reflect a processing limit for the incinerator of 1,667.5 tons of solid waste per day. The amendment includes a long rationale for this increase in maximum capacity (from 1,450 tons per day approved back in December 1991). The two main reasons are: (1) the tonnage capacity fluctuates according to the higher

heating value of the waste received, this heating value may prove to be lower than that projected in studies, and therefore, in order to operate the facility at its design steaming rate, the maximum tonnage allowed must be increased; and (2) allowing the incinerator to burn more tonnage will help New Jersey reduce its dependence on out-of-state disposal by providing "needed capacity."

6. Amended and Restated Service Agreement between the Mercer County Improvement Authority and Ogden Martin Systems of Mercer, Inc. The proposed plan amendment changes the ownership of the incinerator from being a publicly-owned facility to a privatized operation owned by Ogden Martin. Under the privatized scenario, at the end of construction, Ogden Martin Systems of Mercer, Inc. (OMSM) will make a 20% payment of construction costs.
7. Ogden Martin Systems of Mercer, Inc. Additional Waste. The MCIA is responsible for delivering virtually all of the waste to the facility—445,000 tons per year. If the MCIA falls short of this tonnage, the proposed plan amendment allows OMSM to arrange for delivery of additional/supplemental quantities of waste to the incinerator on a short-term, long-term, and/or "spot basis"—which means supplemental deliveries can be arranged on a daily basis or under contracts as long as two years. Should OMSM execute a "long-term" contract (up to two years), that acceptable waste shall be processed on an equal basis as waste delivered on behalf of the MCIA. In no event shall any contract entered by OMSM impair the ability to process acceptable waste delivered by the MCIA. All supplemental waste deliveries are subject to the Amended & Restated Service Agreement, which contains provisions encouraging OMSM to maximize the use of the incinerator in a way that is economically beneficial to the MCIA.

The Mercer County Board of Chosen Freeholders should NOT adopt any of these MCIA proposed amendments. These amendments would commit Mercer County and its municipalities to a solid waste system that will pollute the community; impose extraordinary costs on the County and its taxpayers; artificially limit and potentially decrease the County's successful recycling level; encourage continued waste generation rather than source reduction; limit the economic development opportunities increased recycling can bring to the county; be a net drain on energy resources; and will establish Mercer County as one of the burning sites for waste from all over the state as well as for out-of-state waste.

This report discusses problems with the County's plan to build and finance a waste incinerator and makes some recommendations for a non-incineration alternative.

CRITIQUE OF CURRENT PLAN TO BUILD AND FINANCE WASTE INCINERATOR

Incinerators need a guaranteed annual tonnage in order to survive financially. They need sufficient tonnage to generate sufficient revenues in the form of (1) electricity and energy revenues, and (2) per ton tipping fees. Both sources of revenue pay for incineration's astronomical capital and operating costs and their associated debt service. They are a direct obstacle to maximizing waste reduction (waste prevention, reuse, recycling, and composting). Instead, because they depend on huge quantities of waste, they encourage waste generation and waste disposal.

All the proposed plan amendments are designed to ensure that the Mercer County waste incinerator receives enough tonnage to be financially viable. Unfortunately, the solid waste management plan incorporating incineration as its keystone suffers from the following flaws:

The Incinerator is Over Sized: The incinerator is slated to burn 495,000 tons per year. Approximately 173,500 tons is slated to originate from Atlantic County, but there is no solid commitment to date from Atlantic County. Thus, the MCIA is responsible for securing the 495,000 tons per year, which is significantly greater than the waste already currently generated in the county for disposal. In addition, not all the waste generated in the county for disposal can be processed through an incinerator. The McEnroe approval dated September 21, 1995 requires the MCIA to negotiate contracts with Atlantic and additional counties to procure additional waste. Yet Mercer County does not have agreements with these solid waste management districts.

Maintaining and Increasing Recycling Will Be Impeded: The proposed amendments, if approved, will have a negative impact on recycling and likely prevent the County from meeting its 50% municipal solid waste recycling goal. The 314,400 tons per year reportedly committed from Mercer County represent 17,000 tons per year more than the tonnage disposed in 1994 (the latest year for which verified data are available from the state). In 1994, Mercer County recycled 42% of its municipal solid waste. By burning waste that is largely recoverable, recycling in the county will be artificially limited. Consider the City of Trenton, which is one of the municipalities committing waste to the incinerator. Trenton is only recycling 15 to 20% of its waste. It has not as yet approached its maximum recycling and composting levels. Consider too that the definition for "Solid Waste" in the Solid Waste Contracts between MCIA and municipalities and other "voluntary participants" does include recyclable materials other than those that are "designated." The contract states in Section 3.01 (d) that "Nothing herein contained shall obligate (or permit) the Participant to deliver (or cause to be delivered) to the System any recyclable materials (including Designated Recyclables) in fulfillment of the waste delivery obligations hereunder." Yet, there is no way participants can meet this stipulation without breaking their "guaranteed tonnage" obligations under the contract. At least 60% or 162,900 tons per year of the waste stream now destined for disposal is

made up of recyclables and compostables, and at least 42,000 tons per year of this represents "designated recyclables." Interestingly and purposefully, recyclable materials are not defined in the contract. Moreover, municipalities and other voluntary participants who sign the Waste Services Contract are obligated to pay the per ton Service Charges whether or not they are able to meet the tonnage they guarantee each year to the facility. This tonnage guarantee does not lessen over the 20-year life of the contract—it stays the same. Thus, the incinerator and its so-called "voluntary participation system" coerces participants into prioritizing burning over reducing and recovering waste—in direct conflict with the state solid waste management hierarchy.

Decreasing/Preventing Waste Generation Will Be Impeded: Mercer County has a goal to cap per capita waste generation by 1995 and reduce total waste generation by 2000. These goals are reasonable and by all means should be pursued. Unfortunately, the waste incinerator will be a major obstacle to encouraging waste prevention in the county. Municipalities participating in the "voluntary system" will in effect be forced to deliver their committed tonnages or pay the consequences in higher tipping fees. In addition, the system of "Refund of Surplus Revenues" set forth in section 4.02 (e) of the Solid Waste Service Contract is another economic incentive for municipalities to send as much waste as possible to the incinerator. Thus the County is setting up a system with economic incentives to municipalities to continue to generate waste to feed the incinerator. This system counters the trend taking place around the country to set up systems that provide economic incentives to reduce and prevent waste.

