

**State of Delaware**

**Residential Curbside Recycling**

**Report Documents**

**Prepared by:**

**Delaware Recycling Public Advisory Council**  
**Delaware Department of Natural Resources and Environmental Control**  
**Delaware Solid Waste Authority**

**January 24, 2005**



# Table of Contents

Section	Title
1.....	Memorandum of Agreement Report Summary
2.....	Response to Public Comments Received at the Recycling Public Advisory Council Workshops: “Bringing Curbside Recycling to Delaware”



**Memorandum of Agreement  
Report Summary**

**Statewide  
Residential Curbside Recycling  
Program**

Prepared by:

Delaware Recycling Public Advisory Council  
Delaware Department of Natural Resources and Environmental Control  
Delaware Solid Waste Authority

January 24, 2005



## **Executive Summary**

Recognizing the need to conserve our valuable resources, save dwindling landfill space, and promote active conservation throughout Delaware, former Governor Carper signed an executive order on September 14, 2000, creating the Governor's Recycling Public Advisory Council (RPAC). With the order, he also established a goal of diverting 30% of the residential solid waste stream for recycling. Under the leadership of Governor Ruth Ann Minner, the executive order has stayed in effect, and RPAC has been mandated to find ways to reach this goal. RPAC's primary responsibility is to advise the Department of Natural Resources and Environmental Control (DNREC) and the Delaware Solid Waste Authority (DSWA) on what measures are needed to achieve Delaware's goal for a convenient, yet cost-effective, comprehensive recycling program.

Currently, DSWA is responsible for managing the disposal of household waste through its system of landfills and transfer stations. DSWA also operates the voluntary statewide recycling drop-off program and the voluntary subscription curbside recycling program available in New Castle County. The drop-off system produces an auditable residential recycling rate of about 4 percent. The total municipal recycling rate is 22 percent, well below the national average of unaudited 28 percent and EPA's national goal of 35 percent.

RPAC entered into a Memorandum of Agreement (MOA) with DSWA and DNREC in January 2004 to evaluate the feasibility of implementing a statewide curbside recycling program in Delaware and the costs associated with such a program (curbside means the location where trash is normally set out whether it is the road, backyard, or curb). The MOA provided for additional assessments to be conducted jointly by the three organizations, culminating in specific recommendations for collecting and processing recyclables (including yard waste), recommendations on how to fund a statewide curbside program, and draft legislation to implement the recommendations.

These assessments reveal that achieving the 30% diversion goal will require both curbside recycling of residential recyclables and diversion of yard waste that is currently going into the landfills.

Key points of the draft legislation are as follows:

- All Delaware residents must keep their household recyclables and yard waste separate from their trash.
- Trash haulers must provide their customers with curbside recycling collection service either directly or through contract with a recycling collection company.
- The method of recycling would be preferably single-stream. This means that all recyclables (newspaper, phone books, magazines, white office paper, junk mail, corrugated cardboard, paperboard/boxboard, aluminum and steel cans, narrow-necked plastic bottles, and plastic bags) with the exception of yard waste would be placed in one container at the curb, or at the drop-off site. No separation of individual recyclables would be required. Estimated costs for this service are \$3 to \$7 per month per household;
- Glass would be excluded from the residential curbside recycling program because of potential problems that it poses in a single-stream collection system.
- Residents who haul their own trash must recycle by using the drop-off centers that would be available at DWSA's landfills and transfer stations. Most drop-off centers would be phased out as curbside recycling is implemented in each county.
- The oil recycling, household hazardous waste, and electronic goods programs will continue

to exist, but may be modified based on the reduction in the number of drop-off sites. Plastic bags will be a part of the curbside collection.

- DSWA would establish a Materials Recovery Facility (MRF) to process the recyclables and would also provide transfer stations in Kent and Sussex Counties to manage the recyclables collected in those parts of the state. A dedicated fund (generated by collecting a \$3 per ton waste assessment fee) must be established to offset DSWA's costs of operating the MRF and recyclables transfer operations when those costs exceed the value of the recyclables processed and marketed. This same fund would be used for education and enforcement.
- A fund (consisting of \$5,000,000 appropriated from General Funds) must also be established to assist municipalities with the start-up costs of implementing the program. This fund will sunset in 2008.
- Yard waste would be banned from disposal in the state's landfills. Homeowners would have the option of either managing their yard waste through such practices as composting, grass-cycling, and mulching or having the material removed by a collection service. Removal costs are projected to be \$3 to \$5 per month. Several low- or intermediate-technology composting facilities will be needed throughout the state to manage the collected yard waste. DSWA has agreed to manage the operation of yard waste recycling on public sites, if no other option is available.
- Minimum recovery rate for recyclable materials have been established at 30% for residential solid waste, and 40% for residential and commercial solid waste combined.

The benefits that Delaware would realize as a result of increased recycling would be significant and would include conservation of non-renewable natural resources and energy, extension of landfill life, and the return of valuable materials to the economic mainstream.

Recycling can play an important role in Governor Minner's Livable Delaware Initiative. Through conservation of our resources and proper management of our waste, we can make a dramatic change in Delaware's future landscape - both literally and figuratively.

It is anticipated that diversion of 30% of residential solid waste and 40% residential and commercial solid waste is an achievable goal, but it will require both curbside recycling and a ban on disposal of yard waste in landfills. Neither strategy alone will accomplish the goal. Some costs will be incurred in making the transition to this new recycling system. However, the monthly cost of curbside collection is small. Governor Minner, RPAC, DSWA, and DNREC are committed to expanding recycling throughout the State of Delaware. To do so, we will need the support and commitment of all Delawareans.

## **Introduction**

Recognizing the need to conserve resources, save landfill space, and promote a conservation ethic throughout the State of Delaware, former Governor Carper signed Executive Order No. 82 on September 14, 2000. The Order created the Governor's Recycling Public Advisory Council (RPAC) and established a goal of diverting 30% of the Residential Solid Waste (RSW) stream. RPAC's primary responsibility is to advise the Department of Natural Resources and Environmental Control (DNREC) and the Delaware Solid Waste Authority (DSWA) on what measures are needed to achieve this goal.

Under the leadership of Governor Ruth Ann Minner, Executive Order No. 82 has stayed in effect and RPAC has continued its efforts to find ways to reach the goal.

Over the past several years, RPAC has been evaluating various possible methods of managing the recyclable portion of the RSW stream. Based on these evaluations, RPAC has come to the following conclusion, which has significance for all Delaware residents: *Achieving the 30% diversion goal will require both curbside recycling of residential recyclables and diversion of yard waste that is currently going into the landfills.* In this case, the term curbside means that location where trash is normally collected from (i.e., the road, alley, backyard or other area).

In response to public and legislative interest in the recycling issue, in January of 2004 RPAC entered into a Memorandum of Agreement (MOA) with DSWA and DNREC to evaluate the feasibility of implementing a statewide residential curbside recycling program in Delaware and the costs associated with such a program. The MOA provided for additional assessments to be conducted jointly by the three organizations, culminating in specific actions for collecting and processing recyclables (including yard waste), recommendations on how to fund a statewide residential curbside program, and draft legislation to implement the actions. This report summarizes our actions. By January 2004, the final findings, recommendations, and draft legislation will be presented to the Governor and the General Assembly for their consideration.

## **Today's Situation**

Most residents in the state have curbside collection of refuse. In incorporated areas, such as cities or towns, the municipality provides trash service to its residents and pays for it through taxes. In unincorporated areas, residents must contract with a hauler on their own. There is very little incentive for residents to use the drop off program to recycle since they will pay the same for their trash service regardless.

DSWA is responsible for managing the disposal of household waste through its system of landfills and transfer stations. DSWA also operates the voluntary statewide recycling drop-off program and the voluntary subscription curbside recycling program available in New Castle County. Several of the waste haulers in New Castle County offer discounts to participants in the subscription recycling program.

Surveys indicate that the existing drop-off system is used by approximately 20 to 30 percent of the households in Delaware. According to a study conducted in New Castle County in 2003,

those people using the drop-off program manage to recycle 14 percent of all of the recyclable material available from households. The capture of 14 percent of the available recyclables yields a diversion rate of 4 percent of the total residential solid waste stream (all the garbage produced).

