

**INFORMATION PACKET #11: RECYCLING IS BUSINESS**  
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**SPRING, 1995**

## **INFORMATION PACKET #11: RECYCLING IS BUSINESS**

In response to growing curiosity among New England businessmen and women about whether and how to incorporate recycling, waste reduction, remanufacturing products with recycled raw materials, and buying and selling recycled products, this Information Packet has been produced. The documents assembled below as a Compendium of sources are a few of the 8,000+ documents about nonhazardous waste management held by The Research Library for RCRA, at the EPA-New England office.

Some exemplary documents are here for your scrutiny from projects of national scope, like the National Office Paper Recycling Project, from the Northeast Recycling Council (NERC), and some from US EPA's programs like "WasteWise," and "Jobs Through Recycling." Some have come from the states of California, Connecticut, Massachusetts, New Hampshire, and Rhode Island.

New documents about the many interactions between business and recycling are being produced and collected, literally every month. Also, it is impossible for us to anticipate all of the questions, and information needs that businesses will have. Therefore, this Compendium will be revised periodically. You can help. If there is a key question that you feel is crucial to your business before it takes a recycling plunge of whatever variety, please accept our Challenge: Call The Research Library for RCRA at (617) 573-9687, and ask. If we do not have information already on hand, it is part of the "Research" of our "Research Library" to go out and find it. If what we find has relevance in this Compendium, we will include it, and credit you with its provenance.

Why recycle? From many aspects of business, it makes sense to do so. Recycling adds value to the local and regional economy. Recycling incentives are offered or can be offered by the public and private sectors. Recycling creates jobs. Recycling necessarily gives birth to inventiveness. Recycling infrastructures, including financial ones, are no longer in the fledgling stage, but are either at an adolescent stage or at maturity, depending upon region and the substance or product under scrutiny. Recycling can be integrated profitably into other necessary waste management methods: landfills and landfill mining, constructing Materials Recovery Facilities at or near landfills or Waste To Energy plants; composting; refurbishing and reusing products. Hopefully, the documents in this Compendium will further explain some of the why's and wherefores.

- Fred Friedman, Head  
Research Library for RCRA

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The "National Office Paper Recycling Project," of the U.S. Conference of Mayors has issued a Challenge to businesses with offices. A succinct statement of the Challenge is provided.

Californians Against Waste published "Recycling Means Business In California" that includes a targeted argument, "Why Recycle?"

The Northeast Recycling Council of the Council of State Governments and Roy F. Weston, Inc. conducted a comprehensive analysis of economic activity associated with recycling, including many materials. It provides a state by state and material by material description of the values added when recycled material is processed and remanufactured for the states of the Northeast.

The Office of Waste Management at the University of Massachusetts, Amherst reports on the economics of its waste and recycling operations, showing the importance of factoring both the small amount of money that can be made in recycling and the large amount that can be avoided by recycling instead of landfilling or other forms of disposal.

The Northeast Recycling Council of the Council of State Governments published, "Profiles of Northeast States' Office Wastepaper Recovery Programs" in March, 1995. It is included because it shows what the states of the Northeast are thinking about the management of Office Waste Paper (OWP).

The "Buy Recycled Business Alliance" of the National Recycling Coalition has put out a "Buy-Recycled Guide." The Guide shows you what recycled products are available and how and why to get involved in their use. There are special waste reduction suggestions for Customer Service Departments, Distribution Departments, Food Services, Maintenance Departments, Office Operations, and Manufacturing Operations in an Appendix.

The basic brochure of the "National Office Paper Recycling Project," is their "Office Paper Recycling Guide" which is included as an example of a recyclables collection and procurement manual. It is followed by a list of businesses and governments that have accepted their Challenge and asks you, "Are Your Suppliers On This List?"

US EPA has several initiatives geared to business recycling. WasteWi\$e provides technical assistance and benefits to companies which reduce, recycle, remanufacture from recycled raw materials, or buy recycled products. Two examples of WasteWi\$e fact sheets are included: "How to Start or Expand A Recycling Collection Program," and "Buying or Manufacturing Recycled Products." A

page 2.

list of initial WasteWiSe Charter Members shows some of the firms that have become involved. Other EPA initiatives, "Jobs Through Recycling," "Reuse Business Assistance Centers," and "Recycling Economic Development Advocates" have established grants programs. Four New England states along with the Northeast Recycling Council were recently awarded grants.

Lists of recyclers, remanufacturers, and others involved in recycling are included. If you live in Massachusetts, the lists appended will be for your state and/or region. If you live in Connecticut, Rhode Island, or Vermont, or New Hampshire, or Maine, you will have lists that apply to your state appended. These lists come from a publication of the Research Library for RCRA, "Compendium of New England Recycling Directories," and they are periodically revised as new directories are received.

Lastly, Executive Order #12873 was signed on October 20, 1993. The Order is designed to reduce solid waste, build markets for recycled products, encourage the development of new technologies, and protect the environment by requiring federal agencies and those who hope to receive federal grants, contracts, or cooperative agreements to use recycled products. Full text of the Order can be obtained by calling the Research Library for RCRA.





# WE CHALLENGE YOU

## Register for the PAPER RECYCLING CHALLENGE!

Office workers in the U.S. throw away 12 million tons of paper each year. Because paper comprises nearly 40% of all municipal solid waste, The National Office Paper Recycling Project is encouraging businesses that are taking a leadership role in recycling to take the extra step in registering for the *Paper Challenge*.

### What is the *Paper Recycling Challenge*?

The Challenge asks employers to close the recycling loop in the office: Businesses are asked to make a three-step, voluntary commitment to:

- 1) collect office waste paper,
- 2) purchase recycled paper products, and
- 3) begin an educational program for employees or members of the community.

The following registration form asks you to benchmark your success and pledge to meet goals for improving these activities.

### My office already recycles. Why register for the *Challenge* too?

Many businesses already do their part to buy recycled and collect for recycling. The National Office Paper Recycling Project asks your business to register for the *Paper Recycling Challenge* so that it can stand up and be counted in the nation's only database on office recycling. Organizations that register receive an informative newsletter and become part of an environmental peer-matching network to assist recyclers in meeting their recycling goals.

### Does the *Paper Recycling Challenge* only focus on collection?

NO. The *Challenge* program places equal emphasis on buy recycled and collection activities. Recyclers are required to have both programs in place in order to participate in the *Challenge*.

### What is the National Office Paper Recycling Project?

The National Office Paper Recycling Project is a non-profit partnership of 22 public and private sector organizations from across the U.S. Its goal is to maximize office paper recycling and to minimize waste. This unique public/private partnership has enjoyed the full support of the U.S. EPA to further its goal of tripling office paper recycling by 1995.

**OVER FOR REGISTRATION FORM**

# The Challenge



Printed on recycled paper  
Minimum 20% post  
consumer fiber

The United States Conference of Mayors 1620 Eye Street, NW Washington, DC 20006  
Phone: (202) 223-3088 Fax: (202) 429-0422

### C. Why Recycle?

Despite AB 939's focus on landfill diversion, some of the very best reasons to recycle have little to do with solid waste management or landfill diversion, but rather with its ability to reduce pollution and conserve material and energy resources involved in material production. By using recycled materials to make new materials and products, we can significantly reduce the environmental degradation associated with raw material extraction. Invariably, replacing virgin raw materials with recycled materials will reduce energy use and pollution. Below are a few examples:

- Using recycled glass to make new glass cuts related air pollution by up to 20 percent.<sup>12</sup>
- For every ton of glass recycled, more than a ton of virgin resources are saved (1,330 pounds of sand, 433 pounds of soda ash, 433 pounds of limestone and 151 pounds of feldspar), along with the energy and environmental degradation associated with extraction.<sup>13</sup>
- A ton of glass produced from raw materials creates 384 pounds of mining waste. Using 50 percent recycled glass cuts it by 75 percent, to 98 pounds of waste.<sup>14</sup>
- Using recycled glass in the manufacture of new containers saves 5 percent to 30 percent of the energy that would be needed to make containers from virgin raw materials because furnace temperature can be reduced. Additionally, this will prolong furnace life.<sup>15</sup>
- Making cans from recycled aluminum reduces energy use by 90 to 97 percent and associated air pollution by 95 percent compared to bauxite.<sup>16</sup>
- Making cans from recycled steel saves 47 to 74 percent of energy used to produce the cans from raw materials, while reducing associated air pollution by 85 percent.<sup>17</sup>
- According to the Earth Works Group, recycling the tin and steel in bi-metal cans used by an average California family for a year will save about 125 pounds of iron ore, 20 pounds of coal, and enough energy to light a 60-watt light bulb for more than three months.<sup>18</sup>
- Paper represents nearly one-third of the material generated in California, upwards of 80 percent of which is recyclable.<sup>19</sup>
- In addition to saving trees, replacing virgin pulp with recycled fiber reduces energy use by 23 to 74 percent and reduces pollution by 74 percent, including water pollution by 35 percent. Using recycled fiber also reduces actual water use by 58 percent compared to virgin fiber.<sup>20</sup>

#### **D. Recycling Opportunities in California**

Together, California's Beverage Container Recycling Law (AB 2020) and the California Integrated Waste Management Act (AB 939), have increased the opportunity to recycle in California exponentially compared to just 8 years ago.

- Nearly 6 million California households representing better than 61 percent of single family homes and over 50 percent of the state's population are served by curbside recycling.<sup>21</sup>
- Currently, more than 150 private companies, 25 public agencies, and 5 non-profit organizations provide curbside recycling to 5,858,198 households in 363 jurisdictions.<sup>22</sup>
- In addition to curbside recycling programs, over 1400 enterprises ranging from small "mom and pop" operations to Fortune 500 companies provide buyback and drop-off recycling opportunities at over 2800 locations throughout California.<sup>23</sup>
- More than 4,000 California restaurants and bars recycle their glass.<sup>24</sup>

#### **E. Material Recycling Creates Greater Economic Value than Material Disposal**

Across the country, state and local governments and private businesses are increasingly recognizing that it makes economic as well as environmental sense to reduce and recycle material that would otherwise become solid waste.<sup>25</sup>

By implementing aggressive waste reduction and recycling programs, private companies are saving millions of dollars annually in avoided disposal costs.<sup>26</sup>

- Computer giant IBM now saves over \$2.5 million per year in avoided disposal costs after implementing a new recycling and source reduction program at its facilities in San Jose, California, and Guadalajara, Mexico.

The economic benefits of recycling, however, go far beyond reduced disposal costs. Each stage of processing increases the economic benefits of recycling, encouraging greater economic integration and investment. Each link in the recycling chain, from collection to manufacturing, adds value to a commodity, increases efficiency, eliminates waste, and adds jobs to the local economy.

Recycling creates greater economic value than disposal in two distinct ways. First, as more businesses, local governments, and households recycle, they pay less to dispose of trash. Second, recycled material gains value as it moves through each stage of the recycling process--collection, sorting, processing and remanufacturing--until it re-enters the market place as a new finished material good. Landfilling the same material adds no value, creates no new jobs, and wastes a valuable commodity.

For example, a ton of separated loose office paper has a market value of about \$50. Bale the paper and the market price rises to \$100 per ton. Pulp the paper and its value soars to over \$400 a ton. Convert the pulp into paper products and the value rises to over \$900 per ton. Each step of the process employs more people, requires more administrative and maintenance services, and requires the purchase of more supplies. Landfilling that same resource, on the other hand, adds absolutely no economic value.

- The City of Los Angeles, which has one of the most ambitious recycling programs in the state, reports that through public and private recycling ventures, over \$600 million has already been invested in the local economy.

### **F. Material Recycling Creates More Jobs than Material Disposal**

Several studies by noted economists demonstrate what should be obvious to everyone: collecting, sorting, processing and remanufacturing material through recycling creates more jobs than collecting that same material and burying it.<sup>27</sup>

- Californians recycled more than 600,000 tons of glass in 1993.<sup>28</sup> It is estimated that the collection, processing, and remanufacturing of this secondary raw material sustained jobs for some 4,320 Californians.<sup>29</sup>
- The use of recycled raw materials instead of virgin raw materials saved California glass container manufacturers an estimated \$9 million in raw material costs.<sup>30</sup>
- If this glass was to be thrown away, fewer than 120 jobs would be created, although state-wide garbage bills would have to be increased by \$60 million to cover the new disposal costs.<sup>31</sup>
- Californians recycle more paper than any other material in our waste stream--some 2,647,000 tons annually according to the Integrated Waste Management Board.<sup>32</sup> It is estimated that this resource from California's "urban forests" has helped to sustain some 9,000 jobs while adding more than \$2.2 billion of value to our economy.
- All in all, it is estimated that some 18,000 Californians are currently employed in waste reduction and recycling related industries. The California Integrated Waste Management Board projects that *meeting the state's 50 percent recycling goal will add two billion dollars to California's economy and create over 45,000 new jobs over the next seven years.*

### **G. Waste Reduction and Recycling are More Cost Effective than Disposal**

Increasingly, both business and local governments are recognizing that wasted resources represent lost opportunities to achieve environmental benefits while reducing waste management system costs. Many California cities have already found that an integrated waste management strategy which includes waste prevention and recycling programs will result in the lowest costs for their community and their ratepayers.

- A city the size of Oakland with a tipping fee of \$26 a ton can save its government, businesses, and households \$7 million a year by aggressively expanding its material recovery and reuse efforts.<sup>33</sup>
- A 1993 study by the Clean Washington Center, a division of the State of Washington Department of Trade and Economic Development, found that the "average net cost per ton of recycling in 1992 was lower for disposal in three of the cities." In Spokane, the only city that reported recycling costs higher than disposal costs, the study found that disposal costs may have been underestimated.<sup>34</sup>
- In an October 1993 report to the California Integrated Waste Management Board, the City of Los Angeles Bureau of Sanitation found that a 70 percent diversion strategy that includes 20 percent source reduction would result in substantially lower waste management system costs than a strategy which continues to focus on material disposal.

#### **H. Waste Reduction & Recycling Increase the Efficiency & Competitiveness of California Business**

Waste is the byproduct of inefficiency. California manufacturers have long recognized that increased waste reduction and recycling translates into greater corporate efficiency and increased competitiveness. Whether it's by reducing facility disposal costs through on site recycling, eliminating raw material costs through packaging reduction, or lowering distribution costs through product streamlining, waste reduction and recycling makes dollars and sense for California's businesses.

- Consumer product giant Proctor & Gamble, a pioneer in the packaging reduction and elimination arena, not only created a more efficient product when it reduced deodorant packaging waste by 20 percent, but it also saw sales increase by four percent.

Shortly after Proctor & Gamble introduced the "zero packaging" line of Sure and Secret, most deodorants began appearing on store shelves with reduced or eliminated packaging. A similar scenario has been played out with reduced package cleaning and laundry products through the introduction of product "concentrates" in the marketplace. The competition either quickly responds with similarly reduced packaging or allows the more efficient company a marketplace advantage in terms of packaging material and distribution costs, and the all-important shelf space.

Computer electronics rivals IBM and Hewlett-Packard exemplify the cutting edge in their establishment of packaging reuse and reduction programs.

- IBM ships components from its facility in San Jose to Guadalajara in reusable plastic containers. The assembled product is returned to the United States in these containers, which eliminates all disposal costs associated with shipping. Overall, the program saves IBM \$2.5 million per year in avoided disposal costs with 70,000 cubic

feet of waste diverted from landfill annually.

- Hewlett-Packard, in determining the most efficient way to distribute printed-circuit boards for its LaserJet printers, focused on bulk packaging. A waste reduction team analyzed the entire distribution system for these boards and discovered the product could be sent in bulk by redesigning and expanding certain elements of the original packaging. This reduced the amount of corrugated and expanded foam being used, and cut material costs by \$716,000 a year.
- Office furniture manufacturer Herman Miller has realized the fruits of efficiency through maximum recycling. The company's Rocklin, California facility has implemented a recycling infrastructure that includes corrugated, paper, aluminum, steel scraps, and all grades of plastic. The results: waste haulers in 1991 picked up 9 dumpsters worth of garbage weekly from Herman Miller. In 1993, they picked up 4 dumpsters monthly. As an additional cost savings step, Herman Miller then utilizes recycled content materials for internal use and shipping and packaging.

While all of these programs have resulted in cost savings at several levels, they have been directly or indirectly motivated by state and local waste reduction and recycling mandates. Most have cited Assembly Bill 939, with its 50 percent waste reduction and recycling goal, as a critical catalyst for private business as well as local government to consider strategies for reducing waste, reusing materials, and recycling what can't be reused.

### **I. Waste Reduction and Recycling Promotes Product Innovation**

- California-based Patagonia, a small outdoor gear manufacturer has developed a product known as "PCR Synchronilla" -- a synthetic manufacturing material that replaces virgin fleece in some of their clothing. The product is made from 80 percent recycled fibers, specifically crushed and processed PET bottles. The material has received high praise from Patagonia customers, and Scientific Certification Systems has gone on record stating that "Synchronilla has substantially less environmental impact than the virgin material counterpart."

California's waste reduction and recycling goals have spawned whole new industries, including one loosely referred to as "materials brokers". The innovation here is simple: enterprises transform one company's waste into another's resource. Bay Area businesses can take their unwanted goods to company's such as Urban Ore and the Center for Creative Reuse, which in turn refurbish and retail the goods to economically constrained organizations like public schools and community outlets. Los Angeles boasts a similar enterprise called Materials for the Arts.

This entrepreneurial enterprise has found its way onto the information superhighway, with the introduction of the California Materials Exchange Catalog (CALMAX) by the California Integrated Waste Management Board.

## **J. Recycling Brings Business to California:**

Businesses and entrepreneurs are coming to the golden state to mine California's newest natural resource - garbage. Quietly and without media fanfare, California's recycling laws are drawing business and industry to the state. New companies are created; established businesses are moving into the state or adding new capacity - all because California has committed to cutting its waste in half through material reduction, reuse, recycling and composting.

Under the Recycling Market Development Zone (RMDZ) Program administered by the California Integrated Waste Management Board, dozens of small and medium-sized recycling and remanufacturing businesses have sprung up in California communities. The state's goal is to designate forty zones by 1996. There are currently 29 RMDZ's. Recycling businesses located within a zone become eligible for up to \$1 million in direct loans as well as information on financing strategies, marketing, and technical assistance from the Waste Board. Locally, each zone offers its own package of assistance which can include fast-track permitting, low-interest loans, loan packaging, industrial bonds, and reduced fees.

- Kelly Moore Paints, a California-based paint manufacturer, recently expanded its recycled paint manufacturing operations, doubling recycling capacity and adding six new employees. Company executives credit legislation requiring state purchases of recycled paint (SB 734) for making this expansion possible.
- Pure Tech International, Inc., a New-Jersey based recycling company, has acquired two glass recycling facilities in California in the last six months. A spokesperson for Pure Tech said his company's interest in West Coast glass markets was sparked by California's recycling laws. Citing the state's minimum recycled content law for glass bottles, the spokesperson said, "Basically, glass sells for more (money) in California, and we want to be there."

California's recycling laws have opened up new opportunities for recycling entrepreneurs. Recyclers coming to California each year bring with them new technologies and high wage jobs that will help California recast its economic future and revitalize its industrial base.

## **K. California's Bottle and Can Recycling Law: Quantifying the Success**

California's Beverage Container Recycling program (AB 2020) has achieved an impressive record of success, demonstrating itself to be a public policy solution appropriate to the environmental and economic problem it was adopted to address. Among the program's specific achievements:

- The recycling of more than 80 percent of all beer, soft drink, and wine cooler containers sold. This represents an increase of nearly 150 percent in beverage container recycling since the program was implemented.

- In 1993, 525,000 more tons of glass, plastic and metal beverage containers were recycled than in 1986, the year AB 2020 was adopted. This increase alone represents more than 10 percent of the state's total current recycling.
- As a result of the AB 2020 program, the recycling rate for glass beverage containers has increased more than five-fold from an anemic 10 percent to more than 75 percent. This increased tonnage of secondary raw materials will save California glass container manufacturers more than \$2.2 million annually in reduced energy costs.
- Additionally, by providing manufacturers with sufficient secondary materials to replace virgin raw materials and exceed an average of 35 percent recycled content, the AB 2020 program has helped glass manufacturers reduce their mining waste as well as air and water pollution.
- As a result of the AB 2020 program, the recycling rate for PET plastic has increased from virtually zero to 68 percent, demonstrating that with sufficient incentive and infrastructure any "technically recyclable" material can be successfully diverted from landfill and returned to the economic mainstream.
- The program provides a significant financial benefit to local government, both directly and indirectly, helping to offset rapidly increasing solid waste management costs. The program directly provides nearly \$20 million in funding for curbside recycling programs and material recovery facilities. Indirectly, the increased diversion of beverage container materials has resulted in an estimated \$40 million savings in avoided disposal costs.

The AB 2020 program's incentives, infrastructure, public education, and funding have become a critical part of California's comprehensive waste reduction and recycling strategy.

The cost of this success to the beverage industry and consumers is less than eight-tenths of one cent per beverage container sold (nearly 72 percent of program funds are returned to consumers in the form of refund values). Actual administrative costs will account for less than 7 percent of the program's budget in fiscal year 1993-94.

A legislatively mandated study of program efficiency, prepared by Ernst & Young in June 1991 concluded, among other things, that "AB 2020 is significantly more cost-effective" than traditional nickel deposit legislation.

A survey of state beverage container recycling rates places California 8th overall, with a rate 46 percent better than the national average. Prior to the implementation of AB 2020, California's beverage container recycling rates were among the lowest in the country.

#### **L. California's Bottle and Can Recycling Law: Creating Thousands of Jobs**

In addition to diverting 650,000 tons of glass, plastic and metal containers from landfill annually, California's Bottle and Can Recycling program has resulted in:





# **VALUE ADDED TO RECYCLABLE MATERIALS IN THE NORTHEAST**

**Prepared for**

**THE NORTHEAST RECYCLING COUNCIL  
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Brattleboro, Vermont 05301**

**Prepared by**

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Wilmington, Massachusetts 01887**

**May 8, 1994**



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## SECTION 1

### EXECUTIVE SUMMARY

#### 1.1 PURPOSE OF STUDY

Under contract to the Northeast Recycling Council (NERC), Roy F. Weston, Inc. (WESTON®) developed an analysis of the value added to material recovered from the municipal solid waste stream through processing of recyclables and manufacturing using feedstocks from recycled sources in the Northeast region. The purpose of the study is to quantify the economic activity associated with recycling in the region, which will aid in the promotion of investment in the recycling industry.

NERC is a non-profit, non-partisan organization directed and supported by its member states: Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont. NERC's primary goal is the development and stimulation of markets for recyclable materials. In the course of pursuing this goal, NERC has recognized the lack of quantitative information regarding the recycling industry which hinders efforts to involve the economic development and investment communities in the development of new and expanded facilities for recycling processing and manufacturing. This study is designed to address that lack of quantitative information by providing the basis for understanding the nature and extent of economic activity in the recycling industry in the Northeast.

The study is a comprehensive analysis of economic activity associated with recycling, covering a wide range of materials, processes, and geographic areas. The comprehensive nature of the study meant that data had to be gathered and compiled in a way that has not been done previously. As a result, many areas were encountered in which data was lacking and procedures had to be devised to fill these gaps. Therefore, this study represents an important step forward in developing an understanding of the economic activity associated with recycling. There are, however, many areas in which future data gathering could refine the analysis and improve its accuracy.

In reviewing this report, it is important to recognize that this study was designed to improve the understanding of economic activity associated with recycling. The report is not designed as a solid waste management planning tool, and the results do not indicate anything about the economic viability of recycling or its costs relative to other solid waste management activities. In addition, since the exact nature of the analysis varies in its details from material-to-material, comparisons between materials should only be made with a full understanding of the nature of the analyses performed.

What the report does provide is state-by-state and material-by-material data on quantities of recycled material processed and manufactured and the level of economic activity associated with that processing and manufacturing.



## 1.2 SUMMARY OF APPROACH

The methodological approach utilized in this study is described in Section 2 of this report. The key aspects of that approach are as follows:

- The difference in value of a material before and after a given process is used to quantify the economic activity associated with that process. For instance, if the value of a material is \$20 per ton at the start of a process and \$50 per ton at the end of the process, \$30 per ton of value has been added. If 100 tons go through that process, it is estimated that \$3,000 of value has been added, representing \$3,000 of economic activity.
- Recycling activities are divided into two categories: processing and manufacturing. Processing involves accepting material as collected and producing as an end-product a material that is technically equivalent to virgin material. Thus, for example, plastics processing includes all activities after collection through the production of plastic pellets that can be used in manufacturing. This could include multiple firms: for instance, one that separates and bales the plastics, and one that produces pellets. In fact, these two types of activities were divided into two stages of processing, and this was done for a number of materials. Manufacturing includes activities to produce a wholesale product from the virgin-equivalent end-product of processing. Continuing the example of plastics, this includes production of plastic sheet.
- The amount of recyclable material processed and utilized in manufacturing is estimated by determining tons-per-employee processing and manufacturing rates for different categories of processors and manufacturers, and applying these rates to estimates of total employment in each of these categories. The processing and manufacturing rates were determined through surveying of processors and manufacturers. The estimates of employment by category were prepared by state Departments of Labor, using lists of firms prepared by NERC.
- The following criteria were utilized to guide decisions in filling data gaps and making adjustments to the methodology: 1) select approaches likely to produce conservative results; 2) be conceptually consistent from one approach to the next; and 3) select approaches with a precision that matches that of the known data.

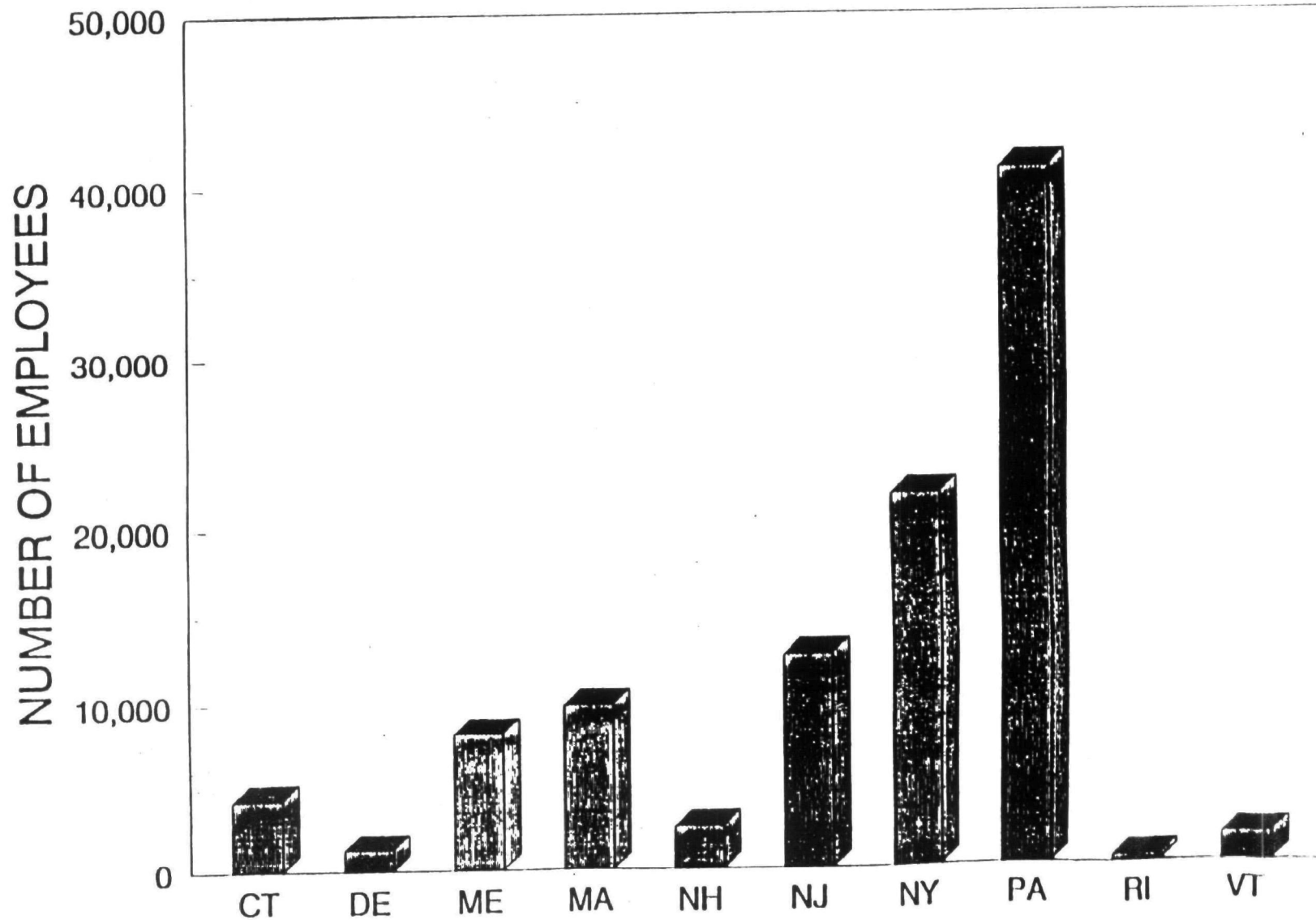
## 1.3 SUMMARY OF RESULTS

Some of the key findings contained in this report are as follows:

- Approximately 103,400 people are employed in firms that process recyclables or use them in manufacturing in the Northeast region. This represents 2.7 percent of the approximately 3.8 million jobs in the manufacturing sector in 1991 for the same ten-state region. A state-by-state breakdown of recycling employment is shown in Figure 1-1, and a comparison with total manufacturing employment is presented in Table 1-1.

FIGURE 1-1

## RECYCLING EMPLOYMENT BY STATE



WESTON  
CONSULTANTS, INC.