The County Has Never Adequately Considered Alternatives to Mass-Burn Waste Incineration: The County first endorsed incineration as part of its solid waste management plan in 1979. It has never wavered from this plan despite remarkable growth in recycling and composting programs and evidence of the serious financial and environmental implications of mass-burn waste incineration. None of the reports produced for the County by a cadre of consultants addresses alternative incineration options (such as fluidized-bed combustion) or non-incineration options. In fact, none even adequately describes the County's recycling and composting efforts, their costs, and opportunities to expand on these as a primary solid waste management strategy for the County. The MCIA has focused on pushing its mass-burn waste incineration plan and finding ways to try to make it work even in a climate where incinerators are failing all across the country as economic boondoggles. Meanwhile the MCIA and its consultants provide no information on programs to maximize waste reduction in the County.

The Costs of the Incinerator are Too High: Incineration is the most expensive way the County can choose to handle its solid waste. The assertions that the "cost of the voluntary system in 1996 will be less than or equal to the current system" and "disposal costs range from \$47-56 in the first year of operation" are misleading at best, and just plain incorrect at worst. First, the disposal costs or "Service Charges" the first year of operation are lower than subsequent years. For instance, in its fifth year of operation, per ton "Service Charges" for the incinerator are slated at \$59 to \$70 per ton and continue to escalate each year. Secondly, the \$47 to \$56 per ton

excludes the Stranded Investment cost that municipalities and other waste generators are being forced to pay—at least another \$43 per ton.¹ Tipping fees the first year of operation will be above \$90 per ton. Thirdly, per ton Service Charges are based on the assumption that 445,000 to 495,000 tons per year are delivered to the incinerator. While the Service Charges cannot exceed those listed in Schedule 3 of the contract, the contract does not specify how costs will be paid for if there is a shortfall below 445,000 tons per year. But the Solid Waste Service Contract obligates signatories to pay Stranded Investment costs and "payment of any Shortfall Amount," in addition to Service Charges. The Shortfall Amount basically commits municipalities and other voluntary participants to pay the per ton Service Charges whether or not they deliver their guaranteed tonnage to the incinerator. The Stranded Investment cost can escalate as system costs escalate. Thus, the County is trying to establish a system that gives them no limits to costs they can impose on municipalities and county taxpayers.

The Stranded Investment System is a Smoke Screen to Disguise the True Incinerator Costs: Many of the costs of the alleged Stranded Investments are incinerator costs. Labeling these incinerator costs as "System Costs" to be borne by all County waste generators hides the true costs of the incinerator. Montgomery County, Maryland officials enacted a similar system in order to finance that county's Ogden Martin incinerator. When tip fees proved too high to attract waste to the incinerator, the County lowered tip fees and established a "base system benefits charge," which was assessed to all property owners, to make up the shortfall in tip fee revenues. As a result Montgomery County property owners are subsidizing the Ogden Martin incinerator by at least \$20 million per year. Similarly, in Mercer County, if less than 445,000 tons per year are delivered to the incinerator, the costs of this shortfall will have to be borne by municipalities and other waste generators in the County through the Stranded Investment charges and through Shortfall Amount payments. Mercer County decision makers should be wary of setting up a system whereby local taxpayers have to foot the bill for a white elephant.

The Strategy for Determining Stranded Investment Will Likely Fail and Costs Will Have to Be Borne by Taxpayers: This plan may not be enforceable. Under what authority can MCIA dictate that haulers and municipalities have to cross over its scales? Experience in New Jersey and elsewhere indicates that haulers will avoid systems that add to their costs. Bergen County, New Jersey, provides a case in point. Residential waste destined for disposal is supposed to go through one of its four transfer stations. In the last couple of years, residential waste disposed has decreased from 303,000 tons per year to 240,000 tons per year. According to Recycling Coordinator Mark Vangieri, the tonnage missing (63,000 tons per year) has not been diverted through recycling or waste reduction, it's bypassing their system because it's cheaper for haulers to take their waste elsewhere.² Mercer County can expect that a significant portion of waste generated in the County will bypass its proposed system.

The System Is Based on Waste Generation Projections and Other Figures That May Be Over Estimated: Projections used for recently built Ogden Martin incinerators in other communities have not been on the mark. The bond prospectus for the 1,800 ton-

per-day facility in Montgomery County, Maryland, for example, expected tonnage per day for the first year to average 1,400 tons; costs to be \$80 per ton; and electricity sales to be 5¢/kWh. In actuality, tonnage for the first year was more than 20% below this expectation, real costs were more than \$100 per ton, and electricity was selling to the local utility, PEPCO, for 2.43¢/kWh. (See pages 10 to 11 of this report for examples of poor performance at other Ogden Martin incinerators.) Figures used to justify the incinerator and its size in Mercer County already show some shortcomings. Killam Associates, consulting engineers for the County, projected that Mercer County would generate 888,445 tons of solid waste in 1994.³ This projection was over-estimated by 115,567 tons per year or 15%.

The System is NOT Designed to Meet the Needs of Each Participant: Contrary to the assertion that the "system is designed to meet the needs of each participant," the system is solely designed to coerce municipalities into signing 20-year contracts to commit their waste to the incinerator. If they don't sign, they're told they're on their own in finding disposal capacity, a scary proposition to the county's many small municipalities. They're also being misled into thinking the "voluntary system" is a cost-effective one for them, when indeed it is not. For instance, if municipalities succeed in increasing their recycling levels and have less waste to send to the incinerator than they anticipated and guaranteed, they are still obligated to pay the equivalent in per ton Service Charges.