### **Economics of the Drop-Off Program**

Calculations are based on New Castle County (NCC) data.

State wide costs	\$3.6 million
NCC costs (approx. 64% of total)	\$2.4 million
NCC Tons Recyclables dropped off	12,700 tons
Cost per ton to collect and process recyclables	\$190.00/ton
Cost to residents to deliver recyclables to drop off <sup>1</sup>	\$ 60.00/ton

With an estimated 20 to 30 percent participation rate, the drop-off program costs are in the range of \$3 to \$5 per month per participating household. The drop-off program is not “free”, in spite of that appearance, and in fact the costs are very similar on a per-household basis to the cost of participating in a curbside collection program.

<sup>1</sup> See DSM Report *Evaluation of Enhanced Residential Waste and Recyclables Collection and Processing for New Castle County*, page 7

### **The Proposal**

Here are the main components of our proposal:

- All Delaware residents must keep their household recyclables and yard waste separate from their trash.
- The goal will be to achieve a 30% diversion rate for RSW and a 40% diversion rate for Municipal Solid Waste (MSW).
- Trash haulers must provide their customers with curbside recycling collection service either directly or through contract with a recycling collection company.
- Residents who haul their own trash must recycle by using the drop-off centers that will be available at DWSA’s landfills and transfer stations. All other drop-off centers will be phased out as curbside recycling is implemented in each county. (The oil recycling, household hazardous waste, and electronic goods programs will continue to exist but may be modified somewhat.)
- The method of recycling will be single-stream collection followed by processing at a Materials Recovery Facility (MRF). This means that all recyclables, with the exception of yard waste, are placed in one container at the curb or at the drop-off site. No separation of individual recyclables is required.
- DSWA will establish a MRF with a \$0 tip fee to process the recyclables.
- Residents will be entitled to utilize DSWA’s subscription curbside recycling service if they so choose.
- Yard waste must be either managed directly by the homeowner or removed in a collection service separate from household recyclables and trash.

## Why Should We Do This? Recycling Has Benefits!

Delaware should recycle more because, in the hierarchy of waste management options, recycling is preferable to disposal. Here are some of the benefits:

- Conservation of non-renewable natural resources
- Conservation of energy
- Extended landfill life
- Reduced long-term landfill liability
- Return of valuable materials to the economic mainstream
- Reduced greenhouse gas emissions
- Promotion of a conservation ethic

### *An Example: The Impact of Recycling on Delaware's Landfills:*

A 30% RSW recycling rate will result in an 18% reduction in total tonnage of materials landfilled (based on the estimate that RSW comprises 60% of MSW being landfilled, with commercial and industrial waste comprising the remaining 40%) thereby extending the useful life of these facilities. Table I below shows the impact that a 30% RSW recycling rate would have on each of the state's landfills:

<b>Table I</b>				
<b>Landfill Impacts From 30% RSW Recycling Rate</b>				
	<b>Cherry Island</b>	<b>Sandtown</b>	<b>Jones Crossroads</b>	<b>Statewide</b>
<b>Annual Landfilled Tons (2003)</b>	525,000	125,000	200,000	<b>850,000</b>
<b>RSW Portion of Landfilled Tons @ 60%</b>	315,000	75,000	120,000	<b>510,000</b>
<b>RSW Recycled @ 30%</b>	94,500	22,500	36,000	<b>153,000</b>
<i>Net Annual Landfilled Tons</i>	<i><b>430,500</b></i>	<i><b>102,500</b></i>	<i><b>164,000</b></i>	<i><b>697,000</b></i>
<b>Net Total Recycled</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>
<b>Current Design Life Expectancy in Years</b>	<b>20*</b>	<b>58</b>	<b>33</b>	<b>28.6</b>
<b>Design Life Expectancy With 30% RSW Recycling</b>	<b>23.6*</b>	<b>68.4</b>	<b>38.9</b>	<b>33.8</b>
<b>Design Life Expectancy With 40% MSW Recycling</b>	<b>28.0*</b>	<b>81.2</b>	<b>46.2</b>	<b>40.1</b>

\*Based on DSWA's application to DNREC for expansion of the landfill.

While a 30% to 40% recycling rate contributes significantly to landfill space savings, it is necessary to acknowledge substantial landfill capacity is still needed statewide to manage the remaining MSW. The amount landfilled statewide each year would still be over 500,000 tons even with a 40% recycling rate, based on 2003 numbers.

## **Recycling Also Has Costs**

Just as it costs money to collect and dispose of household trash, it costs money to collect and process recyclables. Sale of the recyclables can help offset the costs, but the market value of the recyclables is not sufficient to cover the cost of collection and processing.

The cost of collecting recyclables depends on a number of factors, including housing density, distance to the processing facility, the collection method, and the frequency of collection. The method of collection that we propose (single stream) is a key component in keeping the collection cost as low as possible.

In Delaware, costs will vary in different areas of the state. We anticipate that the monthly cost will fall within the range of \$3.00 to \$7.00 per household, very close to the cost per participating household of the existing drop-off program. It must also be noted that in areas where twice per week trash collection is provided it may be possible to provide curbside recycling at little or no additional cost by substituting one day of trash collection with recyclables collection.

These cost estimates were developed by the consulting firm DSM Environmental Services, Inc., which considered two different collection practices. In one system, trash and recyclables are picked up on different days of the week, thus making it possible for the hauler to use the same equipment for both collections. In the second system, trash and recyclables are picked up on the same day, meaning that additional equipment is needed. The first system results in the lower cost, but the second system would probably recover more material. A cost analysis of the two systems shows the following estimated costs per household:

### **Summary of Estimated Per-Month Household Costs for Residential Curbside Collection of Recyclables**

<b>County</b>	<b>Private Subscription (\$/month)</b>	<b>Organized Municipal (\$/month)</b>
<b>System 1</b>		
New Castle County	\$3.70	\$3.14
Kent County	\$2.82	\$3.72
Sussex County	\$4.09	\$2.75
<b>System 2</b>		
New Castle County	\$3.88	\$3.62
Kent County	\$6.38	\$4.20
Sussex County	\$7.71	\$3.85

(Note: These costs are in addition to the cost that private haulers charge for trash collection. It is possible that some trash haulers may reduce their customers' trash collection bills, since the customers will be setting out less trash for collection.)

Users of the existing DSWA RECYCLE DELAWARE drop-off program should note that the household cost of using the drop-off program is approximately 85 cents per month. Not included

in this amount is the cost of transportation by the user. For the estimated 65% of households that use the drop-off program from time to time (with an estimated 20 to 30 percent using the drop-off program regularly), the proposed curbside collection program will provide the convenience of curbside collection of recyclables while significantly increasing the quantity of recyclable materials recovered.

Municipalities that provide trash collection services to their residents or contract for those services can generally estimate the additional costs for the residential curbside collection system by multiplying the number of households served by the costs in the above table.

Other than collection costs, the primary costs of the proposed program are for construction and operation of a MRF to process the recyclables collected at a \$0.00 tip fee.

### **Collection of Recyclables**

#### ***Selection of a Model:***

Our objectives in choosing a recycling model for Delaware were to approve a program that will:

1. cause the least disruption in the current collection system for homeowners, municipalities and counties, private haulers, and state agencies;
2. afford the most options for municipalities and incorporated areas presently providing or coordinating collection within their boundaries;
3. maximize proper separation, collection, and disposition of recyclable materials from MSW;
4. minimize the cost impact on homeowners, municipalities and incorporated areas, businesses, and state agencies; and
5. allow for maximum use of the private sector to engage in the collection, processing, and marketing of recyclable materials, as required by Delaware law (7 Del. C. 64).

After reviewing and discussing a nationwide survey of residential recycling programs and closely scrutinizing three New Jersey programs, we selected three potential models of residential curbside recycling for possible applicability and adaptation in Delaware. The following is a brief discussion of each model considered.