**Table 1-1**  
**Summary of Recycling Employment**

	CT	DE	ME	MA	NH	NJ	NY	PA	RI	VT	TOTALS
Paper Processing	138	323	60	377	30	434	1,668	351	15	20	3,416
Paper Manufacturing	1,794	65	7,190	6,102	1,827	3,595	10,734	15,814	0	815	47,936
Glass Processing	0	0	0	0	0	58	71	72	0	24	225
Glass Manufacturing	309	0	0	285	0	2,180	1,874	3,943	0	0	8,591
Plastic Processing	90	15	0	258	68	308	533	1,280	45	91	2,688
Plastic Manufacturing	273	536	0	1,118	137	145	735	3,498	0	91	6,533
Metal Processing	588	143	207	527	205	1,336	2,494	2,506	96	87	8,189
Ferrous Manufacturing	153	0	0	45	0	1,350	568	2,775	0	0	4,891
Non-Ferrous Manufacturing	59	0	0	45	0	1,809	60	4,497	0	0	6,270
Aluminum Manufacturing	0	0	0	45	0	142	441	2,296	0	0	2,924
Yard Waste Processing	44	0	132	275	0	23	27	0	44	0	545
Tire Processing	17	0	50	33	17	20	170	94	0	17	418
Tire Manufacturing	40	26	0	65	0	10	18	100	20	0	279
Textile Processing	19	0	57	100	19	38	546	316	38	0	1,133
Multi-material Processing	737	174	416	549	280	1,301	1,853	3,351	120	594	9,375
<b>TOTAL EMPLOYMENT</b>	<b>4,261</b>	<b>1,282</b>	<b>8,112</b>	<b>9,824</b>	<b>2,583</b>	<b>12,549</b>	<b>21,792</b>	<b>40,893</b>	<b>378</b>	<b>1,739</b>	<b>103,413</b>
<b>MANUFACTURING SECTOR</b>											
<b>EMPLOYMENT TOTALS (1)</b>	<b>339,000</b>	<b>62,000</b>	<b>98,000</b>	<b>490,000</b>	<b>86,000</b>	<b>591,000</b>	<b>1,054,000</b>	<b>962,000</b>	<b>95,000</b>	<b>43,000</b>	<b>3,781,000</b>
<b>RECYCLING AS PERCENT</b>											
<b>OF MANUFACTURING</b>	<b>1.3%</b>	<b>2.1%</b>	<b>8.3%</b>	<b>2.0%</b>	<b>3.0%</b>	<b>2.1%</b>	<b>2.1%</b>	<b>4.3%</b>	<b>0.4%</b>	<b>4.0%</b>	<b>2.7%</b>

**NOTES:**

(1) Source: 1993 Statistical Abstract for the United States

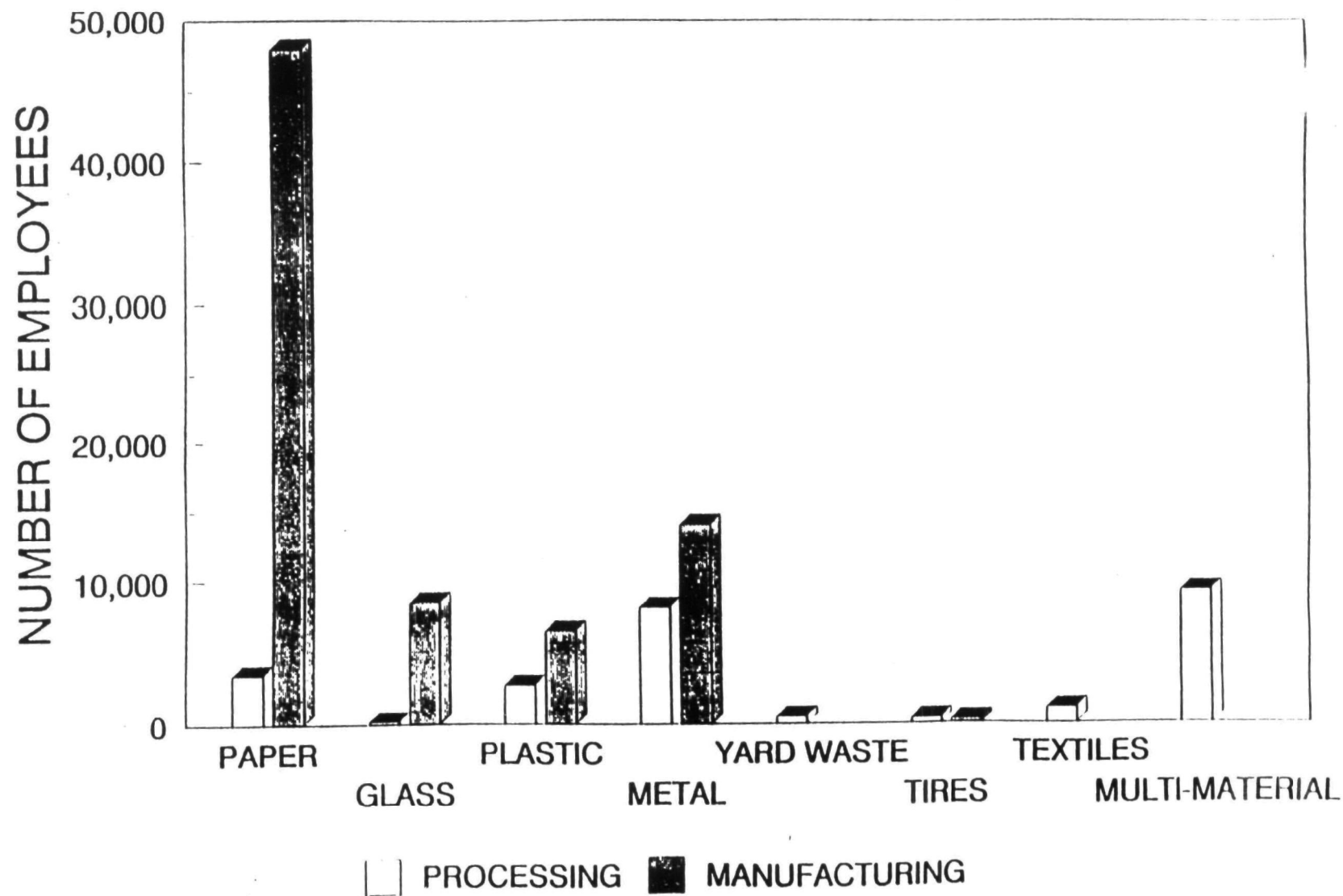




- Material-by-material employment totals are presented in Figure 1-2. Approximately 25 percent of the recycling employment in the region is in processing firms, and 75 percent is in manufacturing firms. Paper manufacturing is the leading recycling employer, with approximately 48,000, or 46 percent of the total regional recycling employment. Multi-material processors are the next largest contributor to employment, with approximately 9 percent of total recycling employment. The percentage of total recycling employment associated with each material is illustrated in Figure 1-3.
- Figure 1-4 presents a summary of material quantities processed and manufactured. Approximately 9.1 million tons of paper are processed annually in the region, which is the largest quantity of material processed. Approximately 6.6 million tons per year of metal are processed, along with 1.5 million tons of yard waste, and 900,000 tons of glass.
- Approximately 10 million tons per year of metal products are manufactured from scrap metal, including 5.8 million tons of ferrous metal products, 3 million tons of non-ferrous metal products, and 1.1 million tons of aluminum products. Approximately 3.6 million tons per year of paper are produced from wastepaper sources. In addition, about 1.8 million tons of scrap tires are used annually in the manufacturing of products.
- Over \$7.2 billion of value is added to recyclables in the region through processing and manufacturing. A summary of value is presented in Table 1-2, along with the state-by-state totals of manufacturing value added, for comparison. This represents approximately 2.6 percent of the total value added by the manufacturing sector in the region.
- Figure 1-5 presents the value added results by material and processing/manufacturing stage. In this graphic, the values added for paper by the second stage of processing and manufacturing have been combined to eliminate an anomaly created by the assumption regarding the split between processing and manufacturing. The total value added for each material is shown in Figure 1-6, and on a state-by-state basis in Figure 1-7.

It is important to recognize that many detailed calculations and adjustments were made to produce the results summarized above. Therefore, to gain a full understanding of the meaning of the results, the full report should be read.

**FIGURE 1-2**  
**RECYCLING EMPLOYMENT**

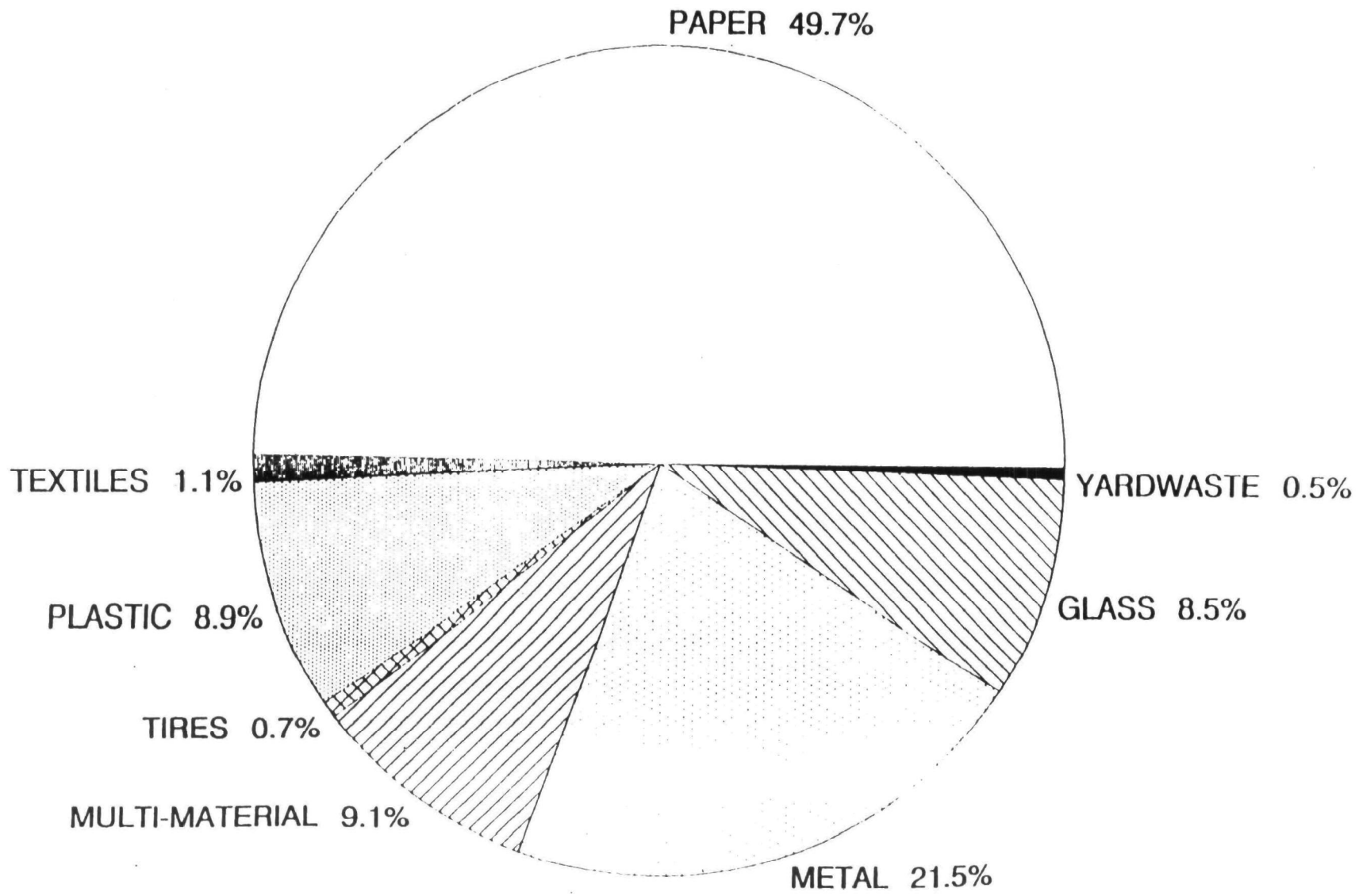


**WESTON**  
ANALYTICAL SERVICES, INC.



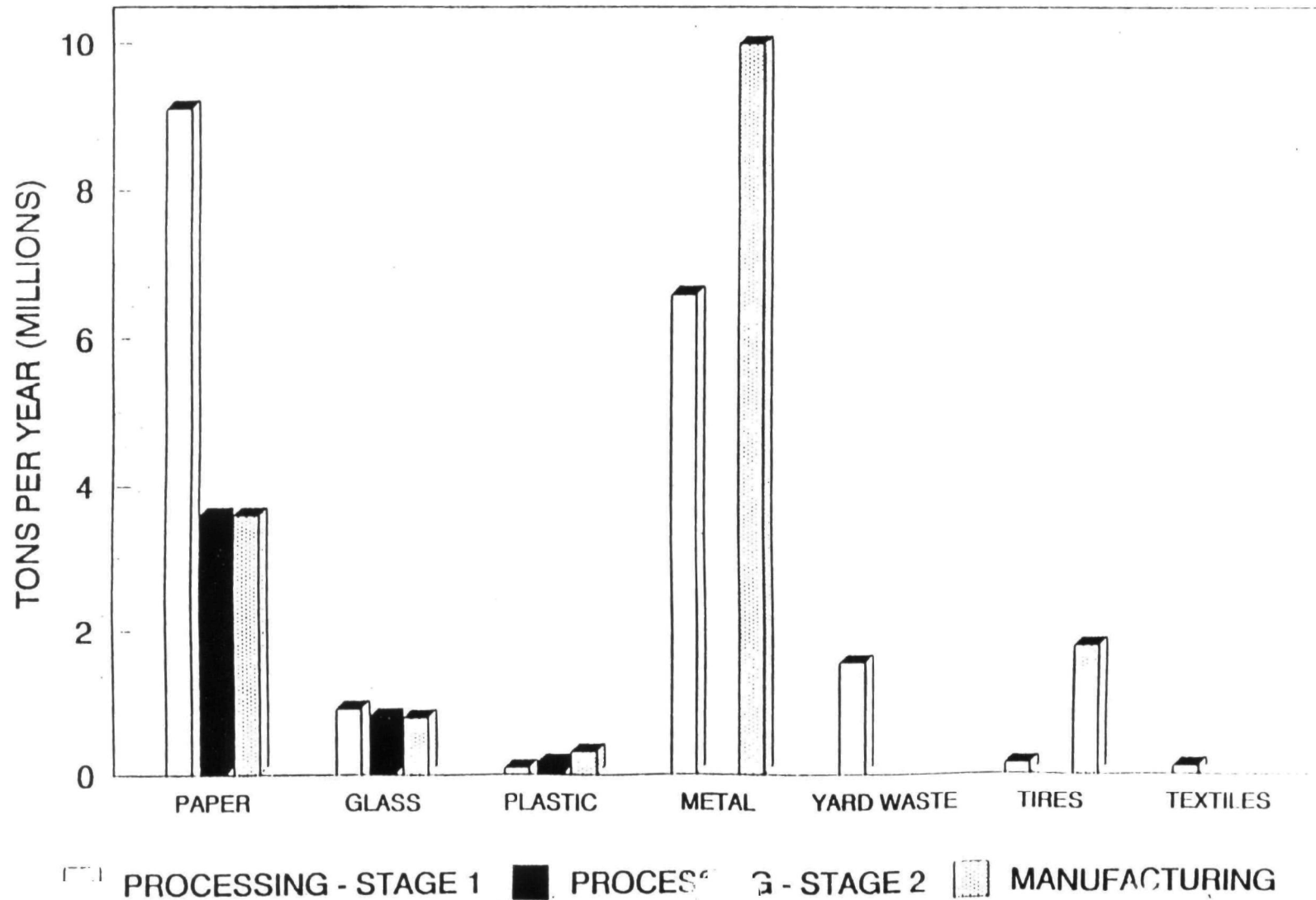
FIGURE 1-3

EMPLOYMENT BY MATERIAL CATEGORY



WESTON  
CONSULTANTS  
INCORPORATED  
10000 WEST 10TH AVE  
DENVER, CO 80231

**FIGURE 1-4**  
**QUANTITIES PROCESSED AND MANUFACTURED**



**WESTON**  
L.A. TECHNOLOGY

Table 1-2

## Summary of Value Added

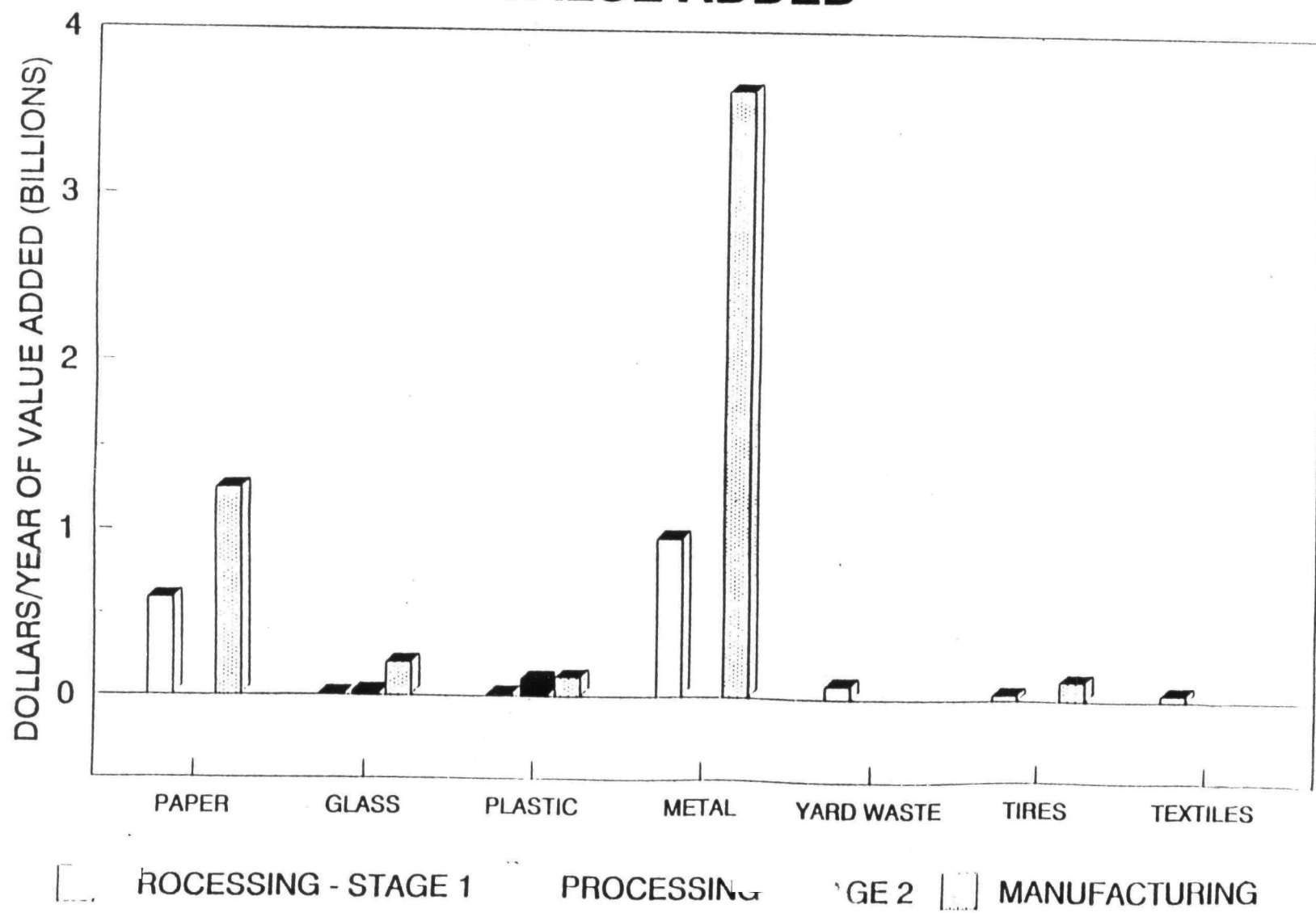
	CT	DE	ME	MA	NH	NJ	NY	PA	RI	VT	REGION
	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)
Paper Processing - 1st Stage	\$40,709	\$22,905	\$22,159	\$42,876	\$14,439	\$80,577	\$162,823	\$172,440	\$6,286	\$28,634	\$593,848
Paper Processing - 2nd Stage	\$183,972	\$1,123	\$114,560	\$200,517	\$98,194	\$304,387	\$333,958	\$403,167	\$0	\$40,914	\$1,680,793
Paper Manufacturing	\$75,682	\$374	(\$33,340)	(\$70,838)	(\$31,813)	(\$80,704)	(\$59,126)	(\$65,909)	\$0	(\$5,115)	(\$422,153)
<b>TOTALS - PAPER</b>	<b>\$148,999</b>	<b>\$24,402</b>	<b>\$103,379</b>	<b>\$172,555</b>	<b>\$80,820</b>	<b>\$304,260</b>	<b>\$437,655</b>	<b>\$509,698</b>	<b>\$6,286</b>	<b>\$64,433</b>	<b>\$1,052,488</b>
Glass Processing - 1st Stage	\$411	\$97	\$232	\$308	\$156	\$725	\$1,033	\$1,868	\$67	\$331	\$5,228
Glass Processing - 2nd Stage	\$0	\$0	\$0	\$3,456	\$0	\$5,618	\$8,877	\$8,974	\$0	\$2,325	\$25,249
Glass Manufacturing	\$13,471	\$0	\$0	\$12,425	\$0	\$42,777	\$50,337	\$82,894	\$0	\$0	\$201,904
<b>TOTALS - GLASS</b>	<b>\$13,882</b>	<b>\$97</b>	<b>\$232</b>	<b>\$16,187</b>	<b>\$156</b>	<b>\$49,120</b>	<b>\$59,247</b>	<b>\$91,736</b>	<b>\$67</b>	<b>\$2,656</b>	<b>\$232,379</b>
Plastic Processing - 1st Stage	\$902	\$213	\$509	\$672	\$343	\$1,593	\$2,269	\$4,103	\$147	\$727	\$11,480
Plastic Processing - 2nd Stage	\$3,567	\$594	\$0	\$10,224	\$2,695	\$12,206	\$21,122	\$50,726	\$1,783	\$3,606	\$106,524
Plastic Manufacturing	\$4,837	\$9,496	\$0	\$19,807	\$2,427	\$2,569	\$13,022	\$61,972	\$0	\$1,612	\$115,741
<b>TOTALS - PLASTIC</b>	<b>\$9,306</b>	<b>\$10,303</b>	<b>\$509</b>	<b>\$30,704</b>	<b>\$5,465</b>	<b>\$16,368</b>	<b>\$36,413</b>	<b>\$116,801</b>	<b>\$1,930</b>	<b>\$5,946</b>	<b>\$233,745</b>
Metal Processing	\$69,959	\$16,950	\$26,537	\$61,341	\$24,671	\$154,400	\$281,210	\$300,716	\$11,418	\$16,263	\$963,464
Ferrous Manufacturing	\$37,477	\$0	\$0	\$15,500	\$0	\$465,005	\$195,646	\$955,747	\$0	\$0	\$1,669,375
Non-ferrous Manufacturing	\$10,762	\$0	\$0	\$8,208	\$0	\$203,482	\$10,944	\$820,246	\$0	\$0	\$1,143,641
Aluminum Manufacturing	\$0	\$0	\$0	\$12,885	\$0	\$40,660	\$126,274	\$657,517	\$0	\$0	\$837,335
<b>TOTALS - METAL</b>	<b>\$118,197</b>	<b>\$16,950</b>	<b>\$26,537</b>	<b>\$97,934</b>	<b>\$24,671</b>	<b>\$953,546</b>	<b>\$614,074</b>	<b>\$2,734,225</b>	<b>\$11,418</b>	<b>\$16,263</b>	<b>\$4,613,816</b>
Yard Waste Processing	\$6,365	\$0	\$19,096	\$39,783	\$0	\$3,327	\$3,806	\$0	\$6,365	\$0	\$78,843
Tire Processing	\$1,406	\$0	\$4,136	\$2,730	\$1,406	\$1,654	\$14,062	\$7,734	\$0	\$1,406	\$34,536
Tire Manufacturing	\$16,614	\$10,799	\$0	\$26,998	\$0	\$4,154	\$7,476	\$41,535	\$8,307	\$0	\$115,883
<b>TOTALS - TIRES</b>	<b>\$18,020</b>	<b>\$10,799</b>	<b>\$4,136</b>	<b>\$29,728</b>	<b>\$1,406</b>	<b>\$5,808</b>	<b>\$21,539</b>	<b>\$49,269</b>	<b>\$8,307</b>	<b>\$1,406</b>	<b>\$150,418</b>
Textile Processing	\$647	\$0	\$1,941	\$3,408	\$647	\$1,294	\$18,584	\$10,761	\$1,294	\$0	\$38,584
<b>TOTALS - ALL MATERIALS</b>	<b>\$115,416</b>	<b>\$62,552</b>	<b>\$155,830</b>	<b>\$390,298</b>	<b>\$113,166</b>	<b>\$1,333,723</b>	<b>\$1,190,427</b>	<b>\$3,512,491</b>	<b>\$35,668</b>	<b>\$90,704</b>	<b>\$7,200,274</b>
<b>VALUE ADDED BY MANUFACTURING SECTOR (1)</b>	<b>\$23,832,000</b>	<b>\$4,231,000</b>	<b>\$5,428,000</b>	<b>\$34,472,000</b>	<b>\$5,847,000</b>	<b>\$44,332,000</b>	<b>\$81,625,000</b>	<b>\$84,842,000</b>	<b>\$5,140,000</b>	<b>\$3,183,000</b>	<b>\$272,812,000</b>
<b>RECYCLING AS PERCENT OF MANUFACTURING SECTOR</b>	<b>1.3%</b>	<b>1.5%</b>	<b>2.9%</b>	<b>1.1%</b>	<b>2.0%</b>	<b>3.0%</b>	<b>1.5%</b>	<b>5.4%</b>	<b>0.7%</b>	<b>2.9%</b>	<b>2.6%</b>

## NOTES:

(1) Source 1993 Statistical Abstract of the United States

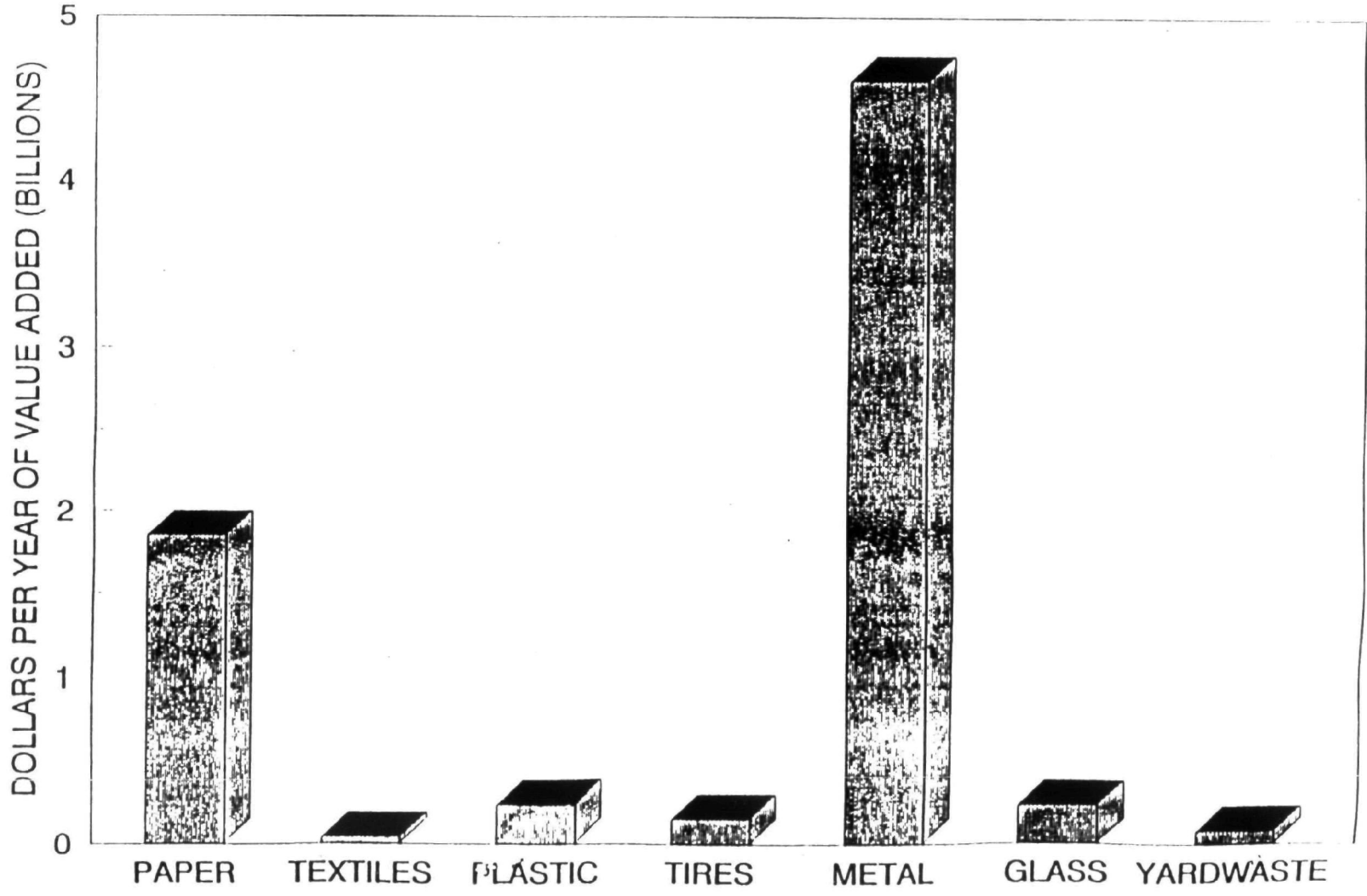
WESTERN

FIGURE 1-5  
VALUE ADDED



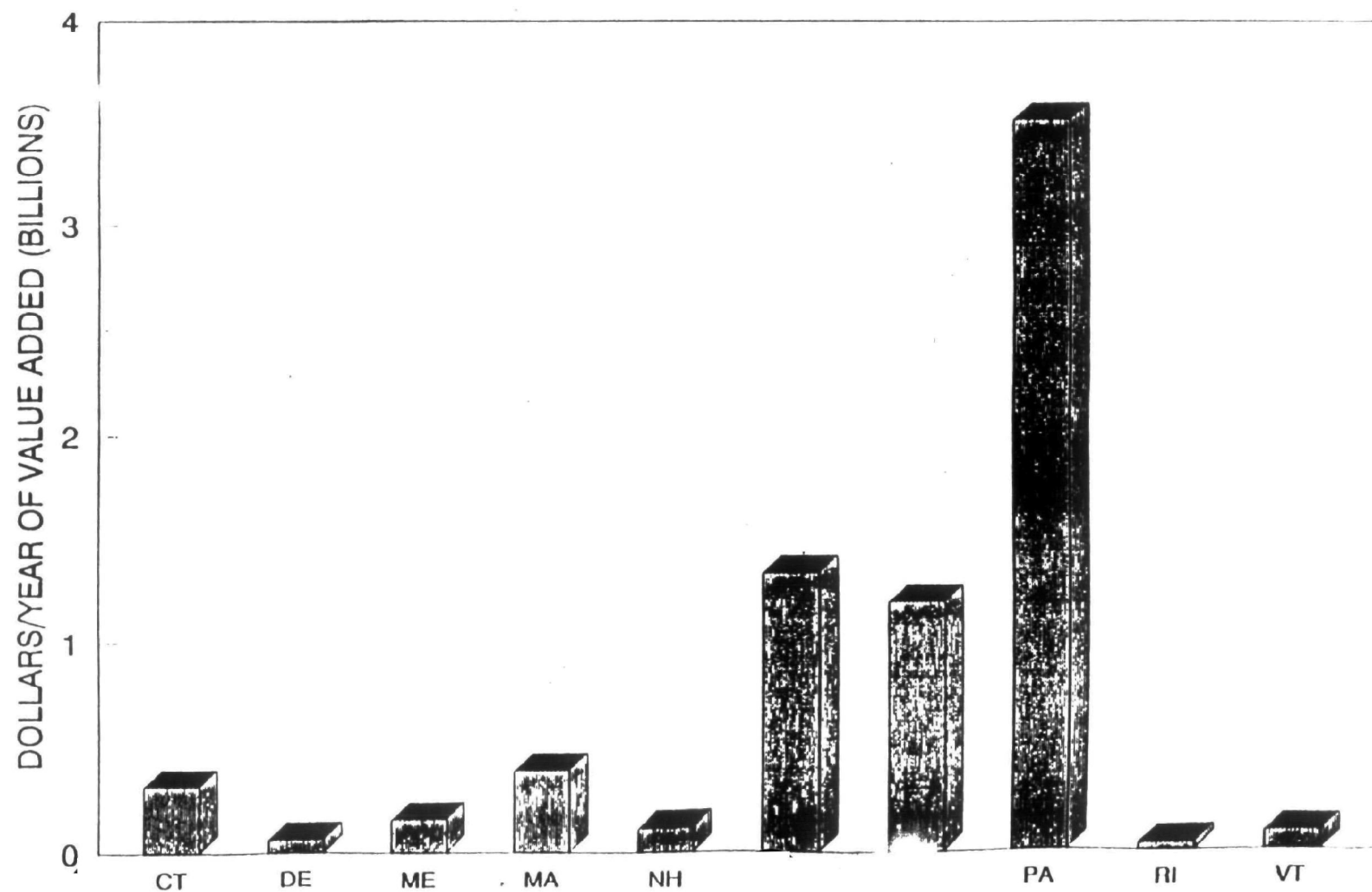
WESTON  
ANALYTICAL  
LABORATORY

**FIGURE 1-6**  
**VALUE ADDED BY MATERIAL CATEGORY**



WESTON  
AN IRVING-CLOUD COMPANY

FIGURE 1-7  
VALUE ADDED BY STATE



WESTON  
CONSULTANTS



## SECTION 2

### OVERVIEW OF METHODOLOGY

#### 2.1 CONCEPTUAL APPROACH

Value added, as the term is used in this study, is a measurement of economic activity, and for this study is focused on the economic activity associated with recycling. There are two major conceptual approaches to the measurement of value added: one uses the increase in value of material as it progresses through stages of an industry as the measure of economic activity, and the second approach uses employment as the measure of economic activity. The primary approach in this study is the increase in material value, in which value added is measured by tracking the increase in prices paid for recyclable materials as they progress through the stages of recycling.

For each material and each recycling stage the value added, on a per-ton basis, is determined by calculating the difference between the price paid for the material at the start of the stage and the price paid after that stage. Recyclable material is assumed to have zero value prior to collection, and the value added during collection and processing is considered in aggregate, since these are often integrated functions preformed by the same companies. Thus, if the price for a certain material is \$30 per ton after processing, it is assumed that \$30 per ton of value has been added to the material through collection and processing. Similarly, if the same material has a price of \$50 per ton after intermediate manufacturing, then it is calculated that \$20 per ton of value had been added during manufacturing. By applying these per-ton figures to estimates of the quantities processed and manufactured, the total value added is determined.

It should be noted that although the value added through collection is included within the analysis (although it is combined with the value added through processing), all of the economic activity associated with collection is not included. This is because some of the economic activity associated with collection of recyclables does not add value, or at least does not add value equivalent to the cost of the activity. In other words, a community may invest \$80 per ton to collect a certain recyclable material, but its value to a processor may still be zero. In this instance, the \$80 per ton of economic activity is not included in the value added analysis.

This situation is a byproduct of the material value approach to the analysis. Only those activities which directly increase the value of a material are accounted for. This is a conservative approach to measuring economic activity associated with recycling.

