2003 Solid Waste Generation
and
Disposal Capacity Report
to the
Joint Standing Committee on Natural Resources
of the 122nd Legislature

Executive Office
State Planning Office
Waste Management & Recycling Program
38 State House Station
184 State Street
Augusta, Maine 04333-0038
(207) 287- 8934

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I. Executive Summary

Purpose of the Report

The Maine State Planning Office is required by 38 M.R.S.A. § 2124-A to report biennially to the Legislature on:

- statewide generation of solid waste;
- statewide recycling rates;
- available disposal capacity; and
- how changes in available disposal capacity have affected or are likely to affect disposal prices.

The purpose of this report is to review and analyze how communities and businesses in Maine manage their solid waste, to identify potential future management issues, and to measure Maine's recycling progress. Additionally, the report provides insight on remaining disposal capacity and how that may be impacting disposal fees.

Findings

Today's solid waste management system in Maine is functioning well and should continue to do so for the foreseeable future. Municipal and private sector efforts continue to reduce the toxicity and volume of waste that is being generated.

Maine still ranks among the top 10% of all U.S. states, based upon percent of municipal solid waste recycled. Unfortunately, growth in the overall municipal solid waste stream continues to exceed the growth of recycling resulting in more solid waste being disposed in waste-to-energy facilities or landfills.

It is important to keep in mind that each ton of solid waste that is recycled is one less ton of solid waste that requires disposal. By implementing other waste management strategies, whether it is reduction, reuse, recycling, or composting, the need for and our dependence upon waste-to-energy facilities and landfills for the disposal of municipal solid waste can be reduced.

The state maintains its commitment to "manage" its own waste. In 2003, the Legislature directed the State Planning Office to purchase the Georgia Pacific landfill in West Old Town, an existing licensed disposal facility. This currently active landfill will serve as a disposal option for municipal solid waste for years to come. With the addition of the state-owned landfill in Old Town, disposal capacity concerns are softened, though the State should not cease review of other disposal facility opportunities, especially for construction and demolition debris.

As was presented in 1999, and remains true today, Maine should be proud of its continued commitment to require and provide for environmentally conscious solid waste disposal facilities. However, only by adopting aggressive waste reduction, recycling, and composting actions and programs, will the state be able to wisely utilize existing disposal capacity and truly reduce the need for future disposal capacity.

2003 Waste Management Highlights

State Waste Management Policies

- Maine continues to implement the state's waste management hierarchy that gives preference to waste reduction and recycling over disposal.
- The State maintains the ban on the development of new commercial solid waste disposal facilities.
- The State continues to monitor disposal capacity with an eye toward maintaining sufficient capacity to meet state needs.

Waste Generation and Waste Reduction

- Maine residents, businesses, and visitors generated 2,019,998 tons of MSW, a nine percent increase from 2001. The state did not meet its waste reduction goal.
- In 2003, much effort was placed on reducing the toxicity of Maine's waste stream. Disposal bans have been placed on certain products containing hazardous materials and efforts are underway to develop local and regional household hazardous waste collection centers. Also, manufacturers are being made responsible for taking back products that contain hazardous components.

Recycling

- The state-wide recycling rate for 2003 is calculated to be 35.5%. Even though the tonnage recycled in Maine increased by approximately 30,000 tons, increased waste generation caused the recycling rate to drop from 37.3% in 2001 and 40.4% in 1999.

Disposal

- Maine municipalities and businesses delivered approximately 32% of the MSW generated in 2003 to the four waste-to-energy facilities. Of that tonnage, approximately two-thirds of that waste was incinerated, with the balance (primarily ash, FEPR and 'by-pass' tonnages) requiring disposal in landfills. The state's four waste-to-energy facilities are currently operating at their processing capacity. A number of them are approaching a twenty-year mark of operations. They have been

beneficial in not only reducing the volume of waste requiring disposal but in generating electricity. The State and member municipalities should begin considering long-term options related to the facilities' continued operation and/or replacement.

- 32% of Maine's waste is buried in landfills, including the ash, residues and the by-pass waste from waste-to-energy facilities. Disposal capacity at the existing municipal and commercial landfills continues to be consumed, reducing the available volume remaining under current licenses and permit conditions. In 2004, additional disposal capacity was obtained by the State Planning Office through the acquisition of an existing landfill in Old Town.

- Construction and demolition debris disposal capacity is limited and some municipally operated disposal sites will soon be out of capacity. Developing alternative management options, including regional solutions, is a priority.

- In 2003, a total of 446,958 tons of out-of-state generated MSW was shipped into Maine and delivered to waste-to-energy facilities or to landfills, double what was imported in 2001. Maine exported 8% of its waste for disposal outside its borders.

Disposal Capacity

- The State maintains an undeveloped, permitted landfill site in T2 R8 (near Lincoln, ME), known as Carpenter Ridge, which has about a two-million cubic yard capacity and is held for future development. State law directs that the State Planning Office, when it has determined that the state has less than four years of disposal capacity remaining, it shall develop a report to the Legislature recommending development of necessary disposal capacity and the process that should be followed.

- The new state-owned Georgia Pacific landfill in Old Town will provide an additional nine million cubic yards of landfill capacity, which translates into space for approximately seven and a half million tons of waste and sufficient disposal capacity to address the needs of the state well into the next decade.

- Eight municipally owned and operated MSW landfills have just over 2 million cubic yards of capacity remaining, which is expected to serve their communities for about 13 years. The two existing commercially-owned landfills had about 6 million cubic yards of available capacity at the end of 2003.

- In total, the state has an estimated 5 to 6 years of remaining landfill capacity. (Capacity at the former Georgia Pacific landfill is not considered in this estimation.)

- There are no impending short-term disposal capacity gaps and there do not appear to be current or projected (within a few year's timeframe) disposal fees that would be considered supracompetitive. Supracompetitive, as applied to *'prices'*, means prices that are higher than they would be in a normally functioning, competitive market -- usually as a result of overconcentration, collusion, or some form of monopolistic practice.

II. Introduction

The Maine State Planning Office (SPO) is required by 38 M.R.S.A. § 2124-A to report to the legislature on:

- statewide generation of solid waste;
- statewide recycling rates;
- available disposal capacity; when the Office determines that the state has less than four years of disposal capacity remaining, it is to develop and present a report to the Legislature recommending development of the state owned Carpenter Ridge Landfill; and
- include an analysis of how changes in available disposal capacity have affected or are likely to affect disposal prices. When the office determines that a decline in available landfill capacity has generated or has the potential to generate supracompetitive prices, it shall include this finding in its report and shall include recommendations for legislative or regulatory changes as necessary.

The subject of this report is consistent with the goals and objectives of the State Planning Office's strategic plan for the Waste Management and Recycling Program.

In evaluating generation rates, management strategies, and disposal capacity, this report considers only Municipal Solid Waste (MSW) and its residues only (primarily ash from W-T-E facilities incinerators). MSW is that waste which is typically generated by households and businesses and may be managed by municipalities. It includes non-bulky waste (corrugated cardboard, newsprint, office and mixed papers, food waste, plastics, glass, metals and textiles) as well as bulky waste tires, appliances, furniture, construction/demolition debris, wood waste and yard waste). Industrial waste streams are not included in this report.