1. **Pure Districting**

Under this model, Delaware would be divided into districts for collection of all household trash and recyclables. Municipalities, incorporated areas, and the existing Kent County “trash districts” would be able to operate as they do at present, with the added requirement to collect recyclable materials separate from trash, either through their contractors or through DSWA collection. By using a single entity for collection, unincorporated areas would benefit from reduced costs of collection (savings are in the range of \$2 to \$3/month for recyclables) and disposal. On the negative side, the bidding process for single-entity collection could eliminate a significant number of private haulers, who may not be able to compete due to economies of scale and lack of capitalization necessary to fulfill the all-inclusive "district" contracts. Legislation has been introduced in the past to create pure districting in Delaware, but has not passed. For these reasons, this model is not being recommended.

2. Recyclable Material Districting

This model takes advantage of the cost benefits of collection districts while providing less disruption to the current structure for trash collection. Recyclable material collection districts would permit municipalities to collect both MSW and recyclables, collect only MSW and contract with private providers for collection of recyclables, contract with private providers for all waste, or allow DSWA to provide the recyclables collection. Unincorporated areas would have the ability to create districts for collection of recyclables at a reduced cost. Private haulers who wish to enter into the recycling arena would be able to bid on individual districts, while those who lack the ability to engage in the dual collection would be able to continue to compete in the MSW market. There is a risk that smaller private haulers not desiring or able to compete for recyclables collection would eventually be displaced by larger companies that provide complete service for recyclables and trash collection. For this reason, this model is not being recommended.

3. Privatization

This model would place the requirement for collection on municipalities (and individual haulers that contract with municipalities), existing districts, and private homeowners. The cost of the program would be placed on the municipalities, existing districts, and homeowners. Under this approach, haulers would be required to provide the collection service for recyclables either directly or by contracting with another business to provide the service. Residents would be required to keep recyclables separate from trash and set them out for collection. DSWA would act as a backup curbside collection service provider. This model provides the least disruption to current collection practices, allows the private haulers to use the business model that works best for them, and, most importantly, allows the free market to work and establish the best pricing structure for the consumer through open competition. For these reasons, this model has been approved.

The “Privatization” model will best achieve the stated objectives in implementing a residential curbside collection program. It allows for a single-stream collection system (convenience and low collection costs) and the establishment of a statewide processing facility (MRF) to manage all curbside collected recyclables at no tipping fee. Haulers may deliver recyclables to the MRF or to any other recycling facility they choose.

***Materials to be Included in Curbside Collection:***

We approved the following recyclables to be collected in the initial statewide, curbside, residential single-stream system:

- Paper (newspaper, phone books, magazines, white office paper, junk mail, corrugated cardboard, and paperboard/boxboard);
- Cans (aluminum and steel); and
- Plastic (narrow-necked bottles and plastic bags).

We approved initially, that glass be excluded from the residential curbside recycling program for the following reasons: Glass often breaks during collection, transport, and processing. There is a concern that broken glass will contaminate other recyclables (especially paper), increase wear

and tear on equipment, and increase processing costs. In addition, as demonstrated in Tables III and IV on page 10, glass has a very low market value. Glass is an abundant and inert material, has no adverse impact on landfill operations, and arguably is the one recyclable material whose advantages of recycling are outweighed by the disadvantages. Glass is also losing market share as a container.

If conditions change to make glass a more attractive material to recycle, it can be added to the collection system at that time.

***Provision for Self Haulers:***

People who haul their own trash or who live in areas where curbside trash collection is not available will not be required to recycle at the curb. However, they will still be required to recycle, by means of drop-off centers at DSWA landfills and transfer stations. These drop-off centers will also be single stream; therefore, all homeowners will be able to collect all of their recyclables in one container.

***Phase-in Schedule:***

The curbside service would be implemented in New Castle County first, expanding to Kent and Sussex Counties one year later.

**Separation and Marketing of Recyclables**

Our proposed model would require the development of a facility capable of separating the recyclable materials (collected in a single-stream system) into their individual components and preparing them for market. DSWA will develop such a facility at its Pigeon Point location in Wilmington. This site has ample space for installation of the necessary processing equipment as well as space to store the recyclables. DSWA will also provide transfer stations in Kent and Sussex Counties to manage the recyclables collected in those parts of the state.

There will be no tipping fee at the MRF or the transfer stations for recyclable materials delivered to those facilities.

***Recyclables in the RSW Stream:***

In 2003, on behalf of RPAC, DNREC contracted with DSM Environmental Services, Inc., to estimate the quantities of recyclables that could be recovered using various collection options and the costs of implementing those options. Using waste composition data reported by Franklin Associates in an assessment conducted for DSWA in 2002, and adjusting the data for New Castle County (based on population), DSM generated categories of recyclable materials that would be expected to be collected in a curbside program. Similar data were subsequently obtained for Kent and Sussex Counties using population data from the 2000 census. The results of these assessments are portrayed in Table II.

DSM reported that a typical curbside collection program would capture, on average, 65% of the available recyclable materials. This figure is based on data from other established curbside programs throughout the country, which show that initially about 80% of the people participate, and they set out about 80% of their available recyclables (the capture rate is calculated by

multiplying the participation rate by the percentage of available recyclables that they set out). Factors that influence the capture rate are: whether or not there is a mandate for recycling, the level of education provided regarding the program, and the level of enforcement and penalties imposed for non-compliance. As these programs mature, capture rates increase; and Delaware is expected to experience an increased capture rate as well.

For Delaware, a 65% capture rate will yield an overall RSW recycling rate of about 12.75%, as compared to the 4% rate being achieved with the current drop-off system. This represents 65,000 tons of materials collected, which is 3 times more material than is currently collected in the voluntary drop-off program and collected in the voluntary curbside subscription service for recyclables currently conducted in New Castle County.

<b>Materials Considered</b> <b>Curbside Recyclable</b>	<b>Generation</b>			
	<b>Statewide</b>	<b>New Castle</b>	<b>Kent</b>	<b>Sussex</b>
<b>PAPER</b>				
<b>ONP: News, Mags, Phone Bks</b>	<b>34,210</b>	<b>21,894</b>	<b>5,474</b>	<b>6,842</b>
<b>Junk Mail</b>				
Office Papers	3,050	1,952	488	610
Third Class Mail	9,950	6,368	1,592	1,990
Other Commercial Printing	11,700	7,488	1,872	2,340
<b>Total Junk Mail</b>	<b>24,700</b>	<b>15,808</b>	<b>3,952</b>	<b>4,940</b>
<b>Cardboard</b>	<b>9,800</b>	<b>6,272</b>	<b>1,568</b>	<b>1,960</b>
Boxboard				
Folding Cartons	9,360	5,990	1,498	1,872
Other Paperboard Packaging	350	224	56	70
Bags and Sacks	4,230	2,707	677	846
<b>Total Boxboard</b>	<b>13,940</b>	<b>8,922</b>	<b>2,230</b>	<b>2,788</b>
<b>TOTAL PAPER</b>	<b>82,650</b>	<b>52,896</b>	<b>13,224</b>	<b>16,530</b>
<b>BOTTLES AND CANS</b>				
Glass Bottles	21,580	13,811	3,453	4,316
Steel Cans	6,460	4,134	1,034	1,292
Aluminum Cans and Foils	3,235	2,070	518	647
Plastic Bottles: PET	3,974	2,543	636	795
Plastic Bottles: HDPE	4,017	2,571	643	803
<b>TOTAL BOTTLES AND CANS</b>	<b>39,266</b>	<b>25,130</b>	<b>6,283</b>	<b>7,853</b>
<b>Total, All Recyclables</b>	<b>121,916</b>	<b>78,026</b>	<b>19,507</b>	<b>24,383</b>
<i>Percent of Available Recyclables</i>	<i>100%</i>	<i>64%</i>	<i>16%</i>	<i>20%</i>
<i>Percent of Total Residential Solid Waste</i>	<i>24%</i>	<i>15%</i>	<i>4%</i>	<i>5%</i>

\* Based on data collected for the year 2000.

**MRF Economics**

Contrary to the views of many, the value of recyclable materials will not support a recycling program. There will be a cost borne by homeowners and businesses for the collection and processing of recyclable materials.