The System is an Obstacle to Creating Recycling-Based Economic Development Opportunities: Recycling and composting create many more jobs than landfills and incinerators. Just processing recyclables—sorting, baling, etc.—sustains ten times more jobs on a per-ton basis than disposal options. It is making new products from the old that offers the largest economic pay-off in the recycling loop. Recycling-based manufacturers sustain more jobs, and these are jobs that offer greater skills and higher wages. Recycling-based papermills and plastics product manufactures, for instance, sustain 60 times the number of jobs as landfills and incinerators. Reuse enterprises also offer economic benefits and can create 200 jobs for every 1 job created at a disposal operation. If just half of the 25.5 million tons of durable goods now discarded into America's landfills and incinerators were instead reclaimed, more than 100,000 new jobs could be created in this industry alone. Durable goods are an example of one important commodity in Mercer County that could be targeted for recovery rather than incineration. The 495,000 tons per year slated to be burned at the Mercer County incinerator will sustain only about 60 jobs. If the County instead attracted this same tonnage to local reuse, recycling, and composting facilities, this tonnage could sustain more than 1,100 jobs.

BACKGROUND

REVIEW OF MERCER COUNTY SOLID WASTE MANAGEMENT PLAN AND SYSTEMS

In 1994 (the latest figures available from the state), Mercer County generated 772,878 tons of solid waste. The County recycled 61.51% of this waste—475,412 tons. The County documented municipal waste stream recycling rate in 1994 was 42.35%.⁴

Killam Associates, consulting engineers for the County, projected that Mercer County would generate 888,445 tons of solid waste in 1994.⁵ This projection was over estimated by 115,567 tons per year or 15%. See Table 1 below.

Table 1: Figures Available for Mercer County Solid Waste Generation and Recovery

	1989	1990	1991	1994 Projected (Killam)	1994 Actual (NJDEP)	1996 Projected (Killam)
Materials Recycled	387,416	487,084	510,397	608,169	475,412	628,048
Waste Disposed			311,389	280,276	297,466	271,501
Waste Generated			821,786	888,845	772,878	899,549
Recycling Rate			62.1%	68.4%	61.5%	69.8%

Source: Killam Associates, *New Jersey Regional Waste Stream Assessment Dated November 1992*, Millburn, New Jersey, September 1993; and NJDEP, 1994 Recycling Rates by County Table.

All of the county's waste destined for disposal (not recycled or composted) is directed to the County transfer station in Ewing Township prior to disposal out-of-state. Mercer County has no operating landfills. Solid waste is disposed under contract with the GROWS Landfill in Pennsylvania.

Mercer County has endorsed the state-mandated goals to recycle 50% of its municipal solid waste stream and 60% of the total waste stream. The County has adopted a source reduction strategy that includes capping per capita waste generation by 1995, reducing total waste generation by 2000, conducting waste audits, a household hazardous waste collection and education program, and a per container rate fee structure program.⁶

The County has expanded its list of residential and commercial designated recyclables to include mixed paper (newspapers, magazines, corrugated cardboard); aluminum; clear, green, and amber glass food and beverage containers; PET and HDPE beverage and laundry detergent containers; tin-plate steel and bimetallic containers; tires; vehicular batteries; white goods; leaves and grass; used motor oil; and ferrous automotive scrap.⁷ Office paper is a designated recyclable for the commercial sector.

The County has a number of composting and recycling facilities.⁸

The Mercer County incinerator has been part of the County's solid waste management plan since 1979. In December 1982, the Board of Chosen Freeholders adopted an ordinance incorporating mass burn incineration into the County Solid Waste Plan. In 1986, the Board designated the Mercer County Improvement Authority (MCIA) as the agency implementing the plan on behalf of the County. In 1988, bonds were issued to implement the planning and construction of the approved resource recovery facility.⁹

In April 1990, then-Governor Florio established a Solid Waste Task Force to recommend, among other things, "a program to minimize the generation of solid waste and maximize reuse, recycling and composting."¹⁰ Two reasons for setting up the Task Force as cited in the Governor's Executive Order were: "planning and

construction of waste-to-energy resource recovery facilities require substantial capital expenditures and a guaranteed flow of processible and combustible waste; and . . . source reduction, reuse, recycling and composting must be increased before proceeding with further development of waste-to-energy resource recovery facilities."¹¹

The Solid Waste Task Force recommended various policies to encourage regionalization of solid waste disposal. As a result, the MCIA entered into an agreement with Atlantic County to accept Atlantic County's waste into its planned incinerator. The capacity of the plant increased from 975 tons per day (317,000 tons per year) to 1,440 tons per day. Mercer County renegotiated its vendor contract and permit applications. In December 1991, the NJ Department of Environmental Protection (DEP) approved the incorporation of the Atlantic County agreement into the Mercer County Solid Waste Plan.

In February 1992, the MCIA issued \$150 million in Insured Solid Waste Revenue Bonds, and \$39,997,153.85 in Solid Waste Revenue Bonds. These bonds were issued to refund the 1988 bond issue, and to provide the financial basis for implementing the revised incineration project.¹²

In 1994 the United States Supreme Court decision C&A Carbone, Inc. v. Town of Clarkstown effectively ended flow control of waste. This decision seriously impacted the financial viability of the planned Mercer County incinerator. As a result, the MCIA changed its proposal for the incinerator suggesting that the County construct a plant with a maximum capacity of 1,557 tons per day and rely on 20-year contracts with Mercer County municipalities, businesses, and institutions, as well as out-of-county sources. Currently the MCIA is proposing to increase the incinerator capacity to 1,667 tons per day in order to take into account greater fluctuations in the heating value of the feedstock waste.

COSTS OF CURRENT AND PLANNED SOLID WASTE MANAGEMENT SYSTEM

Table 2 lists costs already incurred by Mercer County to develop its incinerator as well as to implement other aspects of its solid waste management plan. The incinerator planning and financing costs represent 36% of the total \$62.4 million spent, whereas the rest of the costs represent concrete parts of the system already in place such as actual disposal capacity, actual recycling collection contracts, etc. According to court testimony, another \$25 million has already been spent on the incinerator.

Table 2: Costs Already Incurred by County

Item	Cost
Incinerator Planning (consulting, attorneys, admin.)	\$10,100,000
Transfer Station (construction/operation)	4,800,000
Recycling Program (collection/operations)	4,500,000
GROWS Landfill (disposal capacity)	30,500,000
Financing (bond issuance/reserve, interest)	12,500,000
Total	\$62,400,000

Source: Steven J. Picco, *Report on Solid Waste Disposal Options*, prepared for the Board of Chosen Freeholders of Mercer County by Picco Herbert Kennedy, Trenton, New Jersey, April 25, 1996, pp. 6-9.