#### 2.2 ANALYTICAL BOUNDARIES

The starting point of this analysis is the point at which material is collected, and the value of all materials is assumed to be zero at that point. Since the purpose of this study is to quantify the economic activity associated with recycling and at this stage no economic activity has occurred, it is appropriate to assign the materials a value of zero, even though



certain materials may have some value at the point of collection (and some materials may be considered to have a negative value at this stage)

The ending points for the analysis of value added are more difficult to establish. Materials go through the processing and manufacturing stages differently, and there are also "philosophical" differences about what is appropriate to include as a recycling activity. The philosophical issues generally revolve around the question of how far along the manufacturing processes should one proceed before the determination that this is the end of the recycling activity. For instance, with relation to plastics, there is no disagreement that the processing of plastics to separate them and produce baled material is a recycling activity. In addition, the production of plastic pellets from the recycled feedstock is also generally agreed upon as appropriate to include in an economic analysis of recycling. However, if a toy manufacturer uses the plastic pellets to manufacture toys, should the economic activity associated with the toy manufacturing be included in this analysis?

The determination of appropriate end-points for analysis required considerable time and effort. Input was received from a review team of NERC staff and members at several points during the development of the analysis, and as a result of this input, as well as the information gathered during the analysis, the end-points established evolved over time. One of the key concepts used in the discussion of end-points was virgin equivalency. We have defined virgin equivalency as the point at which recycled materials have been processed to the point of achieving technical equivalency to virgin materials. In other words, this is the point at which, at least theoretically, virgin or recycled material could be used interchangeably, and thus any processing or manufacturing done after this point is not related to the fact that the material came from a recycled source. In the case of plastics, as discussed above, the pellets produced would be the point of virgin equivalency.

Originally, the approach was to utilize virgin equivalency as the end-point for all materials. This is a conservative approach, as some businesses that depend on recycled feedstocks would not be included. It was also found to be difficult to apply in certain instances. Paper is one example. Intermediate manufacturing (production of a material required for final manufacturing) and final manufacturing (production of a wholesale product) are often integrated into a single facility. Thus, in many instances in paper manufacturing there is no production of an intermediate virgin equivalent product (such as steel sheet in the case of ferrous metal) that is produced, sold and transferred to another facility. Even internal to a paper manufacturing facility it would be difficult to define the point at which a virgin material could be substituted for the recycled material, particularly without conducting a facility-by-facility analysis. Thus, for paper it was decided that the wholesale product that emerges from paper mills will be used as the end point for the determination of value added.

As analysis proceeded, and more feedback was received from the review team, it was determined that the notion of virgin equivalency would be applied as the end-point for processing, and that manufacturing would include the next stage of economic activity after achieving virgin equivalency. The result of this determination is that there are several materials for which there are two stages of processing: paper, plastics, and glass. In the first stage, an intermediate product is produced that can be sold or transferred, but has not yet





reached the stage of virgin equivalency. In the second stage of processing, the material is taken from this intermediate stage to virgin equivalency. For paper and plastics, the first stage of processing involves separation of materials and baling. In the case of glass, the first stage involves sorting by color. In the second stage of processing, the following are the end-points for these materials:

- Paper: A pulp that could be substituted for a pulp produced from virgin fiber is considered the end-point for processing. This is generally called deinked market pulp.
- Plastic: Pellets of a single resin are considered the end-point for processing.
- Glass: The end-point for processing is furnace-ready cullet since this material is the closest product to a virgin equivalent.

A summary of the end-points for processing and manufacturing is presented in Table 2-1.

There are also geographical boundaries to consider in this analysis. These boundaries correspond to the boundaries of the NERC region. However, since the goal is to measure economic activity within the region, whether or not that activity is attributable to the region's own wastes, these boundaries apply only to the location of the economic activity to be included or excluded and not to the source of recyclable material. In other words, in this analysis if a processing facility is located within the region, the value added by that facility will be included in the analysis even if the source of the material processed was outside of the region. Thus, one only needs to consider the location of facilities in determining which activities to include, and not the source of the recyclable material.

### **2.3 DETERMINATION OF QUANTITIES PROCESSED AND MANUFACTURED**

Very little comprehensive quantitative data exists regarding recycled materials processed and manufactured. While there is a great deal of data available for individual components of the recycling industry, there is a lack of comprehensive data that is or can be compiled on a regional basis in a meaningful way. This is particularly true because the "recycling industry" is not a single industry and is diverse in nature. This was known at the start of the project through WESTON's other work and was confirmed by NERC members who indicated the lack of data necessary to support the analysis of value added. Therefore, quantitative data had to be assembled and generated specifically for this study before the analysis of value added could be performed.

The ideal approach to compiling the quantitative data needed would be to utilize data already synthesized for each material on a national or state-by-state basis. This data might then have to be broken down into sub-categories, but it would avoid the need to aggregate data from a myriad of sources. Unfortunately, the data needed to support this top-down approach does not exist, with the exception of paper manufacturing and, to a lesser degree, glass manufacturing. As a result, a bottom-up approach was developed, using data gathered from processors and manufacturers and extrapolating it through the use of employment data.



Table 2-1

Summary of End-Points For Recycling Stages

MATERIAL	MATERIAL STATUS AFTER PROCESSING	MATERIAL STATUS AFTER MANUFACTURING	EXPLANATION
PLASTICS	PET PELLETS HDPE PELLETS		Pellets represent a material equivalent to virgin. Manufacturing end-points, if any, will depend on specific manufacturers identified.
FERROUS METAL	SHREDDED WHITE GOODS BALED STEEL CANS BALED FERROUS SCRAP UNBALED FERROUS SCRAP	STEEL SHEET STEEL INGOT CAST STEEL	White goods are typically shredded during processing, while tin cans are typically baled. Other ferrous metals can be shipped to mills baled or unbaled. Detainers produce No. 1 detinned bundle as an end-product. Steel mills can produce steel sheets or ingots, while foundries produce cast steel.
PAPER	PULP SUBSTITUTES	NEWPRINT PRINTING & WRITING PAPER PACKAGING/IND CONVERTING TISSUE KRAFT PAPERBOARD SEMI-CHEMICAL PAPERBOARD RECYCLED PAPERBOARD CONSTRUCTION PAPER/BOARD	Pulp substitutes represent a material equivalent to virgin. One or more types of pulp substitutes will be used for all grades of paper, depending on availability of price information. Many types of paper are manufactured using recycled feedstocks, but the grades shown here are the ones for which quantitative data has been compiled.
GLASS	CLEAR CULLET (Furnace Ready) BROWN CULLET (Furnace Ready) GREEN CULLET (Furnace Ready) MIXED CULLET (Furnace Ready)	BEVERAGE CONTAINERS GLASSPHALT	Color-separated cullet is produced during processing. The vast majority glass is used to produce beverage containers, so this will be the end-point considered for color-separated cullet. To the extent that glassphalt manufacturers are identified, the value added to mixed color cullet in this process can be estimated.
ALUMINUM CANS	BALED UBC FLATTENED UBC	ALUMINUM SHEET	Processing of aluminum cans typically results in baled or flattened cans. The vast majority of used aluminum cans are made into aluminum sheet.
NON-FERROUS SCRAP	BALED SCRAP UNBALED SCRAP		Non-ferrous scrap is handled in a variety of ways, since it represents a range of materials. If the major use of non-ferrous scrap in manufacturing in the region can be identified, that can be used as the end-point for manufacturing.
YARD WASTE	COMPOST		Compost is the end-point of yard waste processing, with no manufacturing stage. Only that compost which is sold will be included in the analysis.
TIRES	RETIRES SHREDDED TIRES CRUMB RUBBER	RUBBER MODIFIED ASPHALT	Only those tires shredded and crumbed for recycling or reuse will be counted. Production of rubber modified asphalt may not be significant enough to include.
TEXTILES	BALED TEXTILES UNBALED TEXTILES	RAGS USED CLOTHING	To the extent that baled or unbaled textiles are sorted and resold at the wholesale level for use as rags or used clothing, this 'manufacturing' activity will be included.



In this approach, processing and manufacturing rates per employee are derived and applied to employment data in order to estimate the quantities of each material processed or manufactured. For each material a processing rate and a manufacturing rate are determined through surveys of processors and manufacturers (in combination with data of this type gathered previously). These rates can then be applied to the number of employees processing or manufacturing that material in each state.

In order to gather the employment data a database of recycling processors and manufacturers was compiled by a NERC intern (Carolyn Gradinsky), utilizing a variety of sources. For each state and each material a listing was developed of firms processing that material and manufacturing using that material. The listings for each state were sent to the Departments of Labor for each of the states for them to assemble employment data. The employment data gathered was incorporated into this study. The employment data gathered (as well as the way in which data gaps were filled) is described later in this report.

WESTON has recently completed a quantitative analysis of recycling in Massachusetts that involved the determination of processing rates per employee for a number of materials. This data was utilized in this study and as a result the surveying of recycling firms could focus on manufacturers and the processor types for which no data was available from the Massachusetts study. In addition, since it was known that the most significant contributor to value added in the region would likely be paper, approximately half of the total surveying time was devoted to paper manufacturers. The results of the surveying and the determination of processing and manufacturing rates are described later in this report.

The employment data and the processing and manufacturing rates were then combined to estimate the quantities of recyclable materials processed and used in manufacturing. This is done by multiplying the employment total for a particular state, material and recycling stage by the processing or manufacturing rate for that material. The only materials for which this approach was not utilized were for paper and glass. Since tonnage data has been compiled on a state-by-state basis for paper and glass manufacturing, this data was used in conjunction with survey results to characterize manufacturing without the use of a per-employee rate. The estimates of quantities of material processed and manufactured are described in Section 3 of this report.

## **2.4 CALCULATION OF VALUE ADDED**

Once material quantities have been estimated, the additional data needed are prices for each material at the end of each processing and manufacturing stage. Data was gathered from national publications which publish prices paid for various recyclable and manufactured materials. To the extent possible, long-term averages for prices paid in the region were utilized. When sufficient data was available, two years of data were averaged, in order to minimize the impact of short-term deviation in price for a particular material.

The difference in value, on a per-ton basis, was calculated between each recycling stage for each material. For instance, if a material had a value of \$30 per ton after the first stage of processing, \$50 per ton after the second stage of processing, and \$100 per ton after manufacturing, the following differentials would be determined: \$30, \$20 and \$50 per ton.



The material would have increased in value \$30 per ton during the first stage of processing, since it started out with a value of zero. It would have gained \$20 per ton in value during the second stage of processing (\$50 minus \$30), and \$50 per ton during manufacturing (\$100 minus \$50). Each of these differentials is applied to the quantity of material in that recycling stage.

It is important to recognize that the tonnage in each recycling stage is not linked to the tonnage in any other stage. Thus, there are typically different quantities of material estimated in each stage. This is because recyclable material often crosses state and national boundaries as it progresses through the stages of recycling. Since we are concerned only with the location of the recycling activity and not the source of the material, the quantity of a certain material processed in a state has nothing to do with the amount of the material manufactured in that state. Thus, care must be taken to apply the appropriate tonnage estimate to the appropriate value added differential. The results of this analysis are described in Section 4 of this report.



## SECTION 3

### DETERMINATION OF QUANTITIES RECYCLED

#### 3.1 INTRODUCTION

In Section 2 of this report the methodological approach to the value added analysis is described. During actual application of the methodology numerous adjustments and modifications were made in order to accommodate the particular nature or lack of data derived. In this section the manner in which recyclable quantities were actually determined is described, along with the results. The determination of value added is described in Section 4.

In making the adjustments to methodology and filling the various data gaps encountered, judgement has to be applied. In order to guide these judgements, the following criteria were used:

- to the greatest extent possible, consult with NERC staff and members in the determination of approach;
- utilize adjustments and assumptions that are likely to produce conservative results;
- maintain conceptual consistency between adjustments and assumptions; and
- recognize the level of precision of the known data so that highly refined and complex assumptions or methodologies are not developed if they are not supported by the precision of the data.

#### 3.2 DERIVATION OF EMPLOYMENT DATA

The first step in the quantification of materials recycled is a determination of employment. This is because the means for deriving quantities of material recycled involves application of processing and manufacturing rates to employment totals. As described in the methodological approach, lists of processors and manufacturers of recyclable materials were developed for each state by a NERC intern. These lists are presented in Appendix A of this report. The initial set of lists had separate categories for each material, with processors and manufacturers of each material presented separately. However, the lists had to be modified because of the manner in which employment data was to be developed.

The intent of the lists was to be able to determine the total number of employees that process each material and manufacture each material, on a state-by-state basis. The employment data was to be requested from state Departments of Labor that maintain files of employment data. However, it was known that in many states, due to confidentiality, employment data for individual firms could not be released, and if a category contained less than three firms, the total employment for that category could not be released.



Therefore, in order to ensure that employment for all firms was tabulated, the lists were modified to combine categories so as to ensure that there were at least three firms in each category.

In most instances employment data could not be determined for all firms. The Departments of Labor generally indicated a total employment for a particular category, and noted how many firms were missing from the total calculated. There are a number of reasons that a firm could be missing from the employment data tabulated. These include a misspelled company name, a firm operating under a different name, a firm going out of business, or a firm owned by another company.

Since considerable effort was expended during the compilation of the lists to ensure that the companies on that list were actual recycling businesses, it was deemed appropriate to try to adjust the state-supplied data to account for the missing firms. This was generally done by using an average employment per firm for the particular type of processor or manufacturer in question, based on data available through surveys of firms, and the employment data provided by the states for firms that were included. Thus if a total employment for glass manufacturers was given for a particular state, and it was noted that two firms on the list could not be located in the state's employment database, the average employment for glass manufacturers would be multiplied by two, and this total would be added to the state-reported total.

Although the manner in which gaps in employment data were filled is not the most conservative approach possible, we believe it is appropriate for a number of reasons. First, as mentioned previously, there was a strong belief that the firms on the list represented companies that were in existence and functioning. Thus, ignoring the data gaps would likely result in an underestimate of employment. Second, it has been pointed out by industry associations and others that some recycling businesses were not included in the lists developed. This means that any over-estimate of employment caused by filling data gaps would be at least partially offset by the employment missing due to certain firms not getting onto the lists. Third, an industry association has stated its belief that the employment data from Departments of Labor does not include all labor from small businesses, which would also offset any over-estimation caused by filling data gaps. Lastly, in compiling the data on average size of firms, a large number of firms were included in the average. In addition, as more firms were added to the list included in determining the average, the average changed only slightly. This is indicative of a statistically valid average.

The results of the estimates of employment for the region are provided in Table 3-1. The adjustments and assumptions used in preparing the estimates of employment are described in the footnotes to the table. The types of adjustments made (in addition to estimating employment for firms not included in state data) include dividing metal manufacturing employment into the three metal categories needed for the value added analysis; splitting an aggregated list of firms with more than one type of firm into the appropriate categories; incorporating survey data as appropriate; and using average employment per firm and number of firms in a list to estimate totals for lists for which states could provide no employment data.

Table 3-1

## Summary of Employment Estimates

	CT	DE	MF	MA	NI	NJ	NY	PA	RI	VI	TOTALS
Paper Processing	138	323	60	377	30	434	1,668	251	15	20	3,418
Paper Manufacturing	1,794	83	7,190	6,102	1,827	3,595	10,734	15,814	0	815	47,938
Glass Processing	0	0	0	0	0	58	71	72	0	24	225
Glass Manufacturing	309	0	0	285	0	2,180	1,874	3,943	0	0	8,591
Plastic Processing	90	15	0	298	68	308	533	1,280	45	91	2,688
Plastic Manufacturing	273	338	0	1,118	137	145	735	3,498	0	91	6,533
Metal Processing	588	143	207	527	205	1,336	2,494	2,508	96	87	8,189
Ferrous Manufacturing	153	9	0	45	0	1,350	588	2,775	0	0	4,891
Non-Ferrous Manufacturing	50	0	0	45	0	1,609	60	4,497	0	0	6,271
Aluminum Manufacturing	0	0	0	45	0	142	441	2,296	0	0	2,924
Yard Waste Processing	44	0	132	275	0	23	27	0	44	0	545
Tire Processing	17	0	30	32	17	20	170	94	0	17	418
Tire Manufacturing	40	26	0	65	0	10	18	100	20	0	279
Textile Processing	19	0	57	100	19	38	546	318	38	0	1,133
Multi-material Processing	737	174	418	549	280	1,301	1,853	3,351	120	594	9,373
<b>TOTAL EMPLOYMENT</b>	<b>4,281</b>	<b>1,292</b>	<b>8,112</b>	<b>9,824</b>	<b>2,583</b>	<b>12,549</b>	<b>21,792</b>	<b>40,893</b>	<b>379</b>	<b>1,739</b>	<b>103,413</b>

## NOTES

General: Employment totals reported by states were adjusted to reflect estimated employment for firms not included in totals.

- (1) Based on average employment of glass processors (24) and number of processors in state
- (2) Total metal manufacturing employees split into 3 categories
- (3) Based on average employment of tire processors (165) and number of processors in state
- (4) 635 employees less estimated employment for glass and tire processors
- (5) Based on average employment of paper processors (15) and number of processors in state
- (6) 1857 employees less estimated paper processor employment
- (7) 205 employees assumed to be split 1/3 processing, 2/3 manufacturing
- (8) Based on average employment of textile processors (18) and number of processors in state
- (9) 316 employees, less estimated employment for tire and textile processors
- (10) Based on average employment of plastic processors (15) and number of processors in state
- (11) 165 employees plus estimated employment for one multi-material firm (24) not included in 165, less estimated employment for plastic processing
- (12) 388 employees, less estimated paper manufacturing employment
- (13) Aggregate of 30 employees for tire processing and manufacturing split 2/3 processing 1/3 manufacturing based on number of firms
- (14) Based on average employment of glass manufacturers (309) and number of manufacturers in state
- (15) Based on average employment of plastic manufacturers (91) and number of manufacturers in state
- (16) Aggregate estimate of 506 employees, less estimates for yard waste processing and glass manufacturing
- (17) Based on average employment of yard waste processors (22) and number of processors in state
- (18) Based on average employment of tire manufacturers (20) and number of manufacturers in state
- (19) Aggregate estimate of 756 employees, less estimate for textile processing
- (20) One glass manufacturer with known employment (285), other manufacturers identified not processing post-consumer glass
- (21) Single tire manufacturer identified during survey with employment reported to be 65
- (22) Two firms with known employment (165), 3 assumed at average size of yard waste processors (22)
- (23) Based on average employment of non-ferrous manufacturers (58) and number of manufacturers in the state
- (24) Based on average employment of ferrous manufacturers (225) and number of manufacturers in state
- (25) Aggregate of 3,101 employees for metal manufacturers, less estimates for ferrous and aluminum manufacturers
- (26) Based on average employment of aluminum manufacturers (71) and number of manufacturers in state
- (27) Based on average employment of metals processors (12) and number of processors in state
- (28) Based on average employment of multi-material processors (24) and number of processors in state
- (29) Two manufacturers with known employment, one assumed at average employment for ferrous metal manufacturers (225)
- (30) Three manufacturers with known employment, one assumed at average employment for aluminum manufacturers (71)
- (31) Seventeen firms with known employment plus eight firms with employment based on average size of paper processors (15)
- (32) Employment extrapolated from 34 to 40 firms based on known employment total for 34 firms
- (33) Known employment for 12 firms, five firms assumed to have average employment per firm of plastic processors (15)
- (34) Known employment for 18 firms, three firms assumed to have average employment per firm of plastic manufacturers (91)
- (35) Known employment for 143 firms, forty firms assumed to have average employment per firm of metal processors (12)
- (36) Employment total of 8588 split 20% ferrous, 47% non-ferrous, 24% aluminum, based on number of firms of each type
- (37) Eleven firms with known total employment, five firms assumed to have average employment of tire processors (165)
- (38) Severely firms with known total employment, fifty one firms assumed to have average employment of multi-material processors (24)

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The net result of this analysis is that for the ten states there are approximately 103,000 employees in firms processing recyclables and using recycled feedstocks in manufacturing. Pennsylvania is the largest employer, followed by New York, and then the three states of New Jersey, Massachusetts, and Maine (which have virtually identical employment totals). Manufacturing accounts for approximately 68 percent of the total employment in the region, and paper manufacturing accounts for approximately 67 percent of all manufacturing employment (or approximately 48 percent of total employment).

### **3.3 DEVELOPMENT OF PROCESSING AND MANUFACTURING RATES**

Processing and manufacturing rates per employee need to be determined in order to enable use of employment data in the determination of quantities of recyclables processed and used in manufacturing. These rates were developed through surveying of processors and manufacturers in the region. Firms were contacted by telephone and asked to provide the number of employees in the firm (or at the particular facility being contacted if it was a firm with multiple locations) and the quantity of recyclable material processed or used in manufacturing per year. These two data items allow calculation of a processing or manufacturing rate per employee.

If a contact at a firm was forthcoming with this information, he or she was asked additional questions regarding the nature of the processes utilized at their facility, and the nature and value of the end-products produced. While there were many contacts made in which significant information was provided, it is the nature of this type of data gathering exercise that the majority of the contacts made resulted in no information at all. Many firms are reluctant to provide information because they believe that the type of information being requested is confidential, particularly with regard to the quantity of material processed or manufactured. In other instances they are unwilling to spend the time to gather the information, or it is not possible to make contact with a person who could provide the information desired.

It was important to prioritize the data gathering activity because of the effort required to gather the information. Since WESTON had conducted a similar exercise in Massachusetts focusing on processors of recyclables, gathering data from the types of firms already surveyed in the Massachusetts study was of the lowest priority. This allowed the data gathering for this project to focus on the manufacturers and those types of processors not already analyzed in the Massachusetts study. In addition, data gathering from paper manufacturers received the highest priority, since it was likely that paper manufacturing would be the component of the recycling industry that would contribute most significantly to the total value added through recycling in the region.

Thus, the approach to data gathering was to ensure that tonnage and employment data was derived from a minimum of three firms in each category (including the Massachusetts data) and to devote the rest of the data gathering effort to paper manufacturing firms. This resulted in approximately 50 percent of the total data gathering effort being devoted to paper manufacturing. It should be noted that at least one attempt was made to contact every manufacturer in every material category in the region, and the additional effort





devoted to paper manufacturing meant that time could be devoted to follow-up contacts to maximize the data gathered from this group of firms.

Table 3-2 summarizes the results of the surveying of processors and manufacturers. It can be seen that in three instances, the desired minimum of three firms providing data was not achieved: gas processors, non-ferrous manufacturers and tire manufacturers. In both instances the very small number of firms in the category meant that even with multiple attempts at data gathering it was not possible to gather data from three firms. While the small sample size used to derive the manufacturing rate for these categories means less confidence in the precision of the rate, the fact that there are so few firms of these types in the region indicates that the total contribution of these categories to the regional value added is less significant than for many of the other categories. As a result, the lack of precision in the manufacturing rates is of less concern than it would be for a major contributor to total value added.

Table 3-2 shows that the range in processing and manufacturing rates per employee is rather large. This is expected, given the many different materials and processes included. It is important to recognize, however, that the per employee rates are an intermediate set of data necessary for the next stage of analysis, but should not be considered an end result. It is also important to note that manufacturing rates were not determined for paper or glass manufacturing. This is because quantitative data has already been compiled for these industries such that the application of per employee rates is not necessary.

### **3.4 DETERMINATION OF QUANTITIES PROCESSED AND USED IN MANUFACTURING**

The employment data compiled can be combined with the processing and manufacturing rates per employee to calculate the quantities of recyclables processed and used in manufacturing in the region. The results of this analysis are summarized in Table 3-3. For paper processing and manufacturing and glass and multi-material processing, specialized approaches were developed. These are discussed in greater detail below. All other categories of processing and manufacturing involved simple multiplication of per-employee rates and employment totals.

In determining the quantity of recyclables used in manufacturing, it is important to recognize that estimates were made of the quantities of recycled feedstocks used in manufacturing and not the total output from facilities that accept recycled material. This is critical because many manufacturing facilities that utilize recycled material use it as a portion of their total feedstock. Thus, if a facility used 20,000 tons of recycled feedstock and 80,000 tons of virgin feedstock to produce 100,000 tons of end-product (assuming no loss of material), this study only tracked the value added to the 20,000 tons of recycled feedstock, and the other 80 percent of production was not considered. This ensures that the value added calculation does not take "credit" for manufacturing processes not associated with recycled material.



Table 3-2

## Summary of Processing and Manufacturing Rates Per Employee

Type of Firm	Number of Firms Providing Data <sup>(1)</sup>	Average Tons/Employee/Year
Paper Processors	9	703
Paper Manufacturers	49	<sup>(2)</sup>
Glass Processors	2	3,100
Glass Manufacturers	5	<sup>(2)</sup>
Metal Processors	50	709
Ferrous Manufacturers	3	1,196
Aluminum Manufacturers	3	385
Non-Ferrous Manufacturers	1	480
Plastic Processors	3	64.2
Plastic Manufacturers	6	48.2
Yard Waste Processors	7	2,992
Tire Processors	8	352
Tire Manufacturers	2	6,390
Textile Processors	7	97.3
Multi-Material Processors	3	906

## NOTES:

- <sup>(1)</sup> Includes data from "Collection and Analysis of Quantitative Data Concerning Recyclables Processing in Massachusetts" by Roy F. Weston, Inc., February 1994.
- <sup>(2)</sup> Ton per employee rates not utilized in determining total tonnage of paper or glass manufactured.

Table 3-3

## Estimates of Quantities of Recyclables Processed and Manufactured

	CT	DE	ME	MA	NI	NJ	NY	PA	RI	VT	TOTALS
Paper Processing 1st Stage											
Tons/Empl Yr	703	703	703	703	703	703	703	703	703	703	
Employees	128	323	80	777	30	434	1,888	351	15	20	3,418
Total tons	97,814	227,088	42,180	265,031	21,000	305,102	1,372,804	248,753	10,545	14,060	2,401,458
Paper Manufacturing											
Tons/Empl Yr											
Employees	1,794	85	7,100	8,102	1,827	3,685	10,734	15,814	0	815	47,038
Total tons	283,200	2,400	244,848	428,580	208,888	650,580	713,780	861,680	0	87,413	3,502,321
Glass Processing											
Tons/Empl Yr	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	
Employees	0	0	0	0	0	0	71	72	0	24	24
Total tons	0	0	0	110,508	0	110,800	270,100	223,240	0	74,880	699,028
Glass Manufacturing											
Tons/Empl Yr											
Employees	300	0	0	285	0	2,181	1,874	3,943	0	0	8,581
Total tons	52,212	0	0	48,157	0	185,800	105,100	321,200	0	0	782,919
Plastic Processing											
Tons/Empl Yr	842	842	842	842	842	842	842	842	842	842	
Employees	80	19	0	258	0	318	533	1,202	55	91	2,088
Total tons	5,778	883	0	18,584	4,388	10,774	34,210	82,178	2,880	9,842	172,570
Plastic Manufacturing											
Tons/Empl Yr	482	482	482	482	482	482	482	482	482	482	
Employees	273	838	0	1,118	127	155	735	3,418	0	91	5,511
Total tons	11,158	25,815	0	53,898	0,803	0,880	15,427	18,804	0	4,482	114,881
Metal Processing											
Tons/Empl Yr	700	700	700	700	700	700	700	700	700	700	
Employees	588	142	207	547	295	1,341	2,404	2,348	95	57	8,181
Total tons	418,892	101,387	149,782	371,842	145,345	857,224	1,718,248	1,778,754	88,184	81,182	3,881,121
Ferrous Manufacturing											
Tons/Empl Yr	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	
Employees	153	0	0	45	0	508	508	2,775	0	0	4,881
Total tons	182,888	0	0	51,620	0	1,814,800	870,728	3,318,588	0	0	5,848,321
Non-Ferrous Manufacturing											
Tons/Empl Yr	480	480	480	480	480	480	480	480	480	480	
Employees	50	0	0	45	0	1,500	80	4,497	0	0	6,471
Total tons	28,720	0	0	21,600	0	772,320	28,800	2,158,541	0	0	3,081,581
Aluminum Manufacturing											
Tons/Empl Yr	385	385	385	385	385	385	385	385	385	385	
Employees	0	0	0	45	0	142	441	2,288	0	0	2,914
Total tons	0	0	0	17,725	0	54,870	189,785	884,081	0	0	1,146,881
Yard Waste Processing											
Tons/Empl Yr	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	
Employees	44	0	132	275	0	23	27	0	44	0	544
Total tons	123,700	0	80,800	770,800	0	85,800	75,800	0	123,200	0	1,519,100
Iron Processing											
Tons/Empl Yr	352	352	352	352	352	352	352	352	352	352	
Employees	17	0	50	33	37	20	170	94	0	17	418
Total tons	5,884	0	17,100	11,818	8,084	7,080	60,880	32,812	0	5,884	140,880
Iron Manufacturing											
Tons/Empl Yr	8,300	8,300	8,300	8,300	8,300	8,300	8,300	8,300	8,300	8,300	
Employees	40	20	0	15	0	18	18	100	20	0	270
Total tons	7,188	168,140	0	445,740	0	83,188	115,112	818,088	127,888	0	1,757,812
Steel Processing											
Tons/Empl Yr	873	873	873	873	873	873	873	873	873	873	
Employees	19	0	57	48	48	38	640	218	28	4	1,111
Total tons	1,848	0	5,548	8,740	1,848	2,887	83,128	20,747	1,887	0	110,841
Metal - Material Processing											
Tons/Empl Yr	800	800	800	800	800	800	800	800	800	800	
Employees	77	174	410	540	0	1,301	1,874	3,321	140	845	8,171
Total tons	107,722	157,845	770,800	487,304	0	1,178,780	1,878,818	3,018,088	108,720	818,181	8,481,721
and Metal (23)	81,420	1,503	34,674	15,780	0	108,441	355,111	278,212	18,811	98,511	781,276
and Glass (24)	71,448	19,888	48,228	52,221	0	178,122	178,831	374,853	11,811	87,888	608,811
and Paper (25)	828,188	124,888	288,128	383,128	200,881	832,358	1,327,845	2,391,481	85,888	878,888	8,718,888
and Plastic (26)	8,877	0	0	2,878	0	0	0	0	0	0	11,755

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Table 3-3

# Estimates of Quantities of Recyclables Processed and Manufactured (Concluded)

## NOTES

- (1) Based on average employment of glass processors (24) and number of processors in state
- (2) Total metal manufacturing employees split into 3 categories
- (3) Based on average employment of tire processors (185) and number of processors in state
- (4) 835 employees less estimated employment for glass and tire processors
- (5) Based on average employment of paper processors (15) and number of processors in state
- (6) 1857 employees less estimated paper processor employment
- (7) 205 employees assumed to be split 1/3 processing, 2/3 manufacturing
- (8) Based on average employment of textile processors (10) and number of processors in state
- (9) 310 employees, less estimated employment for tire and textile processors
- (10) Based on average employment of plastic processors (15) and number of processors in state
- (11) 165 employees plus estimated employment for one multi-material firm (24) not included in 165, less estimated employment for plastic processing
- (12) 388 employees, less estimated paper manufacturing employment
- (13) Aggregate of 30 employees for tire processing and manufacturing, split 2/3 processing, 1/3 manufacturing based on number of firms
- (14) Based on average employment of glass manufacturers (30) and number of manufacturers in state
- (15) Based on average employment of plastic manufacturers (11) and number of manufacturers in state
- (16) Aggregate estimate of 508 employees, less estimates for yard waste processing and glass manufacturing
- (17) Based on average employment of yard waste processors (22) and number of processors in state
- (18) Based on average employment of tire manufacturers (20) and number of manufacturers in state
- (19) Aggregate estimate of 756 employees, less estimate for textile processing
- (20) One glass manufacturer with known employment (26b), other manufacturers identified do not utilize post-consumer cullet
- (21) Single tire manufacturer identified during survey with employment reported to be 85
- (22) Two firms with known employment (11b), 5 assumed at average size of yard waste processors (22)
- (23) Total tonnage of multi-material processors split into material categories based on data from facilities regarding material quantities
- (24) Based on average employment of non-ferrous manufacturers (54) and number of manufacturers in the state
- (25) Based on average employment of ferrous manufacturers (225) and number of manufacturers in state
- (26) Aggregate of 3,101 employees for metal manufacturers, less estimates for ferrous and aluminum manufacturers
- (27) Based on average employment of aluminum manufacturers (71) and number of manufacturers in state
- (28) Based on average employment of metals processors (12) and number of processors in state
- (29) Based on average employment of multi-material processors (24) and number of processors in state
- (30) Estimate of New England cullet use prepared by Resource Management Associates, split between Massachusetts and Connecticut based on glass manufacturing employment
- (31) Resource Management Associates estimate
- (32) Estimate of total glass processed, less estimate of glass processed by multi-material processors
- (33) Two manufacturers with known employment, one estimated based on average employment of ferrous manufacturers (225)
- (34) Three manufacturers with known employment, one estimated based on average employment of aluminum manufacturers (71)
- (35) Seventeen firms with known employment, plus eight firms with employment based on average size of paper processors (15)
- (36) Employment extrapolated from 34 to 40 firms based on known employment total for 34 firms
- (37) Known employment for 12 firms, five firms assumed to have average employment per firm of plastic processors (15)
- (38) Known employment for 18 firms, three firms assumed to have average employment per firm of plastic manufacturers (11)
- (39) Known employment for 143 firms, thirty firms assumed to have average employment per firm of metal processors (12)
- (40) Employment total of 9508 split 28% ferrous, 47% non-ferrous, 24% aluminum, based on number of firms of each type
- (41) Eleven firms with known total employment, five firms assumed to have average employment of tire processors (185)
- (42) Seventy firms with known total employment, fifty one firms assumed to have average employment of multi-material processors (24)

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### 3.4.1 Paper Processing and Manufacturing

#### Processing

The processing of paper was broken down into two stages. In the first stage processors produce sorted paper of various grades (usually baled), and in the second stage paper mills convert that paper into pulp. Two separate sets of analyses were used to estimate the quantities of these materials. To estimate the quantity of paper processed the number of employees at firms processing paper was multiplied by the processing rate for paper. (It is important to note that paper is also processed by multi-material processors, and the estimate of this quantity is discussed in the section on multi-material processing).