The value of recyclable materials is subject to global controls that impact regional market outlets. Historical pricing has a volatility that creates wide pricing spreads (highs and lows). A review of short-term (18 months) and long-term (44 months) pricing is provided below for the recycled materials that DSWA currently markets. Table III provides the short-term pricing analysis, and Table IV provides the long-term pricing analysis:

<b>Table III</b>										
<b>DSWA Recycling Markets Short Term Historical Pricing (From Aug. 2002 Through Jan. 2004)</b>										
<b>Statistical Analysis Data (\$/Ton)</b>										
	<b>Alum.</b>	<b>Stl Cans</b>	<b>Br. Glass</b>	<b>Gr. Glass</b>	<b>Cl. Glass</b>	<b>Cdbrd.</b>	<b>Plas.</b>	<b>ONP</b>	<b>Off. Ppr.</b>	<b>Junk Mail</b>
Mean	1,000.7	55.6	10.0	0.0	20.0	50.9	102.9	35.3	72.6	38.5
Std. Dev.	46.61	16.24	0.00	0.00	0.00	20.53	23.64	8.08	16.16	3.76
Min.	900	38	10	0	20	10	70	24	60	35
Max.	1100	100	10	0	20	80	150	46	95	45

<b>Table IV</b>										
<b>DSWA Recycling Markets Long Term Historical Pricing (From July 99 Through January 2004)</b>										
<b>Statistical Analysis Data (\$/Ton)</b>										
	<b>Alum.</b>	<b>Stl Cans</b>	<b>Br. Glass</b>	<b>Gr. Glass</b>	<b>Cl. Glass</b>	<b>Cdbrd.</b>	<b>Plas.</b>	<b>ONP</b>	<b>Off. Ppr.</b>	<b>Junk Mail</b>
Mean	967.0	43.2	15.8	2.0	23.4	58.9	85.1	29.0	73.8	38.5
Std. Dev.	67.73	19.95	7.91	2.55	4.47	28.63	32.79	10.60	19.24	3.76
Min.	855	3	10	0	16	10	37	15	25	35
Max.	1100	100	28	5.5	30	118	155	48	110	45

By using the statistical mean for each of the recycled materials for the short-term pricing and applying it to estimated statewide tonnages, a prediction of annual revenues can be derived. Table V provides a projection of the overall revenue that would be realized if 100% of the available recyclables were captured and a projection of the revenue realized if 65% of the available material is captured.

<b>Table V</b>					
<b>Estimated Annual Recyclables Generation from RSW</b>					
<b>Materials Considered</b>	<b>Short Term Mean Value</b>	<b>Statewide (100%)</b>		<b>Statewide (65%)</b>	
<b>Curbside Recyclable</b>		<b>Tons</b>	<b>Revenue</b>	<b>Tons</b>	<b>Revenue</b>
<b>PAPER</b>					
<b>ONP: News, Mags, Phone Bks</b>	<b>35.3</b>	<b>34,210</b>	<b>\$1,208,753</b>	<b>22,237</b>	<b>\$785,690</b>
<b>Junk Mail</b>					
Office Papers	72.6	3,050	\$221,294	1,983	\$143,841
Third Class Mail	38.5	9,950	\$382,692	6,468	\$248,750
Other Commercial Printing	38.5	11,700	\$450,000	7,605	\$292,500
<b>Total Junk Mail</b>		<b>24,700</b>	<b>\$1,053,987</b>	<b>16,055</b>	<b>\$685,091</b>
<b>Cardboard</b>					
<b>Cardboard</b>	<b>50.9</b>	<b>9,800</b>	<b>\$498,711</b>	<b>6,370</b>	<b>\$324,162</b>
<b>Boxboard</b>					
Folding Cartons	38.5	9,360	\$360,000	6,084	\$234,000
Other Paperboard Packaging	38.5	350	\$13,462	228	\$8,750
Bags and Sacks	38.5	4,230	\$162,692	2,750	\$105,750
<b>Total Boxboard</b>		<b>13,940</b>	<b>\$536,154</b>	<b>9,061</b>	<b>\$348,500</b>
<b>TOTAL PAPER</b>		<b>82,650</b>	<b>\$3,297,605</b>	<b>53,723</b>	<b>\$2,143,443</b>
<b>BOTTLES AND CANS</b>					
Steel Cans	55.6	6,460	\$359,068	4,199	\$233,394
Aluminum Cans and Foils	1000.7	3,235	\$3,237,311	2,103	\$2,104,252
Plastic Bottles: PET	55.6	3,974	\$220,888	2,583	\$143,577
Plastic Bottles: HDPE	55.6	4,017	\$223,278	2,611	\$145,131
<b>TOTAL BOTTLES AND CANS</b>		<b>17,686</b>	<b>\$ 4,040,545</b>	<b>11,486</b>	<b>\$ 2,626,355</b>
<b>Total, All Recyclables</b>		<b>100,336</b>	<b>\$ 7,338,151</b>	<b>65,218</b>	<b>\$ 4,769,798</b>

At the anticipated 65% capture rate excluding glass and using recent recyclables values, recyclables revenue is estimated at about \$4,800,000. Taking the cost of statewide transportation of recyclables to the MRF and MRF processing cost into consideration, MRF operations should be nearly covered by the value of the recyclables. As recyclables values fluctuate, the MRF may operate at a loss or a small profit.

### **Funding**

Costs for establishing and operating curbside collection programs and processing facilities get passed through to the users by various means, depending upon the program. These costs may be covered by general operating funds, special assessments by state and/or local governments, or contracted costs between private haulers and homeowners.

We approved the concept and recommend that State of Delaware General Funds be made available in the form of grants to municipalities to cover startup costs. These funds would be phased out over a period of time, with the intent that municipalities would be self-sustaining in the future. The funds would be authorized as a one-time appropriation, primarily for equipment startup, with grant approval by DNREC and DSWA. RPAC will continue serve in an advisory capacity regarding municipal grant prioritization and selection, just as they currently do for DNREC's Recycling Assistance Grant Program.

We also approved the concept and recommend that a dedicated fund be established to offset DSWA's costs of operating a MRF when those costs exceed the value of the recyclables processed and marketed. This fund would also cover the costs of outreach and education, recycling studies and planning, and enforcement of the residential program. The source of the funds would be a per-ton waste-end assessment on all solid waste (excluding recyclable materials) collected in Delaware. Assessments for the fund would be collected by the Delaware Division of Revenue, and the fund would be administered by the Secretary of Finance. The amount of the assessment would be set to cover the costs of the MRF operation, education, studies and planning, and enforcement, and is not expected to exceed \$3 per ton.

### **Yard Waste Proposal**

A recycling rate of 12.75% still leaves us with a considerable challenge if we are to reach the 30% goal of RSW recycling. The difference must be made up by diverting the other major component of RSW: yard waste. We approved that Delaware adopt a strategy that has proved successful in many states in diverting yard waste from disposal facilities: a ban on the landfilling of yard waste.

By DSM's estimate, instituting such a ban will reduce the amount of material going into our landfills by more than 100,000 tons per year, enabling us to achieve the 30% diversion goal (assuming that the curbside recycling program is also implemented). Approximately 30% of the diverted yard waste would be managed on the property where it originated, through such practices as composting, grasscycling, and mulching. Additional facilities will be needed to handle the remaining material. We approved the recommendation that several low- or intermediate-technology facilities be constructed and operated throughout the state to provide localized service. Such new yard waste recycling centers should be located on public property accessible to the public and to collectors when and where the private sector is unable to manage this material. DSWA has agreed to manage the operation of these public sites if no other option is available. The new yard waste recycling centers would not replace existing public and private facilities and would be funded through tipping fees.

The following table shows a pre-ban and post-ban estimate of the yard waste:

**Table VI (1)  
Annual Delaware Yard Waste Recycling (In Tons)**

	<b>Total</b>		<b>Residential (90% of Total)</b>	
	Pre Yard Waste Ban	Post Yard Waste Ban	Pre Yard Waste Ban	Post Yard Waste Ban
Yard Waste mixed w/ MSW & Disposed In DSWA Landfills	95,600	31,000	86,040	27,900
New offsite Yard Waste recycling	0	45,200	0	40,680
New onsite Yard Waste recycling*	0	19,400	0	17,460
Yard Waste diverted, mulched and used at DSWA Landfills	4,500	4,500	4,050	4,050
Yard Waste diverted through Municipal and Private mulching	45,724	45,724	41,152	41,152
<b>Total Yard Waste Generated</b>	<b>145,824</b>	<b>145,824</b>	<b>131,242</b>	<b>131,242</b>
<b>Total Yard Waste recycled</b>	<b>50,224</b>	<b>114,824</b>	<b>45,202</b>	<b>103,342</b>
% of Yard Waste recycled	34%	79%	34%	79%

\* Onsite recycling includes homeowner/business use of mulching mowers and on-site composting.