The MCIA still plans to issue private activity bonds to finance the incinerator facility. This bond amount is slated not to exceed \$290 million.

The MCIA estimates that municipalities will have to pay a tipping fee of \$47.22 to \$55.59 per ton in 1999, assuming a minimum 445,000 to 495,000 tons of solid waste per year flow into the incinerator. It acknowledges that the tipping fee will vary based on the number of tons delivered to the facility.¹³ Yet, the real tipping fee municipalities will have to pay includes a "Stranded Investment" charge, which will make the actual tipping fee at least \$90 per ton in 1999, and \$99 per ton if 445,000 tons per year are delivered to the incinerator. The tipping fee will, of course, escalate thereafter, rising to \$121 to \$139 per ton in the year 2016.¹⁴

The MCIA recommends that at least 115,000 tons per year of waste be committed to this project from Mercer County. This tonnage represents 52% of the 220,000 tons of Mercer County "processable" waste now reportedly landfilled, but it represents only 23% of the waste needed at the incinerator to keep tipping fees around \$90 per ton. This means that the County is responsible for attracting commitments for 380,000 tons of waste from outside Mercer County, assuming, of course, it is successful in securing the 115,000 tons per year from in-the-county. Stephen Picco, one of the County's consultants, recommends that the County "should be required to attract outside waste at a level sufficient to reach a total of 445,000 tons per year when combined with Mercer County commitments. . . if this minimal waste figure is not attained by a certain date, the project should not go forward."¹⁵

The MCIA has yet to address what happens if it delivers less than 445,000 tons per year to the incinerator? A shortfall in revenues due to a shortfall in tonnage from outside the county will have to be paid by County taxpayers one way or another. Since the Waste Service Contract between MCIA and "voluntary participants" limits the Service Charge to the \$47 to \$56 per ton range in the first year of operation, one can only assume that the MCIA would add additional costs resulting from tonnage shortfalls to the "Stranded Investment" charge—a per ton fee assessed to County taxpayers. Thus, the MCIA assertions that per ton tip fees for "voluntary participants" will remain within a certain range is absolutely misleading and wrong.

Mercer County's current plan to build a waste incinerator is an unnecessary high-risk one financially. Other recently built Ogden Martin waste incinerators have fallen far short of their developer, consultant, and local government expectations and projections. These include facilities in Montgomery County, Maryland; Onondaga County, New York, and Huntington, New York. Financial problems faced by these incinerators are summarized below.

Montgomery County, Maryland: The bond prospectus for this 1,800 ton-per-day Ogden Martin incinerator expected tonnage per day for the first year to average 1,400 tons; costs to be \$80 per ton; and electricity sales to be 5¢/kWh. In actuality, tonnage for the first year was more than 20% below this expectation, real costs were more than \$100 per ton, and electricity was selling to the local utility, PEPCO, for 2.43¢/kWh. County decision-makers blamed lack of tonnage flowing to the facility as the main problem. Because communities and local haulers balked at paying high tipping fees, they stopped bringing their waste to the facility. The result of this "garbage flight" was, of course, to increase the incinerator's real per ton costs. In order to attract more waste, tip fees were lowered July 1996 to \$44 per ton (from a previous rate of \$59) and to make up the shortfall in revenue, the County set up a "base system benefits charge" assessed to all County property owners. This charge, a line-item on the county property tax bill, was increased 55% in fiscal year 1997, from \$59.26 per property owner to \$91.78. According to County documents, 78% of the base system benefits charge goes to prop up the County's new waste incinerator. Property owners are now subsidizing the incinerator at least \$20 million per year. Consultants hired by the County and State badly over-estimated the amount of waste that would be available to feed the incinerator. They also under-estimated the cost-per-ton to incinerate and the potential for recycling. The incinerator and the County's proposed source reduction and recycling programs are now competing for the same materials and financial resources. County documents show the County does not plan to meet its goal of recycling 50% of its waste stream by the year 2000.¹⁶

Huntington, New York: An analysis of official figures for Ogden Martin's Huntington, New York mass-burn incinerator found that its real cost was paid in two ways. First, more than \$21 million was paid by taxpayers in 1995. Second, another \$9.8 million was paid by rate payers of the Long Island Lighting Company (LILCO) in 1995, under state order, even though the incinerator's electricity was not needed by LILCO. LILCO's average cost to generate electricity is 3¢ per kWh, but it was forced to buy electricity from the Huntington incinerator at 6.6¢ per kWh. Huntington-generated waste delivered to the incinerator costs local taxpayers \$88 per ton, while waste generated from outside Huntington only cost \$45 per ton. Huntingdon taxpayers are footing the bill in order to attract additional waste needed by the incinerator.¹⁷

Onondaga County, New York: This Ogden Martin facility came on-line spring 1995 and has a 990 ton-per-day capacity. This facility is a joint partnership between the Onondaga County Resource Recovery Agency (OCRAA) and Ogden Martin Ltd. It was expected to process 295,000 tons per year but instead has consistently been experiencing a shortfall equivalent to 30,000 tons per year. One result according to County legislator, Vickie Baker, is that the incinerator is now burning readily recoverable materials such as wood waste, corrugated cardboard, and plastics. Ogden

and OCRAA are now looking at chipping and burning tires as well as burning medical and special wastes in order to make up for the tonnage shortfall. The incinerator's tip fee is \$81 per ton, which is artificially low in order to attract as much waste as possible. Other problems have been escalating capital costs and over-estimated projections for energy revenues. In a December 1992 prospectus the capital cost was stated as \$157 million; it ended up being \$187 million. The local utility company, Niagara Mohawk (NIMO) is facing bankruptcy in large part due to having to purchase power from the incinerator. NIMO is considering taking Ogden Martin to court. Ogden recently retained a law firm (for \$3,500 per month or \$21,000 for six months) to prevent NIMO from suing it. Vickie Baker cautions any County considering building an incinerator to avoid doing so at all costs. She asserts that projections for the incinerator—tonnage, costs, revenues, etc.—made by OCRRA, Ogden Martin, and consultants were "all off" and that projected increases in waste generation "are not happening—nothing was what they said it would be."¹⁸

The experience of these Ogden Martin incinerators has serious implications for the economic viability of the Mercer County incinerator. Problems common to these facilities include:

- lack of tonnage (or "garbage flight")
- artificially low tip fees in order to attract waste from outside the area but revenue shortfall picked up by local taxpayers through other means (such as higher utility rates, higher property taxes, or higher local tip fees)
- problems with projected electricity revenues or with local utility company
- detrimental impact on increased recycling levels

All of these problems have a high potential to plague Mercer County if the incinerator is built.