Maine municipalities have designed and implemented various solid waste management facilities over the years, resulting in the construction and operation of approximately 240 transfer stations, over 300 public recycling programs (some communities participate in more than one program) and over 70 composting facilities. In 2003, the solid waste disposal facilities operating in Maine included four waste-to-energy facilities, nine municipally/publicly operated landfills permitted to accept MSW, (seven of which are permitted to accept special waste), and two commercial landfills permitted to accept municipal solid waste (including construction/demolition debris) and special waste.

Also in 2003, the State Legislature passed, and the Governor signed, a resolve authorizing the State Planning Office to purchase and cause to be operated the Georgia Pacific landfill located in Old Town. Where the ban on new commercial disposal facilities continues, the state purchase of this landfill is in response to existing policy and the landfill will be available for the disposal of acceptable Maine generated solid wastes.

III. Definitions and Acronyms

A. The following definitions are provided to assist the reader in reviewing this document:

Broker's Survey – *a biennial survey conducted of private sector recycling brokers and end-users to determine their level and effort related to the management of commercial recyclables.*

Bulky Wastes - *these are solid wastes that do not typically fit into a 30 gallon trash container, and may include such items as wood, large metal appliances and construction materials.*

Construction/Demolition Debris - (CDD) – *these are the wastes generated by building, remodeling and/or destruction activities and may include such wastes as wood and wood products, concrete and brick, gypsum board, shingles and other common components of buildings.*

Front-End Process Residue - (FEPR) – *residual of municipal solid waste resulting from the processing of solid waste processing prior to incineration or landfilling, and includes, but is not limited to, ferrous metals, glass, grit and fine organic matter.*

Household Hazardous Wastes – (HHW) - *items generated by households that are corrosive, toxic, ignitable, or reactive, and as such are hazardous to humans and/or the environment if disposed of improperly.*

Incinerator Ash – *this is the residue from the combustion of municipal solid waste at waste-to-energy facilities. It may also contain fly ash from the facility's operation and is designated as a 'special waste'.*

Municipal Solid Waste Annual Reports – *these are the reports submitted to the State Planning Office by municipalities, as required through 38 M.R.S.A. § 2133. These reports convey their efforts related to municipal solid waste management and provide detail on the tonnage of solid wastes they have overseen and a description of the various solid waste management practices utilized.*

Municipal Solid Waste (MSW) - *solid waste emanating from household and normal commercial activities.*

Special waste - *wastes that generated by other than domestic and typical commercial establishments that exist in such an unusual quantity or in such a chemical or physical state that require special handling, transportation and disposal procedures.*

Supracompetitive - *when applied to prices', means prices that are higher than they would be in a normally functioning, competitive market -- usually as a result of overconcentration, collusion or some form of monopolistic, oppressive practice.*

Universal Wastes – *a category of wastes that include: PCB containing lighting ballasts; Cathode Ray Tube (CRT) containing devices; fluorescent lamps; other lamps containing hazardous wastes; and, mercury-added devices from commercial sources.*

Waste–To–Energy facilities – (W-T-E) – *incinerators which receive municipal solid waste, and through combustion, recover energy and convert it into electricity, while reducing the volume of waste requiring disposal.*

B. The following acronyms are provided to assist the reader in reviewing this document:

CDD – *means Construction/Demolition Debris – these are the wastes generated by building, remodeling and/or destruction activities and may include such wastes as wood and wood products, concrete and brick, gypsum board, shingles and other common components of buildings.*

CRT – *means 'Cathode Ray Tube', the projection device located in certain computer monitors and television sets*

DEP – *means the Maine Department of Environmental Protection*

EPA – *means the United States Environmental Protection Agency*

FEPR – *means Front-End Process Residue – residual of municipal solid waste resulting from the processing of solid waste processing prior to incineration or landfilling, and includes, but is not limited to, ferrous metals, glass, grit and fine organic matter.*

HHW – *means Household Hazardous Wastes - items generated by households that are corrosive, toxic, ignitable, or reactive, and as such are hazardous to humans and/or the environment if disposed of improperly.*

MSW – *means Municipal Solid Waste - solid waste emanating from household and normal commercial activities.*

PCB – *refers to Polychlorinated Biphenyls, a class of chlorinated aromatic hydrocarbons*

SPO – *means the Maine State Planning Office*

W -T- E - *means Waste–To–Energy facilities – incinerators which receive municipal solid waste, and through combustion, recover energy and convert it into electricity, while reducing the volume of waste requiring disposal.*

IV. Statewide Solid Waste Generation Data

A. Methodology

Overview

Since 1989, Maine law has charged the State, (formerly the now defunct Maine Waste Management Agency but that responsibility now resides at the State Planning Office), with analyzing and preparing a plan for the management, reduction, and recycling of solid waste for the State. The state has fourteen years of municipally and commercially provided solid waste information and data, and that is reflected in the information contained within this report.

MSW Generation Calculations

The amount of waste generated within municipalities and managed by them (including reuse, recycling, composting and disposal) is reported annually by municipalities to the State Planning Office. This information is then combined with the data derived from the Commercial Broker's Survey, and other sources[1], to create a reliable estimate of the level of waste generation and recycling efforts in Maine. The estimated statewide solid waste generation combines the amount of waste processed and disposed and the tonnage recycled, composted, and reused.

B. Statewide MSW Generation

Maine residents and visitors generated 2,019,998 tons of MSW in 2003; this is an increase over the 1,844,059 tons of MSW in 2001 the 1,696,006 tons in 1999, the 1,635,000 tons in 1997, the 1,339,352 tons in 1995, and the 1,293,401 tons in 1993. MSW management methods and amounts for 2003 (disposal, recycling, and generation) are outlined in ***Figure 1***. These numbers were adjusted to account for the movement of solid waste across state lines, to include only the waste that was generated in Maine.

[1] These other sources include the annual reports of the four waste-to-energy facilities and the municipal and commercial landfills, as well as disposal data from neighboring state and provincial governments.

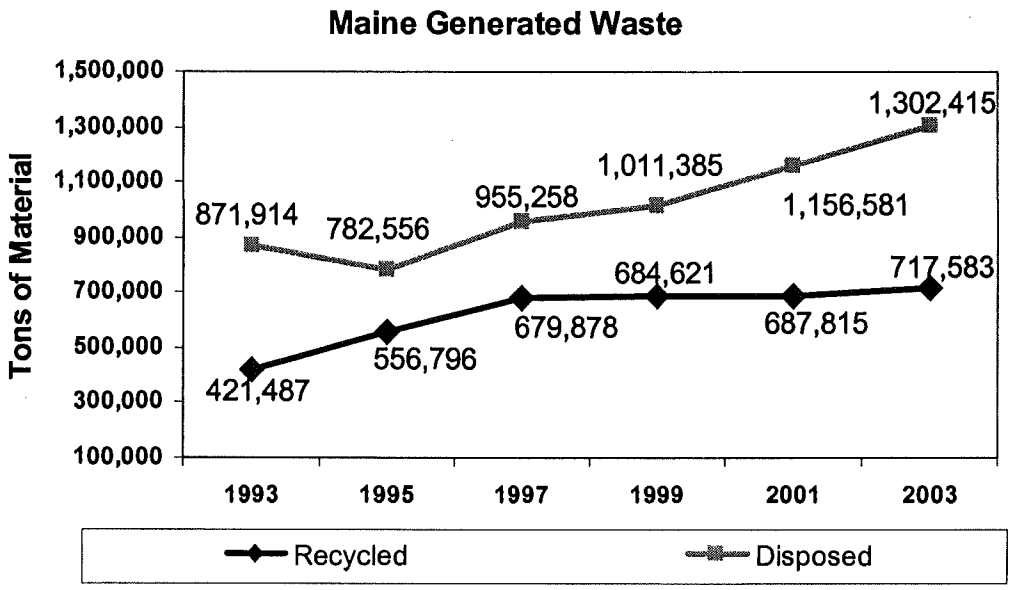

Figure 1

Figure 2 displays 'Maine generated MSW' management methods for 2003. The majority of the exported municipal solid waste was landfilled.