In the second stage of processing, the material is being handled by paper mills, and so the quantity of paper processed in the first stage is not necessarily related to the quantity processed in the second stage, and a separate approach is required. The first step in this approach is to determine total wastepaper consumption by paper mills. This was done using the data gathered through surveying of paper mills, as well as data compiled by the American Forest and Paper Association (AFPA), the New York State Department of Economic Development, and the Lockwood-Post Directory.

Table 3-4 summarizes the data compiled from surveys and other sources. The information in the "Other Data" column includes not only mill-by-mill data compiled by New York State, but also AFPA statewide totals for wastepaper consumed. The end-point for the second stage of processing is pulp produced from wastepaper. Since there is no basis for assigning values to pulps produced from different wastepaper sources or for different grades of paper being produced, a single pulp price was utilized in the determination of value added by the second stage of paper processing. At this stage of the analysis, the only quantity that is necessary is the amount of pulp produced.

Based on discussions with NERC staff, NERC members involved in the project, and industry representatives, as well as review of existing literature, it was determined that the most accurate basis for estimating this total quantity of pulp produced was to utilize the AFPA totals for wastepaper consumption for each state. These quantities were reduced by 20 percent, based on the assumption that 20 percent of the incoming wastepaper fiber is lost during processing. In addition, for certain states, AFPA only reports total for a combination of states. Thus, a combined total is reported for Maine, New Hampshire, and Vermont. The combined total of approximately 542,000 tons was split amongst the three states based on the relative mill capacity of each state (as reported in Lockwood-Post). The adjusted statewide totals are reported in Table 3-3.

#### Manufacturing

For paper manufacturing the total quantity manufactured is the same as the quantity of pulp produced. Thus, no additional calculations are necessary to determine total paper produced. It should be noted, however, that to actually implement the value added analysis a breakdown of the types of paper produced is necessary. It is at this stage of analysis that the mill-by-mill data is particularly useful, since it allows a specific quantity of paper

Table 3-4

## Compilation of Paper Manufacturing Data

		MATERIAL RECEIVED					MATERIAL PRODUCED								SOLVLY RESULTS		OTHER DATA		COMBINED DATA			
		PULP													TONS	EMPLOYEES	TONS	EMPLOYEES	TONS	EMPLOYEES		
		MBED	OMP	OCC	SUBS	HOD	NEWS	ISSUE	PAPER	BOARD	BOARD	MED	BOARD	PRINT							PRINT	
FEDERAL PAPERBOARD	CI	X	X	X	X	X							X									
KIMBLEY-CLARK	CI				X		X										1 300				1 300	
LYDALL	CI		X										X									
HAND-WHITELY	CI	X	X	X	X	X							X									
SIMKINS	CI	X	X	X	X								X				540 000	87			(1)	87
STONE CONTAINER	CI			X							X						117 820	97			117 820	97
STATE TOTALS																	853 820	1 484	481 500	1 784	113 820	1 484
JAMES RIVER	DL				X										X		3 000	85			3 000	85
STATE TOTALS																	3 000	85			3 000	85
BOWAILH	ML	X	X				X										140	1 400			140	1 400
FASTEN FINE PAPER	ME				X			X								X	13 000	450			13 000	450
GLORGIA PACIFIC	ME				X											X						
JAMES RIVER	ML					X		X														
KEYES FIBER	ME	X	X														35 000	450			35 000	450
LINCOLN PULP AND PAPER	ME				X		X									X						
MADISON	ME															X						
OTIS SPECIALTY	ME	X																				
SCOTT PAPER (SKOWIEGAN)	ME				X		X									X						
SCOTT PAPER (WINSLOW)	ME				X	X																
STAILER	ML			X	X		X										85 000	800			85 000	800
S D WARREN	ME	X			X										X	X	1 500				1 500	
WOOD FIBER IND	ML		X						X								175				175	
YORKTOWNE PAPER	ML	X	X	X	X			X					X				20 800	80			20 800	80
STATE TOTALS																	133 840	4 835			133 840	4 835

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Table 3-4

# Compilation of Paper Manufacturing Data (Continued)

		MATERIAL RECEIVED					MATERIAL PRODUCED										SURVEY RESULTS		OTHER DATA		COMBINED DATA	
		PULP					KRAFT LINER - KRAFT CORR RECD CORR -										TONS	EMPLOYEES	TONS	EMPLOYEES	TONS	EMPLOYEES
		WILD	COMP	OOD	SUBS	WOOD	NEWS	TOILET	PAPER	BOARD	BOARD	RECD	BOARD	PRINT	PRINT							
AMERICAN TISSUE	MA				X												71				71	
CASCADES DIAMOND	MA		X														250				250	
CRANE	MA				X	X											1 300				1 300	
CROCKER TECHNICAL	MA					X											52				52	
DECORATIVE SPECIALTIES	MA		X		X												200				200	
ERVING PAPER	MA				X	X											225				225	
ESLEEK MAN	MA				X	X											125				125	
HAVERHILL	MA	X	X	X	X												250				250	
INTERNATIONAL PAPER	MA																					
JAMES RIVER (ADAMS)	MA					X									X		115				115	
JAMES RIVER (FITCHBURG)	MA	X	X	X					X								212				212	
KIMBERLY - CLARK	MA					X									X		325				325	
MEAD	MA								X													
MERRIMAC (E. PEPPER)	MA	X															118				118	
MERRIMAC (LAWRENCE)	MA	X	X						X						X		145				145	
NEWARK ATLANTIC	MA	X	X	X	X							X					83 000	120			83 000	120
NEWARK BOXBOARD	MA	X	X	X													85				85	
PARSONS	MA														X							
PATRIOT PAPER	MA				X	X									X							
PEARST FOLDING BOX	MA	X	X	X	X								X				75				75	
PWA ROLLAND DECOR	MA								X													
RISING PAPER	MA					X											180				180	
SEAMAN PAPER	MA					X									X		100				100	
SONOCO	MA	X	X	X	X				X			X					180				180	
SOUTHWORTH	MA					X											270				270	
STRATHMORE	MA					X											850				850	
TEXON	MA					X											120				120	
WESTFIELD RIVER	MA				X				X								130				130	
STATE TOTALS																	83 000	6 534	835 700		83 000	6 534
APC COMP	NY	X	X	X	X				X								22 885	50			22 885	50
ASHUEL OT PAPER	NY					X		X														
BROWN PRODUCTS	NY			X					X													
COY	NY								X													
DE ROBERTSON	NY	X			X				X								2 800	30			2 800	30
GROVETON PAPERBOARD	NY				X						X				X							
JAMES RIVER (BERLIN)	NY	X	X			X																
JAMES RIVER (GROVETON)	NY					X			X						X							
LYDALL	NY					X																
"APLA SERVICE	NY								X													
"APENILCH	NY	X	X	X	X												25 200	50			25 200	50
PENACOOK FIBRE	NY		X	X													1 000	10			1 000	10
STATE TOTALS																						

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Table 3-4

# Compilation of Paper Manufacturing Data (Continued)

		MATERIAL RECEIVED					MATERIAL PRODUCED								SHIMPLY RESULTS		OTHER DATA		COMBINED DATA	
		PULP					RAFT	LINER -	RAFT	CORR	REC D	COATED	UNCLD		TONS	EMPLOYEES	TONS	EMPLOYEES	TONS	EMPLOYEES
		WRED	OMP	OCC	SUBS	MOD														
CAMDEN PAPERBOARD	NJ	X	X	X							X				58,400	72			58,400	72
CUSTOM PAPERS (H vils)	NJ							X					X							
CUSTOM PAPERS (W Glen)	NJ				X			X					X			200				200
DAVLY CO	NJ	X			X				X						23,400	70			23,400	70
GARDEN STATE	NJ		X				X								230,000	300			230,000	300
GARWOOD	NJ										X									
GEORGIA - PACIFIC	NJ		X	X							X									
HOMASOTE CO	NJ		X					X							28,300	250			28,300	250
JAMES RIVER (GARWOOD)	NJ				X															
JAMES RIVER (MILFORD)	NJ				X			X					X		4,000	400			4,000	400
LOWE	NJ										X									
MAFCOTE IND	NJ	X	X	X																
MANCAL PAPER	NJ					X	X								85,000	1,000			85,000	1,000
NEWARK BOXBOARD	NJ	X	X	X							X									
PAPER BOARD SPECIALTIES	NJ	X	X	X	X						X									
RECYCLED PAPER BOARD	NJ	X	X	X							X				85,000	130			85,000	130
SIMKINS IND	NJ		X	X	X															
USG CORP	NJ	X	X	X	X						X									
STATE TOTALS															502,100	2,422		813,200	502,100	2,422

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Table 3-4

Compilation of Paper Manufacturing Data  
(Continued)

		MATERIAL RECEIVED					MATERIAL PRODUCED										SURVEY RESULTS		OTHER DATA		COMBINED DATA	
		P&P															TONS	EMPLOYEES	TONS	EMPLOYEES	TONS	EMPLOYEES
		WEEK	CRP	OC	SUB	NO	NEWS	TISSUE	PAPER	BOARD	BOARD	WEB	COBS	PRINT	PRINT							
ARMSTRONG WORLD	NY		X	X					X								200					200
BIO-TECH	NY							X														
BROWNVILLE SPECIALTY	NY	X	X	X	X								X		X		14,300	80	14,300		14,300	80
BUFFALO PAPERBOARD	NY									X							82,400	100			82,400	100
BURNBROS (LITTLE FALLS)	NY				X				X						X				3,800		3,800	
BURNBROS (LYONS DALE)	NY				X			X	X						X							
CASCADES NIAGRA	NY			X							X		X				120,000	130	80,000		120,000	130
CHAMPION INT	NY				X	X																
CLIMAX MFG	NY	X	X	X	X								X				40,000	85	41,000		40,000	85
COLUMBIA (CHATHAM)	NY												X				21,000	100	26,000		21,000	100
COLUMBIA (WALLOMBAC)	NY												X				21,000	100	26,000		21,000	100
DECORATIVE SPECIALTY	NY																		1,000		1,000	
DOMTAR GYPSUM	NY		X	X	X								X						83,000		83,000	
EASTMAN KODAK	NY																		12,000		12,000	
ENCORE	NY							X									100,000	300	72,000		100,000	300
FINCH PULPM	NY				X										X				8,100		8,100	
FLOWER CITY	NY							X	X										8,100		8,100	
FORT ORANGE	NY	X	X	X	X	X					X		X				26,000	200	28,000		26,000	200
GEORGIA-PACIFIC	NY					X		X														
HOLLINGSWORTH VOSE	NY																		1,200		1,200	
INTERNATIONAL (CORBINT)	NY				X										X		20,000	800	10,800		20,000	800
INTERNATIONAL (OSWEGO)	NY				X										X		2,800	80			2,800	80
INTER (TICONDEROGA)	NY				X										X				3,000		3,000	
JAMES RIVER (CARHAGE)	NY	X		X	X			X									28,000	300	80,000		28,000	300
JAMES RIVER (D. GLEN FALLS)	NY		X			X		X														
KNOWLTON-WATERTOWN	NY																		130		130	
LAFAYETTE PAPER	NY											X					85,000	87			85,000	87
LYDALL	NY								X								1,800	70			1,800	70
LYONS FALLS	NY																					
MARTISCO PAPER	NY		X	X						X							23		4,200		4,200	23
MONTYNE PAPER	NY	X	X					X									29		3,000		3,000	29
MOHAWK PAPER	NY		X												X		218		8,000		8,000	218
MOHAWK VALLEY	NY				X				X						X							
NORFOLK PAPER	NY				X					X									28,000		28,000	
NORTH END - FULTON	NY																		900		900	
PACKAGING CORP.	NY		X		X												12,000	130	8,000		12,000	130
RED HOOK PAPER	NY												X				2,800	8	8,000		2,800	8
SCHOLLER TECH	NY				X					X					X							
SCOTT PAPER	NY				X			X											3,300		3,300	
SONOCO	NY	X	X	X	X								X				20,000	41	21,000		20,000	41
SPECIALTY PAPERBOARD	NY	X	X	X	X					X									8,550		8,550	
SPECIALTY (LEWIS)	NY	X	X	X	X					X												
STENS & THOMPSON	NY					X													22,800		22,800	
THE PAPYRUS	NY				X														18,400		18,400	
SONS PAPER	NY		X	X	X	X		X									200	300	25,200		25,200	300
UNO	NY		X	X	X								X						38,000		38,000	

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Table 3-4

# Compilation of Paper Manufacturing Data (Concluded)

		MATERIAL RECEIVED					MATERIAL PRODUCED										SURVEY RESULTS		OTHER DATA		COMBINED DATA		
		PULP															TONS	EMPLOYEES	TONS	EMPLOYEES	TONS	EMPLOYEES	
		MIXED	OMP	OCC	SUBS	MOD	NEWS	TISSUE	PAPER	BOARD	BOARD	MED	BOXED	PRINT	PRINT								
AMERICAN PAPER	PA		X	X		X							X										
BRANDYWINE	PA	X	X	X	X			X					X										
CAHILL (TAMM)	PA	X	X	X	X																		
CONNELLY CONT	PA			X							X	X					48 000	85			48 000	85	
DAVEY	PA	X				X							X				23 400	84			23 400	84	
HENRY MOLDED	PA																						
INTERSTATE CONT	PA			X									X				9 000	130			9 000	130	
INTL HAMMERMILL (ERIE)	PA					X									X		27 300	1 100			27 300	1 100	
INTL HAMMER (LOCKHAVEN)	PA					X	X								X			860				860	
JEFFERSON SMURFIT	PA	X	X	X	X																		
NATIONAL GYPSUM	PA	X	X	X									X										
NEWMAN	PA	X	X	X	X								X				50 000	100			50 000	100	
PENNTech	PA															X							
POPE AND TALBOT	PA					X		X										100				100	
PHOETER & GAMBLE	PA					X		X															
READING	PA												X										
ROCK-TENN	PA	X	X	X	X								X				840 000	102			840 000	102	
SCOTT PAPER	PA			X		X		X															
SEALED AIR (MODENA)	PA				X	X		X									20 000	28			20 000	28	
SEALED AIR (READING)	PA				X			X									20 000	30			20 000	30	
SHYNOCK	PA	X															6 500	47			6 500	47	
SIMPSON	PA					X										X							
SONOCO	PA	X	X	X									X										
STONE CONTAINER	PA	X	X	X		X		X		X		X											
TARGETT	PA								X														
WELSTAVCO	PA	X														X	X						
WOODSTREAM	PA																						
YORKTOWNE PAPER	PA	X	X	X	X								X										
STATE TOTALS																	1,044,200	2,428		1,077,100		1,044,200	2,428
CPM INC	VT	X	X	X	X			X							X								
PUTNEY PAPER	VT	X	X	X				X	X								11 000	115			11 000	115	
ROCK-TENN	VT	X	X	X	X								X				80 000	180			80 000	180	
SIMPSON	VT					X		X								X							
SPECIALTY PAPER BOARD	VT	X		X	X			X					X				35 000	250			35 000	250	
STATE TOTALS																	100 000	525			100 000	525	

(1) The 540 000 tons of wastepaper consumption reported by Simkins is believed to be incorrect, based on data available regarding the size and capacity of that mill. Therefore, this quantity was not utilized in the final analysis.

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PAPER  
CORP.



produced by a mill to be related to a type of paper produced. Nine categories of paper production were established, based on the combination of the type of data available regarding production at the mills, and the price data available to assign values to categories of paper product. The nine categories are as follows:

- newsprint,
- tissue,
- kraft paper,
- linerboard,
- kraft board,
- corrugating medium,
- recycled boxboard,
- coated printing and writing paper, and
- uncoated printing and writing paper.

As described earlier, mill-by-mill data was compiled from surveys and literature. As shown in Table 3-4, this data also indicates the type of end-products produced by each mill. Thus, the mill-by-mill data allowed wastepaper consumptions reported for these mills to be assigned to one or more of these end-product categories. In those instances in which mills were reported to produce paper in more than one of the end-product categories, the wastepaper consumption was split evenly between the categories. Since the mill-by-mill data could not be compiled for all mills, a procedure had to be devised to assign the tonnage for the remaining mills to end-product categories.

After pursuing numerous options about how to fill this data gap, it was determined that the best approach involved assuming that the difference between the mill-by-mill total and the AFPA total for each state was in the production of newsprint or tissue, depending on the types of mills in each state. The rationale for this approach is two-fold. First, the AFPA total wastepaper consumption is believed to be the most accurate comprehensive data of this type that is available. Second, since newsprint and tissue have the lowest value of the grades of paper produced, a conservative estimate of value added would result, by assuming that all mills without specific data produce tissue and/or newsprint.

In application, the totals from the mill-specific data were determined, and then the difference between these totals and the AFPA estimates were determined. If the mills for which no specific data were available in a particular state included mills that produced tissue, then all of the calculated differential was applied to the tissue category. The same principle would be applied if the mills with no specific data included mills that produced newsprint. If both newsprint and tissue were produced by the mills without specific data, the differential in totals was split evenly between newsprint and tissue. The results of these assumptions and procedures are summarized in Table 3-5.

Note that in carrying over the results from Table 3-4, data from mills that provided tonnage data was not included in the survey data in Table 3-5, if no information was available regarding the end-products produced by the mill. As a result, the survey data totals in Table 3-5 differ from those in Table 3-4 in certain instances.



Table 3-5

Paper Production Estimates

	NEWS	ISSUE	KRAFT PAPER	LINER-BOARD	KRAFT BOARD	CORR MED	REC'D 90XB0	COATED PRINT	UNCTD PRINT	TOTALS
<b>CONNECTICUT</b>										
Survey Data (1)	0	0	0	0	0	113 820	0	3	0	113 820
Estimates	0	377 880	0	0	0	0	0	0	0	377 880
Consumption Totals	0	377 880	0	0	0	113 820	0	0	0	491 500
Production Totals	0	302 304	0	0	0	90 896	0	3	3	733 200
<b>DELAWARE</b>										
Survey Data (1)	0	0	0	0	0	0	0	0	3 000	3 000
Estimates	0	0	0	0	0	0	0	0	0	0
Consumption Totals	0	0	0	0	0	0	0	0	3 000	3 000
Production Totals	0	0	0	0	0	0	0	0	2 400	2 400
<b>MAINE</b>										
Survey Data (1)	140	63 000	16 900	0	0	0	10 400	3	6 300	28 840
Estimates	103 559	103 559	0	0	0	0	0	3	0	207 118
Consumption Totals	103 899	166 559	16 900	0	0	0	10 400	3	6 300	308 056
Production Totals	62 959	124 847	13 320	0	0	0	8 320	3	5 200	244 846
<b>MASSACHUSETTS</b>										
Survey Data (1)	0	0	0	0	0	0	93 000	3	0	93 000
Estimates	0	442,700	0	0	0	0	0	3	0	442,700
Consumption Totals	0	442,700	0	0	0	0	93,000	0	0	535,700
Production Totals	0	354 160	0	0	0	0	74 400	3	3	428 560
<b>NEW HAMPSHIRE</b>										
Survey Data (1)	0	2,500	22,863	0	0	0	25,200	0	0	50 563
Estimates	0	211,770	0	0	0	0	0	0	0	211 770
Consumption Totals	0	214 270	22,863	0	0	0	25,200	0	0	262,333
Production Totals	0	171 416	18 292	0	0	0	20 180	3	0	209 888
<b>NEW JERSEY</b>										
Survey Data (1)	230,000	33 000	2,000	28,300	23 400	0	121,400	0	2 000	502,100
Estimates	153,350	153,350	0	0	0	0	0	0	0	311 100
Consumption Totals	383,350	250 350	2,000	28 300	23,400	0	121 400	0	2 000	813 200
Production Totals	308 440	220 440	1 400	22,540	19 720	0	97 120	3	1 500	650 560
<b>NEW YORK</b>										
Survey Data (1)	0	178,050	52 625	62,400	73,000	63 000	293,283	20 000	19 750	749 110
Estimates	0	123,090	0	0	0	0	0	0	0	123 090
Consumption Totals	0	301,140	52,625	62,400	73,000	63,000	293 283	20 000	19 750	892 200
Production Totals	0	240 912	42 100	49 920	42 400	52 000	234 828	19 000	15 300	713 560
<b>PENNSYLVANIA</b>										
Survey Data (1)	0	0	40,000	0	0	24 000	948 400	0	27 300	1 037 700
Estimates	0	39 400	0	0	0	0	0	0	0	39 400
Consumption Totals	0	39,400	40 000	0	0	24 000	948 400	0	27 300	1 077 100
Production Totals	0	31 520	32 000	0	0	19 200	757 120	0	21 840	881 680
<b>VERMONT</b>										
Survey Data (1)	0	5,300	23,000	0	0	0	77,300	0	0	106,000
Estimates	0	3 306	0	0	0	0	0	0	0	3 306
Consumption Totals	0	8,606	23 000	0	0	0	77,300	0	0	109 306
Production Totals	0	7 043	18 400	0	0	0	62 000	0	0	87 443
<b>REGION</b>										
Survey Data (1)	230,140	346 050	157 390	90 700	101 400	202,620	1,547,183	20 000	58 350	2 774 033
Estimates	259 109	1 457 236	0	0	0	0	0	0	0	1 716 345
Consumption Totals	489 249	1 803 306	157 390	90,700	101 400	202,620	1 547,183	20,000	58 350	4 490 400
Production Totals	391 399	1 442 843	125 912	72 580	81 120	182 096	1 253 748	18 000	44 840	3 592 320

(1) Survey data does not include data from mills for which end-product categories were not known. The results for these mills are included in the "Estimates" category.



### 3.4.2 Glass Processing and Manufacturing

#### Processing

For glass processing, two stages of processing were assumed, based on the nature of how the material is typically handled. The first stage of processing is assumed to occur at multi-material processing facilities. These facilities sort glass into colors, and although some of them produce cullet from the sorted glass, it was assumed in this analysis that these facilities produce sorted glass. The second stage of processing produces color-sorted cullet that is ready to be used by manufacturers. This second stage of processing is assumed to occur at processing facilities that only handle glass. In some instances, the color-sorted glass from a multi-material processor may go to a second stage processor, but it is likely that in most cases the two stages of processing are going on in parallel, with the multi-material processors and glass processors both selling material to brokers or directly to glass manufacturers.

The derivation of glass quantities processed by multi-material processors is described in Section 3.3.3 of this report. The quantities of glass processed by glass processors (second stage processing) were determined by utilizing the per-employee processing rate defined for these processors, and the state-by-state estimates of employment in this category. The one exception to this is for Massachusetts. In a previous study for Massachusetts, WESTON had quantified the amount of glass processed in the state. This estimate was used, and the amount processed by glass processors was defined as the total estimate less the quantity of glass estimated to be processed by multi-material processors. It is also worth noting that in most states no glass processors were identified. This is because glass processing is often handled at multi-material facilities.

#### Manufacturing

As with paper manufacturing, an existing source of information contains compiled information on the consumption of recycled material in glass manufacturing. The existing data source is a report titled "Glass Container Markets in the New York Region," prepared in 1992 for the New York State Department of Economic Development by Resource Management Associates. Since it focused exclusively on the glass industry, the New York study contains a more extensive survey of glass manufacturing in the region than could be accomplished within this study. Thus, it was determined that using the data from the New York report was likely to be more accurate than extrapolating from the data gathered during surveys of glass manufacturers during this study.

Thus, the data for glass manufacturing was taken directly from the New York study, with only one adjustment. The tonnage reported for New England in the study had to be split between Connecticut and Massachusetts (the only states in New England with glass manufacturers utilizing glass cullet as a feedstock). The split between these two states was based on the relative employment in glass manufacturing in the two states.



### **3.4.3 Multi-material Processing**

The determination of total tonnage processed by multi-material processors is done in the same manner as all other processors, i.e. application of a per-employee processing rate to the employment totals in this category for each state. However, since these processors handle a variety of materials it is necessary to split the total quantity of material processed into material categories. Only in this way can this data be incorporated into the value added analysis.

As is shown on Table 3-3, the total tonnage processed by multi-material processors is split between glass, metal, paper and plastic based on data from four multi-material processors which reported specific quantities of material processed. Two of these facilities are publicly-owned material recovery facilities and two are commercial firms that process multiple materials. These facilities are located in states with and without bottle bills. By utilizing data from private and public facilities and non-bottle bill and bottle bill states, the average determined is designed to represent the spectrum of multi-material processing. The split in materials is determined as follows:

- paper - 79.1 percent;
- glass - 10.7 percent;
- metals - 9.2 percent; and
- plastic - 1.0 percent.

The mixture of materials from these facilities was assumed to be representative of the mix from all multi-material processors, and on this basis the total tonnage of material processed was assigned to the four material categories. A further breakdown of these quantities into subcategories is discussed in Section 4.



## SECTION 4

### DETERMINATION OF VALUE ADDED

#### 4.1 APPROACH

With the estimation of tonnages processed and manufactured complete there are three steps left to determine the value added through recycling: 1) establishment of value of materials at each stage of recycling; 2) refinement of material quantities to reflect the categories in which price data is available; and 3) application of the material value estimates to the material quantity estimates to determine total value added.

#### 4.2 VALUE OF MATERIALS

For each material category there are a number of subcategories based on a more specific designation of the type of material and the stage of processing or manufacturing it has achieved. As a result, even though there are only eight major material categories, 41 price categories were defined. These categories are listed, along with the price determined and the data sources, in Table 4-1. In all instances, attempts were made to average price data over a two year period so as to minimize the impacts of temporary shifts in prices. The price information requiring more specific explanation is as follows:

- Weighted Average Baled Paper Price: The prices for baled paper in the five wastepaper categories defined were determined and are used in the calculation of value added in the first stage of processing. In order to determine the value added in the second stage of processing, the differential value between baled paper and pulp must be determined, and as a result, an average price for baled paper is needed. The weighted average price determined is based on the relative quantities of each type of paper processed in the first stage of processing and the price for baled material of each type.
- Weighted Average Plastic Pellet Price: In order to determine the differential value between plastic pellets (the second stage processing output) and the manufacturing output, an average value of plastic pellets must be calculated. This is done based on the mix of plastic pellets processed, and the price for each pellet type.
- Plastic Sheet Price: The type of products produced by plastics manufacturers from recycled feedstock varies widely, and there is no known source of published information regarding the value of these products. Therefore, it was decided to use the value of a plastic product that would conservatively estimate the value added through plastic manufacturing. A plastic manufacturer that produces plastic sheet provided price information for this product. This is believed to represent a price at the low end of prices for products produced by plastics manufacturers, and thus should provide a conservative estimate of value added.



Table 4-1

Material Prices

MATERIAL CATEGORY	PRICE \$/TON
Baled ONP	\$16.00
Baled OCC	\$31.55
Baled Mixed Paper	(\$1.88)
Baled Pulp Subs	\$221.00
Baled HGD	\$112.00
Wtd. Avg. Baled Paper Price	\$65.11
Pulp	\$533.00
Newspaper	\$416.33
Tissue	\$350.00
Kraft Paper	\$598.00
Linerboard	\$342.00
Kraft Board	\$736.00
Corrugating Medium	\$309.00
Recycled Boxboard	\$452.00
Coated Printing & Writing	\$988.00
Uncoated Printing & Writing	\$689.00
Clear Glass	\$7.60
Brown Glass	\$5.85
Green Glass	\$2.75
Clear Cullet	\$50.70
Brown Cullet	\$37.10
Green Cullet	\$15.10
Clear Bottles	\$295.00
Brown Bottles	\$295.00
Green Bottles	\$295.00
Baled HDPE	\$143.00
Baled PET	\$129.00
HDPE Pellets	\$529
PET Pellets	\$928
Wtd. Avg. Plastic Pellet Price	\$752
Plastic Sheet	\$1,120.00
Ferrous Scrap	\$84.53
Baled Steel/Tin Cans	\$62.60
Wtd. Avg. Ferrous Scrap Price	\$83.19
Non-ferrous Scrap	\$280.00
Aluminum Scrap	\$440.00
Baled Aluminum Cans	\$691.00
Wtd. Avg. Alum. Scrap Price	\$531.27
Steel Products	\$288.00
Secondary Lead	\$660.00
Secondary Al Ingot	\$1,275.00
Compost	\$51.67
Crumb Rubber	\$235.00
Rubber Products	\$300.00
Wiping Cloths/Used Clothing	\$350.00

SOURCES Pulp and Paper Week; Recycling Times;  
Plastic News; and American Metal Market





- Weighted Average Ferrous Scrap and Aluminum Scrap Prices: For ferrous metal and aluminum emerging from processors, two subcategories had to be created for each metal, based on two very distinct types of scrap. For ferrous metal the two categories are steel/tin cans and ferrous scrap; for aluminum they are aluminum cans and aluminum scrap. For each of these metals, the two subcategory prices had to be averaged in order to determine a differential between the scrap price and the price of material produced by manufacturers. The weighted average was determined based on the relative quantities of the two subcategories of metal processed.
- Steel Products: Ferrous manufacturers provided little data regarding the nature of products they produced from recycled feedstock. One product that was known to be produced is reinforcing bar. Since this material has a relatively low value compared to other steel products, it is conservative to assume that all steel produced from recycled material is in the form of reinforcing bar. This is the price data that was utilized.
- Secondary Lead: Non-ferrous manufacturing covers a wide spectrum of metals. Since the mixture of metals is not known, a conservative assumption was made that all non-ferrous manufacturing is in the form of lead. This is conservative due to the low value of lead relative to other non-ferrous metals.

#### **4.3 REFINEMENT OF MATERIAL QUANTITIES**

For a number of material categories, the quantities of material processed had to be broken down into subcategories to reflect the differences in price between different types of material. These refinements are summarized below, and the results presented in Table 4-2.

##### **Paper Processed**

The total amount of paper processed was determined by summing the estimates of paper processed by firms that just process paper and the paper processed by multi-material processors. This total was then broken down into the five wastepaper categories for which price data was determined based on the mix of paper consumed and exported from the region. In other words the total amount of each of these five paper types consumed by mills in the region and exported from the region was determined. From this it was found, for example, that 21 percent of the total paper consumed in, and exported from, the region was newspaper. It was assumed that 21 percent of total paper processed would be newspaper, since the mix of paper processed should approximate the mix of paper consumed and exported from the region.

##### **Glass Processed**

The total quantity of glass processed was divided among the three colors, based on data from processors reporting the quantities of different colors of glass processed. This split of colors was assumed to apply to the second stage of processing and manufacturing, since it reflects the mixture of colors of glass produced.