The current economic viability of the County's incineration plan depends on the County securing financing, tonnage, a utility contract, and other critical items. As Stephen Picco stated in his report, these "are so crucial to the success of the project that the failure to secure any one of them would be fatal."¹⁹ Table 3 lists these items and the status of the County securing them.

Table 3: Important Assumptions to Economic Viability of Incinerator

Item (from Picco Report)	Status	Impact (ILSR Assessment)
Internal Revenue Service Approval of the Change in Project Status	??	
Commitment of Statewide Bond Allocation (\$290 million)	Received	
Minimum Total Waste (115,000 tons per year from County, plus 380,000 tons per year from out-of-county)	9 municipalities: 98,000 TPY 4 MC organs.: 26,400 TPY 3 MC haulers: 190,000 TPY ACUA: 173,500 TPY slated but no binding commitment from Atlantic County. TOTAL = 487,900 TPY or 314,400 TPY without Atlantic County (all these figures are potential, not guaranteed)	Serious implications. These agreements are non-binding to date. Experience at other Ogden Martin incinerators indicates that the County may not be able to provide 445,000 tons per year.
Binding agreement for the sale of electricity	No energy agreement guaranteeing revenue to the MCIA	Serious implications especially given problems at other Ogden Martin incinerators.
Extension of Existing Permits	Received	
Conservative Economic Assumptions	--	Rarely do cost figures prove to be conservative. In fact, at several recently operating Ogden facilities, tonnage has been overestimated and costs underestimated.

Source: Steven J. Picco, *Report on Solid Waste Disposal Options*, prepared for the Board of Chosen Freeholders of Mercer County by Picco Herbert Kennedy, Trenton, New Jersey, April 25, 1996, pp. 17-20; *Proposed Amendments to the Mercer County District Solid Waste Management Plan*, MCIA, September 19, 1996; ; Institute for Local Self-Reliance, 1996.

The project does not have fixed contracts for the sale of electricity. According to a April 22nd letter from Harold W. Border, Jr., Senior Vice-President, External Affairs, PSE&G to the County, "PSE&G cannot consider extending our contract with MCIA under the terms outlined in your December 14, 1995 letter or the earlier pricing arrangement described in the November 1, 1995 meeting. . . . Effectively the existing contract has become null and void due to MCIA's inability to meet its terms in the various deadlines included therein. . . . Current and anticipated future market conditions do not permit us to pay any prices in excess of existing market prices as they may vary from time to time. . . . Since the new project configuration of the MCIA project does not require the remedial flow control legislation and is based upon 'voluntary' municipal participation, we have many questions about the effects of this new approach on the size of the project, as well as the project's viability."²⁰

The lack of a binding agreement for the sale of electricity is sufficient reason alone to abandon the incinerator project. With guaranteed energy revenues the anticipated

tip fee of \$46 to \$57 per ton will not cover the facility's costs. If the tip fee is kept artificially low for out-of-county waste, then Mercer County taxpayers will have to cover the shortfall in revenues. If the tip fee for out-of-county waste is raised to reflect the true costs of operating the facility, communities outside Mercer who agree to send their wastes to the plant could desert the plant in favor of cheaper options. Because cheaper disposal options exist, towns and cities and counties that may initially agree to send waste to the plant could change their plans. The 115,000 tons per year of waste reportedly "committed" to the incinerator from Mercer County represent only 23% of the waste needed at the incinerator to keep tipping fees around \$90 per ton.

In his report, Steven Picco lays out the costs of an "abandonment scenario," that is, the cost to the County for all the developmental costs incurred to date. He comes up with a baseline figure of \$33.84 per ton (although it's not clear what tonnage figure he used to determine this). Whether or not the incinerator is built, "this baseline number will be charged County-wide in one form or another and should be viewed as the cost of generating waste in Mercer County."²¹ If the incinerator project moves forward, the baseline cost county-wide would be an additional \$9.43 per ton or a total of \$43.27 per ton for all municipalities.

The County's plan for covering these costs through its "Stranded Investments" scheme may not pan out.

The proposed amendment to the Mercer County District Solid Waste Management Plan requires all waste generators in the County to contribute (through payment of a user charge, calculated on a per ton basis) for all costs involved (including debt service on previously issued indebtedness) and/or services rendered prior to the "implementation date" of the incinerator. Payment for these costs, which the County labels "Stranded Investments," will be made by all generators (commercial and municipal) regardless of whether or not such generators elect to become "voluntary participants." According to the proposed amendment, generators will be required to cross-over scales operated and maintained by or on behalf of the MCIA. This reportedly will enable the MCIA to determine the amount of solid waste. These scale records would form the basis of allocating the cost of the Stranded Investments payable in each year.

The problem with this plan is that it may not be enforceable. Under what authority can MCIA dictate that haulers and municipalities have to cross over its scales? Experience in New Jersey and elsewhere indicates that haulers will avoid systems that add to their costs. Bergen County, New Jersey, provides a case in point. Residential waste destined for disposal is supposed to go through one of its four transfer stations. In the last couple of years, residential waste disposed has decreased from 303,000 tons per year to 240,000 tons per year. According to Recycling Coordinator Mark Vangieri, the 63,000 tons per year missing has not been diverted through recycling or waste reduction, it's bypassing their system because it's cheaper for haulers to take their waste elsewhere.²² Mercer County can expect that a significant portion of waste generated in the County will bypass its proposed system. If this happens, what will be the financial impact on haulers and municipalities?

The uncertainties of energy revenues, the supply of waste materials, and future regulatory requirements (which would force the County to invest even more capital) all point to the incinerator as a very financially risky investment; one that is not needed given other alternatives for handling solid waste in the county.

Ironically, Mercer County has never adequately considered alternatives to mass-burn waste incineration.