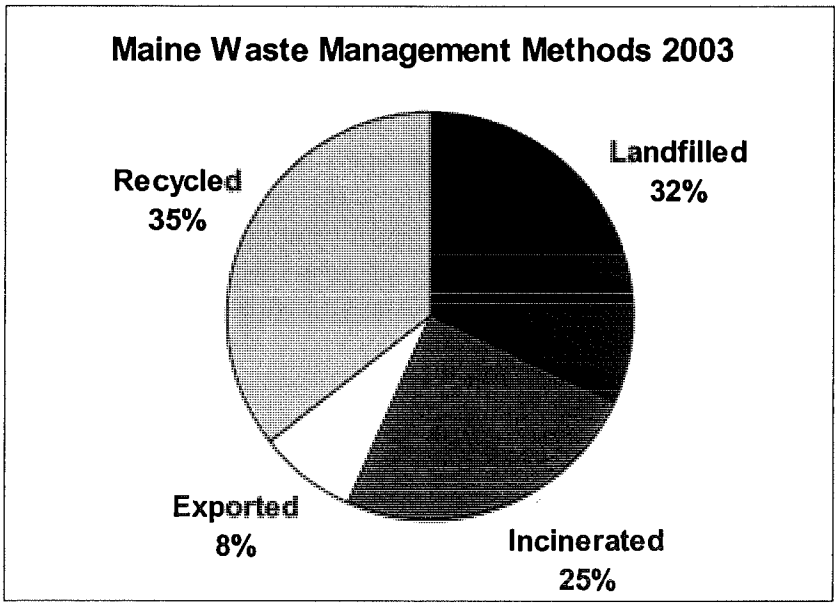

Figure 2

C. 'Per Person' MSW Generation

Statewide MSW generation data, when calculated on a 'per person' basis, indicates that each resident generates approximately 3,094 pounds (roughly 1.547 tons) of municipal solid waste a year, which equals about 8.66 pounds of waste per person per day. This number is derived from the total municipal solid waste generated in Maine for 2003 (2,019,998 tons) and the estimated 2003 population of 1,305,728. This is higher than the national 'per person' waste generation weight reported by the U.S. Environmental Protection Agency (EPA), which in 2001 (the latest year that such data is available) is approximately 4.4 pounds of waste per person per day.

One obvious reason why Maine's per person numbers are higher than the national average is that Maine includes 'construction/demolition debris' (CDD) in its definition of municipal solid waste, which the U.S. EPA does not, so Maine's 'per person' numbers will definitely be higher. Other possible explanations for the higher 'weight per person' could include: the impact of the tourist industry and visitors to Maine (in 2003, an estimated 43.8 million visitor days were counted for Maine, which is the equivalent of about 120,000 year-round residents - - a 10% increase from the current population level); better tracking and accounting of the municipal solid waste generated within Maine (where solid waste management occurs at the local level, the opportunity for improved data collection exists); and, the nature and character of residents' lifestyle that influences the variety and type of wastes that are produced.

V. Statewide Recycling Rate

A. Methodology

Overview

Since 1989, Maine law has charged the State, (State Planning Office), with analyzing and preparing a plan for the management, reduction, and recycling of solid waste for the State. In response to this directive, the State has kept a census of the percentage of municipal solid wastes recycled in Maine. This census is part of the ongoing effort of the State to reach a recycling goal of 50% of the municipal solid waste stream and to track progress toward achieving this goal.

In 1992, the State's first formal assessment of the recycling effort in Maine consisted of a Broker's Survey. In 1993, the State once again conducted a survey of private recyclers, supplementing that information with municipal recycling data. This marketing review effort of private recyclers is now repeated biennially. When doing this Broker's survey, the State contracts with an outside consultant, to provide confidentiality of the information collected. That information includes the tonnage of municipal solid waste generated in Maine that is being recycled and/or marketed by private companies.

This information is used in conjunction with data collected from the submitted Municipal Solid Waste Annual Reports, which are also used to calculate individual recycling rates for municipalities and regions. Maine municipalities are required to report MSW disposal and recycling data for their municipal solid waste management activities and have been very cooperative in providing data via the Municipal Solid Waste Annual Reports. The private sector waste management and recycling companies have been helpful in completing the needed data requests initiated by the outside consultant.

Recycling rate calculations

The recycling rate was derived by using recycling and disposal data in conjunction with the following formula:

$$\text{Recycling Rate} = \frac{\text{(MSW recycled)}}{\text{(MSW generated)}} * 100$$

This process is not a precise measurement. Some data is incomplete, particularly for composting and reuse efforts, in the public sector and certain recycling activities in the private sector. Additionally, adjustments were made to eliminate duplicate counting of recyclables, as when material moves from an in-state broker to an in-state end-user. Although there may be errors in the estimates for some individual materials, SPO estimates that the overall result is accurate to within two (2) percentage points.

B. Statewide Recycling rate

Based upon information and data received, the State Planning Office estimates that 35.5% of the municipal solid waste was recycled in 2003. This reflects just under a two percentage point decrease from the 37.3% recycling rate determined in 2001. In 2003, as compared to 2001, the overall tonnage of MSW generated increased by 175,601 tons and is reflective of the fact that the tonnage of MSW delivered to waste-to-energy facilities increased, waste exported to disposal facilities increased, and the tonnage of material landfilled in-state increased. Where the statewide recycling rate is a mathematical calculation, where the tonnage of recyclables is divided by the total tonnage of MSW generated, even though recycling efforts resulted in an additional 29,768 tons of materials being recycled, the calculation results in a drop of the state's recycling rate.

There has been a shift in some of the categories of materials recycled and the average tonnage reported by municipalities as being recycled or reused has increased since 2001 but not significantly. The total of recycled material has risen, from 687,815 tons in 2001 to 717,583 tons in 2003, but does not quite keep pace with the overall growth in MSW generation. Please refer to ***Figure 3*** for a graphic illustration of this.

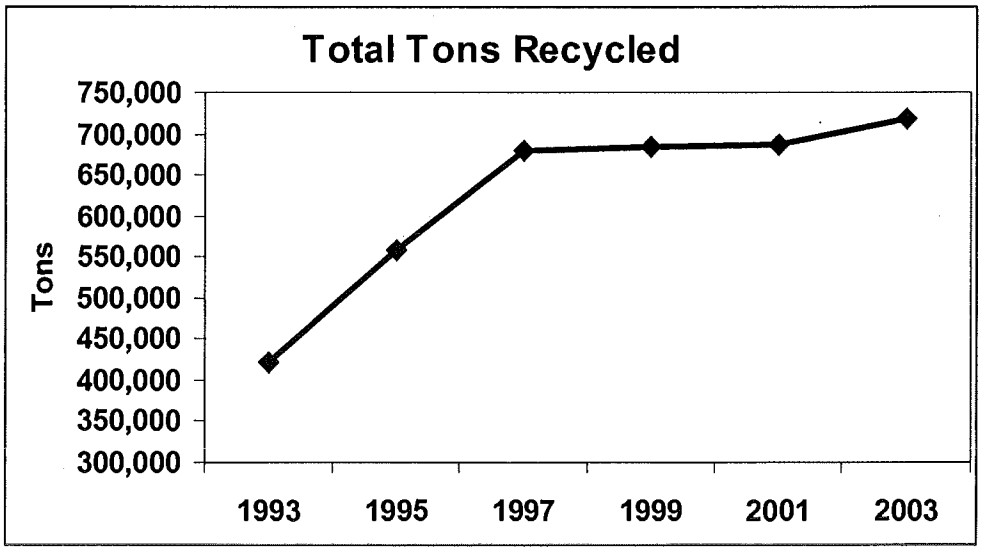

Figure 3

The material breakdown and totals for recyclables in 1993, 1995, 1997, 1999, 2001, and 2003 are displayed in ***Figure 4***:

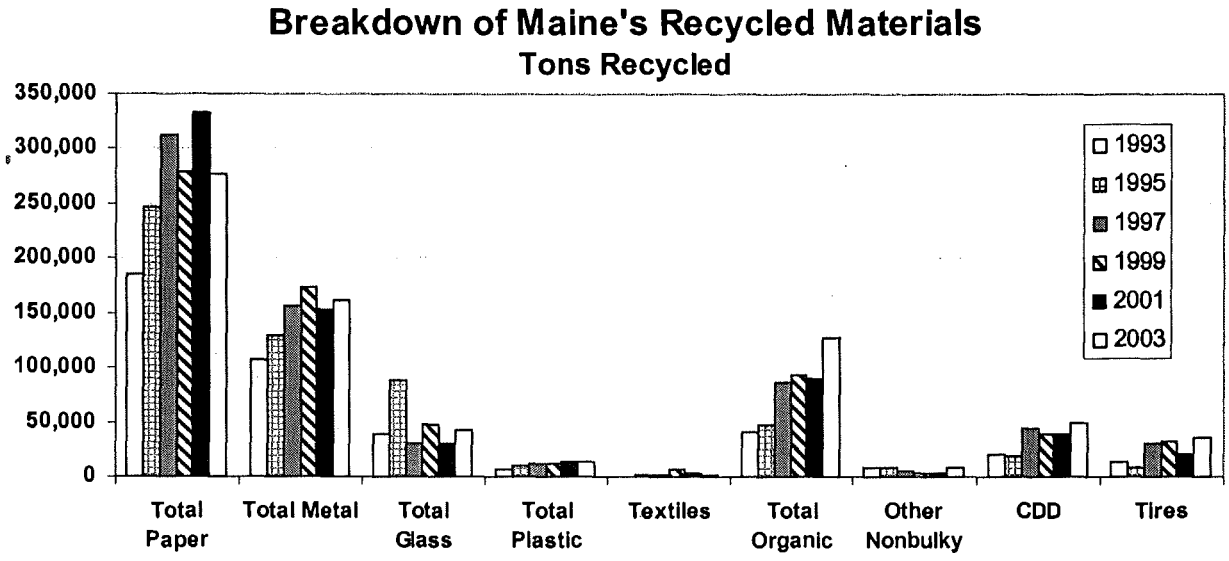

Figure 4

A Perspective on the Value of Recycling

It is important to keep in mind that each ton of solid waste diverted from disposal, whether it is reused, recycled or composted, is one less ton of solid waste that requires disposal. Given that the waste-to-energy facilities are operating at their processing capacity, and that landfill disposal capacity is being consumed, activities that promote reuse, recycling and composting as components of an integrated solid waste management program become more important. By implementing other waste management strategies, as identified in the solid waste management hierarchy (which are actually resource management strategies), the need for and our dependence upon waste-to-energy facilities and landfills for the disposal of municipal solid waste can be reduced.

Methodology: Determining the Statewide Recycling Rate

The State of Maine's definition for municipal solid waste includes construction/demolition debris. However, under the EPA guidelines, construction/demolition debris (CDD), is treated as a separate category, and is not considered part of MSW. The U.S. EPA has considered developing standards for measuring MSW recycling on a national basis but has run into considerable opposition from many states because of the possible 'realignment' and loss of credit due to change in applicable categories.

When the 2003 state-wide recycling rate for Maine is calculated, using the EPA guidelines, the state-wide recycling rate rises to 39.0%. These methodologies were applied to calculate each recycling rate in ***Table A:***

MAINE STATE-WIDE RECYCLING RATE -- 2003

Recycling rate = recycled tons/total solid waste generated (disposed + recycled + exported)

MAINE STATE GUIDELINES		**EPA GUIDELINES (CDD not included)**	
	(in tons)		(in tons)
MSW with CDD generated	2,019,998	MSW w/o CDD generated	1,712,036
MSW with CDD recycled	717,583	MSW w/o CDD recycled	667,869
RECYCLING RATE:	**35.5%**	**RECYCLING RATE:**	**39.0%**

Table A

Recycling Efforts Overview

Maine still ranks among the top 10% of states, based upon percent of municipal solid waste recycled. This continued high status is the result of teamwork on the part of many organizations in the public and private sectors and very clearly demonstrates that recycling is an important part of Maine's established solid waste management infrastructure. It also underscores the importance and value of having strong and consistent markets for the recyclables managed by Maine municipalities and businesses. The importance of strong and consistent markets for recyclables is clear when these points are considered:

- prompt and reliable recyclable movement, through shipping of the material to markets, is essential in keeping recycling programs engaged. Should market strength decrease, local support for recycling efforts may be damaged when it appears that recycling efforts of residents does not result in materials actually being sent to markets.

- value of recyclables continues to play a crucial role for many program's continued participation in recycling efforts. Should revenues decrease for recyclables, program justification becomes another challenge for operators.

- the tonnage of recyclables, if no longer recycled and had to be delivered to waste-to-energy facilities or landfills, could quickly disrupt the existing solid waste management system.

C. Progress Towards Achieving State Goals

MSW management and the hierarchy

The State of Maine's solid waste management policy is to plan for and implement an integrated solid waste management program based on a management hierarchy. The hierarchy guides public decisions regarding investments in, and the permitting of, solid waste management facilities. 38 M.R.S.A. § 2101, establishes the management priorities within the hierarchy. In order, the priorities are:

1. *Reduction, including both the amount and toxicity of waste;*
2. *Reuse (use of a product in same form as the original use);*
3. *Recycling (reprocessing of waste and creation of a new, usable material);*
4. *Composting of biodegradable waste;*
5. *Volume Reduction (waste processing that reduces the volume of waste requiring disposal, including incineration for-energy recovery); and*
6. *Land disposal.*

Maine's Recycling and Waste Reduction Goals

In 1989, the Maine State Legislature established the goal of recycling 50% of the state's annual municipal solid waste that is generated. This goal was set partially in response to Maine's anticipated solid waste management crisis, which included an increasing amount of MSW being generated and requiring management, skyrocketing disposal costs to municipalities and businesses, and decreasing available landfill capacity. The 2003 state recycling rate is calculated to be 35.5%, short of the 50% goal. However, the State remains committed to reaching the 50% goal in light of the value of recycling and composting on reducing overall solid waste management costs, the positive impact on the environment, and a lessening of the need for additional solid waste disposal facilities.

During the first session of the 120th Maine Legislature, a state waste reduction goal was discussed and passed. This goal challenges the State to reduce the annual generation of municipal solid waste tonnage by 5% by January 2003, and by an additional 5% every subsequent 2 years. The baseline tonnage to be used for calculating this reduction is the 1999 solid waste generation data gathered by the State Planning Office. The intent of this goal is to keep the importance of reducing solid waste in the forefront and encourage efforts to achieve the goal. As waste generation continues to climb in Maine, efforts within the State have not kept pace with the waste reduction goal.