Table 4-2

## Determination of Value Added

	CONNECTICUT		DELAWARE		MAINE		MASSACHUSETTS		NEW HAMPSHIRE		NEW JERSEY	
	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)
Paper Processed - 1st Stage												
Baled ONP	131,813	\$2,111	74,223	\$1,188	71,804	\$1,148	138,837	\$2,223	46,788	\$749	281,104	\$4,178
Baled OCC	230,882	\$7,278	129,801	\$4,095	125,572	\$3,862	242,875	\$7,684	81,826	\$2,582	458,822	\$14,408
Baled Mixed Paper	83,148	(\$158)	48,785	(\$88)	45,281	(\$85)	87,576	(\$185)	28,483	(\$55)	184,582	(\$308)
Baled Pulp Bubs	104,405	\$23,074	58,745	\$12,883	66,831	\$12,960	108,884	\$24,302	37,832	\$8,184	288,854	\$46,871
Baled MOD	75,822	\$8,482	42,212	\$4,728	48,837	\$4,574	78,818	\$8,850	28,818	\$2,888	148,485	\$18,831
Subtotals - Paper Proc. 1st Stage	625,182	\$40,788	351,765	\$22,885	348,385	\$22,158	658,478	\$42,878	221,751	\$14,438	1,237,458	\$88,577
Paper Processed - 2nd Stage												
Pulp	383,208	\$183,872	2,488	\$1,123	244,846	\$114,568	428,568	\$288,517	288,888	\$88,184	658,568	\$388,387
Paper Manufactured												
Newspaper	0	\$0	0	\$0	82,858	(\$8,878)	0	\$0	0	\$0	388,448	(\$35,887)
Tissue	383,384	(\$55,322)	0	\$0	138,847	(\$24,877)	354,188	(\$84,811)	171,418	(\$31,388)	288,448	(\$38,881)
Kraft Paper	0	\$0	0	\$0	13,528	\$878	0	\$0	18,282	\$1,188	1,888	\$188
Unbleached	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	22,848	(\$4,324)
Kraft Board	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	18,728	\$3,888
Corrugating Medium	88,888	(\$28,381)	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Recycled Boxboard	0	\$0	0	\$0	8,328	(\$874)	74,488	(\$8,828)	28,188	(\$1,833)	87,128	(\$7,887)
Coated Printing & Writing	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0
Uncoated Printing & Writing	0	\$0	2,488	\$274	3,288	\$811	8	\$8	8	\$8	1,848	\$234
Subtotals - Paper Manufacturing	383,208	(\$75,682)	2,488	\$274	244,846	(\$23,348)	428,568	(\$78,838)	288,888	(\$31,813)	658,568	(\$88,784)
TOTALS - PAPER		\$148,888		\$24,482		\$188,378		\$172,335		\$88,888		\$388,288
Glass Processed - 1st Stage												
Clear Glass	38,438	\$277	8,683	\$85	28,567	\$158	27,143	\$288	13,843	\$185	84,322	\$488
Brown Glass	12,148	\$71	2,888	\$17	8,858	\$48	8,848	\$53	4,814	\$27	21,441	\$125
Green Glass	22,882	\$83	5,388	\$13	12,885	\$25	17,831	\$47	8,888	\$24	48,358	\$111
Subtotals - Glass Proc. 1st Stage	73,468	\$411	16,888	\$97	48,328	\$232	53,821	\$288	27,144	\$188	128,122	\$725
Glass Processed - 2nd Stage												
Clear Cullet	0	\$0	0	\$0	0	\$0	58,485	\$2,431	0	\$0	81,858	\$3,852
Brown Cullet	0	\$0	0	\$0	0	\$0	18,882	\$588	0	\$0	38,568	\$853
Green Cullet	0	\$0	0	\$0	0	\$0	35,381	\$137	0	\$0	27,358	\$711
Subtotals - Glass Proc. 2nd Stage	0	\$0	0	\$0	0	\$0	118,568	\$3,458	0	\$0	148,888	\$5,818
Glass Manufactured												
Clear Bottles	28,828	\$8,585	0	\$0	0	\$0	24,568	\$8,888	0	\$0	84,558	\$28,858
Brown Bottles	8,878	\$2,288	0	\$0	0	\$0	8,187	\$2,111	0	\$0	28,188	\$7,288
Green Bottles	18,788	\$4,877	0	\$0	0	\$0	18,318	\$4,313	0	\$0	33,858	\$14,858
Subtotals - Glass Manufacturing	55,438	\$13,471	0	\$0	0	\$0	48,137	\$12,425	0	\$0	148,888	\$42,777
TOTALS - GLASS		\$13,482		\$97		\$232		\$18,187		\$188		\$49,128
Plastic Processed - 1st Stage												
Baled HDPE	2,838	\$428	884	\$88	1,858	\$237	2,188	\$313	1,118	\$188	5,188	\$747
Baled PET	3,738	\$484	883	\$111	2,111	\$272	2,785	\$438	1,421	\$183	8,881	\$831
Subtotals - Plastic Proc. 1st Stage	6,576	\$912	1,768	\$213	3,788	\$508	4,973	\$752	2,539	\$371	14,069	\$1,578
Plastic Processed - 2nd Stage												
HDPE Pellets	2,542	\$881	474	\$188	0	\$0	7,288	\$2,813	1,821	\$741	8,788	\$3,358
PET Pellets	3,238	\$4,383	318	\$431	0	\$0	8,278	\$12,411	2,445	\$1,853	11,873	\$8,847
Subtotals - Plastic Proc. 2nd Stage	5,788	\$3,264	883	\$618	0	\$0	18,568	\$12,224	4,266	\$2,595	19,661	\$12,205
Plastic Manufactured												
Plastic Other	13,158	\$4,837	23,828	\$9,488	0	\$0	33,888	\$18,887	8,883	\$2,427	8,888	\$2,588
TOTALS - PLASTIC		\$8,188		\$18,188		\$18,188		\$30,781		\$2,595		\$18,188

WESTON  
INCORPORATED

Table 4-2

**Determination of Value Added  
(Continued)**

	CONNECTICUT		DELAWARE		MAINE		MASSACHUSETTS		NEW HAMPSHIRE		NEW JERSEY	
	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)
<b>Metal Processing</b>												
Ferrous Scrap	368,308	\$31,133	80,235	\$7,543	130,707	\$11,809	322,941	\$27,298	129,888	\$10,978	812,862	\$68,711
Non-ferrous Scrap	33,483	\$9,375	8,112	\$2,271	12,701	\$3,556	29,358	\$8,220	11,808	\$3,306	73,897	\$20,801
Aluminum Scrap	33,483	\$14,732	8,112	\$3,569	12,701	\$3,569	29,358	\$12,918	11,808	\$5,185	73,897	\$32,514
Baled Aluminum Cans	19,133	\$13,221	4,636	\$3,203	7,257	\$5,015	16,776	\$11,592	6,747	\$4,862	42,227	\$29,179
Baled Steel/Tin Cans	23,919	\$1,497	3,795	\$383	8,072	\$388	20,970	\$1,313	8,434	\$328	52,783	\$3,304
<b>Subtotals - Metal Processing</b>	<b>478,322</b>	<b>\$69,958</b>	<b>115,890</b>	<b>\$16,950</b>	<b>181,437</b>	<b>\$26,537</b>	<b>419,403</b>	<b>\$61,341</b>	<b>168,684</b>	<b>\$24,871</b>	<b>1,055,665</b>	<b>\$154,400</b>
<b>Ferrous Manufacturing</b>												
Steel Products	182,988	\$37,477	0	\$0	0	\$0	53,820	\$15,500	0	\$0	1,814,800	\$485,005
<b>Non-ferrous Manufacturing</b>												
Secondary Lead	28,320	\$10,762	0	\$0	0	\$0	21,800	\$8,208	0	\$0	772,320	\$293,482
Aluminum Manufacturing												
Secondary Ingot	0	\$0	0	\$0	0	\$0	17,325	\$12,885	0	\$0	54,870	\$40,660
<b>TOTALS - METAL</b>	<b>118,197</b>	<b>\$118,197</b>	<b>16,950</b>	<b>\$16,950</b>	<b>26,537</b>	<b>\$26,537</b>	<b>97,934</b>	<b>\$97,934</b>	<b>24,871</b>	<b>\$24,871</b>	<b>253,548</b>	<b>\$193,548</b>
<b>Yard Waste Processing</b>												
Compost	123,200	\$9,385	0	\$0	389,000	\$19,098	770,000	\$39,743	0	\$0	84,400	\$3,327
<b>Tire Processing</b>												
Crumb Rubber	5,884	\$1,408	0	\$0	17,800	\$4,138	11,816	\$2,730	5,884	\$1,408	7,040	\$1,854
<b>Tire Manufacturing</b>												
Rubber Products	255,600	\$18,814	166,140	\$10,799	0	\$0	415,350	\$26,998	0	\$0	63,900	\$4,134
<b>TOTALS - TIRES</b>	<b>18,020</b>	<b>\$18,020</b>	<b>10,799</b>	<b>\$10,799</b>	<b>4,138</b>	<b>\$4,138</b>	<b>29,728</b>	<b>\$29,728</b>	<b>1,408</b>	<b>\$1,408</b>	<b>73,000</b>	<b>\$5,808</b>
<b>Textile Processing</b>												
Wiping Cloths/Used Clothing	1,849	\$847	0	\$0	5,546	\$1,941	9,730	\$3,406	1,849	\$847	3,897	\$1,294
<b>TOTALS - ALL MATERIALS</b>	<b>\$215,416</b>	<b>\$215,416</b>	<b>\$82,552</b>	<b>\$82,552</b>	<b>\$155,830</b>	<b>\$155,830</b>	<b>\$399,296</b>	<b>\$399,296</b>	<b>\$113,186</b>	<b>\$113,186</b>	<b>\$1,333,723</b>	<b>\$1,333,723</b>

**WESTON**

Table 4-2

**Determination of Value Added  
(Continued)**

	NEW YORK		PENNSYLVANIA		RHODE ISLAND		VERMONT		REGION	
	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)
<b>Paper Processed - 1st Stage</b>										
Baled ONP	527,816	\$8,442	558,777	\$8,940	20,370	\$326	92,787	\$1,465	1,024,321	\$30,768
Baled OCC	922,703	\$29,111	977,198	\$30,831	35,824	\$1,124	182,287	\$5,120	3,385,282	\$108,175
Baled Mixed Paper	332,573	\$625	352,215	\$662	12,840	\$24	58,488	\$110	1,212,861	\$2,280
Baled Pulp Subs	417,592	\$82,288	442,255	\$87,738	16,123	\$3,563	73,438	\$16,230	1,523,041	\$336,592
Baled HOD	300,066	\$33,807	312,788	\$35,392	11,585	\$1,299	52,779	\$5,919	1,094,491	\$122,973
<b>Subtotals - Paper Proc. 1st Stage</b>	<b>2,500,549</b>	<b>\$182,823</b>	<b>2,640,234</b>	<b>\$172,440</b>	<b>96,543</b>	<b>\$6,286</b>	<b>439,748</b>	<b>\$28,834</b>	<b>9,120,004</b>	<b>\$593,848</b>
<b>Paper Processed - 2nd Stage</b>										
Pulp	713,760	\$333,958	861,680	\$403,167	0	\$0	87,445	\$40,914	3,592,320	\$1,680,793
<b>Paper Manufactured</b>										
Newspaper	0	\$0	0	\$0	0	\$0	0	\$0	391,399	\$45,868
Tissue	240,812	\$44,087	31,520	\$5,768	0	\$0	7,045	\$1,289	1,442,845	\$264,004
Kraft Paper	42,100	\$2,737	32,000	\$2,080	0	\$0	18,400	\$1,198	125,912	\$8,184
Linerboard	49,920	\$9,535	0	\$0	0	\$0	0	\$0	72,560	\$13,859
Kraft Board	62,400	\$12,667	0	\$0	0	\$0	0	\$0	81,120	\$16,487
Corrugating Medium	52,000	\$11,648	19,200	\$4,301	0	\$0	0	\$0	182,098	\$36,310
Recycled Boxboard	234,628	\$19,005	757,120	\$61,327	0	\$0	82,000	\$5,027	1,253,748	\$101,554
Coated Printing & Writing	16,000	\$7,280	0	\$0	0	\$0	0	\$0	16,000	\$7,280
Uncoated Printing & Writing	15,800	\$2,165	21,840	\$3,497	0	\$0	0	\$0	58,840	\$7,897
<b>Subtotals - Paper Manufacturing</b>	<b>713,760</b>	<b>\$58,126</b>	<b>861,680</b>	<b>\$65,809</b>	<b>0</b>	<b>\$0</b>	<b>87,445</b>	<b>\$5,115</b>	<b>3,592,320</b>	<b>\$122,153</b>
<b>TOTALS - PAPER</b>		<b>\$437,453</b>		<b>\$309,894</b>		<b>\$6,286</b>		<b>\$34,433</b>		<b>\$1,822,498</b>
<b>Glass Processed - 1st Stage</b>										
Clear Glass	91,813	\$698	165,875	\$1,259	5,933	\$45	29,388	\$223	483,504	\$3,523
Brown Glass	30,538	\$179	55,225	\$323	1,978	\$12	9,788	\$57	154,501	\$904
Green Glass	37,483	\$159	103,853	\$288	3,723	\$10	18,427	\$51	298,828	\$900
<b>Subtotals - Glass Proc. 1st Stage</b>	<b>179,834</b>	<b>\$1,033</b>	<b>324,853</b>	<b>\$1,868</b>	<b>11,633</b>	<b>\$67</b>	<b>57,584</b>	<b>\$331</b>	<b>906,831</b>	<b>\$5,226</b>
<b>Glass Processed - 2nd Stage</b>										
Clear Cullet	112,251	\$4,838	113,832	\$4,908	0	\$0	37,844	\$1,635	412,130	\$17,763
Brown Cullet	37,417	\$1,169	37,844	\$1,188	0	\$0	12,648	\$395	137,377	\$4,293
Green Cullet	79,432	\$879	71,424	\$882	0	\$0	23,898	\$294	238,391	\$3,184
<b>Subtotals - Glass Proc. 2nd Stage</b>	<b>229,100</b>	<b>\$6,877</b>	<b>223,099</b>	<b>\$6,874</b>	<b>0</b>	<b>\$0</b>	<b>74,490</b>	<b>\$2,325</b>	<b>808,098</b>	<b>\$25,249</b>
<b>Glass Manufactured</b>										
Clear Bottles	89,501	\$24,308	163,858	\$40,030	0	\$0	0	\$0	389,108	\$97,501
Brown Bottles	33,167	\$8,554	54,818	\$14,088	0	\$0	0	\$0	133,035	\$34,510
Green Bottles	82,432	\$17,475	102,813	\$28,777	0	\$0	0	\$0	250,119	\$70,992
<b>Subtotals - Glass Manufacturing</b>	<b>195,100</b>	<b>\$50,337</b>	<b>321,290</b>	<b>\$82,894</b>	<b>0</b>	<b>\$0</b>	<b>0</b>	<b>\$0</b>	<b>782,560</b>	<b>\$201,804</b>
<b>TOTALS - GLASS</b>		<b>\$58,247</b>		<b>\$91,736</b>		<b>\$67</b>		<b>\$2,656</b>		<b>\$232,379</b>
<b>Plastic Processed - 1st Stage</b>										
Baled HDPE	7,387	\$1,056	13,358	\$1,810	478	\$68	2,368	\$339	37,373	\$5,344
Baled PET	9,401	\$1,212	17,092	\$2,193	809	\$79	3,914	\$389	47,585	\$8,138
<b>Subtotals - Plastic Proc. 1st Stage</b>	<b>16,788</b>	<b>\$2,269</b>	<b>30,450</b>	<b>\$4,003</b>	<b>1,087</b>	<b>\$147</b>	<b>5,282</b>	<b>\$727</b>	<b>84,958</b>	<b>\$11,482</b>
<b>Plastic Processed - 2nd Stage</b>										
HDPE Pellets	15,056	\$5,812	38,157	\$13,957	1,271	\$491	2,571	\$992	75,831	\$29,309
PET Pellets	19,167	\$15,311	48,019	\$48,769	1,818	\$1,283	3,272	\$2,514	89,838	\$77,215
<b>Subtotals - Plastic Proc. 2nd Stage</b>	<b>34,223</b>	<b>\$21,123</b>	<b>86,176</b>	<b>\$62,726</b>	<b>2,889</b>	<b>\$1,774</b>	<b>5,843</b>	<b>\$3,506</b>	<b>175,669</b>	<b>\$106,524</b>
<b>Plastic Manufacturing</b>										
Plastic Sheet	3	\$13,022	168,604	\$61,972	0	\$0	4,388	\$1,812	314,891	\$115,741
<b>TOTALS - PLASTIC</b>		<b>\$16,413</b>		<b>\$116,891</b>		<b>\$1,841</b>		<b>\$5,846</b>		<b>\$233,745</b>

WESTON

Table 4-2

**Determination of Value Added  
(Concluded)**

	NEW YORK		PENNSYLVANIA		RHODE ISLAND		VERMONT		REGION	
	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)	TONS	VALUE ADDED (in 000's)
<b>Metal Processing</b>										
Ferrous Scrap	1,480,477	\$125,145	1,583,171	\$133,825	60,111	\$5,081	85,619	\$7,237	5,072,318	\$428,763
Non-ferrous Scrap	134,589	\$37,685	143,925	\$40,299	5,465	\$1,530	7,784	\$2,179	461,120	\$129,114
Aluminum Scrap	134,589	\$59,219	143,925	\$63,327	5,465	\$2,404	7,784	\$3,425	461,120	\$202,893
Baled Aluminum Cans	76,908	\$53,143	82,243	\$56,830	3,123	\$2,158	4,448	\$3,073	263,497	\$182,076
Baled Steel/Tin Cans	98,135	\$8,018	102,893	\$8,435	3,993	\$241	5,580	\$348	329,371	\$20,619
<b>Subtotals - Metal Processing</b>	<b>1,922,687</b>	<b>\$281,210</b>	<b>2,056,067</b>	<b>\$300,716</b>	<b>78,066</b>	<b>\$11,418</b>	<b>111,194</b>	<b>\$16,263</b>	<b>6,587,426</b>	<b>\$963,464</b>
<b>Ferrous Manufacturing</b>										
Steel Products	679,328	\$195,846	3,318,565	\$955,747	0	\$0	0	\$0	5,849,301	\$1,669,375
<b>Non-ferrous Manufacturing</b>										
Secondary Lead	28,800	\$10,944	2,158,541	\$820,246	0	\$0	0	\$0	3,009,581	\$1,143,641
<b>Aluminum Manufacturing</b>										
Secondary Ingot	169,785	\$126,274	884,083	\$657,517	0	\$0	0	\$0	1,125,863	\$817,335
<b>TOTALS - METAL</b>		<b>\$614,074</b>		<b>\$2,734,225</b>		<b>\$11,418</b>		<b>\$16,263</b>		<b>\$4,613,816</b>
<b>Yard Waste Processing</b>										
Compost	75,600	\$3,906	0	\$0	123,200	\$8,365	0	\$0	1,526,000	\$78,843
<b>Tire Processing</b>										
Crumb Rubber	59,840	\$14,062	32,912	\$7,734	0	\$0	5,984	\$1,406	146,960	\$34,536
<b>Tire Manufacturing</b>										
Rubber Products	115,020	\$7,476	639,000	\$41,535	127,800	\$8,307	0	\$0	1,782,810	\$115,881
<b>TOTALS - TIRES</b>		<b>\$21,538</b>		<b>\$49,269</b>		<b>\$8,307</b>		<b>\$1,406</b>		<b>\$150,418</b>
<b>Textile Processing</b>										
Wiping Cloths/Used Clothing	53,126	\$18,594	30,747	\$10,761	3,697	\$1,294	0	\$0	110,241	\$38,584
<b>TOTALS - ALL MATERIALS</b>		<b>\$1,189,427</b>		<b>\$3,512,481</b>		<b>\$35,888</b>		<b>\$99,794</b>		<b>\$7,209,274</b>

WESTON



### Plastic Processed

As with glass, data from processors reporting the quantities of types of plastics processed, a split between HDPE and PET was determined, and applied during both stages of processing.

### Metal Processed

For metals, the material processed by multi-material processors is generally different than that processed by firms that just handle metals. Multi-material processors tend to handle metal containers (aluminum and steel cans) but very little other types of scrap. Therefore, the total metal processed by multi-material processors was split between aluminum cans and steel cans based on data from processors reporting the different quantities of each material handled (44 percent aluminum cans, 50 percent steel cans). For metal processors, the split of material into ferrous, non-ferrous and aluminum scrap categories was based on data from firms reporting quantities by material (85 percent ferrous scrap, with the remaining 15 percent split evenly between non-ferrous and aluminum).

## **4.4 DETERMINATION OF VALUE ADDED**

The determination of value added involves determining the differential value between the starting and ending point of each stage of recycling and multiplying that differential by the quantity of material passing through that stage. In Table 4-2, the results of that calculation are provided for each material subcategory and recycling stage, and a summary of the key value added data is presented in Table 4-3. A total of approximately \$7.2 billion of value added has been estimated for the region.

One of the unusual consequences of the assumptions made in the analysis is that the paper manufacturing stage has a negative value added for most states. This is a result of the assumptions made regarding the end of the second stage of processing. The end-point of the second stage of processing is considered pulp. The only published price for pulp is for material that would actually be sold as pulp; however, the value for pulp within a paper mill is actually much less than value for pulp that is produced for sale. As a result, the value for the pulp assumed in this study is higher than the value for many of the paper end-products after manufacturing is complete. Obviously, the manufacturing process after production of pulp is not imparting negative value, otherwise paper mills would simply sell pulp and not bother with the rest of the process.

Thus, while the value added through the second stage of processing and manufacturing may be unrealistic on an individual basis, combined they represent a reasonable estimate of the value added by paper mills. In other words, the value assigned to pulp artificially inflates the value added by the second stage of processing. When one adds in the "negative" value added through manufacturing this high value is adjusted downward to reflect the value actually added by paper mills recycling paper.

Table 4-3

## Summary of Value Added

	CT	DE	ME	MA	NH	NJ	NY	PA	RI	VT	REGION
	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)	VALUE ADDED (in 000's)
Paper Processing - 1st Stage	\$40,709	\$22,805	\$22,159	\$42,876	\$14,439	\$80,577	\$162,823	\$172,440	\$6,286	\$28,634	\$593,848
Paper Processing - 2nd Stage	\$183,972	\$1,123	\$114,580	\$200,517	\$98,184	\$304,387	\$333,958	\$403,167	\$0	\$40,914	\$1,680,793
Paper Manufacturing	(\$75,882)	\$374	(\$33,340)	(\$70,838)	(\$31,813)	(\$80,704)	(\$58,128)	(\$85,909)	\$0	(\$5,115)	(\$422,133)
<b>TOTALS - PAPER</b>	<b>\$148,999</b>	<b>\$24,402</b>	<b>\$103,379</b>	<b>\$172,555</b>	<b>\$80,820</b>	<b>\$304,260</b>	<b>\$437,655</b>	<b>\$509,698</b>	<b>\$6,286</b>	<b>\$64,433</b>	<b>\$1,852,488</b>
Glass Processing - 1st Stage	\$411	\$87	\$232	\$308	\$168	\$725	\$1,033	\$1,868	\$67	\$331	\$5,226
Glass Processing - 2nd Stage	\$0	\$0	\$0	\$3,456	\$0	\$5,618	\$6,877	\$6,974	\$0	\$2,325	\$25,249
Glass Manufacturing	\$13,471	\$0	\$0	\$12,425	\$0	\$42,777	\$50,337	\$82,894	\$0	\$0	\$201,904
<b>TOTALS - GLASS</b>	<b>\$13,882</b>	<b>\$87</b>	<b>\$232</b>	<b>\$16,187</b>	<b>\$168</b>	<b>\$49,120</b>	<b>\$58,247</b>	<b>\$91,736</b>	<b>\$67</b>	<b>\$2,656</b>	<b>\$232,379</b>
Plastic Processing - 1st Stage	\$902	\$213	\$509	\$672	\$343	\$1,593	\$2,269	\$4,103	\$147	\$727	\$11,480
Plastic Processing - 2nd Stage	\$3,567	\$594	\$0	\$10,224	\$2,895	\$12,208	\$21,122	\$50,728	\$1,783	\$3,606	\$106,524
Plastic Manufacturing	\$4,837	\$9,496	\$0	\$19,807	\$2,427	\$2,589	\$13,022	\$81,872	\$0	\$1,812	\$115,741
<b>TOTALS - PLASTIC</b>	<b>\$9,306</b>	<b>\$10,303</b>	<b>\$509</b>	<b>\$30,704</b>	<b>\$5,665</b>	<b>\$16,389</b>	<b>\$36,413</b>	<b>\$116,801</b>	<b>\$1,930</b>	<b>\$5,946</b>	<b>\$233,745</b>
Metal Processing	\$69,959	\$16,950	\$28,537	\$61,341	\$24,871	\$154,400	\$281,210	\$300,716	\$11,418	\$16,263	\$963,464
Ferrous Manufacturing	\$37,477	\$0	\$0	\$15,500	\$0	\$485,005	\$185,846	\$855,747	\$0	\$0	\$1,669,375
Non-ferrous Manufacturing	\$10,762	\$0	\$0	\$8,208	\$0	\$283,482	\$10,944	\$820,246	\$0	\$0	\$1,143,641
Aluminum Manufacturing	\$0	\$0	\$0	\$12,885	\$0	\$40,660	\$128,274	\$657,517	\$0	\$0	\$837,335
<b>TOTALS - METAL</b>	<b>\$118,197</b>	<b>\$16,950</b>	<b>\$28,537</b>	<b>\$97,934</b>	<b>\$24,871</b>	<b>\$953,546</b>	<b>\$614,074</b>	<b>\$2,734,225</b>	<b>\$11,418</b>	<b>\$16,263</b>	<b>\$4,613,816</b>
Yard Waste Processing	\$8,365	\$0	\$19,096	\$39,783	\$0	\$3,327	\$3,806	\$0	\$8,365	\$0	\$78,843
Tire Processing	\$1,406	\$0	\$4,136	\$2,730	\$1,408	\$1,854	\$14,082	\$7,734	\$0	\$1,406	\$34,536
Tire Manufacturing	\$18,814	\$10,799	\$0	\$28,888	\$0	\$4,154	\$7,478	\$41,535	\$8,307	\$0	\$115,883
<b>TOTALS - TIRES</b>	<b>\$18,020</b>	<b>\$10,799</b>	<b>\$4,136</b>	<b>\$29,728</b>	<b>\$1,408</b>	<b>\$5,808</b>	<b>\$21,539</b>	<b>\$49,269</b>	<b>\$8,307</b>	<b>\$1,406</b>	<b>\$150,418</b>
Textile Processing	\$647	\$0	\$1,941	\$3,408	\$647	\$1,294	\$18,594	\$10,781	\$1,294	\$0	\$38,584
<b>TOTALS - ALL MATERIALS</b>	<b>\$315,416</b>	<b>\$62,552</b>	<b>\$155,830</b>	<b>\$390,298</b>	<b>\$113,186</b>	<b>\$1,333,723</b>	<b>\$1,190,427</b>	<b>\$3,512,481</b>	<b>\$35,888</b>	<b>\$90,704</b>	<b>\$7,200,274</b>

WESTERN



It can be seen from Table 4-3 that paper and metals are the major contributors to value added in the region, accounting for over 82 percent of total value added, split roughly evenly between the two materials. Glass is the next biggest contributor, accounting for approximately 5 percent of regional value added, with plastic and tires contributing approximately 3 percent and 2 percent of the total, respectively. Yard waste processing accounts for another 2 percent of regional value added, and textiles contribute less than one percent to the total.

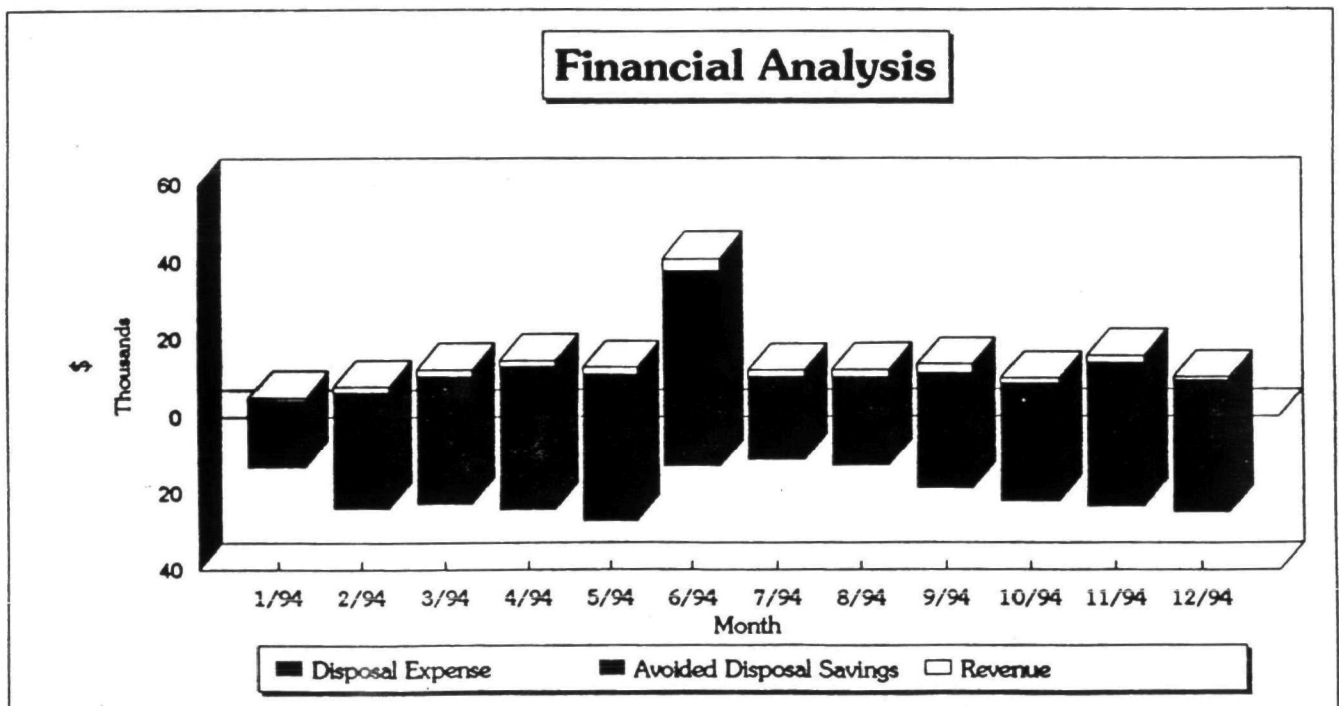
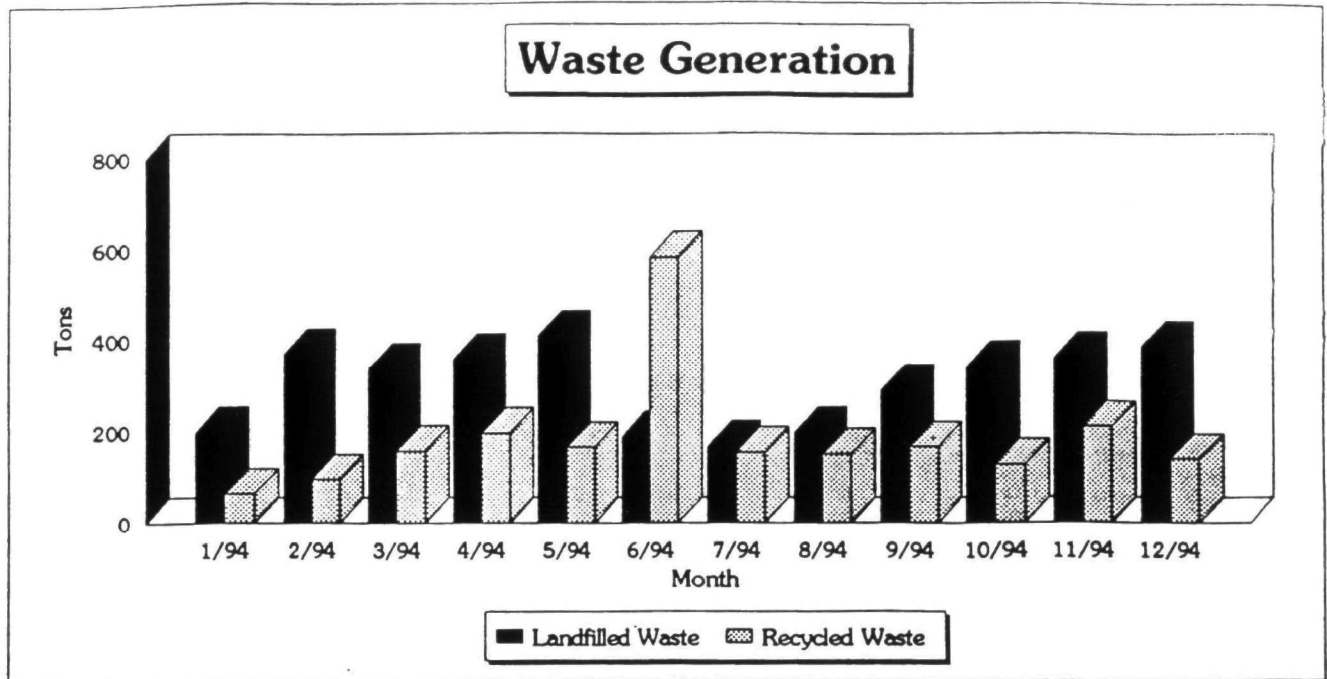
Splitting the regional value added by processing versus manufacturing, it is found that processing adds approximately \$3.7 billion of value regionally, while manufacturing adds approximately \$3.5 billion of value. This split is skewed, however, by the difficulty in assigning an appropriate value to the end-point for the second stage of paper processing. The assumptions inflate the value added through processing of paper and deflate the value added through paper manufacturing, since paper manufacturing (defined as the processes after production of pulp) is calculated to subtract value rather than add it. If paper manufacturing were assumed to add zero value (instead of negative value), processing would contribute \$3.3 billion of value and manufacturing would add \$3.9 billion of value.

The value added totals by state can be evaluated. Pennsylvania is the largest contributor to total value added, primarily as a result of the large amount of metal processing and manufacturing in the state. New Jersey is the second largest contributor to total value added.