Mercer County first considered waste incineration in 1979. It was not alone. By the mid 1980s, 21 incinerators were planned in the state, one for each of New Jersey's counties. In 1990, the state abandoned its policy of encouraging the development of incinerators, and endorsed a Solid Waste Task Force recommendation that "the further development of incineration or other large solid waste disposal facilities be conditioned upon the developer of the proposed facility demonstrating a need for the facility. The facility developer should demonstrate a need for the facility after attainment of a 60% recycling rate, after full investigation of regional approaches with interdistrict agreements, and with a willingness to provide excess capacity to other regions of the State."²³

Despite the remarkable progress recycling and composting has made in the State and wide recognition of the serious cost and environmental problems with mass burn incineration, Mercer County never wavered from its plan to build the incinerator and never fully evaluated alternatives. The developer, Ogden Martin, has not demonstrated a need for the facility. In fact, the facility will be a direct obstacle to the County maintaining its recycling levels and moving beyond them.

Steven J. Picco's report, *Report on Solid Waste Disposal Options*, included a section on alternatives to the Mercer County Improvement Authority proposal (see pages 21 to 22 of that report). His discussion of alternatives is completely inadequate and presents only two alternative options, composting and landfilling, both of which are dismissed.

There is a non-burn alternative to the County's current plan, but there is no one black box approach. Increased source reduction, recycling, and composting are the heart of a non-incineration approach. Remaining waste can be landfilled out-of-county. As Steven J. Picco acknowledges, the "most successful composting centers are relatively modest in size and serve a very narrowly defined geographic area with a limited population and that incorporates source separation so that only food waste, paper, and vegetative wastes are composted." But his assertion that composting "does not appear to provide a solution for a county-wide program" is wrong. Consider that already the County has 11 composting facilities. These facilities can be expanded to take more organic material from the areas they are already serving. The alternative to the incinerator is a decentralized alternative. This is the beauty of it.

NON-INCINERATION ALTERNATIVE SCENARIO

The County's current recycling program is a remarkable success and among the national record-setters. Like many programs, even the best, there is plenty of room for improvement. Participation in recycling efforts is low in many parts of the County and many municipalities' recycling rates are dragging behind others that are higher. Trenton, for example, Mercer's largest municipality, is only recovering 15 to 20% of its residential waste.²⁴ Raising this level to 50% (in line with the County's goal of recycling 50% of its municipal solid waste) would divert significant tonnage from disposal.

Mercer County has not reached its "maximum feasible recovery of recyclable materials," as directed by current state policy.²⁵ Table 3 shows the materials Killam Associates (engineering consultants for the County) estimated disposed and recovered in 1996. Of the 271,540 tons it estimated would be disposed in 1996, 81 percent was slated to be burned at the incinerator as "processable" waste. This included a significant portion of "designated recyclables" such as 8,257 tons of newspaper, 2,796 tons of magazines, 9,725 tons of corrugated cardboard, 2,066 tons of HDPE/PET containers, 10,902 tons of yard trimmings, and 7,869 tons of glass and metal food and beverage containers. It also included recoverable materials such as 62,088 tons of other paper, 17,540 tons of wood waste, 31,970 tons of food scraps, and 9,660 tons of textiles. These recyclable or compostable materials *alone* represent 162,900 tons per year or 60% of the waste destined for disposal.

The County should immediately evaluate its current waste prevention, reuse, recycling, and composting system and programs and identify strategies to improve and build on these in order to truly achieve maximum feasible recovery of recyclable material.

Opportunities for further increasing recycling and composting levels include programs to reuse household and business sector durables, textiles, and programs to collect food waste for composting.

The data consultants provide to the County is all oriented toward showing how much of the County's waste stream is combustible not recoverable. For instance, the Killam Associates report, *Addendum to the Mercer County, New Jersey Regional Waste Stream Assessment Dated November 1992 (September 1993)*, which includes waste composition data, does not contain any information on reusable goods. Yet, reusable items represent more than 22% of the municipal solid waste stream. These include wooden pallets, textiles, and durable items such as furniture, sporting equipment, electronics goods.²⁶ All of these types of items could be recovered at increased levels in Mercer County. The Institute for Local Self-Reliance has recently produced six reports documenting successful reuse programs and enterprises around the country.²⁷ Mercer County can and should build on the experience of working reuse models. Reuse should be a higher priority than recycling and certainly than incineration.

Table 3: Killam Associates' Estimated Mercer County Solid Waste Stream Quantities for 1996

Material	Disposed	Recovered	Generated	Composition	Recycling Rate
Office Paper	3,793.59	11,380.77	15,174.36	1.7%	75%
Newsprint	8,257.20	24,771.59	33,028.79	3.7%	75%
Corrugated	10,080.31	30,240.92	40,321.23	4.5%	75%
Magazines	4,193.98	2,795.98	6,989.96	0.8%	40%
Other Paper	57,067.67	6,340.85	63,408.52	7.0%	10%
Total Paper	83,392.75	75,530.11	158,922.86	17.7%	48%
HDPE/PET Containers	2,066.35	2,066.35	4,132.70	0.5%	50%
Other Plastic Containers	1,092.97	0.00	1,092.97	0.1%	0%
Other Plastics	19,640.23	607.43	20,247.66	2.3%	3%
Total Plastics	22,799.55	2,673.78	25,473.33	2.8%	10%
Grass Clippings	NA	NA	8,731.60	1.0%	NA
Stumps	NA	2,042.26	NA	NA	NA
Other Yard Trimmings	NA	NA	64,496.07	7.2%	NA
Total Yard Trimmings	10,984.15	62,243.52	73,227.67	8.1%	85%
Total Wood	18,769.01	15,356.47	34,125.48	3.8%	45%
Food Waste	31,969.90	1,682.63	33,652.53	3.7%	5%
Diapers	6,888.28	0.00	6,888.28	0.8%	0%
Textiles	9,747.38	4,177.45	13,924.83	1.5%	30%
Rubber/Tires	3,241.30	1,432.66	4,673.96	0.5%	31%
Glass Containers	5,197.20	15,591.59	20,788.79	2.3%	75%
Aluminum Containers	977.61	2,932.82	3,910.43	0.4%	75%
Tin/Bimetal Containers	1,693.79	5,081.38	6,775.17	0.8%	75%
Other Aluminum	686.29		686.29	0.1%	0%
Ferrous/Nonferrous Metal	16,877.63	136,555.41	153,433.04	17.1%	89%
Total Metals	20,235.32	144,569.61	164,804.93	18.3%	88%
C&D, Other Glass	33,273.70	244,007.12	277,280.82	30.8%	88%
Motor Oil		1,563.16	1,563.16	0.2%	100%
Junked Autos		3,025.00	3,025.00	0.3%	100%
White Goods		669.71	669.71	0.1%	100%
Batteries		799.07	799.07	0.1%	100%
Misc. Industrial	6,212.24	50,000.00	56,212.24	6.2%	89%
Misc. Other	18,828.87	4,726.28	23,555.15	2.6%	20%
TOTAL	271,539.65	628,048.16	899,587.81	100.0%	70%

Source: Table 3-12A, Estimated Mercer County Solid Waste Stream Quantities, 1996, Addendum to the Mercer County, *New Jersey Regional Waste Stream Assessment Dated November 1992*, September 1993.