In evaluating the state's progress towards implementing the hierarchy; a comparison is made of the MSW that has been recycled (materials reused, composted and recycled), and disposed (landfilled or delivered to waste-to-energy facilities) for 1993, 1995, 1997, 1999, 2001, and 2003 (***refer to Figure 1***). This graph illustrates that recycling, as a management option, continues to grow but not at a rate that matches the growth seen in the overall MSW stream.

Opportunities still exist to reduce the volume of MSW delivered to incinerators or landfills. Public and private sectors should be encouraged to develop partnerships to pursue and implement these strategies. The alternative to ongoing efforts to better manage our municipal solid waste stream as a resource is continued reliance upon landfill disposal capacity and planning for replacement capacity will need to be accelerated.

VI. Disposal Capacity

A. Landfills

1. Municipally-operated MSW landfills

A survey of MSW landfills indicated that among the eight municipally-operated MSW landfills, there are approximately 2,108,779 cubic yards of remaining available capacity.[2] This capacity is sufficient to carry those communities for an average of thirteen years, supposing a steady but continual growth in the volume of municipal solid waste requiring disposal. In 2003, 146,617 tons of waste was disposed at those landfills. The actual remaining life varies for each landfill, resulting in 'unevenness' of remaining municipally-owned disposal capacity across the state. This variation, as to when a particular community or region may exhaust their current disposal capacity, is independent and possibly irrespective of any possible state-wide disposal capacity concern. ***Table B*** provides information on each individual municipally-operated landfill, including fill rates and estimated available remaining capacity:

2003 -- Municipal Landfill Tonnages

	2003 Fill Rate (tons)	Remaining Capacity Cubic Yards (est.)
Bath landfill	20,042	152,074
Brunswick	14,016	160,968
Greenville	1,389	60,723
Hatch Hill	43,281	540,995
Lewiston	18,938	383,571
Presque Isle	14,190	213,744
Tri-Community	34,269	588,000
West Forks	492	8,706
Total Tons Landfilled:	**146,617**	
Total Remaining Capacity (est.)		**2,108,779**

Table B

Note: each cubic yard of landfill space may hold 0.6 to 0.75 tons of MSW

[2] A ninth municipally operated landfill, the Regional Waste System's (RWS) landfill in Scarborough, is not included in this list since that facility primarily accepts residues and ash from the waste-to-energy facility operated by RWS, and not MSW as a general activity.

2. Municipally-operated CDD disposal facilities.

There are 20 publicly operated disposal facilities that accept primarily locally generated Construction and Demolition Debris (CDD), inert fill, brush and trees, with a combined current disposal capacity of approximately 944,233 cubic yards. These facilities often furnish the only 'local option' for the management of these wastes. The remaining capacity at individual facilities varies, although state-wide numbers indicate that adequate capacity exists for another ten to twelve years, a number of these facilities will be full before then, creating 'pockets' where CDD disposal options will need to be reconsidered. A total of 64,666 tons of material was buried at these disposal sites during 2003, a 23% increase from 2001 when 52,577 tons was landfilled by these facilities.

CDD disposal capacity and management needs, along with those for oversized municipal solid waste {such as furniture and other durable goods} continue to be a common highlighted issue in the management of municipal solid waste. These material streams are unacceptable at incinerators and cannot be recycled or reused without some investment of capital and labor, primarily in the area of processing these materials and items. Markets for processed CDD and bulky wastes do exist but are limited regionally, due to the volume being generated and related transportation issues. This topic is considered further in the recommendations section of this report.

3. State-owned landfills

The State Planning Office owns property in T2 R8 (near Lincoln), upon which a special waste landfill was permitted in the mid 1990's. This 'greenfield' site is known as Carpenter Ridge and a landfill design for about two million cubic yards of waste has been developed. This is the landfill site selected by the former Maine Waste Management Agency and has been held by the state to assist in fulfilling its disposal capacity commitment when it is needed.

However, in 2003, an opportunity presented itself in the City of Old Town, when Georgia Pacific, owner of the paper mill there, considered ceasing its papermaking operations due to the high cost of energy needed by the mill. The State offered to assist the mill in making improvements to keep it economically competitive by purchasing the mill's landfill in Old Town and using that facility to serve the disposal needs of the State. Where the ban on new commercial disposal facilities continues, the state purchase of this landfill is in response to existing policy and the landfill, once license amendments are approved, will be available for the disposal of acceptable Maine generated solid wastes.

Though a resolve, authorized by the State Legislature and subsequently signed by the Governor, the State Planning Office was instructed to purchase and cause to be operated, the Georgia Pacific landfill located in Old Town. The SPO issued a Request for Proposals for the operation of the landfill, selected a qualified operator, and submitted license amendments to the Maine Department of Environmental Protection to permit a change in the final elevation of the landfill and to accept additional waste streams. At the end of 2003, the necessary license amendments had not been issued by the DEP.

Editor's note: at the time of this publication's printing, the Maine Department of Environmental Protection had approved the requested license amendments but that approval was appealed to the Board of Environmental Protection, who dismissed the appeals. Subsequently, the appellants filed petitions with the Penobscot County Superior Court to have the court overturn the Board's decision.

4. Commercial landfills

Having two commercial landfills operating in the state has served the state well in terms of providing competitive disposal capacity options for municipal solid waste, construction and demolition debris, and special wastes. These two landfills are:

- Crossroads Landfill, located in Norridgewock, owned by Waste Management, Inc.
- Pine Tree Landfill, located in Hampden, owned by Casella Waste Services, Inc.

The total disposal capacity currently licensed at these two commercial landfills is approximately 5,694,898 cubic yards. The majority of this capacity is at the Crossroads Landfill, which an estimated 4,096,736 cubic yards of capacity remaining at the end of 2003.

The Pine Tree Landfill in Hampden has less than three years remaining capacity, at current fill rates. The Crossroads Landfill has approximately 8 to 10 years of disposal capacity remaining, at current fill rates.

5. Special Wastes

This report is to examine the management of municipal solid waste generated and disposed of in Maine. Special wastes, while outside the apparent review of this report, are considered, however, when such wastes are the result of managing MSW, as in the case of waste-to-energy facilities, whose ash is categorized as a special waste. In addition, disposal of these wastes, regardless of their source, do consume landfill capacity and are a data set used by the Office in determining remaining disposal capacity.

Special wastes are those wastes that are generated by other than domestic and typical commercial establishments, that exist in such an unusual quantity or in such a chemical or physical state that require special handling, transportation and disposal procedures. Some examples of special wastes are: ash from waste-to-energy facilities; wastewater treatment plant or other sludges; sand blast grit; coal ash; and, industrial and industrial process waste. These wastes are typically required to be landfilled, with some exemptions provided to wastewater treatment plant sludges and certain types of ash.

In 2003, 160,713 tons of waste-to-energy facility incinerator ash was buried. This is an increase from the 155,165 tons of incinerator ash landfilled in 2001. In addition, nearly 98,481 tons of other Maine generated special waste was landfilled during 2003 at the commercial landfills.