(<sup>1</sup>)DSM “Yard Waste Ban” Report, September 15, 2004

The anticipated cost to homeowners who choose to contract for the collection of their yard waste would be in the range of \$3 to \$5 per month.

**Other Important Components to Consider**

***Education***

Education is crucial to the success of both the residential curbside collection of recyclables and the yard waste landfill ban. We approved a joint effort be undertaken to identify what is needed to create an ongoing and successful educational program. Currently, both DSWA and DNREC have educational programs promoting recycling in Delaware, with DSWA having specific educational outreach programs that promote its statewide drop-off recycling centers and its subscription curbside recyclables collection service. RPAC, DSWA, and DNREC, municipalities, and the private sector need to coordinate efforts to educate and promote the statewide program. Funding for education initiatives would be provided through the waste-end assessment fee. Education will occur through all forms of media as well as cooperative efforts with municipalities and the waste hauling industry.

***Enforcement***

In addition to operational, logistical, and cost considerations, a successful program requires an effective enforcement mechanism. This mechanism must clearly set forth the requirements and sanctions. Enforcement should be exercised only after:

1. the implementation of the education efforts, including notifications and warnings;
2. a grace period for compliance; and
3. follow-up referral for formal enforcement action in extreme cases

DSWA and DNREC would provide enforcement resources for the residential recycling program. DSWA would provide the first-step effort in identifying compliance problems and using educational means of obtaining compliance. DNREC would receive referrals from DSWA and others to deal with chronic enforcement cases through use of its civil and criminal enforcement authority.

### ***Reporting and Performance Measurement***

The performance of the residential curbside collection and yard waste recycling programs must be measured against the goals set for the program. The quantity of recyclable materials collected, processed, and marketed must be measured and reported properly if a reasonable estimate of program effectiveness is to be made.

We approved that an effective measurement system be developed through use of a qualified and experienced consultant.

RPAC will continue to serve in its advisory capacity to DNREC and DSWA to ensure that any specific recycling goals and objectives are being met.

### ***Commercial Sector Recycling***

A significant portion of MSW is generated by the commercial sector. Waste characterization studies estimate that Commercial Solid Waste (CSW) comprises about 40% of the MSW generated in Delaware.

We established a 40% recycling goal statewide for MSW, which includes RSW and CSW. We further approved that RPAC be authorized to commission a detailed study of the commercial waste sector to estimate the quantities of recyclables generated and recycled by business and industry in Delaware and to recommend measures to achieve the 40% diversion goal. The funding for the study would be provided through the waste-end assessment fee. The commercial sector will be encouraged to participate in this study.

### **Public Participation**

RPAC held four public meetings in November to present the proposal to the public and receive comments prior to developing the draft legislation. The meetings were held November 4, 2004, at the Dover Sheraton; November 8, 2004, at the Rehoboth Convention Center; November 16, 2004, at the Caravel Building, Wilmington; and November 17, 2004, at the Embassy Suites, Newark. People were requested to sign in but did not have to unless they wished to comment or ask a question. After a brief presentation on the proposal, those who had signed in and indicated they wished to speak were called on to make their comment or ask their question. A court reporter recorded all public comments and questions at the four meetings. A comprehensive

summary and response to the comments is attached and is also available for review on DNREC's web site at <http://www.dnrec.state.de.us/dnrec2000/Recycling.asp>.

Three recurring issues were raised at the meetings:

- Delawareans support recycling and agree we need to recycle more;
- Cost to the customer was a concern with several suggestions being made on ways to reduce costs and;
- Glass should not be excluded, and the drop-off program should continue in a reasonably convenient fashion for those that will continue to use it.

### **Conclusions**

- Recycling is an important part of waste management.
- A 30% RSW diversion rate is achievable in Delaware, but it will require both curbside recycling and a ban on disposal of yard waste in landfills. Neither strategy alone will accomplish the goal.
- The approved recommendations in this report have been developed with specific attention being paid to the current waste management situation in Delaware. An attempt has been made to preserve the free market trash collection system and to minimize the program's impact on any sector of the population.
- We anticipate that the monthly cost of curbside collection of recyclables will be in the range of \$3.00 to \$7.00 per household.
- For residents who choose to have their yard waste removed from their property, we anticipate a cost of \$3.00 to \$5.00 per month. Our proposal provides for an education program to teach homeowners how to manage their yard waste at home.
- RPAC, DSWA, and DNREC are committed to expanding recycling throughout the state. In order to do so we will need the support of all Delawareans.

## *Glossary of Waste Management Terms*

---

**Commercial/Industrial Solid Waste** means waste generated by stores, offices, restaurants, warehouses, industry and manufacturing.

**Composting** means the process by which organic material is decomposed to a stable point so that it can be safely used as a soil amendment, conditioner, or additive.

**Discards** include the solid waste remaining after recycling and composting. These discards are mainly disposed of in landfills or combusted, although some waste is littered, stored, or disposed on site, particularly in rural areas.

**Diversion** of materials from disposal may be accomplished through source reduction and recycling (including composting). (*Note: this term is synonymous with **waste reduction**.*)

**Generation** refers to the amount of materials and products that enter the waste stream before recycling (including composting), landfilling, or combustion takes place. (*Note: MSW is considered to have been generated if it is placed at curbside or in a receptacle such as a dumpster for pickup, or if it is taken by the generator to another site for recycling or disposal.*)

**Grasscycling** means using a mulching mower (or not) and leaving the grass clippings on the lawn. Grass clippings quickly decompose and add organic content and nutrients to the soil.

**Landfill Avoidance** refers to those activities (i.e., resource recovery and combustion) that reduce the amount of waste generated that ultimately gets landfilled.

**Materials Recovery Facility (MRF)** means a facility in which recyclable and reusable materials are recovered, by either hand sorting, mechanical processing, or a combination thereof.

**Municipal Solid Waste (MSW)** includes durable goods (excluding vehicles and other moving equipment), nondurable goods, containers and packaging, food scraps, yard trimmings and miscellaneous inorganic waste from residential (single- and multi-family households) and non-residential (commercial, institutional and industrial) sources. MSW does not include construction and demolition debris, vehicle bodies, municipal sludges, combustion ash, industrial process wastes, and trees and brush from parks, streets or power line trimmings that might also be disposed in municipal solid waste landfills

**Recovery of materials** means removing certain materials/products from the waste stream for the purpose of recycling (including composting).

**Recyclable materials** refers to the portion of the waste stream that can be separated from the waste stream and managed through the process of recycling.

**Recycling** refers to materials that would otherwise be discarded and includes any of the activities necessary for a recovered material to be used in a new product. Recycling involves any and all

of the following steps: separating, collection, processing, market or free distribution, remanufacturing (if done), and purchase/use by a consumer. Excludes the use of these materials as a fuel substitute or for energy production.

**Residential solid waste (RSW)** consists of wastes that fall within the following categories and that are generated by the residential sector (single- and multi-family dwellings).

Durable goods

Major appliances  
Furniture and furnishings  
Small appliances and carpets and rugs  
Rubber tires  
Lead-acid batteries  
Miscellaneous durables  
(e.g., consumer electronics, luggage, sporting equipment)

Containers and Packaging

Glass packaging  
Metal packaging  
Paper and paperboard packaging  
Plastics packaging  
Wood packaging  
Other miscellaneous packaging

Nondurable goods

Old newspapers  
Old magazines  
Office papers  
Disposable diapers  
Clothing and footwear  
Other nondurable goods (e.g., books, junk mail, tissue paper and paper towels, paper and plastic plates and cups, other nonpackaging paper, trash bags, sheets, and towels)

Other Wastes

Food waste  
Yard trimmings  
Miscellaneous inorganic wastes

**Resource Recovery** means removing certain materials/products from the waste stream for the purpose of recycling (including composting), reuse, or energy production.