Recovery of food scraps is another excellent opportunity for the County to divert significant tonnage from disposal. It is probably one of the fastest growing areas in the recycling and composting field. Backyard composting continues to increase around the country as one method to encourage household food waste composting.

Of the 32,000 tons of food waste generated annually in Mercer County, approximately 1,000 tons are already being recovered as feed for hog farms in Gloucester and Burlington Counties. These farmers, and others, want more food waste. Restaurants, cafeterias, schools, hospitals, prisons are excellent sources of food scraps for hog farmers. The regulatory and physical infrastructure, contractual

model, and market demand already exist to facilitate expanded food waste recovery in Mercer County. Furthermore, food scraps are a poor "combustible" for the incinerator. Food waste recovery into hog feed is an environmentally sound alternative to burning food waste and is currently available at low cost.²⁸

One method for recovery of food scraps from households is curbside collection using a "wet-dry" collection and recovery system. The wet-dry system consists of materials being separated into two fractions: (1) "wet" for composting, and (2) "dry" for recycling. The idea of "garbage" disappears. Wet waste includes compostable items such as food scraps, yard trimmings, and noncompostable items such as heavily soiled packaging. The dry fraction contains recyclable items such as glass, metal, plastics, textiles, and paper, and nonrecyclable items such as Pyrex. Hazardous wastes such as batteries, paint, oils, household cleaners, pesticides, aerosol cans, and light bulbs, are kept out of both the wet and dry fractions. After processing and/or composting, all items that are not recycled or composted are sent to a landfill. One advantage of the wet-dry system over conventional source-separation programs is that it allows a far higher proportion of the waste stream to be diverted to secondary materials markets.

A number of communities have successfully implemented wet-dry systems. These include Guelph and St. Thomas in Ontario. Guelph operated a pilot program for a number of years that consistently achieved 67% diversion. It has now implemented a full-scale dry waste recycling program which is diverting 48 to 52% of the dry waste collected. Its composting facility will be fully commissioned in the next 4 to 5 months and is expected to divert 80% of all wet waste delivered to the facility. Overall diversion rates are anticipated to be at least 65%.²⁹ St. Thomas's wet-dry system is "working remarkably well" and is diverting 65% of that community's residential waste (50% through composting and 15% through recycling).³⁰

The County needs to fully consider alternatives to incineration before proceeding with its incineration plans. The recommended strategy for attaining maximum cost-effective waste prevention, reuse, recycling, and composting includes:³¹

- source reduction,
- product reuse,
- household hazardous waste (HHW) reduction and recycling,
- materials recycling, and
- composting of organics (including food waste).

The strategy for source reduction and reuse includes the following:

1. Promote backyard composting of municipal organics, on-site composting of commercial organics, and agricultural on-site composting to the maximum extent economically feasible.
2. Implement user-based fee systems for municipal waste.
3. Expand technical assistance services and materials provided to industrial, commercial, and institutional generators.

4. Expand public education and awareness programs to minimize municipal waste quantity, in general, and waste toxicity, in particular.
5. Consider disposal bans for certain items.
6. Encourage citizens, businesses, and local government to substitute reusable products for disposable ones.
7. Mount a public education campaign on waste prevention.
8. Encourage commodity reuse through repair (e.g., appliance repair), and products such as cloth diapers and refillable containers.

The strategy for maximum cost-effective source-separation of recyclables and compostables includes the following elements:

1. Expand materials targeted for recovery (for instance, include textiles)
2. Pursue active market development and marketing studies for targeted materials, including integration of recycling economic development activities into state and local economic development agencies and activities.
3. Promote expanded municipal-scale leaf and yard trimmings composting.
4. Provide curbside collection of organics in all municipalities. Prior to full-scale collection of food scraps along with lawn and garden debris, pilot collections should be initiated to determine optimal configuration for organic waste containers and collection vehicles.
5. Retrofit and expand in-county materials recovery facilities to allow processing of additional types of materials as well as additional volumes.
6. Evaluate whether additional regional-scaled composting facilities would be needed to handle additional organics composted. Depending on success and cost-effectiveness of backyard and on-site composting, and of expanded municipal leaf and yard trimmings composting, Mercer County may need to construct additional facilities.
7. Expand technical assistance and plan enforcement to cover commercial waste generators and to monitor source reduction at the source.

Strategies to create a local and regional recycling-based manufacturing infrastructure include:

1. Buy recycled-content products.
2. Utilize recycled materials in road construction projects.
3. Educate local manufacturers on the advantages of using recycled materials.
4. Enlist economic development agencies in recycling planning.
5. Actively encourage recycling industries to locate in your community, especially those that represent high-value end uses and “closed loop” recycling.
6. Offer financing incentives to recycling-based enterprises, particularly those that are community based.

7. Work with industrial park businesses, developers, and operators to include community-based organizations as partners in joint ventures.

These strategies can help Mercer County improve its already successful recycling and composting programs and create recycling-based economic development opportunities.

Waste remaining after comprehensive source reduction, reuse, recycling, and composting programs are in place, can in the short-term be landfilled.

There are several permitted landfills in New York, Delaware, and Pennsylvania that have sufficient capacity to accept Mercer County waste.³² While some Mercer County towns such as Trenton have apparently been unable to secure pricing commitments beyond three years, landfill contracts may be able to be negotiated on a multi-town basis.³³ The County should move immediately to issue a request for bids for long-term disposal capacity and to renegotiate its GROWs contract.