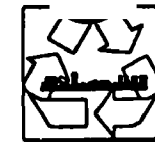


# University of Massachusetts Amherst

## Office of Waste Management



# University of Massachusetts Amherst- Monthly Waste Generation Report



## Waste (tons)

Month	Household Waste	Demolition Waste	Total Waste
1/94	195.24	3.74	198.98
2/94	369.96	0.00	369.96
3/94	320.67	17.51	338.18
4/94	338.15	20.56	358.71
5/94	396.80	14.42	411.22
6/94	175.07	14.55	189.62
7/94	158.50	9.81	168.31
8/94	169.35	30.10	199.45
9/94	290.00	1.17	291.17
10/94	333.29	8.44	341.73
11/94	332.26	29.07	361.33
12/94	374.49	12.32	386.81
<b>Total</b>	<b>3453.78</b>	<b>161.69</b>	<b>3615.47</b>

Disposal Expense: \$224,495.70 \$14,553.00 \$239,048.70

## Recyclables (tons)

Corrugated Cardboard	Low Grade Paper	High Grade Office Paper	Glass/Alum/Tin/Plastic Containers	Misc. Materials Recycled	Food notes	Total Tons Recycled
19.61	11.10	12.24	5.39	15.92	(1)	64.26
33.39	15.68	24.31	13.44	8.60	(1)	95.42
30.41	45.15	32.62	19.53	50.37	(2)	158.06
25.82	52.06	30.57	16.47	91.28	(3)	196.20
24.56	24.87	35.32	18.67	62.58	(4)	166.00
13.29	58.06	60.26	8.79	462.54	(5)	582.94
13.40	33.70	33.65	10.12	64.77	(6)	155.64
19.48	62.49	37.83	10.90	21.96	(1)	152.66
42.69	37.05	44.75	14.04	29.03	(7)	167.56
35.13	29.15	20.44	19.77	24.45	(8)	128.94
31.78	48.38	33.31	10.62	86.90	(9)	210.99
29.76	19.26	12.14	19.83	59.82	(10)	140.81
<b>319.32</b>	<b>326.93</b>	<b>377.44</b>	<b>167.57</b>	<b>958.22</b>		<b>2219.48</b>

% of Total Waste Stream Recycled

24.41%  
20.30%  
31.85%  
35.36%  
28.76%  
75.46%  
48.04%  
43.36%  
36.53%  
27.39%  
36.87%  
26.69%

38.04%  
(average)

Est. Revenue: \$1,915.92 \$0.00 \$18,494.36 \$0.00 — \$20,410.48

Avoided Disposal Savings:

\$20,755.80	\$25,800.45	\$24,533.60	\$10,892.05	\$62,284.30	\$144,266.20
-------------	-------------	-------------	-------------	-------------	--------------

\*For 1994

(1) Scrap metal

(2) 12 tons scrap metal, 12.24 tons wood waste

(3) 25.36 tons scrap metal, 7.22 tons wood, 58.7 bituminous concrete

(4) 52.14 tons scrap metal, 6.5 tons wood, 94 ton food, 3 tons clothes

(5) 43.02 tons scrap metal, 45.88 tons wood, 86.15 tons bituminous concrete,

365.49 tons concrete, 22 tons tires

(6) 31.20 tons scrap metal, 8.17 tons wood, 4.70 tons bituminous concrete, 20.70 tons concrete

(7) 23.77 tons scrap metal, 5.26 tons wood

(8) 15.59 tons scrap metal, 7.2 tons bituminous concrete, 1.66 tons plastic

(9) 32.37 tons scrap metal, 4.98 tons wood, 49.55 tons bituminous concrete

(10) 18.24 tons scrap metal, 24.50 tons bituminous concrete, 7.42 tons transformers, 9.66 tons electronics

R. Marc Pournier, Waste Manager

Office of Waste Management, Physical Plant

University of Massachusetts at Amherst

(413)545-4386

Total Disposal Expense since January 1994: \$239,048.70

Total Revenue since January 1994: \$20,410.48

Total Avoided Disposal Savings since January 1994: \$144,266.20

Average recycling rate since January 1994: 38.04% of the total UMass waste stream

**PROFILES OF NORTHEAST STATES'  
OFFICE WASTEPAPER RECOVERY PROGRAMS**

**Compiled by the Northeast Recycling Council  
March 20, 1995**

## Increasing Office Waste Paper Recycling in New Jersey

The New Jersey Department of Environmental Protection (DEP) is taking a look at existing policies to determine what changes can be made to increase the recycling rate and processing capacity for office waste paper (OWP) in New Jersey. Statistics compiled by the DEP indicate that 372,000 tons of office paper was generated in New Jersey in 1992, the latest year for which complete statistics are available. It is estimated that in that same year, 31% of OWP was recycled. Waste paper recycling rates are reported to the DEP through the recycling tonnage grant program. This information will be used to determine if counties are achieving their mandated recycling rates. Nineteen of New Jersey's 21 counties have designated OWP or mixed paper a mandated recyclable material.

The DEP has been working with several companies on the development of new recycled paper mills. Once up and running, these mills will add potentially 1500-2000 tons per day additional OWP processing capacity in New Jersey. This will increase the demand for OWP and result in a higher capture rate.

Presently, paper collected from offices which is not "source separated" must be collected by licensed solid waste haulers and processed at materials recovery facilities (MRF). For generators which do not source separate mandated recyclables but rather contract with MRFs to do the separation, exemptions from the source separation mandate must be granted by the municipality. About 30 MRFs process paper in New Jersey. The permitting process for MRFs in New Jersey is extensive and costly. With the rising market demand for all grades of paper, much of the waste stream generated by offices is recyclable. An examination of the office waste stream shows that the vast majority of material generated is recyclable paper, with only a small percentage of non-paper material.

The DEP is evaluating the impact of allowing processors (called "Class A" recycling centers in current regulations) of office waste which has not been fully source separated to be excluded from Departmental approval, similar to facilities which process other source separated Class A materials such as bottles, cans, news and cardboard. By allowing recycling facilities, in addition to MRFs, to collect and process the office waste stream without requiring full on-site separation of paper from non-paper waste, the participation rate and processing capacity in New Jersey will increase. Employees could place all the wastes generated at their desks, including minimal amounts of non-paper material, in a single container. The only separate handling requirements would be of waste generated in an office cafeteria or lunch room, and Class B recyclable material. This approach will promote the capture of paper generated by offices which do not have the space, or the willingness, to separately handle their office paper.

The policy under consideration by the Department is influenced by discussions with paper processors which collect office paper and

mills which produce lower grade paper products such as paperboard tube and linerboard. These discussions reflect that mills can generate their products from a feedstock which contains a higher level of nonpaper material than would traditionally be found acceptable, from a regulatory standpoint, in a "source separated" material. It could be argued that the acceptable level of contaminants in paper collected and processed at recycling facilities should be no more stringent than the minimum allowable by end markets for the material. The Department would set a limit for the total percentage of nonpaper material which could be accepted at a Class A facility, however, it would be more flexible than what is currently allowed. With this flexibility, Class A facilities could provide recycling services to those offices which have been unwilling or unable due to space or other constraints to handle paper waste separately.



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GOVERNOR'S RECYCLING PROGRAM  
Office of State Planning  
2 1/2 Beacon Street  
Concord, New Hampshire 03301  
(603) 271-1098

## Press Release

**For Release**  
March 10, 1995

**For More Information:**  
Barbara McMillan, Recycling Planner

### **Start Paper Recycling for Earth Day!**

CONCORD\*\*\*April 22, 1995 marks the 25th Anniversary of Earth Day -- what better time for businesses throughout New Hampshire to begin an important new habit - recycling their waste paper!

Waste paper, and lots of it, is the by-product of the day to day activity of retail stores, offices, manufacturers, and endless other businesses. And the majority of that waste paper is recyclable, including computer print out paper, letterhead, envelopes, copy paper, memos, scratch paper, newspaper, cardboard, and magazines.

*Office Paper Recycling* is a new bulletin produced by the Governor's Recycling Program to help small businesses recycle their waste paper. The bulletin highlights twenty-four recycling companies who are willing to collect small volumes of waste paper. Take your first step toward recycling your office waste paper for Earth Day by calling the Governor's Recycling Program at (603) 271-1098 to receive a free copy of the *Office Paper Recycling* bulletin

- END -

# Office Wastepaper Recovery in Maine

## Historical Figures & Capacity Prospects

	Tons Recovered	Rate
1991:	21,863	30%
1993:	34,763	44%

Stone & Webster deinking facility going on line this year. Increases capacity  $\approx$  89,000 tons from  $\approx$  165,000 to  $\approx$  254,000 tons.

OWP recovery is mandated for businesses with 15 or more employees.

Barriers to marketing recyclables

- Rural collection inefficiencies. (70% of businesses in Maine employ < 9 people)
- Lack of understanding by small businesses regarding methods and costs.

## Ongoing & Planned Assistance Programs to Increase Recovery of OWP

- Investment tax credits targeted toward paper collectors & processors
- Low interest loan program
- WASTECAP technical assistance program
- Periodic workshops
- Maine Market Cooperative
- EPA jobs through recycling program: Expand collection of small business OWP

## Efforts to Track OWP Recovery

### *Biennial State Plan*

- Broker Survey
- Municipal Reports

### *Data Collection Challenges*

- Resource Intensive
- Confidentiality
- Estimation Methods



Department of Environmental Management  
85 Park Street  
Providence, RI 02903-1137  
(401) 277-3447  
FAX (401) 277-2511  
TDD (401) 277-1367

## Office Waste Paper Recovery in Rhode Island

In Rhode Island, businesses, state agencies and municipalities are required, in varying degrees, to recycle. State agencies and businesses must, by law, segregate OWP from their waste streams. In addition, several cities and towns have taken steps to recover OWP from the municipal waste stream by providing OWP drop-off centers.

Increasing the recovery of OWP in Rhode Island is promising for several reasons. The economics of recovering OWP from the waste stream is sound today and should remain so in the future. This, coupled with the fact that recycling is the law and that tipping fees are expected to rise slightly, makes recycling OWP a practice that makes sense for businesses, government agencies and households.

OWP recycling is mandatory for businesses and state agencies. All businesses and state agencies, regardless of size, are required to recycle 17 items, including OWP, listed in the Commercial Recycling regulations. Businesses with 50 employees or more are required to submit a recycling plan and subsequent annual reports on the amount of recyclables and waste they generate, and how these materials are being handled. These reports were not designed with data entry and analysis in mind, they were designed to encourage recycling through the philosophy of "make them report and they shall recycle." However, we do know from the data that the bulk of businesses with 50 or more employees do recycle paper. Commercial enforcement is limited and technical assistance is available upon request.

Like businesses, state agencies are required to submit recycling plans to DEM. Information provided on these plans is integrated directly into "blanket" waste and recycling collection contracts. The enforcement target in state agencies, however, is the waste hauler who is awarded the contract through a competitive bidding process. Haulers are required, as a term in the contract, to submit quarterly reports indicating the amount of recyclables collected from each state location. The purpose of these reports is twofold. First, it helps DEM identify state locations that are not recycling. Second, it serves as an indicator of the efficacy of an agency's program. Through these reports and by providing technical assistance, DEM hopes to increase the recovery of OWP, and other recyclables, by establishing recycling programs in every agency and by improving existing programs.

The Department also publishes a Local Recycling Markets list which lists local markets for OWP and other mandatory materials.

Currently, Rhode Island law requires municipalities to separate six materials from the municipal waste stream. OWP is NOT one of the mandatory recyclables. However, as a result of an increased tip fee and current market prices for OWP, several cities and towns have taken steps to recover OWP from the municipal waste stream by providing OWP drop-off centers. Barrington, Block Island, Charlestown, East Greenwich, Westerly and the Solid Waste Management Corporation (SWMC) all have a provision for OWP at drop-off centers. (Underlined municipalities received money from the DEM to initiate.) A pilot program to expand the list of recyclables including OWP, is underway in the Town of Foster. Additionally, SWMC is planning to expand the MRF that serves cities and towns to accept OWP. Because OWP is not a mandatory recyclable for municipalities, there is no enforcement.

For more information about OWP recycling in Rhode Island contact: Garrett Iannella, RIDEM, 85 Park Street, Providence, RI 02903 (401) 277-3434x4409.



## DELAWARE SOLID WASTE AUTHORITY REPORT ON OFFICE WASTE PAPER FOR NORTHEAST RECYCLING COUNCIL

Currently, the overwhelming majority of office waste paper recycling is done by the private sector through contractual arrangements between the collector and the business being served. In FY 92, 6,659 tons of office paper was reported to DSWA as being collected for recycling; in FY 93 10,831 tons; and in FY 94, 3,756 tons. This information is reported to DSWA in accordance with our regulations requiring all private/commercial recycling operations to report tonnages collected and marketed on an annual basis.

As part of the overall OWP recycling program, the Delaware Department of Administrative Services conducts a statewide program for forty government office buildings. This program collects 60 tons annually.



# STATE OF CONNECTICUT

## DEPARTMENT OF ENVIRONMENTAL PROTECTION



### SNAPSHOT OF OWP (HIGH AND MEDIUM GRADE OFFICE WASTE PAPER) RECOVERY IN CONNECTICUT

#### Legislation:

High grade white office paper from the non-residential sector is one of the items mandated for recycling in Connecticut (Sections 22a-241b-1 thru 22a-241b-4 of the RCSA). Although enforcement of recycling requirements is provided through municipal ordinance and state statutes affecting generators, haulers, and owners or operators of disposal facilities, enforcement does not appear to be reaching many of the smaller and mid-sized businesses.

#### Prospects for Increasing OWP Recovery in CT

Anecdotally it appears that most of the larger offices are recycling their office paper, but that many of the smaller and medium sized businesses are not. Economically and logistically it is easier for the larger businesses to implement successful programs to recover OWP. Often these programs include an on-going environmental task force which monitors and corrects contamination problems and helps provide incentives for successful employee participation such as recycling exhibits, feedback on the amount of paper recycled, publicizing accrued environmental benefits, and, if appropriate, publicizing revenue generated, etc. In order to deal with their janitorial service's less than enthusiastic response to recycling, one large insurance company stipulated in their contract that any revenue lost, due to contamination of the OWP separated by the insurance company's employees, is required to be made up by the janitorial service.

In order to facilitate recycling by small businesses, some Connecticut towns have provided drop-off recycling areas which can be utilized by these businesses; there is a tipping fee at at least one of those drop-off areas. However, regardless of whether there is a tipping fee or not, participation among the small businesses generally does not appear to be high. Some of the municipal recycling coordinators attribute this to the perception by smaller businesses that they are not required to recycle (or that recycling requirements will not be enforced) and that it's not worth the effort. To date, most efforts in Connecticut to promote recycling have focused on the residential sector and the larger businesses, not on the small and medium sized businesses. Increased education and improved enforcement efforts coupled with programs that would involve little or no expense to the smaller businesses would probably result in improved recovery of recyclables, including OWP. In attempt to help improve the recycling participation rate among the smaller businesses, the CT DEP is planning to fund a small business waste audit program (see description on reverse side). Connecticut's Business Environmental Council (see attached description) provides recycling assistance to Connecticut businesses of all sizes.

State agencies throughout Connecticut recycle their OWP under a contract awarded by the Department Of Administrative Services (DAS) purchasing division. Workshops sponsored by the DEP, DAS, and DPW (Department of Public Works) were held in June 1990 and

provided recycling technical assistance to state agencies . However, centralized oversight of state agency recycling programs is practically non-existent and recovery rates would benefit from improved assistance and enforcement.

Some residentially generated OWP is captured through mixed residential paper programs, which market the paper mainly to paperboard and tissue and towel mills, and through residents bringing their OWP to their place of work to be recycled. However the residential OWP stream remains largely unrecovered.

The postal service in Connecticut is getting ready to launch a statewide program to recover and recycle undeliverable bulk mail generated in Connecticut post-offices.

### Tracking OWP Recovery in Connecticut

The state does make an attempt to track the amount of OWP collected in Connecticut. Reports submitted by the municipalities and recycling facilities do provide some information. However, often paper is reported as "mixed paper", or as "other paper separated by grade" ("other paper" means other than OCC, ONP, high grade white paper, magazines, or phone books and includes grades such as printed sulphate stock, manilla tab cards, mixed high grade, windowed envelopes, etc ). It is, therefore, difficult to know how much of that "mixed paper" and "other paper separated by grade" is actually high or medium grade office paper. Approximately 13,745 tons of paper described as office paper, 22,000 tons of "other paper separated by grade", and 31,000 tons of "mixed non-residential" waste paper were reported received from Connecticut sources by Connecticut recycling facilities in FY94. Reporting is probably not complete.

### Innovative Programs

Although I have not heard of anything similar in Connecticut, a promising program to help small businesses recycle was started in Minnesota in 1990 (description is attached). A quick call (3/15/95) to the hauler involved in the program indicated that the program is still viable and has been successful.

### **Small Business Waste Audit Program**

Early summer 1995, the Connecticut Department of Environmental Protection Recycling Program will be issuing a Request for Proposal for an organization to provide waste audits and recycling/source reduction technical assistance to 400 small businesses in the state. The waste audits will be provided free of charge and utilize a training program designed by the Connecticut Business Environmental Council. The council has been providing assistance to businesses since 1992. Upon completion of the waste audit, a meeting will be scheduled with each business to provide methods and ideas on how to reduce their waste stream and recycle. The project is expected to last for 2 years to reach the 400 small businesses. It is funded at \$50,000. For additional information, please contact Kim Trella at 203-424-3365.

CT DEP 3/15/95

## MASSACHUSETTS OWP RECOVERY

Robin Ingenthron, Recycling Director

1. In general, what are the prospects for increasing OWP recovery in Massachusetts?

Four ways to increase OWP:

1. Increase participation and capture rate
2. Small-quantity generators
3. Service geographic "islands"
4. Make exporting harder

In combination, these efforts might increase OWP by 1/3 under current pricing. Competition in cities like Boston does not increase recovery that much; "canibalism" of existing programs mainly leads to higher prices and lower quality. Hopefully, the higher prices will also allow metro Boston routes to get "deeper routes", ie increase participation and capture rate, better service to small quantity generators.

2. Is OWP recovery mandated....? No
3. What state assistance programs have or will be implemented to increase recovery of OWP?

- a) Increase capture rate in public buildings:

DEP representatives working with Governor Weld's "Clean States Initiative" schmoozed with key officials at the Massachusetts Dept. of Capital Planning and Operations; the state agency in charge of rental and/or maintenance of all state offices. DCPO officials identified the operative language for janitorial services, which specify such activities as "cleaning ash trays on a daily basis". Mass. DEP was going out to bid for space on one of its own offices, and DCPO agreed to alter the janitorial language to require janitors to arrange for all recycling in the building (from collection to removal and sale) and also specified phosphate-free and other non-hazardous cleaning practices. The DEP bid demonstrated to DCPO that this language was not a "deal killer", and DEP is now negotiating to have the same language put into the standard boilerplate for all state bids.

- B) Secure the base in established tissue/board mills:

While some of these "red brick" factories frankly may have trouble surviving even without the spike in recycled feedstock prices, DEP is concerned that these industries have been ignored as new mills have been courted. Since Mass. experience with Patriot Paper (a new "deinking" plant investment which took \$40- million in capital and then failed), we would prefer not to take for granted that the newer Northeast mill investments will succeed. The new mills in Fitchburg is also only a pulp converter, and will not add

as much value or jobs to the recycled tonnage as the tissue mills it is competing with. DEP has paid for the hiring of a professional paper mill consultant to work with an existing economic development agency (Industrial Services Program - ISP) to visit and assess the needs of the traditional recycling mills.

C) Promote Municipal/Chamber of Commerce cooperation:

Primarily applied to assist hospitality industry develop a home-grown, "Man and Van" service sector for small barrel pick-ups

D) Promote new service mixes:

Examples, in addition to the Janitorial services contract:

- o North Shore Fibers contracted with a package delivery firm, which has a deeper route system, for service of small quantity generators.
- o Earthworm Inc. established reverse delivery/sales of recycled paper and toner cartridges, added to copier-based business services for small-quantity generators.
- o McGinnis Recycling/"City Shredding", added confidential destruction to add value to small-quantity generators.
- o DEP/Municipal recycling transfer stations, collecting loose material (reducing cost/competition for Mass-based mills, originally for newspaper), considering trailers to collect OWP in less urban centers. "Wal-Mart" approach to OWP collections, to address poorly serviced cities such as Leominster and Pittsfield.

E) Other state efforts:

- o DEP and industry trade associations jointly created a Massachusetts "WasteCap" to promote recycling without a regulatory emphasis.
- o DEP is considering a regulatory incentive to allow incinerators and landfills to front-end "dump and pick", allowing them to avoid waste ban inspections and/or "backing the tonnage off" of ton/day permits.
- o DEP is funding a public outreach/advertising campaign to promote recycling generally.

4. Are there efforts to track the process of OWP recovery?

Using "Value Added" methodology, DEP estimated the 1992 recovery of OWP to be about 205,000 tons. DEP hopes to track only the annual employment records filed each year with Dept. of Revenue and extrapolate general rates automatically.

## STATUS OF OWP RECYCLING IN NYS

### Generally speaking, what are the prospects for increasing recovery of OWP?

The answer to this question depends upon where one is in the State, and with the exception of the NYC Metropolitan Area, there is very little "hard" data available on OWP recovery. Based on conversation with local recycling officials and private dealers, it appears that recovery programs are fairly well established in the Utica, Syracuse, Binghamton and Rochester areas.

A very well established collection and processing infrastructure exists in the NYC metropolitan region (which includes Long Island, NYC, northern New Jersey, and counties immediately to the north of NYC). According to Jaakko Poyry Consulting, the recovery rate of OWP in this region was estimated to be 89% in 1993.

### Is OWP recovery mandated, and if so, how are these laws implemented and enforced at the local level?

The State has a mandatory source separation law that went into effect in September, 1992. The law applies to all generators of solid waste - that is, it includes the commercial, industrial and institutional (CII) sector. Implementation and enforcement is the responsibility of local government. Enforcement schemes vary but generally speaking enforcement is either done by spot checking haulers at transfer stations and disposal facilities, issuing citations directly to business generators, or some combination of the two.

The more aggressive local programs consist of a two pronged approach to increasing business recycling - that is, technical assistance and enforcement. Some municipalities are actually hiring enforcement officials and are issuing warnings and citations for failure to comply with recycling laws. Others are in the process of instituting such steps. Resource constraints are limiting the effectiveness of municipal efforts to increase business recycling. While some communities have the resources to assign "business recycling specialists" to provide hands-on technical support to assist businesses in setting up programs, others are trying to do so with existing personnel who must still manage activities related to residential recycling programs.

### What State assistance programs have or will be implemented to increase recovery of OWP?

The Department of Economic Development's Recycling Investment Program is one vehicle to provide technical and financial assistance for a variety of recycling projects, including those focused on OWP recovery.

In areas where the prospects for recovering additional supplies of OWP are good, the business arms of local ARCs offer a cost-effective way to provide recycling services. We are currently reviewing proposals submitted to us from two local ARCs. Two investor owned utilities in NYS have already partnered with local ARCs to recover and process recyclable materials on behalf of the utilities (i.e. Niagara Mohawk and Monarch Industries in Onondaga County; Central Hudson Gas and Electric and Pilot Industries).

### Are there efforts to track the progress of OWP recovery, and if so, what type of information is being compiled and how will it be used?

No formal, ongoing efforts are currently underway to track the progress of OWP recovery. ORMD staff do make inquiries about the status of municipal efforts to increase recovery from time to time on an as-needed basis. As in other states, formal studies are often commissioned to determine supply availability for mill specific projects.



# State of Vermont

Department of Fish and Wildlife  
 Department of Forests, Parks and Recreation  
 Department of Environmental Conservation  
 State Geologist  
 RELAY SERVICE FOR THE HEARING IMPAIRED  
 1-800-253-0191 TDD>Voice  
 1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES  
 Department of Environmental Conservation  
 Environmental Assistance Division  
 103 South Main Street  
 Waterbury, Vermont 05671-0407

(802) 241-3444  
 FAX (802) 241-3273

## NERC Quarterly Meeting, March 20-21, 1995 Status of Office Waste Paper Recycling in Vermont Vicky Viens, (802) 241-3448

### 1: Prospects for increasing OWP recovery in Vermont?

In 1989, the regional planning entities conducted a waste generation study to determine the amount of waste generated in Vermont. The study estimated a total waste generation of 700,000 tons per year. Tellus Institute and Wehran Engineering compiled this information for the state in the report "Analysis of Solid Waste System Costs for the State of Vermont," July 1990. The report indicated that "Mixed Office Paper" made up 2.2% of the waste stream. This would indicate 15,400 tons of OWP generated. (The report did not track a separate category for white office paper.) Vermont Processor reports for 1993 and 1994, include an estimated 4,400 tons of office paper recycled per year. We estimated that 65 percent of the population is serviced by these processors. Based on 65 percent of the population reporting OWP tonnages processed, we estimated that 6,800 tons of paper were recycled during those two years in Vermont through processors.<sup>1</sup> Assuming that population and employment growth has offset source reduction efforts, one can assume that there is 8,600 tons of OWP not currently recycled.

### 2: Mandatory OWP recovery programs, how are these laws implemented and enforced at the local level?

In Vermont, recycling programs are mandated and implemented at a local level. Out of 12 districts, four mandate the recovery of OWP from the commercial sector.

### 3: State Assistance programs implemented to increase OWP recovery

Vermont has offered solid waste grants since 1987 that have allowed municipalities to obtain 40% grants for implementation of programs for recycling and waste reduction. Restrictions on these grants have varied with each fiscal appropriation, but generally money for recycling equipment and facilities has been available to municipalities, including setting up their own recycling programs, including building source-separated MRFs or buying balers and compactors.

One innovative program, called Business Recycling Assistance, has allowed municipalities to enter into long term agreements with local businesses. In these cases, businesses set up recycling programs and leased recycling equipment from municipalities, obtained under solid waste grants, at reduced prices.

<sup>1</sup> For this extrapolation we did not know 1) the population served by these processors, 2) tonnages of paper recycled through direct sale to brokers or end-users, 3) amount of source reduction or increase in paper usage since 1989 and 3) problem of extrapolating tonnages based on reporting in the more densely populated areas. From 100% Recycled Paper

#### **4: Tracking OWP recovery in Vermont.**

Currently, the Recycling and Resource Conservation Section is requesting proposals to establish a database for tracking recycled materials in Vermont. We expect the analysis to be completed in the next year. The establishment of the database and subsequent data analysis have several goals:

- A. achievement and evaluation of state waste diversion goal (reduction (includes reuse)/recycling),
- B. assistance in market development, and
- C. research and evaluation for future programs and legislation.

This database would include tracking office waste paper, most likely in two categories: white office paper and mixed office paper. Tonnages would be tracked through information from processors, brokers, and end-users that receive material from collectors.

#### **5: Innovative Programs**

The State of Vermont's Clean State Council, mandated by the Governor, directs state government agencies to develop programs to manage wastes with preference to pollution prevention and resource conservation strategies. Among a number of plans, the order calls for improvements in office paper recycling programs.

##### **Current State program:**

- Custodial workers empty OWP recycling bins into toters located at various locations/stations throughout the complex
- State Buildings collect the materials and empty in roll-off
- Contractor empties roll-offs when full
- State Recycling Coordinator provides desk side and 14-gallon recycling bins and provides training workshops in each Department.
- As mandated by the Governor's Clean State Council, each Department has a Recycling Coordinator.
- Recycling Section staff inspects each load hauled to processing facility for quality control

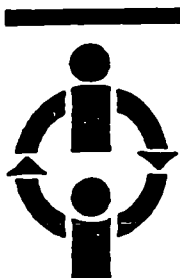




The Buy Recycled  
Business Alliance

Working to close the loop.

# BUY-RECYCLED GUIDE



NATIONAL  
RECYCLING  
COALITION  
INC.

1101 30th Street NW, Suite 305  
Washington, DC 20007  
202/625-6406



Recycled Paper

## ACKNOWLEDGEMENTS

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Thank you to Dana Arnold of EPA, formerly of Center for Earth Resource Management Applications (CERMA), for developing the Guide.

The Guide was reviewed by many people representing a variety of organizations, including the National Recycling Coalition's Board of Directors, the National Association of Purchasing Managers, Californians Against Waste, the Environmental Defense Fund, the Environmental Action Fund, the Northeast Waste Disposal Authority, and others. We appreciate their input.

The Buy Recycled Business Alliance began in April 1992 with 20 national companies committed to increasing their purchase of recycled content products. In September 1992, the group launched the Buy Recycled Campaign, an educational and promotional effort to close the recycling loop by integrating recycled content purchases into a company's daily operations. The Alliance hopes to recruit 5000 companies large and small, by the end of 1995.

The Buy Recycled Business Alliance is guided and funded by the Steering Committee. This committee currently includes representatives from:

American Airlines  
Anheuser-Busch, Inc.  
AT & T  
Bank of America  
Bell Atlantic Co.  
Browning Ferris Industries  
The Coca-Cola Co.  
Cracker Barrel Old Country Store, Inc.  
E.I. DuPont Co.  
Fort Howard Corp.  
Garden State Paper Co.  
James River Corp.  
Johnson & Johnson  
Johnson Controls  
Kmart  
Laidlaw, Inc.  
Lever Brothers Co.  
McDonald's Corp.  
Menasha Corp.

Moore Business Forms, Inc.  
Quaker Oats  
Quill Corp.  
Rock-Tenn Co.  
Rubbermaid, Inc.  
Safeway Inc.  
Sears Roebuck and Co.  
Wal-Mart, Inc.  
Waste Management, Inc.  
Wellman, Inc.  
Wisconsin Tissue Mills

### Associations:

American Plastics Council  
Food Marketing Institute  
Steel Can Recycling Institute

This group has worked hard, and their ongoing efforts are greatly appreciated.

## FORWARD

**WELCOME!** You're in good company! Many companies have initiated "Buy Recycled" programs recently. This manual has been prepared by business, for business. It represents the product of many months of hard work and dedication so you can save time and money. When it comes to recycling our message is the famous ad line, "Just Do It!"

The National Recycling Coalition (NRC) initiated the "Buy Recycled" Campaign by forming a steering committee of companies representing a diverse cross section of the American business and industrial community. The Buy Recycled Business Alliance is committed to increasing the purchase of recycled content products through education and leadership by example.

Our nation is facing an urgent solid waste disposal problem. In response, the business community is making dramatic changes in how it generates and manages waste, and has a tremendous opportunity to make a valuable contribution to overall progress on recycling issues. While there are no guaranteed formulas or prescriptions for businesses, basic operating principles are emerging.

A guiding principle is that our traditional view of product design, use and disposal must change. The increased cost and limitations of landfill capacity and incineration are driving a number of changes in all sectors - business, government and the public. A key question is what will drive this change - government action or business and industry initiative?

The best response is prompt, voluntary action to demonstrate leadership in providing appropriate and cost effective solutions to reduce waste and encourage recycling. The Buy Recycled Business Alliance believes that business is part of the solution to the problem and should practice a full range of options appropriate to their particular activity.

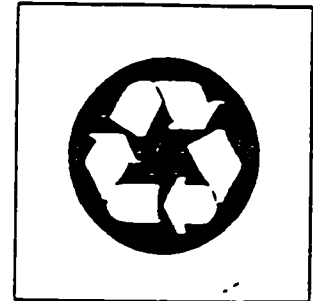
This manual is intended to help you. It is neither a set of regulations nor a detailed prescription for corporate action. It contains currently available principles, guidelines, tools and strategies. Leading companies have found them helpful in implementing a substantial and cost effective buy recycled program.

Many businesses have been practicing various aspects of a buy recycled program for many years, others started more recently. However, given the pressing nature of the solid waste problem and the public attention focused on it, it is essential to continuously expand our efforts. The NRC and the Alliance believe the national business community has a golden opportunity to aggressively pursue a buy recycled program and contain costs at the same time. We cannot afford to ignore the long term needs of our customers and remain competitive. In this case, we need to demonstrate leadership with sound environmental practices.

## WHY BUY RECYCLED PRODUCTS?

Americans generate a huge amount of garbage. In 1991, the amount generated throughout the United States exceeded 260 million tons. The bulk of the waste is landfilled, at the same time that the number of landfills is decreasing, tipping fees are increasing, the ability to site a new landfill is hampered by environmental concerns and permitting constraints, and states are trying to close their borders to out-of-state waste. For these reasons, interest in recycling is at an all time high.

You are probably familiar with the recycling logo, with its three chasing arrows. The arrows represent the three elements of the recycling process: collecting materials that otherwise would be thrown away, manufacturing new products using those materials, and purchasing the new products. Recycling isn't completed until the materials we collect are turned into new products and those products are purchased. This is known as "closing the loop."



For recycling to succeed, purchasers must let manufacturers know that they buy recycled products.