**Reuse** refers to the use of a product or component of MSW in its original form more than once. Examples include refilling glass or plastic bottles, using corrugated or plastic containers for storage, and returning milk crates.

**Source reduction** refers to those activities that reduce the amount or toxicity of wastes that enter the municipal solid waste management system. Reuse of products such as refillable glass bottles, reusable plastic food storage containers, or refurbished wood pallets are examples of source reduction. Management of yard trimmings at home is another example of source reduction.

**Tipping fee** – a fee charged by a waste management facility, usually on a per ton basis, to accept a given waste (trash, recyclables, yard waste) for processing or disposal.

## **Acronyms**

CSW – Commercial Solid Waste

DNREC – Department of Natural Resources and Environmental Control

DSWA – Delaware Solid Waste Authority

MOA – Memorandum of Agreement

MRF – Materials Recovery Facility

MSW – Municipal Solid Waste

RPAC – Recycling Public Advisory Council

RSW – Residential Solid Waste



**Responses to Public Comments Received at the  
Recycling Public Advisory Council Workshops:  
“Bringing Curbside Recycling to Delaware”**

**Prepared for:**

**The Governor’s Recycling Public Advisory Council**

**Prepared by:**

**State of Delaware**  
**Department of Natural Resources & Environmental Control**  
89 Kings Highway  
Dover, DE 19901  
302-739-3689

January 4, 2005



**Workshop presentations givenby: Paul Wilkinson, Chair, Recycling Public Advisory Committee**

**Thursday, November 4, 2004**  
**Dover Sheraton**  
**Dover, Delaware**

Number of people signing in: 20  
Number of people commenting: 16

**Monday, November 8, 2004**  
**Rehoboth Beach Convention Center**  
**Rehoboth Beach, Delaware**

Number of people signing in: 46  
Number of people commenting: 23

**Tuesday, November 16, 2004**  
**Carvel State Building**  
**Wilmington, Delaware**

Number of people signing in: 35  
Number of people commenting: 17

**Wednesday, November 17, 2004**  
**Embassy Suites**  
**Newark, Delaware**

Number of people signing in: 82  
Number of people commenting: 32

Number of people providing comment by e-mail, telephone, and mail: 43

---

*1. The program cost could be a burden for some people.*

Response: Many people commented that the cost of the program would be a burden for them or someone they know. At this point, we don't know exactly how much it will cost, but based on analyses performed by experts in the field of trash and recycling management, we project that it will be between \$3.00 and \$7.00 per month. Residents in municipalities (living within town or city limits) where trash pickup is paid for through property taxes will probably pay less than those in unincorporated areas because municipal residents will benefit from the more advantageous economics that result when a single hauler services all of the households in a community. Residents that haul their own trash, while also being required to recycle, will see no monthly fee since they will drop off their recyclables free of charge at the landfill or transfer station where they deposit their trash.

Minimizing the cost of curbside recycling and maximizing the recovery of recyclable material were the primary considerations in designing the proposed program. The proposed single-stream pickup would make it easy and relatively inexpensive for the haulers to collect the recyclables, since they can use existing trucks and can pick up the recyclables as quickly as they pick up trash. High public participation is anticipated due to the minimal effort required by the homeowner to participate. Haulers that realize savings on landfill costs, by being able to take recyclables to the Materials Recovery Facility (MRF) at no cost, may pass some of these savings on to their customers. This is already happening in New Castle County, where several haulers offer discounted trash collection to those customers who sign up for the DSWA's subscription curbside recycling program. This discount helps to offset the cost of the recycling service.

The projected monthly cost comes from a report prepared for the Recycling Public Advisory Council (RPAC) by DSM Environmental Services, Inc., a consulting firm hired to study the feasibility of curbside recycling in Delaware, in anticipation of this effort. In the report, titled "Evaluation of Enhanced Residential Waste and Recyclables Collection and Processing for New Castle County," DSM concluded that a residential single-stream once-a-week collection of recyclables would yield the lowest cost per ton and the highest recovery of material. The study is available on DNREC's web site, [www.dnrec.state.de.us/DNREC2000/Recycling.asp](http://www.dnrec.state.de.us/DNREC2000/Recycling.asp), under the name "New Castle County Recycling Study".

Another aspect of this issue is the unseen savings attributable to recycling. Extended landfill life, less air and water pollution, and energy savings are some of the benefits that cannot be directly calculated but will accrue in the future as a result of increased recycling. By recycling, we are taking responsibility for our waste today, as opposed to putting it into landfills that may be potential environmental liabilities

for generations to come. The proposed program would remove as much as 400,000 tons per year of the nearly 1,000,000 tons per year that is being disposed.

2. Other places have implemented curbside recycling at no additional cost to residents. We should be able to do the same.

Response: The consultant that conducted the cost study of enhanced recycling in New Castle County concluded that, with implementation of the most efficient and economical model possible, curbside recycling could be provided at no additional cost to residents in unincorporated areas of New Castle County and at very little additional cost to residents of municipalities. Unfortunately, that model would involve trash districting, a concept that has been raised in the past and failed legislatively.

Where residents currently receive twice-a-week trash collection, there is the potential to add recycling at little or no cost by switching to once-a-week trash and once-a-week recyclables pickup; however, residents in unincorporated areas currently receiving once-a-week trash collection will likely incur a cost in the range of \$3 to \$7 per month per household for an added curbside recycling service.

3. Why should we pay for curbside when we can recycle at the drop-off program for free?

Response: With a per-household per-month fee of \$0.85 assessed by the DSWA to support the existing drop-off program, it is not free. Additionally, since there is only an estimated 20% participation rate in the drop-off program, the non-users are in essence paying \$4.25 per month for each participant. These figures do not include the participants' costs in gas, mileage, and time to participate in the drop-off program. The drop-off program is not "free," nor will it achieve the 30 percent diversion goal. This, coupled with the fact that, all things considered, drop-off costs are similar to curbside costs, it is necessary to implement a curbside recycling program in order to achieve the 30 percent residential and 40 percent municipal goal.

4. Why does the proposal include subsidies for municipalities and not private haulers?

Response: The proposal includes money to reimburse municipalities for initial expenditures toward equipment to implement curbside pickup of recyclables. It would only be for municipalities that collect their own trash and it could only be used to buy additional equipment for recyclables collection. Most municipalities are running on a tight budget, and we felt that it would be overly burdensome to require them to purchase additional equipment without some offset. Private haulers, on the other hand view this as a business opportunity, and we believe the free market and open competition without subsidy should dictate the cost. In addition, a hauler who does not want, or is not able, to pick up the recyclables can arrange for another company or DSWA to provide that service.

5. Money for municipalities should be in the legislation and should be ongoing to help municipalities finance the program.

Response: The Municipal Assistance Fund is proposed to sunset in 2008. With start-up help, the municipalities should be able to incorporate future expenses into their budgets without an on-going subsidy.

6. The proposal should include a provision for Pay-As-You-Throw pricing.

Response: Pay-As-You-Throw (PAYT) is a system of garbage collection whereby each household is charged according to the amount of trash that it sets out, rather than having everyone pay the same amount regardless of generation. This type of system is being used in many communities throughout the country, in various forms, and is an effective incentive for people to reduce their trash. Self haulers in

Delaware are charged on a PAYT basis, since they pay for each bag of trash that they dispose of. However, PAYT does not lend itself well to implementation on a statewide basis. The State is not involved in collection of waste and does not control the manner in which trash collection customers are charged for the service. Some residents pay through their local taxes; others contract with a private hauler and are billed by that hauler. Those entities that perform and receive payment for the service – the municipalities and private haulers – are the ones that can implement PAYT collection. Homeowners who desire PAYT should negotiate with their private haulers for this feature and petition their municipalities to implement PAYT. Nothing in our proposal would prevent this.