In the longer term, the County might consider mixed waste processing. There are a number of such facilities in operation.³⁴ Others are in various stages of planning, siting, and construction. Processing mixed waste to remove a significant portion of metals and other hazardous constituents such as household batteries, as well as remaining recyclables such as cardboard and glass or plastic containers, is technologically feasible.

RECOMMENDATIONS

The County should immediately move forward with an independent audit to document the real fiscal situation and implication of moving forward with the incinerator. Even Steven Picco stated in his report that "because the new Ogden proposal represents a radical departure from previous incarnations of the service agreement, it has been impossible to perform a detailed cost analysis of the terms."³⁵

The County should abandon its plans to build the incinerator, assume the \$50 million loss (if this is indeed the cost), and recover the losses over time through reduced costs of an alternative system. A similar situation occurred in 1986 in Austin, Texas, when the City Council canceled an incinerator (after spending \$23 million on it) in favor of a recycling/composting/landfilling program, which will save them \$100 million over 20 years.

The County should approach the NJDEP in working out a solution for addressing the cost of this abandoned project as the NJDEP has been a strong supporter of the project. The New Jersey Solid Waste Task Force recommended that the state address the public costs of abandoned incinerator projects: "As the State moves into a new era in solid waste management which emphasizes source reduction and recycling, the public cost of abandoned projects must be addressed."³⁶

The County should immediately evaluate its current waste prevention, reuse, recycling, and composting system and programs and identify strategies to improve and build on these in order to truly achieve maximum feasible recovery of recyclable material.

END NOTES

¹Steven J. Picco, Exhibit H, "Voluntary System Projected Tipping Fee," *Report on Solid Waste Disposal Options*, prepared for the Board of Chosen Freeholders of Mercer County by Picco Herbert Kennedy, Trenton, New Jersey, April 25, 1996..

²Personal communication, Mark Vangieri, Bergen County Recycling Coordinator, October 1996.

³Killam Associates, Appendix C, Addendum to the Mercer County, *New Jersey Regional Waste Stream Assessment Dated November 1992*, Millburn, New Jersey, September 1993.

⁴"1994 Recycling Rates by County," provided by Guy Watson, Chief, Bureau of Recycling and Planning, Division of Solid and Hazardous Waste, NJ Department of Environmental Protection.

⁵Killam Associates, Appendix C, Addendum to the Mercer County, *New Jersey Regional Waste Stream Assessment Dated November 1992*, Millburn, New Jersey, September 1993.

⁶NJDEP, *Solid Waste Management State Plan Update (Adopted December 1993)*, September 1993, pp. 185-186.

⁷NJDEP, *Solid Waste Management State Plan Update*.

⁸Ibid.

⁹Steven J. Picco, pp. 2-3.

¹⁰Executive Order No. 8, State of New Jersey, Executive Department, April 6, 1990.

¹¹Ibid.

¹²Steven J. Picco, p. 4.

¹³Steven J. Picco, p. 16.

¹⁴Steven J. Picco, Exhibit H, "Voluntary System Projected Tipping Fee."

¹⁵Steven J. Picco, pp. 19-20.

¹⁶Personal communication, Greg Smith, Maryland Environmental Network, October 1996.

¹⁷*The Recycler*, Huntington, New York, fall 1996; and personal communication with Gordon Gibson, Citizens for a Livable Environment and Recycling, Huntington, New York, October 1996.

¹⁸Personal communication, Vickie Baker, Onondaga County Legislator, New York, October 1996.

¹⁹Steven J. Picco, p. 17.

²⁰Letter to Eric D. Wisler, Esq., DeCotiis, Fitzpatrick & Gluck, Teaneck, New Jersey, from PSE&G, Newark, New Jersey, April 22, 1996.

²¹Steven J. Picco, p. 26.

²²Personal communication, Mark Vangieri, Bergen County Recycling Coordinator, October 1996.

²³*The Emergency Solid Waste Assessment Task Force, Final Report*, August 6, 1990, p. 18.

²⁴Personal communication with Tony Mack, City of Trenton Recycling Coordinator, October 1996.

²⁵Amendment to N.J.S.A. 13:1E-99.13, the New Jersey Statewide Mandatory Source Separation and Recycling Act.

²⁶U.S. EPA, *Characterization of Municipal Solid Waste in the United States: 1995 Update*, EPA530-R-96-001, March 1996.

²⁷See Institute for Local Self-Reliance, *Plug Into Electronics Reuse (1996)*, *Creating Wealth from Everyday Household Items (1996)*, *Weaving Textile Reuse into Waste Reduction (1996)*, *Sustaining Businesses and Jobs Through Pallet Repair and Reuse (1996)*, *Reuse Operations: Community Development Through Redistribution of Used Goods (1995)*, and *Community Development Corporations and Reuse Operations: Four Case Studies of Working Relationships (1996)*.

²⁸Testimony by Melvin S. Finstein, Ph.D., Professor of Environmental Sciences, Department of Environmental Sciences, Cook College, Rutgers the State University of New Jersey, New Brunswick, New Jersey, August 21, 1996.

²⁹Personal communication, Janet Laird, Manager of Waste Management Development, City of Guelph Works Department, Guelph, Ontario, October 1996.

³⁰Personal communication, Paul van der Werf, General Manager, Composting Operations, Green Lane Environmental Ltd., Lambeth, Ontario, October 1996.

³¹The strategies delineated below are adopted from Institute for Local Self-Reliance, *Minimizing Waste, Maximizing Recycling* (1995), and from Sound Resource Management Group, Inc., *Rhode Island at the Recycling Crossroads: A Sensible Strategy for Reclaiming Rhode Island's Wastestream Resources* (1993).

³²Steven J. Picco, p. 23.

³³*Ibid.*, pp. 23-24.

³⁴The national Solid Waste Composting Council has developed a data base on mixed solid waste composting facilities. In addition, recent and current pilot projects are investigating collection route and vehicle needs, as well as compost quality produced, in two- and three-stream biowaste separation strategies.

³⁵Steven J. Picco, p. 27.

³⁶*The Emergency Solid Waste Assessment Task Force, Final Report, August 6, 1990, pp. 18-19.*