As a purchasing agent, you are in a unique situation when it comes to purchasing recycled products. Consider the following:

- ▲ You have a tremendous opportunity to help resolve the national solid waste management problem.
- ▲ By being proactive in learning about the broad range of available recycled products and how they can be used by your company, you can lead your company in an activity that ultimately will save money, contribute to the success of your corporate recycling program, be good for the environment, and foster goodwill among employees and customers.
- ▲ What your company buys has a direct relationship to what it throws away. If disposal can be avoided by reducing, reusing, or recycling materials, then the company will avoid related labor, storage, and disposal costs. Similarly, if your company can reuse materials or reduce what it uses, then it will save on materials costs.

Many companies are purchasing recycled products. Given the public pressure to increase recycling collection programs and to minimize waste generation, it is essential to expand programs. Quality customer service and sound business management should guide the implementation of a buy recycled program. The Alliance believes that purchasers and suppliers should voluntarily and aggressively implement buy recycled programs.

## HOW THIS MANUAL WILL HELP YOU

Establishing a buy recycled program will take support from senior management, thought, time, and education.

This manual is designed to help you begin or expand a recycled products purchasing program. It outlines the elements of such a program and points out ideas that have been used successfully by others. It also answers frequently asked questions about recycled products, including concerns about price, availability, and performance.

### Key Elements of a Buy-Recycled Program

- ▲ Management Commitment to Buy Recycled Products
- ▲ Use of Cross-Functional Teams
- ▲ Education about Recycled Products
- ▲ Evaluation of Current Purchases for Opportunities
- ▲ Revising Specifications, Policies and Procedures
- ▲ Goals and Phase-ins
- ▲ Product Testing
- ▲ Internal and External Promotion
- ▲ Monitoring the Program and the Market

## WHAT IS A "RECYCLED" PRODUCT?

The first step in buying recycled products is understanding what they are. Key words to become familiar with are recycled, recovered materials, postconsumer, and preconsumer. By understanding the differences, you can specify the kind of recycled product that you want. Be aware that "recycled" does not mean that a product contains 100% recovered materials. Nor does it always mean that a product contains postconsumer materials. Following are general definitions of these terms.

At this time, there is neither consensus on how to define a "recycled" product nor nationally accepted standards for what percentage of recovered materials should be used in products. As a result, recycled content claims are confusing to consumers and manufacturers.

Recycled simply means that a product contains *some* recovered materials.

Recovered materials is a broad term, covering both "preconsumer" and "postconsumer" materials.

Postconsumer materials are used materials such as corrugated containers, office paper, pallets, drums, and packaging materials that are collected in office, commercial, and residential recycling programs.

Preconsumer materials are generated by manufacturers and product converters, such as trimmings, damaged or obsolete products, and overruns.

The difference between "preconsumer" and "postconsumer," then, is whether or not the consumer uses the material for its own use. "Recycled" does not mean that a product contains 100% recovered materials. Nor does it always mean that a product contains postconsumer materials.

The U.S. Environmental Protection Agency (EPA) has issued guidelines for purchasing the following recycled products: recycled paper and paper products, re-refined lubricating oil, retread tires, building insulation products, and use of fly ash in cement and concrete. Each of the guidelines includes definitions, and the paper, oil, and building insulation products guidelines recommend minimum recovered materials content standards. While these guidelines are intended for use by governmental purchasing agencies and their contractors, you can use them as a starting point for defining recycled products.

The Recycling Advisory Council (RAC) has recommended definitions, standards, a measurement protocol, and labeling requirements for use by purchasing managers in specifying recycled paper products. RAC is partially funded by EPA and is administered by the National Recycling Coalition. RAC is composed of industry, consumer, environmental, and government representatives.

Other sources of definitions and standards include state recycled product purchasing laws and programs and the standards used in the Canadian EcoLogo program. Also consult with product vendors and manufacturers and environmental groups for recycled content information and suggestions.

You should be aware that there is a great deal of disagreement over definitions and standards. Neither the EPA guidelines nor the recommendations in the RAC report have gained universal endorsement. The Alliance is not endorsing one definition or recommendation over another. Instead, the Alliance encourages informed decision-making. Consult the resources section of this manual for specific referrals and for additional information on obtaining the EPA guidelines and the RAC report.

Several efforts are under way to standardize the terms and recovered materials content levels, including:

On July 28, 1992, the Federal Trade Commission (FTC) announced guidelines for environmental marketing claims. The guidelines are recommendations, not enforceable regulations. They are intended to reduce consumer confusion and to prevent false or misleading use of common environmental terms. They consist of four general principles, specific guidance applicable to certain environmental marketing claims, and examples of both. The guidelines on recycled content claims are summarized in the adjacent box. Appendix A contains the four general principles and the specific guidance applicable to general claims of environmental benefit and to "recycled content" and "recyclability" claims.

#### FTC GUIDANCE ON "RECYCLED CONTENT" CLAIMS

The FTC guides permit claims of preconsumer and postconsumer recycled content. In order to claim preconsumer content, the manufacturer or vendor must be able to substantiate that the materials would otherwise have entered the solid waste stream. Therefore, if a product only contains material that is normally reused by industry within the original manufacturing process (e.g., mill broke), the manufacturer or vendor cannot claim that it is a recycled product.

- ▲ Several committees of the American Society for Testing and Materials (ASTM) are developing standards for use of recycled materials in paper and plastic products, re-refined oil, fiberglass insulation, cement and concrete, and other products.

You should also check with your state solid waste office regarding recycled product procurement regulations and environmental labeling claims used on products sold within your state. Several states, including California, New York, and Rhode Island, have labeling standards. We will update this manual as more information becomes available.



## WHAT ARE THE STEPS TO TAKE?

### 1. Commitment

First, obtain a commitment to purchase recycled products from management. Experience shows that buy recycled programs run smoother and are easier to implement when everyone understands that the company is buying recycled products as a matter of policy. Senior management support also is necessary because there can be barriers, such as cost and availability, that will require the time and effort of the company's purchasers and users to overcome.

Corporate commitment statements can be general or specific. Two examples are provided below. The first statement, from Du Pont, is more general, while the second statement, excerpted from the McDonald's Corporation's environmental policy, is more specific.

#### Du Pont:

"Resolved, that in furtherance of Du Pont's commitment to its waste management policy, it is the policy of Du Pont to preferentially purchase items made of recycled materials where such products meet our continuously improving quality requirements and are available at reasonable prices and terms."

#### McDonald's:

Recycle -- We are committed to the maximum use of recycled materials in the construction, equipping and operations of our restaurants. We are already the largest user of recycled paper in our industry, applying it to such items as tray liners, happy meal boxes, carry out bags, carry out trays and napkins. Through our "McRecycle" program, we maintain the industry's largest repository of information on recycling suppliers, and will spend a minimum of \$100 million a year on the use of recycled materials of all kinds. We are also committed to recycling and/or composting as much of our solid waste as possible, including such materials as corrugated paper, polyethylene film and paper. We will change the composition of our packaging, where feasible, to enhance recyclability or compostability.

## 2. Cross-Functional Team(s)

Next, choose a team to develop the buy recycled program. Involve individuals from throughout the company, not just purchasing staff. Involving purchasing staff, management and representatives of all units or departments adds the benefit of their different perspectives.

Cross-functional teams are an opportunity for purchasers and users to become educated about the needs and constraints each faces. These can range from procurement policies to performance requirements. In addition, by involving all units, the likelihood of success increases.

Du Pont used a cross-functional team including members of all relevant business units. The team was led by Purchasing. It evaluated all product purchases, selected areas of opportunity for recycled product purchases, and determined where products were purchased (i.e., centrally, regionally, or locally). The task team also revised the Corporate Procurement Guide to incorporate purchasing guidelines for implementing the buy-recycled policy.

## 3. Become Educated About Recycled Products

There are a number of issues to learn about, including:

- ▲ The scope of recycled products being offered. Recycled paper is not the only recycled product available. In fact, you can probably find recycled products to use in every corporate department!
- ▲ Product quality and performance. Product quality has improved over the past several years, and recycled products often are made to the same or similar standards as their virgin material counterparts. Users may be concerned about performance, however, fearing that recycled products are inferior to products made with virgin materials. Ask product manufacturers and vendors for performance information. Also ask your state and local recycling coordinators about their experience with use of recycled products. Many of them can refer you to government agency purchasers and users for additional information. Refer to the resources section of this manual for other information sources.
- ▲ Product availability. Recycled products often are manufactured by smaller companies, and they might not be readily available in all parts of the United States. Ask about availability in the quantities that you need. Also ask about the lead times needed by manufacturers. This will both help you to purchase recycled products successfully and help the manufacturer to meet your quantity and availability requirements.

- The types and percentages of recovered materials used. ("Type" refers to the kind of recycled content in the product, such as pre- or postconsumer, while "percentages" are the proportional content of each type of recycled material in the product.) Based on this information, you can make an informed decision about how to specify what you mean by "recycled product."

Manufacturers have always made use of materials generated in their plants or by intermediate manufacturers, such as envelope converters. Some manufacturers have also been using other recovered materials, depending on the product manufactured, and they are beginning to increase the use of postconsumer materials in all products. In addition, manufacturers that traditionally use virgin materials are beginning to use recovered materials.

Much of the increased usage of recovered materials is due to demand for recycled products by government and corporate purchasers. As manufacturers find that you want recovered materials in products and packaging, they will use them and tell you what amount they are using.

Don't be upset if the product doesn't contain 100% recovered materials, however. Because of product performance requirements and/or feedstock availability, not all products can contain large amounts of recovered materials. After all, it is preferable that manufacturers use some recovered materials than none at all.

#### 4. Evaluate Current Purchases for Opportunities

Next, review your current purchasing programs. What recycled products are you already purchasing? Consider expanding to other recycled products, and explore whether you can buy products with greater levels of recycled content. Also determine which products are purchased nationally, regionally, and locally.

As shown by the lists on the next pages, recycled products can be used in offices, building interiors and exteriors, manufacturing facilities, loading docks, vehicles, and pavements. By working with the other members of the cross-functional team, you can identify multiple product categories in which to focus new or expanded purchasing efforts.

Some purchasers have found it more efficient to purchase a few recycled products first and then incrementally expand the program. If possible, try to support the markets in which you have purchasing power or to which you most contribute through your collection programs. Remember that the program may fail unless users become familiar with the products, so begin your program by starting with a few products. Then you can periodically add additional products in the target area and expand into additional areas.

## Examples of Currently Available Recycled Products

Following are examples of the range of recycled products available today. There are currently over 3500 different products available with recycled content.

### Paper Products

- Adding machine and cash register tape
- Animal bedding
- Bond/letterhead
- Chip board
- Coated and uncoated printing papers
- Computer paper
- Construction paper
- Copier paper
- Corrugated and paperboard boxes
- Food service bowls and carry-out trays (molded pulp)
- Greeting cards
- Mailing tubes
- Map paper
- Newsprint
- Office supplies
  - Calendars
  - Envelopes and padded mailers
  - Fax paper
  - File folders (manila, hanging, and expanding)
  - Labels
  - Post-It™ Notes
  - Writing tablets
- Poster board
- Storage boxes
- Text and cover stock
- Tissue and towel products
- Wrapping paper

### Transportation Uses

- Anti-freeze
- Re-refined engine lubricating oils
- Retread tires (airplanes, automobiles, buses, off-road vehicles, and trucks)
- Pallets
- Road signs and posts
- Truck bed mats

## Examples of Currently Available Recycled Products (Cont'd)

### Plastic Products

- Bags
- Bicycle racks
- Boxes, bins, and containers
- Carpet
- Curb edging
- Fiber fill
- Food service trays
- Lighting covers
- Lumber
- Manhole steps
- Mats
- Office supplies
  - Desk sets
  - Highlighters and markers
  - Pens and pencils
  - Recharged toner cartridges
- Picnic tables and benches
- Safety barriers

### Construction Materials

- Asphalt concrete (containing crumb rubber or glass cullet)
- Acoustic ceiling tiles
- Carpet
- Compost and mulch
- Culverts
- Geotextiles
- Plastic products
  - Drain pipe
  - Fence posts and fencing
  - Floor tiles
  - Landscaping timbers
- Portland cement concrete (containing coal ash)
- Portable rubber road mats
- Recycled asphalt or concrete
- Railroad ties
- Roofing insulation and shingles
- Shower and toilet partitions
- Thermal insulation
- Wall board

## Examples of Currently Available Recycled Products (Cont'd)

### Rubber Products

- Bulletin boards
- Dock bumpers
- Carpet under-cushion
- Fenders
- Gaskets
- Floor tiles and mats
- Industrial hoses
- Playground equipment and surfacing
- Portable bases and walkways
- Speed bumps
- Trailer bumpers
- Wheel chocks

### Aluminum

- Aluminum beverage cans
- Other aluminum cans

### Steel

- Columns
- Flat roll products
- I-beams
- Nails
- Re-bar supports
- Steel cans
- Structural plate

### Glass

- Abrasives - loose grain
- Jewelry
- Liquid filter media
- Recycled content containers
- Underdrain units for drainage

Sources: *The Official Recycled Products Guide*, Recycled Products Information Clearinghouse, *The Recycled Rubber Products Catalogue*, Steel Can Recycling Institute.

## 5 Specifications Revisions

Next, review your purchasing specifications. You don't need special specifications to purchase recycled products, but you might need to amend your existing specifications. Look for the following:

- ▲ **Materials clauses.** Does the specification require that only virgin materials be used or prohibit use of recycled or recovered materials? Specifications should be materials neutral unless there is a legitimate performance reason for specifying virgin materials.
- ▲ **Over-specification.** Remember, you do not have to compromise on performance in order to buy recycled products. Your specifications might be asking for more than necessary, however. A common problem is basing specifications on aesthetics, rather than on performance and function requirements. Examples include high brightness requirements for paper products and clear or light color requirements for plastic products. High brightness might not make the paper any easier to use, and clear or light color might not make the plastic bags any more efficient, but could make it difficult or impossible for a manufacturer to use higher percentages of recycled materials. Learn about these problems by discussing the specifications with product vendors or manufacturers.
- ▲ **Definitions and minimum content standards.** Define what you mean by "recycled" both in terms of what types of recovered materials can be counted and the percentage. Use minimum content standards whenever feasible. Be sure to use the definitions and standards in specifications, solicitation documents, and certification forms.
- ▲ **Substitutions.** Leave specifications open to substitutions that satisfy the end need, rather than specifying the materials that must be used. By allowing substitutions, you give manufacturers and vendors leeway to provide you with products containing higher levels of recovered materials.

## 6. Policies and Procedures Revisions

In addition to specifications, buy recycled concepts must be incorporated into purchasing policies, procedures, and documents. This serves two purposes. It assures that purchasing policies and procedures do not contain barriers to purchase of recycled products. And, to the extent that policies and procedures are written, revising them assures that buying recycled is institutionalized.

Barriers in purchasing policies and procedures can be unintentional. For example, when purchasing a range of products such as office supplies, do you require vendors to offer all products? In order to help increase bids for recycled products, allow

vendors to bid only on some items or to offer recycled products for some and virgin products for others.

Also assess time frames for responding to solicitations and for beginning delivery of products. Product manufacturers and vendors will inform you about required lead times to begin delivery or respond to orders against long-term contracts. As recycled product availability increases in response to demand, this issue will fade.

If you use bid solicitations, state your buy recycled policy on the first page. This is a good way to inform your vendors that you buy recycled products.

Purchasing managers often require certification of the recovered materials used. Certifications help to ensure that the product meets your recycled content specification. You can use a certification form provided by the product manufacturer or your own form. Alternatively, require that products carry a private certification (such as the Green Cross or Green Seal) or a government certification (such as the Canadian EcoLogo or those used by your state government). Appendix B contains an example of a certification form.

## **7. Setting Goals and Program Assessment**

After determining what recycled products you already purchase, set goals for increasing those purchases and adding products. A successful buy recycled program should also include periodic evaluations of the goals and the overall program. Quantifiable goals help stimulate and shape program development, while measurement allows tracking of progress. Goal-setting should be a high priority in response to mounting public and legislative pressure to set target threshold levels for product and packaging manufacturers and users. Unless manufacturers and users come forward with voluntary commitments, these mandates are likely to be imposed by government.

There is no single way to set recycled product purchasing goals. Instead, each firm should determine the approach that is most appropriate for its particular business, organization, and culture. As more and more businesses participate in buy recycled programs, new ways of measuring and targeting goals will evolve. Keep in mind the following points:

- ▲ Goals should be time based. They should be precise and specific. For example, "50% increase in recycled paper purchases" is much less specific than "By July 1, 1995, increase recycled paper purchases 50% over 1991 levels."
- ▲ Goals should motivate. Establish them in such a way that they encourage progress toward the ultimate buy recycled objectives. State them in such a way that the people most responsible will be accountable for the results. Because goals that are set too high or too low will be ineffective, research all issues before setting preliminary goals. Then adjust them periodically.



Three goal-setting options to consider are purchasing goals, incremental vs. absolute goals, and total corporate objectives. These are discussed in the box on page 15.

Once goals are set, it is important to establish a recordkeeping and data gathering system to be used in assessing progress toward achieving the goals. To the extent possible, recordkeeping related to recycled product purchases should be integrated into existing purchasing recordkeeping systems. In many systems, simply adding data fields to enter the percentage(s) of recycled content in the item purchased will allow all necessary reports to be generated.

It is common to record dollars spent on recycled product purchases. This is how the Alliance's "Buy Recycled" Campaign is structured. While this is useful information, it will not help you to assess progress in achieving non-dollar-oriented goals, such as increasing the recycled content in products purchased. Also keep in mind that, while recordkeeping helps you to assess your program, data can also be used to influence decision-making by product manufacturers. It is more helpful to a paper mill deciding whether to invest in deinking capacity to know the tonnage that you purchase than to know the dollars spent.

Another element of recordkeeping is determining whether to report data on a product by product basis or across an entire class of products. The procedures established for recording recycled product data will vary from company to company. The essential component is the percent of recovered material that is used. The ultimate decision depends on how purchasing information currently is maintained. Do whatever works best for your company, as long as you can track recycled product purchases against your stated goals.

## Goal Setting Options

### Purchasing Goals

Many companies begin their recycled product purchasing programs by focusing on two or three areas. They look at all products in these areas with an eye to increasing overall purchases of recycled products or increasing the recycled content of products purchased.

One caution about individual goals: Be sure that working toward goals in one or two areas does not inadvertently lead to a net increase in overall waste by forcing growth in other categories. For instance, if a firm switches materials to achieve light-weighting, but moves away from a commonly recycled material in the process, it must insure that the gains from light-weighting significantly offset the loss from recycling.

### Incremental vs. Absolute

Some goals can be stated as incremental, such as increasing purchases by 25% over current levels. Other goals can be stated as absolutes, such as increasing recycled content in individual products to 25% by a specified date.

### Total Company Goals

Another dimension is how to report goals organizationally. For a single or very dominant product, the most meaningful goal might be a single, company-wide goal.

For a large multi-divisional or decentralized company, the cost of data gathering necessary to track a company-wide goal might be a major obstacle. Therefore, consider facility, business unit, or even sub-unit goals.

## 8. Handling Product: Price

Recycled products can cost more than comparable products made with virgin materials. Why? At the present time, recycled products cannot achieve the same economies of scale. Recycled material feedstocks may be more expensive to use than virgin materials. And, when the domestic or world economy is in a recession, the prices of virgin products may be further reduced in response to slack demand, increasing the price gap.

You should not conclude, however, that *all* recycled products are more expensive. In fact, most recycled products are less expensive or comparably priced. What this means is that by purchasing a range of products, you can be certain that costs may even out over time. For example, McDonald's has found that in the past two years, while some recycled products cost more, overall expenditures have not increased.

It is important to work with your vendors to obtain recycled products in the price range you want. Don't stop asking even if you cannot buy recycled products the first time because of price. Challenge your vendors to find quality recycled products at lower prices.

To make its buy recycled program work, Bank of America had to rethink how it purchases products. Bank of America buyers have established relationships with suppliers. The buyers had to refocus these relationships to meet the company's new needs. The buyers started with their longstanding relationships but made it clear that they were willing to shop around. This made the suppliers understand how serious Bank of America was and motivated them to work harder to provide the products and prices the company wanted. The more Bank of America buyers asked for quality recycled products containing postconsumer material, the more attractive the prices became.

Keep in mind that if your commitment to buying recycled products truly is a long range commitment, expenditures are not likely to increase. In fact, as more recycled products are purchased, the prices are likely to come down as increased demand leads to increased production of those products. That is why raising the demand for recycled products is so vital.

Government agencies and some corporate purchasers are using price preferences, set asides, and cooperative purchasing to overcome price differentials. You may want to consider using these techniques to "prime the pump." Remember, however, that their purpose is to encourage development of recycled products. They are not intended to provide a subsidy to recycled products manufacturers and vendors. Therefore, consider using them for a two year period, and reconsider the need for them during periodic assessments of your program. You should find that, in time, they are no longer needed.

## 9 Product Testing

A wide range of high-quality recycled products is available today. Still, users sometimes assume that a recycled product will provide inferior performance and are looking for problems. For example, after one paper jam, they may tell you that the paper is "no good." Therefore, it is important to make sure that they don't require a recycled product to perform better than a virgin product.

When in doubt about product performance, test samples of recycled products. For example, test one or more cartons of recycled paper in office and printing equipment. If users object to recycled products, consider a blind test. For example, test virgin and re-refined lubricating oils in company vehicles but do not tell the vehicle operators which type of oil is in their vehicle. Otherwise, it is impossible to determine if reports of engine "problems" are real or imaginary. Be certain to inform the users about the test results as part of informing them about recycled products.

## 10. Working With Vendors

As both an information source and suppliers of recycled products, vendors are a key component of a successful buy recycled program. They also are a key component of a related waste management technique, source reduction, which is discussed in the next chapter of this manual.

It is important to emphasize to your vendors that your company has committed to buying recycled products, they must support your commitment, and you are willing to seek out new vendors if they don't. Once vendors understand that you are serious, they should be willing to work with you to obtain recycled products in the price range you want.

In addition to product suppliers, ask service contractors, such as printers, janitorial services, and maintenance contractors to use recycled products. (An example of a letter asking service contractors to use recycled products is in Appendix C.)

## 11. Promotion

Once your buy recycled program is established, don't hide it! Promote your program both externally to existing and potential suppliers, customers, and other businesses, and internally to corporate users. And don't stop with an initial promotion campaign. Promotion is part of the education process. It also is part of generating goodwill about the buy recycled program among employees, vendors, and customers.

There are several promotional steps you can take. The first step is to work with existing vendors, as discussed in the previous section. Remember to continue to promote your buy recycled program to them to encourage them to obtain recycled products for you. If they do not offer a particular recycled product now, keep asking for it. Experience has shown that they will soon be able to supply the products that you want.

If your company purchases regionally or locally, consider asking suppliers to highlight recycled products in their catalogues. For example, an Alliance member company approached its suppliers to promote the availability of recycled products. In response, the suppliers have issued new product catalogues identifying recycled products or containing a recycled products index.

Another easy promotional step is to print publications, literature, forms, and even business cards, on recycled paper – and include the words "Printed on recycled paper" on them. Information about your buy recycled program also should be included in corporate newsletters, advertising, and annual reports to stockholders.

## 12. Monitoring

A successful buy recycled program should include monitoring of both program implementation and recycled product markets.

Programs that cannot document success are difficult to justify in future budgets. Therefore, it is important to establish procedures to monitor the quantities of products being purchased and the overall program costs, as well as to monitor user acceptance.

To monitor program implementation, you should first determine quantities and costs for target products in a baseline year. Then, compare costs for several years, keeping in mind that costs of recycled products fluctuate over time, just as costs of virgin products do. Include the costs of purchasing administration, too. While you can expect administration costs to rise initially during the planning phase, they should drop again as personnel become accustomed to the program.

It also is important to identify and assess user acceptance. As previously noted under Product Testing, "problems" with recycled products may be more "perceived" than real. Therefore, as part of program monitoring, document successes as well as problems. Be sure to publicize the successes and the steps to be taken to resolve problems.

The range of recycled products is expanding, as is the use of increasing amounts of recycled materials, including postconsumer materials, in products. Keep abreast of changes in products, and use this information to revise your product specifications or to expand the buy recycled program.

## APPENDIX A

### FTC GUIDES FOR ENVIRONMENTAL MARKETING CLAIMS

In July of 1992, the FTC issued guidelines on environmental marketing claims. The guidelines are recommendations, not enforceable regulations. They consist of four general principles, specific guidance applicable to certain environmental marketing claims, and examples of both. This appendix provides the four general principles and the specific guidance applicable to claims of recycled content and recyclability. To obtain a copy of the guide, contact the FTC at 202/326-3753.

#### GENERAL PRINCIPLES

- (1) Qualifications and disclosures should be sufficiently clear and prominent to prevent deception.
- (2) Environmental claims should be presented in a way that makes clear whether the environmental attribute or benefit being asserted refers to the product, the product's packaging, or to a portion or component of the product or packaging. In general, if the environmental attribute or benefit applies to all but minor, incidental components of a product or package, the claim need not be qualified to identify that fact. There may be exceptions to this general principle. For example, if an unqualified "recyclable" claim is made and the presence of the incidental component significantly limits the ability to recycle the product, then the claim would be deceptive.
- (3) An environmental marketing claim should not be presented in a manner that overstates the environmental attribute or benefit, expressly or by implication. Marketers should avoid implications of significant environmental benefits if the benefit is in fact negligible.
- (4) Environmental marketing claims that include a comparative statement should be presented in a manner that makes the basis for the comparison sufficiently clear to avoid consumer deception. In addition, the advertiser should be able to substantiate the comparison.

#### SELECTED SPECIFIC GUIDELINES

- (1) *General Environmental Benefit Claims:* It is deceptive to misrepresent, directly or by implication, that a product or package offers a general environmental benefit. Unqualified general claims of environmental benefit are difficult to interpret, and depending on their context, may convey a wide range of meanings to consumers. In many cases, such claims may convey that the product or package has specific and far-reaching environmental benefits. . . Unless broad claims can be substantiated, they should either be avoided or qualified, as necessary, to prevent deception about the specific nature of the environmental benefit being asserted.

- (2) *Recyclable*: It is deceptive to misrepresent, directly or by implication, that a product or package is recyclable. A product or package should not be marketed as recyclable unless it can be collected, separated or otherwise recovered from the solid waste stream for use in the form of raw materials in the manufacture or assembly of a new package or product. Unqualified claims of recyclability for a product or package may be made if the entire product or package, excluding minor incidental components, is recyclable. For products or packages that are made of both recyclable and non-recyclable components, the recyclable claim should be adequately qualified to avoid consumer deception about which portions or components of the product or package are recyclable.

Claims of recyclability should be qualified to the extent necessary to avoid consumer deception about any limited availability of recycling programs and collection sites. If an incidental component significantly limits the ability to recycle the product, the claim would be deceptive. A product or package that is made from recyclable material, but, because of its shape, size or some other attribute, is not accepted in recycling programs for such material, should not be marketed as recyclable.

- (3) *Recycled Content*: A recycled content claim may be made only for materials that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). To the extent the source of recycled content includes pre-consumer material, the manufacturer or advertiser must have substantiation for concluding that the pre-consumer material would otherwise have entered the solid waste stream. In asserting a recycled content claim, distinctions may be made between pre-consumer and post-consumer materials. Where such distinctions are asserted, any express or implied claim about the specific pre-consumer or post-consumer content of a product or package must be substantiated.

It is deceptive to misrepresent, directly or by implication, that a product or package is made of recycled material. Unqualified claims of recycled content may be made only if the entire product or package, excluding minor, incidental components, is made from recycled material. For products or packages that are only partially made of recycled material, a recycled claim should be adequately qualified to avoid consumer deception about the amount, by weight, of recycled content in the finished product or package.

APPENDIX B  
SAMPLE CERTIFICATION FORM

**Certification:** The offeror shall certify that all products supplied under any contract resulting from this solicitation will meet or exceed the minimum percentage of recovered materials indicated below.

(Offeror should only make entries that apply to this offer.)

Minimum % Offeror's %

[Specify type  
of recycled materials  
per product.] \_\_\_\_\_

We reserve the right to require proof of the certified content prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

The offeror hereby certifies that all papers proposed to be supplied under this contract will contain the percentage(s) specified in the "Offeror's %" column above.

Offeror Company Name	_____
Certifying Official's Name	_____
Certifying Official's Signature	_____
Title	_____
Date	_____



SEARS

APPENDIX C  
SAMPLE NOTICE TO VENDORS

Home Office  
Sears Tower  
Chicago Illinois 60684  
312 875 4505

Laurence E. Cudmore  
President  
Merchandise Group

August 5, 1991

Dear Valued Supplier:

Sears and our vendors enjoy a proud tradition of anticipating and responding to the challenge of evolving customer demands.

Today, that challenge is even more complex due to the emergence of a new force -- environmental issues. Sears shares the national concern for improvement of our environment and preservation of our natural resources. We are committed to satisfying customer demand for environmentally sensitive product and packaging. This commitment will impact virtually everything we sell and service.

Recent surveys indicate that customers increasingly make buying decisions based upon environmentally oriented packaging and product. Product packaging is the largest component of our country's acute solid waste disposal problem.

Together, we can market practical, innovative solid waste solutions as an effective alternative to government mandates.

Specifically, we ask you to be a partner with our Sears Buyer and the National Merchandise Manager to:

- . Lock for opportunities to reduce packaging volume and weight by reducing packaging materials used on the products you manufacture by at least 10% by the end of 1992.
- . Use increasing amounts of recycled materials in the packaging you use with specific minimum goals of 25% recycled content in corrugated containers by the end of 1992 and 20% recycled content in plastic containers by the end of 1995.
- . Utilize the highest recycled content materials possible in other types of packaging, such as folding cartons and blister cards.

Do not limit your efforts to these goals -- be innovative! These goals should apply to all product packaging as well as any repair and replacement parts packaging you supply Sears.

We have asked one of our Senior Executives, Mr. Keith Tice, National Director of Packaging and Labeling, to head up this important issue. Please confirm your commitment by completing the enclosed questionnaire and returning it to him in the envelope provided within thirty days.

To formally recognize your accomplishments, two new Sears Source of the Year Awards will be presented to the hard and soft lines sources best exemplifying our solid waste reduction commitment.

Thank you for your support.

Very truly yours,



enc.

A Sears Roebuck Company

Adapted from Sears questionnaire:

\_\_\_\_\_ Yes, we will meet or exceed Sears packaging volume, weight, and recycled content goals.

Please indicate your current recycled content.

What percent recycled content will you achieve in your packaging and by what date?

Corrugated	_____ %	_____ %	Date _____
Plastics	_____ %	_____ %	Date _____
Folding Cartons	_____ %	_____ %	Date _____
Hang Cards	_____ %	_____ %	Date _____
Expanded Polystyrene Filler	_____ %	_____ %	Date _____

Any other program you may have implemented:

Company \_\_\_\_\_  
Signed \_\_\_\_\_  
Title \_\_\_\_\_

Date \_\_\_\_\_

Please return to:

## SOURCE REDUCTION APPENDIX

Source reduction is any activity that reduces, avoids or eliminates the generation of waste at its source. It focuses on preventing the generation of wastes as opposed to controlling, treating or managing waste after it has already been made.

The Buy Recycled Campaign's objective is to improve procurement practices as they impact solid waste issues. While the primary focus of the campaign is on recycled products, there is another important aspect of procurement that has a powerful impact on the solid waste crisis.

This appendix suggests many potential opportunities to consider reducing waste entering landfills by simply not producing the waste in the first place. These suggestions all need to be evaluated on a case-by-case basis. They are not all applicable all of the time, due to various circumstances and the need to consider other relevant concerns. A reduction in waste resulting in an increased environmental or health risk, for example, might not be considered a good trade off. This list is also not intended to be all inclusive.

Let's start with the word "waste." By definition, something which is wasted is a loss to you. Some waste may be unavoidable, a necessary by-product of operating your business. But when you avoid waste, you can save money twice: by not paying for materials that are thrown away, and by avoiding disposal costs. In fact, we may be throwing away useful materials.

What does your business throw away and why? Asking yourself this question leads you to source reduction. Reexamining your operations to find ways, both big and small, to reduce your waste will cut your purchasing and disposal costs, save our natural resources, and identify you as a company that cares about your community and the environment.

The following suggestions are intended as a starting point from which to develop your own creative ideas. No matter what the nature of your business or the size of your company, you may find ways to reduce waste from any of the following areas: customer service, distribution/manufacturing, food service, maintenance/housekeeping, office operations and manufacturing.

As you find other ways to "reduce at the source," let us know. We will be updating this appendix and will include your ideas.

## CUSTOMER SERVICE

- Ask your customers if they need a bag rather than automatically giving them one.
- Use incoming bags and boxes as containers for your customers to use.
- Encourage customers to bring their own reusable shopping bag.
- Stock recycled content products.