B. Waste-To-Energy facilities

Maine's four waste-to-energy facilities received 643,668 tons of MSW, which was approximately 32% of Maine's generated MSW in 2003. An additional 228,638 tons of MSW, from out-of-state sources, was delivered to the waste-to-energy facilities. While the W-T-E facilities have provided a reliable outlet for MSW, the seasonal nature of waste generation has caused some tonnage overage problems during the summer months and the need to 'attract' additional tonnage during the winter months. The waste-to-energy facilities continue to provide a service in reducing the volume of MSW requiring disposal and producing energy for residential and commercial customers, a combined capacity of approximately 62 MW a day of electricity. ***Figure 5*** shows the processing capacity of the four waste-to-energy facilities:

Waste-To-Energy Facility	Daily processing capacity (tons/day)	Annual processing capacity (tons/year)
Maine Energy	1,000	250,000
Mid Maine Waste Action Corporation	200	70,000
Penobscot Energy Recovery Corporation	1,100	270,000
Regional Waste Systems	550	170,000
Total of **W-T-E** facilities	2,850	760,000

Figure 5

The four waste-to-energy facilities, while combusting MSW and producing electrical power, also are responsible for the production of several streams of materials and residues that require disposal: By-pass waste, Front-End Process Residue and ash.

By-Pass Waste

By-pass waste is that portion of the municipal solid waste stream that was intended for delivery to and incineration at a waste-to-energy facility, but was diverted from the facility because the facility could not accept the waste. Reasons for solid waste being 'by-passed' include interruptions of the waste-to-energy facility, actual facility shut-down, and/or the facility is at its operational capacity and additional waste that the facility is contractually obligated to receive and manage could not be managed properly. The by-pass waste is typically delivered to a landfill for disposal.

Front-end Process Residue

Front-end Process Residue (FEPR) is solid waste that has been removed by the processing of municipal solid waste prior to its incineration, and may include ferrous metals, glass, grit and fine organic matter. In the past, FEPR had been used in conjunction with landfill closure programs, but this is no longer a viable outlet. The FEPR waste stream has a strong negative impact on landfill capacity, since alternatives to landfilling this material stream do not readily exist. While some composting of FEPR has been done, the resulting product typically contains levels of heavy metals that restrict its use to landfill cover applications only.

The Maine Energy (ME) and Penobscot Energy Recovery Company (PERC) waste-to-energy facilities utilize 'Refuse Derived Fuel' technology, and generate front-end process residue (FEPR) as a by-product of their operations. Front-end process residue from both Maine Energy and PERC was disposed of at the Pine Tree Landfill, though a portion was delivered to other disposal facilities. The Regional Waste Systems (RWS) and Mid-Maine Waste Action Corporation (MMWAC) waste-to-energy facility incinerators utilize 'Mass Burn' technology, and do not produce FEPR.

Waste-To-Energy Facility Ash

The ash from waste-to-energy incinerators is categorized as a special waste and is required to be landfilled. The ash from the ME and PERC incinerators is buried at the commercial landfills, whereas the ash from RWS is buried in their own landfill and the ash from MMWAC is buried at the City of Lewiston's landfill. The four waste-to-energy facilities generated a total of 160,713 tons of ash in 2003 that was landfilled. This amounts to an increase from the 155,165 tons of incinerator ash landfilled in 2001. Fly ash and captured residues are typically combined with the 'bottom ash' from the facility's operation and landfilled.

Waste-To-Energy Material Process Overview

Figure 6 illustrates the impact of the waste-to-energy facilities, both in terms of MSW tonnage combusted and the by-products generated through their operations. Of the 857,428 tons of total MSW delivered to the W-T-E facilities, 502,835 tons was actually combusted.

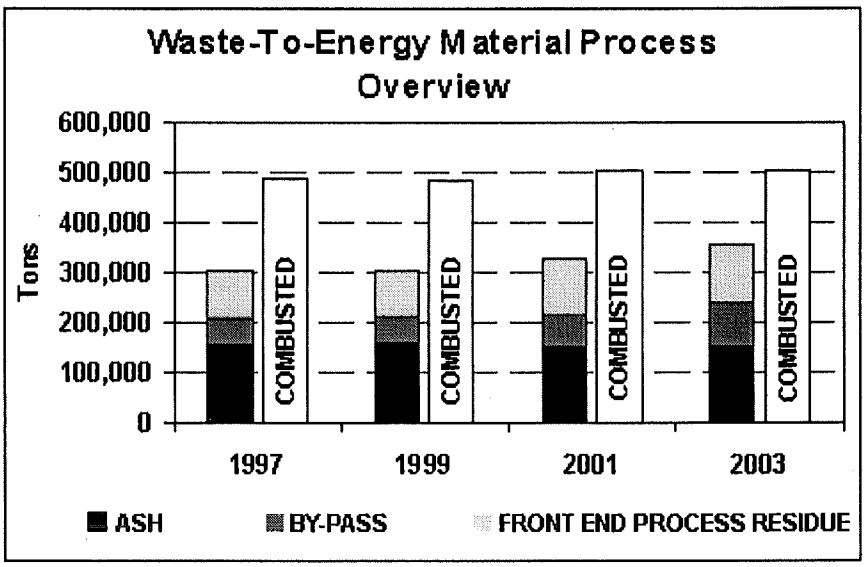

Figure 6

For the year 2003, this graph reflects the 76,391 tons of bypass waste; 117,488 tons of FEPR; and 160,713 tons of ash managed. 502,835 tons of MSW was combusted. This combustion produces approximately 435,000,000 k-Watt hours of electricity (enough to power over 72,000 households a year, or about 1 household in seven in Maine). (It would have taken about 30 million gallons of # 6 fuel oil to have produced a similar amount of electricity.) The residuals from the facilities' operation, 354,593 tons in total, required landfilling.

The four W-T-E facilities in Maine are being operated at close to maximum capacities and are providing both a product from the combustion of the MSW as well as a reduction of the MSW tonnage requiring disposal. Three of these facilities are at or close to their twentieth year of operation. While the facilities have been maintained, and upgraded operationally, throughout their useful life, it may be appropriate to consider what, if any, changes to the MSW management system in Maine would be needed should any of these facilities cease operations. While it is possible to continue operation of these facilities past their intended 30 year life, those decisions have not been made as of today. Perhaps as the result of new or improved MSW management options becoming available, or other concerns and issues, the W-T-E facilities may cease operations, possibly placing additional burdens on the then existing MSW management system.

C. Imported/Exported Municipal Solid Waste

Historical Record

In 1997, Maine's MSW imports and exports were equal, at 138,000 tons moving each way across the state line. During 1999, imported MSW tonnage totaled 168,709 tons (of which 140,039 tons were delivered to incinerators) while 91,274 tons were exported. In 2001, a total of 218,942 tons of MSW were imported and 77,765 tons were exported.

2003 Data

During 2003, a total of 446,958 tons of MSW were imported to Maine, while the State exported 156,994 tons.

MSW is considered a commodity under interstate commerce laws and as such is subject to fluctuations accruing to supply and demand at the regional level. Imported MSW and CDD tonnage, delivered primarily to the two largest waste-to-energy facilities and the Pine Tree Landfill, continue to rise, as do exports of MSW and CDD. Market conditions in any given year may lead to an imbalance that places additional burden on Maine's limited disposal capacity.

In 2003, two of the waste-to-energy facilities in Maine (ME and PERC) received 228,638 tons of out-of-state generated MSW. Approximately 75% of this tonnage was delivered to Maine Energy in Biddeford and the remaining 25% delivered to the PERC facility in Orrington. Additional out-of-state generated wastes disposed of in Maine were 218,087 tons of construction/demolition debris that was landfilled at the Pine Tree Landfill and 232 tons of construction/demolition debris that was buried at the Crossroads Landfill.