7. Why is glass not a part of the curbside collection program?

Response: One of the most frequently heard comments concerned glass, and people’s desire to continue recycling this material. The reason for the decision to omit glass from curbside collection, at least initially, goes back to the collection method. With single-stream collection, all recyclables are placed into one container and subsequently loaded into one truck. It would be impossible to prevent glass from breaking during this process, and broken glass has the potential to contaminate the other recyclables (especially paper and plastic), thereby potentially lowering the value and the recyclability of these materials. In addition without glass haulers can use the same equipment to collect trash as they use to collect recyclables making single stream a more efficient collection option.

We also heard from the Glass Packaging Institute and from a recycler who handles glass. They emphasized the environmental benefits of recycling glass, the continuing importance of glass as a packaging material, the proximity to Delaware of markets for clean cullet, and the fact that many recycling programs around the country include glass in their single-stream collection system.

At this time, it is unclear whether or not glass is problematic in single-stream collection systems. We have chosen to leave it out of our system until there is convincing evidence that it can be successfully managed as a part of the single-stream mix, without compromising the recyclability of other materials or damaging the equipment used by recyclers. We have left the door open to add glass to the system if and when it can be shown that this will not cause problems.

In the meantime, we believe that glass recycling in some form should be retained, and we are still considering some possible methods of providing residents with the opportunity to recycle glass most likely through the drop-off program.

8. More types of plastic should be included.

Response: At this time, DSWA has markets only for the narrow-necked bottles that are collected in the drop-off program. They may reconsider other plastics if markets develop for those types of plastics.

9. Why will the ‘RECYCLE DELAWARE’ program have to go away?

Response: If the ‘RECYCLE DELAWARE’ program continues as it is and we implement residential curbside recycling, Delaware residents will be paying an unnecessary added cost for recycling. It costs DSWA approximately three million dollars a year to run the ‘RECYCLE DELAWARE’ program – money that would be better spent supporting a MRF. A limited form of the ‘RECYCLE DELAWARE’ program will continue at the landfills, transfer stations, and an undetermined number of other sites. DSWA will continue to collect used oil, oil filters, batteries, and perhaps plastic grocery bags and glass, at select sites throughout the state.

10. If you reduce the number of 'RECYCLE DELAWARE' sites, you may make it harder for people to get there and reduce the number of people recycling.

Response: We are confident that the implementation of curbside recycling will result in a significant increase in the number of people recycling and the amount of material diverted from our landfills. Because curbside recycling is so much more convenient than drop-off recycling, many people who are unwilling to go to the trouble of loading recyclables into the car and driving to a drop-off center are willing to set their recyclables at the curb for pickup. The previously mentioned study of enhanced recycling in New Castle County concluded that a program of the type that we are recommending would divert at least three times as much material (in New Castle County) as is currently captured by the drop-off program.

11. We will still have to go to a drop-off site to recycle items that aren't collected at the curb. We will have to travel farther, because there will be fewer drop-off locations. The drop-off program should be retained, and residents should be able to "opt out" of the curbside recycling if they want to continue to use the drop-off program.

Response: It would be impossible to enforce a curbside residential program in which people could choose not to participate by saying that they are taking their recyclables to a drop-off location.

We are still looking at the options for providing for the recycling of "specialty materials" such as used oil, batteries, plastic bags, and glass, and will strive to retain a small number of those locations that have the highest participation rates and are convenient to access.

12. More effort should be made to promote the existing drop-off program, instead of instituting residential curbside recycling; drop-off centers should be in more convenient locations; some drop-off centers are muddy or dirty; some are in out-of-the way locations and seasonal visitors don't know they're there; some centers are overflowing much of the time.

Response: Several commenters had suggestions for improving the drop-off program and said they would rather see that program improved and better promoted than to have curbside recycling mandated. On the other hand, some said that they would welcome a curbside program and pointed out that it is difficult for some people to transport their recyclables to a drop-off center and would be much easier to place them at the curb.

Even with more promotion, more sites, and improved conditions at the sites where people have experienced problems, the drop-off program will never get us to our goal of recycling 30% of residential waste. To get the needed participation, we must have the convenience of curbside recycling.

13. How would people in apartments and condominiums recycle?

Response: There are unique issues associated with multi-family dwellings. On one hand you have the opportunity to collect a lot of recyclables at one place, and the collection costs are low; on the other hand, participation rates in multi-family dwellings are typically lower than in curbside programs. Right now, DSWA is evaluating how to best implement multi-family recycling.

14. What about rental units in resort areas? The recyclables from one tenant would have to be left for the next tenant to deal with.

Response: The pickup of the recyclables in these units would be handled in the same way that the trash is handled. It also needs to be recognized that many of these "tenants" are from other states where curbside recycling is prevalent, and they are already in the habit. We don't anticipate this being an unmanageable problem.

15. Public buildings, including schools, should be required to recycle.

Response: While there is some paper recycling occurring in some schools and some state buildings, we hope that eventually there will be recycling goals for all segments of the population. The Executive Order that established the RPAC set a goal only for residential recycling. As a part of our proposal, we are recommending that any legislation enacted to implement residential recycling also include a provision for RPAC to evaluate the commercial sector and develop recommendations for increasing recycling in businesses and institutions. We strongly believe that the public and commercial sector should also be recycling.

16. You need to start with separated recyclables or it will be hard to change; other states effectively separate recyclables, and you should reconsider the issue.

Response: Many curbside programs began as fully separated systems, with residents setting recyclables out in as many as four or five separate containers. Compartmentalized trucks had to be purchased so that the recyclables could be kept separate during transport. This system of collection is both inconvenient for the homeowner and labor intensive for the hauler. The trend now is to move away from totally separated recyclables to a system where recyclables can be set out in one or two containers, with the separation then occurring at a MRF. Improvements in separation technology, combined with the greater convenience for homeowners and greater efficiency in collection, make commingled collection the preferred choice with regard to convenience and cost.

17. Franchise districts should be created for the collection of trash and recyclables.

Response: Several people commented on the fact that our proposal, by leaving the existing trash collection framework in place and adding to this system the requirement for curbside recycling, will result in even more truck traffic in areas that already have several trash trucks coming through the community each week. This will result in more air pollution, more noise, and greater wear and tear on the roads. The creation of trash districts would provide a more efficient and environmentally friendly system for both trash and recyclables collection.

We are well aware of the advantages of trash districts, such as those that exist in Kent County, and we agree that this would be the most efficient of cost effective way of collecting trash and recyclables. The consultants who performed the cost study of recycling in New Castle County evaluated this type of scenario and confirmed that this would result in the most cost efficient recycling system. We are also aware of efforts that have been made in the past to establish trash districts. These efforts have been unsuccessful because they are contrary to Delaware's strong support of the free market system. Since our goal is to develop a plan that will succeed, we are proposing a model that does not require the development of trash districts.

18. Haulers will be able to charge whatever they want to for the recycling service.

Response: Just as with the current trash system, the haulers will be in competition with each other for customers' business. If you don't like one hauler's price, you may be able to get a better deal from another hauler. This is the basis of our free enterprise system.

19. Enforcement is an issue. There should be a specific agency funded to enforce the program.

Response: Experience with programs around the country has demonstrated that participation is largely dependent on an effective education program. Accordingly, we are recommending that the greatest

emphasis be put on education, with enforcement to be undertaken only with people who continue to defy the legislation. The proposal includes funding for both education and enforcement.

We do not foresee exercising any enforcement until such time as people have had the opportunity to adjust to the new program. The adjustment period will probably take at least one year. Residents identified as not participating after this period will be contacted directly by DSWA and will be provided with educational instruction on how to correctly participate in the program. Residents who still refuse to participate will be referred to DNREC for possible enforcement action.

20. There needs to be an education effort aimed at the legislators and the Governor to gain their support.

Response: The RPAC's annual report, the final report summary describing the proposed program, and the draft legislation to implement the program will be provided to the administration and the General Assembly for their consideration. Provided that the draft legislation is sponsored, it will be necessary for all legislators and the administration to become educated on this issue before they decide whether or not to support it.

21. There needs to be a curriculum developed for the schools to educate the next generation.

Response: DSWA has an excellent education program that they currently offer to all the schools. Developing modules for teachers to use in their classroom as part of the standards is a good idea and may be a part of our education effort eventually.