During 2003, Maine exported 75,408 tons of MSW and 81,586 tons of CDD primarily to landfills in New Hampshire and New Brunswick, Canada. Of the total 156,994 tons of MSW that was exported, 52% (81,586 tons) was construction/demolition debris.

VII. Analysis of Waste Disposal Capacity

The broad analysis of solid waste disposal capacity is based up these following factors:

- total statewide disposal capacity is considered
- continued growth in MSW generation rates
- continued operation of and reliance upon the four W-T-E facilities
- recycling efforts slightly increasing annually
- imports/exports remain at 2003 levels
- including the municipally-operated CDD facilities, and
- an 'in place' landfill weight of 0.75 tons per cubic yard of capacity

With these factors in mind, the total remaining in-state disposal capacity, as of the end of 2003, was approximately 7,100,000 cubic yards, which would provide disposal for about 5,325,000 tons of waste. With an annual municipal solid waste disposal requirement of approximately 800,000 tons, existing disposal capacity would be consumed within six-and-a-half years. Recognizing that of the date of this report, a year's worth of disposal capacity, for waste generated in 2004, would also have been consumed, leaving about five-and-a-half years of in-state disposal capacity remaining.

This reinforces the need for, and underscores the value of, the landfill in Old Town purchased by the State Planning Office in 2004, that would serve the disposal needs of the state. The additional capacity at that site, which has been approved by the DEP but at the time of this report was under appeal, would add another nine million cubic yards of disposal capacity to the state-wide total, or approximately seven to ten years of additional waste disposal capacity. Should the Old Town landfill effort be unsuccessful, the numbers indicate that the trigger for SPO submitting a report to the Legislature to develop Carpenter Ridge landfill site would soon be pending.

VIII. Analysis of how changes in available disposal capacity have affected or are likely to affect disposal prices

This report is to determine whether changes in available landfill capacity may have generated, or has the potential to generate supracompetitive prices. Supracompetitive is an adjective which, as applied to *'prices'*, means prices that are higher than they would be in a normally functioning, competitive market -- usually as a result of overconcentration, collusion or some form of monopolistic oppressive practice.

When the office determines that a decline in available landfill capacity has generated or has the potential to generate supracompetitive prices, it is directed to include this finding in its report and shall include recommendations for legislative or regulatory changes as necessary.

Findings and Recommendations:

The disposal capacity situation that exists in Maine, as of the time of this report, does not appear to have generated, nor does it appear to have the potential (within a few year's timeframe) to generate disposal fees that would be considered supracompetitive. The declining remaining disposal capacity at the Pine Tree Landfill is of some concern, but given that the State Planning Office has purchased the former Fort James Landfill in Old Town, for the benefit of disposing of Maine generated solid wastes, the concern is not an immediate one. The Maine Department of Environmental Protection has approved the necessary landfill license amendments to enable the intended state operation of the West Old Town Landfill but is awaiting final legal action on appeals filed against the Board of Environmental Protection. It is important to note that as part of the Operating Services Agreement that the State Planning Office has with Casella Waste Systems, the operator selected by the State for the landfill, ceiling prices have been established for tipping fees, which should serve to stabilize future tipping fee schedules.

Editor's note: it should be noted, however, that while municipally-operated landfills do report a 'safe window' of available disposal capacity, a number of them have raised, some substantially, their tipping fee during 2004 or have intentions to do so in 2005. The final tipping fees will be similar to, or higher than, publicly disclosed commercial disposal facility tipping fees.

IX. Reduction of Toxicity of MSW Requiring Disposal

Policy and Background

It is the policy of the State to pursue and implement an integrated approach to hazardous and solid waste management that reduces the toxicity of the waste at its source and throughout its management process. It is also one of the statutory responsibilities of the State Planning Office (SPO) to assist communities with the proper collection and disposal of household hazardous waste in coordination with overall waste and recycling management, within available resources.

Over the past several years, State and local governments have placed a strong emphasis on the reduction of toxics in the municipal solid waste stream. Efforts have been promoted and encouraged through a three-prong implementation program:

1) enact State bans on the disposal of certain products containing hazardous components;
2) encourage producers of mercury-added products, or have products that may be hazardous when disposed of to take back their products for recycling; and,
3) support municipal programs to manage these materials separately from the rest of the waste stream through funding of facilities and operations.

These steps, which are increasingly being adopted with each passing year, will result in better management of toxics and products with toxic components, protecting our health, environment and the people associated with the handling of our solid waste.

Rechargeable batteries were one of the first products designated as a 'required take back product', where the manufacturer of the product is responsible for managing their product at the end of its life. Rechargeable batteries were banned from disposal in the municipal waste stream in the late 1980's and the manufacturers were required to establish and operate a collection and return system for the used batteries.

Since then, the list has grown to include mercury-added products, as defined through 38 M.R.S.A. §1663 and §1666. As of July of 2002 for commercial and industrial generators, and effective January 1, 2005 for all residential waste generators, there is a disposal ban on placing any mercury-added product into Maine's municipal solid waste disposal stream. The list of mercury-added items that are banned from disposal includes all fluorescent lamps (regardless of mercury content), thermostats, thermometers, and any other mercury-added devices. There is presently no requirement for producer responsibility for recycling management costs of these items.

In addition, residentially generated electronic wastes (primarily television sets and computer monitors that contain cathode ray tube devices) are also to be banned from disposal effective January 1, 2006, as defined through 38 M.R.S.A. §1610. Commercial entities are already required to recycle these items.

Universal Wastes include: PCB containing lighting ballasts; Cathode Ray Tube (CRT) containing devices; fluorescent lamps; other lamps containing hazardous wastes; and, mercury-added devices from commercial sources.

Mercury-added Products Management

The State Planning Office (SPO) is directed to assist municipalities and other public entities with the management and recycling of waste mercury-added products, as well as with Universal Wastes and electronic wastes. This support has been provided through the furnishing of grant funds (with little or no 'match' required) to help municipalities construct storage facilities and implement programs to capture these mercury containing devices and Universal Wastes Initially, the SPO also established a state contract for a vendor to provide the collection and recycling of the mercury containing devices collected by a municipality. This contract was not continued, however, due to the number of businesses that became involved in offering management services and the pricing became very competitive.

Electronic Waste

Electronic waste, often referred to as 'e-waste,' is also subject to a disposal ban. The disposal ban applies to the following electronic devices: computer central processing units, cathode ray tubes, cathode ray tube devices, flat panel displays or similar video display devices with screens greater than four inches measured diagonally and that contains one or more circuit boards. Commercial and industrial generators of these wastes are currently prohibited from disposing of these items and are required to recycle them. Effective January 1, 2006, however, residential generators of these products are also prohibited from disposing of these devices and are required to recycle them.

The management of electronic waste is to be provided by the original equipment manufacturers, as described in 38 M.R.S.A. §1609. Municipalities are still responsible for providing the initial 'collection effort' for the residentially generated electronic waste items, but once the municipality has delivered those items to a 'consolidation facility', the equipment manufacturers are responsible for collection and recycling of those devices. This requirement is hoped to generate positive 'producer responsibility' on the part of the original equipment manufacturers in reducing the toxics included in the construction of these devices, and assuring recovery and recycling of used electronic wastes.

Household Hazardous Waste

Another state-wide effort underway through SPO is municipal support of programs directed at capturing and removing what is referred to as 'Household Hazardous Wastes' (HHW). Household Hazardous Wastes are items that are generated by households that are corrosive, toxic, ignitable, or reactive, and as such are hazardous to humans and/or the environment if disposed of improperly.

To date, HHW management efforts by municipalities have been primarily 'one-day collection events', where a licensed hazardous waste management company sets up and receives HHW from residents for only one day. These collection events have been both offered by single communities and part of regional efforts and have been conducted for many years. However, due to the costs of managing this relatively small portion of the municipal solid waste stream, many municipalities have been reluctant to regularly offer this service or to even offer the service at all.

In 2001, the Legislature's Natural Resources Committee directed the Bureau Remediation and Waste Management (DEP), in consultation with the SPO, to study and report on the costs associated with the collection of household hazardous waste (HHW). The Resource Economics and Policy Department at the University of Maine was selected for this research. The study looked at the costs and performance associated with four different collection scenarios: single site one day collection events; several small regional permanent facilities; a few large central permanent facilities coupled with possible mobile collections; and curbside or at the door collection service to residences. This study has been used in identifying possible regional permanent programs and facilities.

State furnished financial support

To date, the State Planning Office has awarded grant funds totalling nearly $800,000 to 63 public entities to aid in the construction of facilities that will serve as collection points for mercury containing products, Universal Waste and electronic wastes. In addition, the State Planning Office has awarded (8' x 12') prefabricated storage sheds to 36 public programs for the storage of mercury containing products and Universal Waste. These programs have the potential to serve an additional 55 communities over and above the communities served by the larger storage facilities.

To assist public programs with the operational costs associated with the furnishing of one-day HHW collection events, the Legislature allocated just over $400,000 in 2003 that will be distributed by the SPO to municipalities providing a HHW collection event.

Utilizing bond funds approved in 2002, regional groups and SPO are working towards the goal of establishing permanent household hazardous waste collection facilities that would be available to residents throughout the year. This type of program has been shown to increase the removal of HHW items from the municipal waste stream, providing additional safety to humans, the environment and people who work with solid waste.

Editor's note: In 2004 alone there were 22 one-day collections with 117 communities participating. The State Planning Office awarded grant funds to many of these programs to conduct the one-time collection events. We estimate that more then 75% of Maine's population has access to either an ongoing or one-day Universal Waste collection and recycling through their local municipal program.

X. Conclusions and Recommendations

The state has a fairly consistent solid waste management program, steadied upon existing municipal, state and commercial landfills, four waste-to-energy facilities, and strong commitment from the public and private sectors in recycling. Even though the solid waste infrastructure presently in place appears be able to provide for the proper management of state's solid waste, there are some aspects worth noting:

- implementation of current strategies in the management of municipal solid waste do not always support the solid waste management hierarchy, whether it is reuse, recycling, composting or incineration, over the landfilling of MSW. Where current policy accepts the responsibility for the management of wastes within state boundaries, efforts in the management of solid waste should reflect the hierarchy.

    - Recommendation: that the State continue recognition of this hierarchy and the following of the appropriate 'steps' when designing and implementing changes to solid waste management programs.

    - Recommendation: that the State conduct an economic review of the current cost of landfill disposal development and calculate the replacement cost in '2010 dollars' of landfill capacity that is unnecessarily consumed today.

- with the State's purchase of the Fort James landfill in Old Town, there is now sufficient disposal capacity to address the needs of the state well into the next decade.

    - Recommendation: that having the state rely upon a single disposal facility is not appropriate. The state should continue its efforts to identify, and where appropriate, acquire, additional supporting disposal capacity.

- waste reduction sits at the top of the waste management hierarchy. Waste reduction is defined as 'not generating waste'. By not generating solid waste in the first place, the need to dispose of waste is eliminated.

    - Recommendation: that the Office shall continue its education and information outreach efforts encouraging residents to adopt waste reduction strategies and actions as part of their everyday activities.

    - Recommendation: that the Office shall continue efforts with other agencies and states to encourage the business sector to adopt and implement waste reduction actions, both in terms of volume and toxicity.

- reuse, recycling and composting, as management alternatives, require constant support and endorsement from all levels.

- Recommendation: that the Office continue efforts in promoting 'reuse centers' across the state and encourage creation of new 'reuse centers', where local support is available.

- Recommendation: that the Office seek on-going bond funds to assist municipal recycling programs with expansion of services and additional material streams.

- Recommendation: that the Office continues efforts devoted to increasing the diversion of food residuals from the waste stream and the composting of those organics, along with other organic residuals at regional facilities.

- Recommendation: that the Office promotes the positive value that recycling provides: to the secondary materials market; in creating jobs and opportunities; decreases the tonnage of greenhouse gas emissions; and, decreases the need for disposal capability for those materials.

- identify the value and efforts of waste diversion activities, where waste may be utilized but not recycled *per se*, and is not required to be landfilled.

  - Recommendation: that the Office, along with other state agencies, continues promoting this type of solid waste management practice.

- implementation of programs and actions to reduce the toxicity of Maine's waste stream.

  - Recommendation: that the Office continues furnishing informational and educational assistance to municipalities on materials and products that are harmful to the people of Maine and their environment.

  - Recommendation: that the Office continues to seek on-going bond funds to assist municipal programs with the development of needed infrastructure to facilitate program development and implementation.

  - Recommendation: that the Office continue to seek on-going funds to assist municipal programs with operational expenses related to the providing of household hazardous waste, mercury containing products and Universal Waste management programs

- that encouraging manufacturers to consider the impact of their products at the 'end of their life' and adopt practices and processes to reduce possible health and environmental damages when designing such products.

  - Recommendation: that the Office continues working with other state agencies, organizations and multi-state efforts in convincing manufacturers of the importance of such decisions.

- the continuing increase in the tonnage of construction/demolition debris and bulky wastes being generated places additional demand on landfill disposal capacity. The lack of broad- based recovery and recycling options of these materials frustrates efforts to reduce the volume of this waste requiring disposal.

    - Recommendation: that the Office continues promotion of appropriate recovery methods and systems for these waste items. Growing demand within the biomass industry for processed CDD wood will also assist in creating a market for this product.

    - Recommendation: that the State continues review of the various components of this waste stream and propose appropriate management options, to reduce the opportunity for toxics to be released to the environment.

- encouraging municipalities to cooperatively address common solid waste management needs through regional programs and initiatives, to achieve improved economies of scale and efficiencies.

    - Recommendation: The state should continue to encourage regional cooperation among municipalities to create regional solid waste management programs. Furthermore the state should strengthen existing regional programs as a sound method of encouraging practices that support the waste management hierarchy.

- recognize that economics continue to play an increasing role in the selection and implementation of waste management practices and programs.

    - Recommendation: that the Office continues gathering and summarizing municipal solid waste program financial data to gain a better handle on specific program efficiencies that may be replicated within other programs.

- the continuing lack of management options for the Front-End Process Residue that is produced by the waste-to-energy facilities, that places additional demand on landfill disposal capacity.

    - Recommendation: that the Office works with the generators of FEPR to identify possible management options, other than landfilling, for this waste stream.

- There are five to six years of disposal capacity remaining, without consideration of capacity being sought at the state-owned landfill in Old Town. The anticipated additional capacity at that landfill, through the requested license amendment, would add another seven to ten years of state-wide capacity.

    - Recommendation: the Office does not foresee the immediate need to pursue development of the Carpenter Ridge Landfill.