22. Who owns the recyclables?

Response: Once the recyclables are picked up at the curb, they are the property of the collector. The collector may market the recyclables, may take them to DSWA for processing, or may take them to another processing facility. With Delaware's proposal featuring a zero tip fee for recyclables delivered to the MRF, the landfills, and the transfer stations, haulers will most likely take the recyclables to DSWA who will process and market them. The revenue from the recyclables will be used to offset the processing cost.

23. Use non-refunded money from the bottle bill to fund the recycling program; increase the deposit on the bottle to encourage people to return the bottles for their money; and set up redemption centers in convenient places so people can return the bottles. Provide crushers in supermarkets to facilitate recycling of cans and bottles.

Response: We received several comments about the bottle bill. Unfortunately for the State, the money not reimbursed to the consumer is kept by the distributor. There is no provision for that money to come back to the State. (We confirmed this with the Director of the Division of Revenue, Patrick Carter, who verified that unclaimed bottle deposits have never been escheated.) Changing that, or raising the deposit amount, would require legislation. Those who support the concept of expanding the bill are aware that the opponents of bottle bills nationwide are well organized, well funded, and experienced at challenging such legislation; they fear that if we try to change it, we run the risk of losing it altogether.

The bottle bill allows for the establishment of redemption centers, but these would be businesses set up by the private sector. The State does not have the ability or the authority to set up redemption centers. To date, no redemption centers have been set up; however, one may be established soon in south Wilmington.

24. Include beer and soft drink bottles in the curbside program.

Response: Any narrow-necked plastic soda bottle could be recycled in the curbside program. Glass bottles would be excluded, as explained previously.

25. Has there been any thought given to incineration?

Response: The RPAC was created to recommend ways to increase the recycling rate in Delaware. An incinerator would not help that goal, so we have not considered the issue. In addition, existing Delaware law effectively prevents the establishment of an incinerator anywhere in the state.

26. To what extent will the counties be involved in this effort?

Response: Only Kent County's franchise districts are affected. New Castle and Sussex County governments are not affected.

27. I am concerned that entities on the RPAC are obstructing movement towards a real recycling program.

Response: This proposal, a combined effort of RPAC, DSWA, and DNREC, is the most concerted effort yet to devise a recycling program that would gain the support of the public, the legislature, and the administration and have the greatest chance of being turned into law. The RPAC, DNREC and DSWA are committed to seeing this effort through.

28. DSWA profit should go to defray the cost of recycling.

Response: DSWA currently funds the 'RECYCLE DELAWARE' program with money from its tipping fees. Costs of that program will greatly decrease when curbside recycling is implemented, and DSWA agrees that those savings should be directed toward the cost of constructing, operating, and maintaining the MRF.

29. There should be a charge at the Materials Recovery Facility for recyclables.

Response: The reason for maintaining a zero tip fee at the MRF is to encourage the haulers to bring the recyclables to DSWA instead of taking them elsewhere. A certain minimum amount of material is required to make the MRF operation cost effective. It is likely that, when markets for recyclables are favorable, the value of the recyclables will actually exceed the operating costs of the MRF. Likewise, when market prices are low, the value of the materials will not cover the debt service and the operational and maintenance costs of the MRF. In order to keep the tip fee at zero, it will be necessary to have a fund to cover those costs during those periods when market prices are low. This fund will be generated by charging a waste-end assessment fee on all waste disposed of at the landfills. It is anticipated that this fee will not exceed \$3 per ton, and the exact price still needs to be determined.

30. What happens if the recyclables can't be sold?

Response: There will always be fluctuations in the recyclables markets, but DSWA has a long track record of finding and keeping markets. They also have the luxury of a lot of storage space, so they can hold onto recyclables until the market rebounds or an alternative market is found. Sometimes they give materials away; this is still preferable to putting them in the landfill. Again, this is why a dedicated fund is necessary to address those times when commodity prices are low.

31. The consultant's report indicates that we could reach the recycling goal with a voluntary program combined with a good educational program.

Response: The goal of 30 percent residential and 40 percent municipal recycling could never be achieved unless DSWA builds a single stream MRF and municipalities and the private sector haulers become involved in the collection of recyclables. According to the DSM New Castle County study, voluntary subscription curbside recycling combined with continued drop-off would capture only 19% of available recyclables, as compared to 64% with a residential curbside program.

32. Payments for recycling should be partially earmarked for purchase of new landfill property.

Response: DSWA is responsible for the state long-term solid waste management planning and will take this under consideration.

33. If DNREC allowed scavenging at the landfills, recycling would be taken care of and we wouldn't have to have a residential program.

Response: DNREC will approve salvaging of materials delivered to the landfills if it is carried out in an organized manner that does not pose a threat to human health and the environment. Currently, DSWA is looking into the possibility of implementing a salvaging program based on a "mercantile exchange" concept that has proven successful in some other states.

34. The projected costs for Sussex County are wildly low.

Response: Not only the consultant but also a large hauler doing business throughout the state provided estimates of the costs of collecting recyclables at the curb. The hauler's estimate was \$6.50 per month per household in Sussex County. This assumed every-other-week pickup of recyclables. Please note that these estimates were very conservative and erred on the side of caution. Actual cost may be even less through competition or reduced trash fees.

35. Would I have to pay an additional fee for yard waste all year round if I only put it out a couple of times a year?

Response: Yard waste will be banned from the landfill because it makes up an estimated 23% of the total residential waste stream. The collection and disposition of yard waste pose definite management challenges because of the seasonal nature of the material. Some haulers may choose to spread the cost over the whole year rather than burdening customers with higher additional charges for a portion of the year, while others may charge customers only for the times that they use the collection service. The haulers will be in competition with each other, so customers should be able to find one that meets their needs. Homeowners may avoid the fee altogether by grass cycling and composting their own yard waste.

36. What will be the environmental impact of the yard waste storage areas?

Response: One commenter in particular had many questions about the yard waste management facilities. Most had to do with issues that would be addressed under DNREC regulations. These facilities would be required to receive approval from DNREC and to comply with all applicable regulations.

37. What will the economic impact be to the business community currently supplying mulch/compost?

Response: The economic impact is hard to determine; however, studies (e.g., EPA's document, "Organic Materials Management Strategies," July 1999) indicate that the potential markets for compost and mulch far exceed the available material.

38. The yard waste portion of the proposal is too sketchy and needs to be better defined.

Response: There are several private sector businesses that have expressed interest in managing the yard waste generated as part of the ban. It is the preference of the RPAC that the private sector succeed in managing the state's yard waste through mulching and composting. However, if the private sector is unable to provide this service, the DSWA has agreed to manage the state's yard waste either at its own facilities or on other suitable state or county owned properties provided voluntarily for this purpose. The state is in the process of identifying suitable state-owned properties that may be available for this purpose. We're considering a delay in the implementation of the yard waste ban to better develop the sites that will manage these materials.

39. I am concerned that these facilities may pose the risk of causing disease, weed, and pesticide problems.

Response: These are important issues that will need to be addressed by DNREC in developing regulations and guidance to govern these types of facilities. A working group of stakeholders has already been formed and will convene to aid in the development of regulations once the legislature has authorized DNREC to implement a ban on the landfilling of yard waste.

40. This entire effort is a statewide mandate developed to address a New Castle County issue.

Response: This effort dates from 1999, long before the appearance of the current problems at the Cherry Island landfill. The goal has always been to find a way to increase the state's chronically low recycling rate. Diverting more material from landfilling is a matter of statewide importance, because the benefits of recycling will accrue to all of the residents of Delaware.

Aside from the far-reaching environmental benefits of recycling, it is also important for Delawareans to realize that our waste disposal system is a statewide system, and problems at any one of our three landfills should be of concern to all of us. The landfills are state landfills, not county landfills. If one landfill must stop accepting waste, that waste may have to be sent to one of the other landfills. Minimizing the amount of material going into all three landfills is important.

41. Some people are physically unable to place their trash at the curb. Will they still be required to take their recyclables to the curb?

Response: Although not specifically stated in the summary report, it is our intent that a household's recyclables would be collected at the same location where the trash is collected. If a trash hauler is providing collection at the homeowner's doorstep or in the homeowner's back yard, that is where the recyclables would be placed for pickup. These arrangements need to be made with the hauler.