## DISTRIBUTION

- Use shredded paper for packing materials.
- Lower product shipping costs and waste by reducing weight of product packaging.
- Establish a system for reusing or returning packaging to the supplier.
- Use recycled content packaging materials.
- Use minimal packaging whenever possible, including secondary and tertiary packaging, dividers and shipping containers.
- Donate, sell or exchange surplus property. Contact waste exchanges (see reference section).
- Return or repair pallets. Eliminate pallets through use of reusable and/or recyclable slip sheets. Use pallets made of recycled/recyclable material.
- Set up recycling collection programs.
- Use protective shipping only where necessary (such as corners for mirrors).

## **FOOD SERVICE/CAFETERIAS**

- Buy products in bulk whenever possible or in reusable/refillable containers.
- Donate excess food to a food bank or shelter.
- Offer smaller portions to prevent waste.
- Arrange to use leftover food as animal feed, or compost organic matter.
- Optimum procurement and storage methods will prevent waste and spoilage.
- Use concentrated food items when appropriate.
- Consider providing reusable tableware (mugs, glasses, silverware, plates) for employees, subject to your cafeteria requirements.
- Would using cloth towels, table covers, napkins and hand towels be acceptable in your operation?
- Consider the possibility of buying and using reusable coffee filters.
- Remove inner dividers for packaging (cups, saucers, etc.). Work with suppliers to reduce packaging.



## **MAINTENANCE/HOUSEKEEPING**

- Purchase maintenance and janitorial supplies in large reusable containers.
- Consider the possibility of reducing the volume/weight of sanitary paper products. Consider whether or not roll towels vs. folded towels, roll tissue, large napkins vs. smaller napkins, etc. would provide any reduced waste in your facility.
- Consider unbleached and recycled content products.
- Install reusable air filters in your building's HVAC system.
- Ensure that preventative maintenance is done on equipment.
- When designing an office, purchase recycled content products and furnishings with less hazardous contents.
- Compost yard waste or leave grass clippings on lawns. Use environmentally compatible landscaping which is low maintenance and drought resistant.
- Switch to longer lasting energy efficient light bulbs and fixtures.

## OFFICE OPERATIONS

### PAPER

- Make double sided copies and change copier defaults on computers to double sided.
- Use reusable envelopes for inter-office mail.
- Edit incoming and outgoing mailing lists to avoid duplication.
- Omit fax cover sheets or use post-it fax notes.
- Post announcements in central locations and circulate documents rather than making multiple copies. Circulate publications rather than ordering multiple issues.
- Set up central filing systems.
- Determine if all copies are necessary on multi-copy forms.
- Use generic stationary, or personalize stationary with word processor.
- Reuse draft paper into scratch pads, or donate the paper to a child care center for use as drawing paper.
- Store documents on computer disks, not on paper.
- Edit documents on the computer before printing.
- Use smaller typeface, smaller margins, single spacing and rigorous editing to keep document small.

### SUPPLIES

- Use mechanical pencils, refillable pens and tape dispensers.
- Reuse paper clips, rubberbands and clamps. Reuse file folders, manila envelopes, binders and folders.
- Use "slide-in" binder cover sheets instead of specially printed covers so binders can be easily reused.
- Use undated, erasable marker boards or chalk boards.

### EQUIPMENT

- Purchase printers and photocopiers that print on both sides of a page.
- Purchase computer fax boards that allow you to fax documents without printing.
- Purchase plain paper fax machines.
- Use voice and electronic mail rather than hard copy mail.

## OTHER

- Ask to be removed from unwanted mailing lists.
- Save and reuse packing items received, such as boxes, polystyrene "peanuts" and bubble wrap.
- Would the use of non-disposable mugs and coffee cups for beverages provide an acceptable alternative in your facility as well as a reduction in waste?
- Use remanufactured products such as toner cartridges, video tapes and re-linked typewriter ribbons.
- Use plastic window pins for name tags and allow the sleeve to be reused while recycling the inserted paper. Encourage meeting attendees to return their badges by placing designated boxes at meeting room exits.

## MANUFACTURING

- Implement preventative and predictable maintenance programs to improve efficiency and to eliminate downtime
- Produce purchase goods in fewer models or styles, reducing the overall lines, options, and associated packaging and wastes generated for each.
- Purchase longer-lived and energy efficient manufacturing equipment.
- Maximize necessary packaging designs for efficiency and lightweight.
- Reduce the number of parts. Design of components for recyclability and reduce options. Ford reduced over 200 different types of ABS plastics used in car interiors to two.
- Use bulk line lubes, chain lubes, sanitizers, etc. in process whenever possible.
- Reduce or eliminate toxic components of product, process, and packaging whenever possible.
- Combine functions of products (like shampoo and conditioners).
- Borrow / lease capital equipment not frequently used.
- Work to improve supplier quality of raw materials and components to reduce waste
- Produce and purchase in bulk containers.
- Use and package in concentrate.

## RECYCLED PRODUCTS INFORMATION SOURCES

The following list identifies sources of information about recycled products and recycled products purchasing. It is not a comprehensive list, and it does not include sources of information about collecting recycled materials. For additional information, contact the National Recycling Coalition or your state recycling organization.

### GENERAL

#### **"Buy Recycled" Campaign**

U.S. Conference of Mayors  
1620 I Street NW  
Washington, DC 20006  
202/293-7330

Provides sample ordinances, case studies, and procurement and bidding specs at both state and local level.

**Buy Recycled Guide Book**  
Buy Recycled Business Alliance  
National Recycling Coalition  
1101 30th Street NW, Suite 305  
Washington, DC 20007  
202/625-6406

Implementation manual designed for business purchasers. Includes information on sources of recycled products.

**The Natural Connection**  
PO Box 8233  
N. Brattleboro, VT 05304  
802/365-7188

Directory of manufacturers of eco-friendly products.

**The Official Recycled Products Guide**  
American Recycling Markets, Inc.  
PO Box 577  
Ogdensburg, NY 13669  
800/267-0707

Subscription basis comprehensive directory of recycled products, manufactures and vendors. Over 4500 listings in multiple categories. Monthly newsletter. Several subscription options. Also available on an on-line database, RecycleLine.



**Recycled Products Guide**  
General Services Administration  
Centralized Mailing List Service  
P.O. Box 6477  
Ft. Worth, TX 76115  
817/334-5215

Catalog designed for the federal government community. Primarily office supplies plus some other categories. Federal stock numbers, price and recycled content are listed; vendors are not.

**Recycling and Source Reduction for the Lodging Industry**  
American Hotel and Motel Assoc.  
One Denver Place  
999 18th Street, Suite 1240  
Denver, CO 80202  
303/297-8104

**Resource Guide to Office Product Manufacturers**  
National Office Products Association  
Special Task Force on Recycling  
301 North Fairfax Street  
Alexandria, VA 22314-2696  
703/549-9040

Trade association publication cross-referenced by office product manufacturers and product categories. Some manufacturers provide information about post-consumer content.

## **ALUMINUM**

**Aluminum Association, Inc.**  
900 19th Street NW, Suite 300  
Washington, DC 20006  
202/862-5100

**Aluminum Recycling Assoc.**  
1000 16th Street NW, Suite 603  
Washington, DC 20036  
202/785-0550

**Can Manufacturers Inst.**  
1625 Massachusetts Avenue NW, Suite 500  
Washington, DC 20036  
202/232-4677

## AUTOMOBILE PARTS

Auto Parts Rebuilders Assoc.  
401 Fair Lakes Court, Suite 210  
Fairfax, VA 22033  
703/968-2772

Automotive Dismantlers and Recyclers Assoc.  
10400 Eaton Pl., Suite 203  
Fairfax, VA 22030  
703/385-1001

## BATTERIES

Battery Council International  
401 N. Michigan Avenue  
Chicago, IL 60611  
312/644-6610

Rayovac Corp.  
601 Rayovac Drive  
Madison, WI 53711-2491  
608/275-3348

## CONSTRUCTION MATERIALS

Cellulose Insulation Manufacturers Assoc.  
136 S. Keowee Street  
Dayton, OH 45402  
513/222-1024

Center for Resourceful Building Technology  
PO Box 3412  
Missoula, MT 59806  
406/549-7678

Guide to resource efficient building materials, including recycled products.

N. American Insulation Manufacturers Assoc.  
44 Canal Center Plaza, Suite 310  
Alexandria, VA 22314  
703/684-0084

## GLASS

Glass Packaging Inst.  
1627 K Street NW,, Suite 800  
Washington, DC 20006  
202/637-4850

## IRON STEEL

American Iron & Steel Inst.  
1133 15th Street NW, Suite 300  
Washington, DC 20005  
202/452-7100

Inst. of Scrap Recycling Industries (ISRI)  
1325 G Street NW, Suite 1000  
Washington, DC 20006  
202/456-4050

Steel Recycling Inst.  
Foster Plaza 10  
680 Andersen Drive  
Pittsburgh, PA 15220

## OIL

American Petroleum Inst.  
1220 L Street NW, Suite 900  
Washington, DC 20005  
202/682-8000

Assoc. of Petroleum Re-Refiners  
P.O. Box 427  
Buffalo, NY 14205  
716/855-2212

United Association of Used Oil Services  
335 Beard Street,  
Tallahassee, FL  
904/222-6000

National Petroleum Refiners Assoc.  
1899 L Street NW, Suite 1000  
Washington, DC 20036  
202/457-0480

## PAPER

Alkanna Paper Advocate  
320 E. Center Street  
Provo, UT 84606  
801/373-1598

American Newspaper Publishers Assoc.  
11600 Sunrise Valley Drive  
Reston, VA 22091  
703/648-1000

American Paper Inst.  
260 Madison Avenue  
New York, NY 10016  
212/540-0600 or:

1250 Connecticut Avenue, NW Suite 210  
Washington, DC 20036  
202/463-2420

Envelope Manufacturers Assoc.  
1600 Duke Street, Suite 440  
Alexandria, VA 22314-3400  
703/739-2200

Graphic Arts Technical Foundation  
4615 Forbes Avenue  
Pittsburgh, PA 15213-3796  
412/621-6941

Information on using recycled paper, inks and solvents and on the recovery of silver.

National Office Paper Recycling Project  
U.S. Conference of Mayors  
1620 I Street NW, 4th Floor  
Washington, DC 20005  
202/293-7330

Handbook on office paper collection and buying recycled office paper products.

Recycling Advisory Council (RAC)  
National Recycling Coalition  
1101 30th Street NW, Suite 305  
Washington, DC 20007  
202/625-6410

*Final Report on Recycled Paper Definitions, Procurement Standards, Measurement Protocol, Labeling Guidelines and Buy Recycled Initiatives* recommends standards and definitions for government purchasing of recycled paper products.

Yellow Pages Publishers Assoc.  
340 E. Big Beaver Road, 5th Floor  
Troy, MI 48063  
313/680-9238

List of products made from old phone books.

### PLASTICS PACKAGING

Aseptic Packaging Council  
1000 Potomac Street NW, Suite 401  
Washington, DC 20007  
202/340-0600

Council on Plastics in the Environment  
1001 Connecticut Avenue NW, Suite 401  
Washington, DC 20036  
202/331-0099

Plastic Bottle Information Bureau  
1275 K Street NW, Suite 400  
Washington, DC 20005  
202/371-5244

Polystyrene Packaging Council  
1025 Connecticut Avenue NW, 515  
Washington, DC 20036  
202/822-6424

Recycled Plastic Products Sourcebook  
American Plastics Council  
1275 K Street NW, Suite 400  
Washington, DC 20005  
800/243-5790

Helps private and public sector buyers identify products made with recycled plastic.  
Lists products along with manufacturer name and post-consumer and/or recovered material content.

Society of the Plastics Industries  
1275 K Street NW, Suite 400  
Washington, DC 20005  
202/371-5200

The Vinyl Environmental Resource Center  
One Cascade Plaza, 19th Floor  
Akron, OH 44308  
800/969-8469

### **TIRES/RUBBER**

American Re-treaders Association  
502/968-8990

Asphalt Rubber Producers Group  
3336 N. 32nd Street, Suite 106  
Phoenix, AZ 85018  
602/955-1141

National Tire Dealers and Re-Treaders Assoc.  
1250 I Street NW, Suite 400  
Washington, DC 20005  
202/789-2300

Rubber Manufacturers Assoc.  
1400 K Street NW, Suite 900  
Washington, DC 20036  
202/682-4800

Scrap Tire Management Council  
1400 K Street NW, Suite 900  
Washington, DC 20036  
202/408-7781

Tire Retread Information Bureau  
900 Welton Grove  
Pacific Grove, CA 93950  
408/372-1917

### OTHER

Appliance Recycling Centers of America  
2601 NE Broadway  
Minneapolis, MN 55104  
612/331-1000

Concern, Inc.  
1794 Columbia Rd. NW,  
Washington, DC 20009  
202/328-8160

Council for Textile Recycling  
7910 Woodmont Avenue, Suite 1212  
Bethesda, MD 20814  
301/656-1077

International Cartridge Recycling Assoc.  
1101 Connecticut Avenue NW, Suite 700  
Washington, DC 20005  
202/857-1154

National Assoc. of Chemical Recyclers  
1333 New Hampshire Avenue NW, Suite 1100  
Washington, DC 20036  
202/463-6956

## RECYCLED PRODUCTS INFORMATION: STATE SOURCES

### Arizona

Small Business Reduce Reuse & Recycle Project  
34 West Monroe, Suite 900  
Phoenix, Arizona 85003  
602/495-6469

### California

Buy Recycled! The Business and Government Buyer's Guide to Recycled Products  
Californians Against Waste Foundation  
926 J Street, Suite 606  
Sacramento, CA 95814  
916/443-8317

Buy Recycled Program Guide  
California Integrated Waste Mgmt. Board.  
8500 Cal Center Drive  
Sacramento, CA 95826  
916/255-2662  
800/553-2962 Hotline

California Buy Recycled Guide  
San Jose University  
Environmental Studies Program  
San Jose, CA 95192-0204  
408/924-5453

L.A. Network Resource List  
L.A. Network Guide to Buying Recycled  
Integrated Solid Waste Mgmt. Office  
200 North Main Street, Room 580  
Los Angeles, CA 90012

Shopper's Guide to Recycled Products  
Californians Against Waste Foundation  
926 J Street, Suite 606  
Sacramento, CA 95814  
916/443-8317



## Colorado

### **Buy Recycled, Colorado**

Colorado Office of Energy Conservation  
1675 Broadway, Suite 1300  
Denver, CO 80202-4613  
303/620-4292

### **Colorado Recycling Guide**

The Denver Post  
1560 Broadway  
Denver, CO 80202  
303/820-1010

## Indiana

### **Buy Recycled Indiana**

State of Indiana Department of Commerce  
One North Capitol, Suite 700  
Indianapolis, Indiana 46204-2288  
Contacts: Mitra Khazai, 317-232-8951  
Alex Yovanovich 317-232-8873

## Michigan

### **Recycled Products: Recycled Materials Market Directory**

Office of Waste Reduction Services  
Environmental Services Division  
Dept. of Commerce and Natural Resources  
PO Box 30004  
Lansing, MI 48909-7504

Michigan Waste Reduction Clearinghouse  
800/NO-2-WASTE (800/662-9278)

## New Jersey

**New Jersey Business Guide to Recycled Products**  
Erica Schiffman, Project Manager  
P.O. Box 6438, Raritan Plaza II  
Edison, New Jersey 08818-6438  
908/225-1180

**NJ Department of Environmental Protection & Energy**  
**Division of Solid Waste Management**  
Trenton, New Jersey 08625-0414

## New York

**Earth General**  
Stephan H. Doering  
72 Seventh Avenue  
Brooklyn, New York 11217-3649  
718/398-4648

## Oregon

**Guide to Recycled Products: Consumer-Retail Edition**  
Metro  
600 NE Grand Avenue  
Portland, OR 97232-2736  
503/797-1700

**Index of Recycled Products**  
The Metropolitan Service District  
2000 SW First Avenue  
Portland, OR 97201  
503/221-1646

Pennsylvania

Circle The Loop: Guide to Recycled Products  
Pennsylvania Resource Council  
P.O. Box 88  
Media, PA 19063

Environmental Shopper  
Pennsylvania Resource Council  
P.O. Box 88  
Media, PA 19063

Washington

Recycled Product Directory  
Clean Washington Center  
Department of Trade & Economic Development  
2001 Sixth Avenue, Suite 2700  
Seattle, WA 98121  
206/464-7040 or 206/587-5520  
800/622-4637

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PRODUCTS  
GUIDE

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- Over 500 different recycled product classifications;
- Over 400 pages of cross-referenced information;
- Listings are updated regularly and published 2 times per year;
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"Excellent book - saving city employees valuable time in locating recycled products."

Mike Goodison, City of Davis, CA

"Your directory is more and more invaluable."

Susan Kinsella, Californians Against Waste Foundation

"At Earth Care, the Recycled Products Guide has become an irreplaceable resource. Besides making available to our customers a premium line of recycled paper products, we are very concerned with giving our customers names, addresses and phone numbers of companies making environmentally sound products that we do not carry. For this reason, when someone writes or calls us requesting information on where to get recycled cardboard, plastic trays or even minnow buckets made from recycled paper, we can simply look in the RPG and give that customer the information they need! RPG works for us to make our job easier!"

Robin Kutzer, Earth Care Paper Inc.

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RECYCLED PRODUCTS GUIDE  
P.O. Box 577  
Ogdensburg, NY 13669

COMPLETE

Firm \_\_\_\_\_  
Organization \_\_\_\_\_

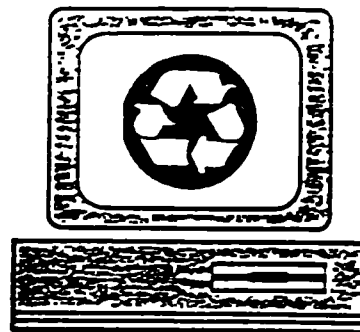
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Company \_\_\_\_\_  
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## REFERENCES

- Buy Recycled. Colorado*, prepared by Boulder Energy Conservation Center, Boulder, CO, for Colorado Office of Energy Conservation, 1992.
- Buy Recycled Paper Products*. National Office Paper Recycling Project, Washington, DC, 1991.
- Buying Recycled Products -- A Primer for Consumers and Institutional Purchasers*, Center for Earth Resource Management Applications, Inc., Springfield, VA, 1992.
- Final Report on Recycled Paper Definitions, Procurement Standards, Measurement Protocol, Labeling Guidelines, and Buy recycled Initiatives*, Recycling Advisory Council, Washington, DC, February 6, 1992.
- Guide to Commercial Recycling*, Santa Clara County Manufacturing Group, Santa Clara, California. Third Edition, April 1992.
- Guide to Commercial & Institutional Recycling*. Northeast Maryland Waste Disposal Authority, Baltimore, MD, undated.
- Illinois Success Stories in Waste Reduction*, Illinois Department of Energy and Natural Resources. Springfield, IL, ILENR/RR-92/01, 1992.
- Office and Commercial Waste Reduction*, Illinois Department of Energy and Natural Resources. Springfield, IL, ILENR/RR-91/10, 1991.
- Preferred Packaging Procurement Guidelines*, Environmental Management Task Force, Washington Retail Association, Olympia, WA, January 1992.
- The Official Recycled Products Guide*, American Recycling Market Inc., Ogdensburg, NY, Winter Edition, 1991/92.
- The Recycled Rubber Products Catalogue*, Scrap Tire Management Council, Washington, DC, undated.
- Tips for Successful Recycled Product Procurement Programs*, Center for Earth Resource Management Applications, Inc., Springfield, VA, undated.
- Waste Reduction Guide*, U.S. Postal Service, Washington, DC, Handbook AS-552, February 1992.
- Workplace Waste Reduction Guide*, President's Commission on Environmental Quality, Solid Waste Task Force, Washington, DC, working draft, 1992.

## QUESTIONNAIRE

Thank you for taking a few minutes to complete and return this questionnaire. It is critical to the success of the National Recycling Coalition's "Buy Recycled" Campaign to evaluate the quality and value of our materials.

### I. ORGANIZATION:

1. I represent:

- |  |  |
|--|--|
| <input type="checkbox"/> Large Business              | <input type="checkbox"/> Government Organization     |
| <input type="checkbox"/> Small Business              | <input type="checkbox"/> Local                       |
| <input type="checkbox"/> Purchasing Agent            | <input type="checkbox"/> State                       |
| <input type="checkbox"/> Private Sector              | <input type="checkbox"/> Federal                     |
| <input type="checkbox"/> Public Sector               | <input type="checkbox"/> Non-Government Organization |
| <input type="checkbox"/> Public Information/Educator | <input type="checkbox"/> Environmental               |
| <input type="checkbox"/> Private Individual          | <input type="checkbox"/> Public Interest             |
|  | <input type="checkbox"/> Recycling                   |

2. I am a member of:

- ☐ NRC      ☐ Buy Recycled Business Alliance      ☐ NAPM
- ☐ State Recycling Organization (specify) \_\_\_\_\_ ☐ Other \_\_\_\_\_

### II. EVALUATION:

1. Rate each: 5 Excellent, 4 Good, 3 Average, 2 Poor.

Overall, is the guide useful? \_\_\_\_\_

Provide useful information for developing or expanding your program? \_\_\_\_\_

Handout material \_\_\_\_\_ Practical examples \_\_\_\_\_

### III. RECEIVING INFORMATION

1. When and how did you hear about the "Buy Recycled" Campaign (mail, phone, trade magazine, newspaper, another organization, etc)

Month

Source



2. By what method do you prefer to receive program information?  
(Rate each: 5 Most Preferred, 4 Preferred, 3 Somewhat Preferred, 2 Not Preferred,  
1, Unacceptable)

Trade Publication\_\_\_\_(specify)\_\_\_\_\_  
NRC Publications\_\_\_\_\_  
Direct Mail\_\_\_\_\_  
Seminar/Workshop\_\_\_\_\_  
Telephone\_\_\_\_\_  
Trade Shows\_\_\_\_\_  
Other specify):\_\_\_\_\_

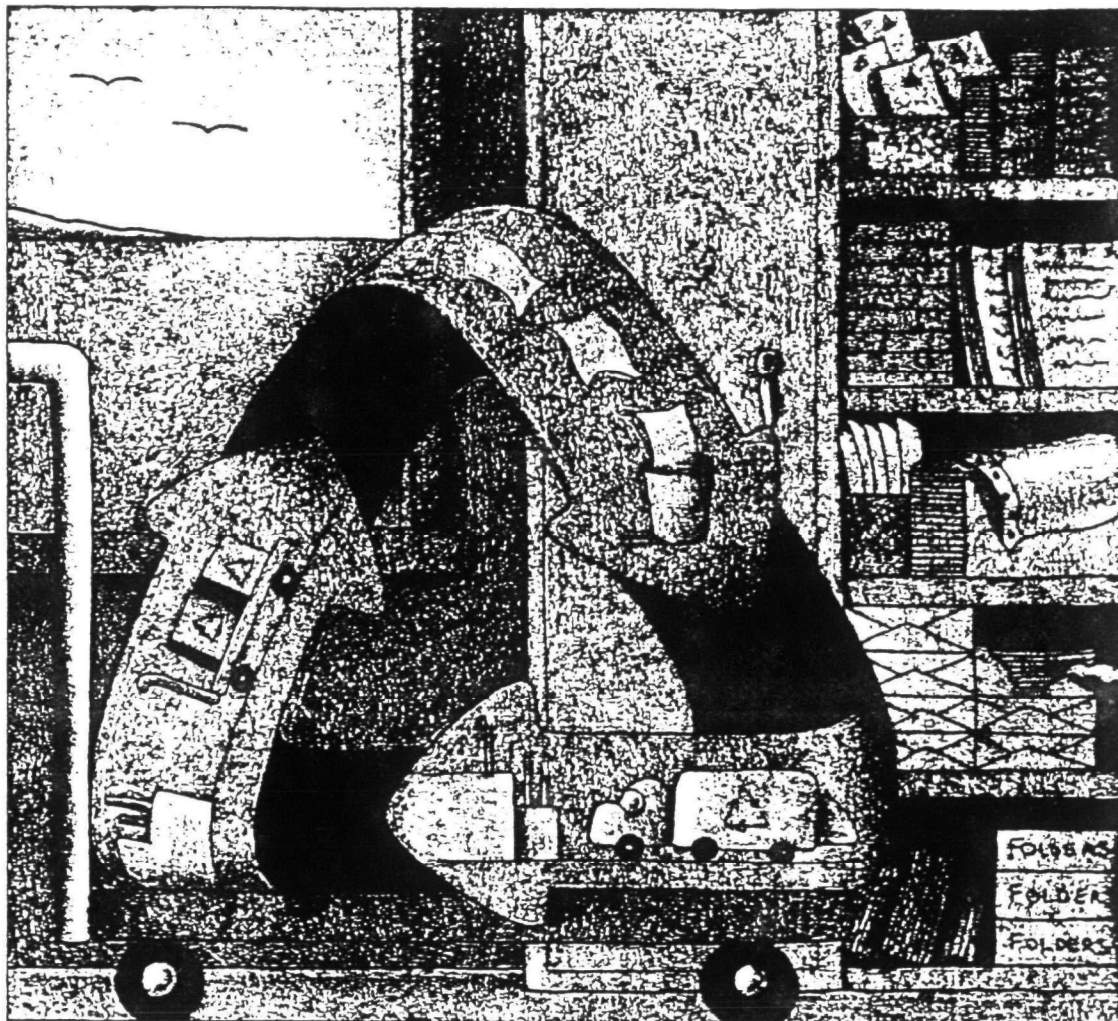
3. Would you welcome updates to this guide (such as a source reduction guide, product resources, newsletter) ?

#### IV. ORGANIZATION:

1. Are you familiar with the National Recycling Coalition?
2. Would you like to receive membership information regarding the Coalition?

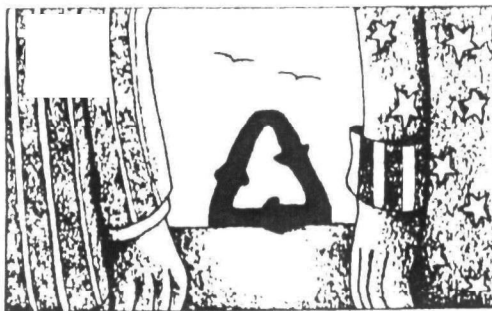
#### COMMENTS:

NAME OF ORGANIZATION .....  
ADDRESS .....  
CITY .....  
STATE .....  
ZIPCODE .....  
PHONE .....  
FAX .....  
PRINCIPAL CONTACT .....  
TYPE OF ORGANIZATION .....  
NUMBER OF EMPLOYEES .....



## Office Paper Recycling Guide

How your office can complete the recycling loop.  
Buy recycled paper products and collect office waste paper.



## National Office Paper Recycling Project

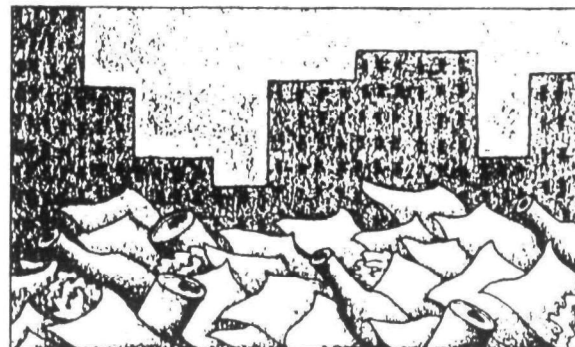
The National Office Paper Recycling Project is a joint effort by private companies and public interest groups to promote a national office paper recycling strategy. The goal of the project is to maximize the recycling of office waste paper and to minimize its disposal. This guide to office recycling is intended to provide information on the importance of buying recycled products and collecting recyclable office waste paper.

### National Office Paper Recycling Project

The United States Conference of Mayors  
1620 Eye Street, NW  
Washington, DC 20006

Director: Brian A. Day  
Recycling Specialist: Chris Denniston  
Project Manager: David Gatton

Illustrator: Margaret Scott  
Contributors: Marla Dockery, Richard Keller and Dana Arnold  
Editor: Cindy Spitzer



## What is Recycling?

Recycling involves three distinct steps, represented by the three arrows of the traditional recycling symbol: (1) the collection and processing of recyclable materials, (2) the manufacture of these materials into new products, and (3) the purchase and use of recycled-content products. Offices can participate in recycling not only by collecting

recyclable materials but it is equally important to purchase and use recycled-content products. It is essential in fact that Buy Recycled programs are adopted. One without the other is self-defeating. Recycling exists *only* when the loop is closed. This guide is intended to assist you in doing both.

## Why Recycle?

Paper and paperboard make up the largest component of solid waste by weight. In the U.S., over 40% of municipal solid waste is paper – about 71.8 million tons each year. Recycling office paper makes economic and environmental sense.

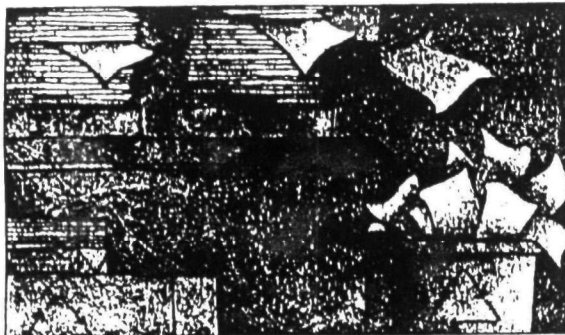
### A few good reasons to recycle in your office:

- Recycling office waste paper saves valuable landfill space – 3 cubic yards for every ton of paper recycled – and extends the lives of our landfills. EPA reports that by the year 2000 half of the current 6,500 operating landfills will be closed.

- Throwing away paper is a careless waste of a valuable resource.
- Recycling fosters goodwill among employees and the community – many employees are recycling at home and want to help conserve our natural resources and landfill space by recycling at work as well.
- Your state law or city ordinance may require businesses to recycle office paper.
- An office paper recycling program will help your community meet its recycling goals.

*Printed on recycled paper – of course!*

*page 1*



## Before You Begin . . .

Office paper collection programs have one common element – the separation of office waste paper from other waste materials and contaminants at the source. Program options range from a sorting of multiple grades of paper to a simple mixed paper stream. Some programs concentrate on sorting out higher value grades of paper, such as white ledger and computer paper. Other offices prefer a mixed paper program, which diverts a greater volume of the

office waste stream. The character of the waste paper generated, the location and size of your office, the willingness of employees to participate, the capacity of storage areas and accessibility of pickup locations, and – most importantly – the availability of end markets are factors that will determine the structure of the program most suitable for your office. Design a program that works best for you and serves your particular needs.

\*\*\*\*\*

### Cost of Recycling

Recycling involves additional collection and processing for which a fee is customarily charged. However, a portion of this added cost may be offset

by the sale of the recovered paper or by the avoided disposal costs.

### Paper Grades

One of the first things you need to consider is the types of paper used in your office. If you are unfamiliar with some of the terms, definitions of common

office paper grades can be found on the following page. Definitions may vary based on your market. Please check with your recycler.

**Computer Paper:** Also known as CPO (computer print out). Continuous paper printed on an impact printer, usually solid white, including blue- or green-lined, pin-feed printer paper that is untreated and uncoated. Does not include laser-printed paper.

**White Ledger:** Most white office paper in single sheets or continuous forms, including white computer paper, copy paper, letterhead, white notebook paper and ledger paper.

**Colored Ledger:** Same as white ledger, only paper is colored.

**Filestock:** A specialty grade of (mixed) office type papers that is derived from discarded files. These may come from offices, records storage, records centers, archives, libraries, etc. Mostly white and colored ledger but may also include carbonless paper, bleached file folders, paper clips, binders, etc.

**Mixed:** A mixture of various grades of recyclable waste paper not limited by fiber content and includes most types of clean and dry paper including glossy, white ledger and computer papers, newspapers, magazines, catalogs, phone books, cards, laser-printed white ledger, windowed envelopes, sticky notes, and often contains corrugated and brown paper.

**Newspaper:** Also known as ONP (Old News Paper), is used primarily for making newsprint, corrugated or folding boxes.

**Corrugated:** Also known as OCC (Old Corrugated Cartons). It is used for shipping containers and is manufactured from a fluted paperboard, called corrugating medium, sandwiched between two paperboards called linerboard.

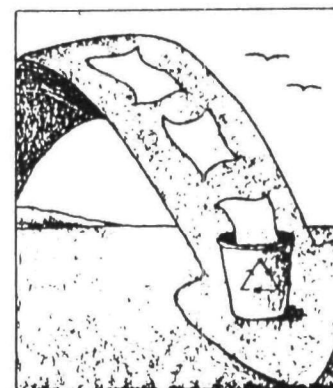
**NOTE:** Contaminants can significantly decrease the market value of your recyclable paper. Remember, you need to keep certain items out of your

recyclable paper: Food containers (bottles, cans, plastic cups, polystyrene, aluminum, food wrappers, etc.), food waste, restroom waste, and carbon. Check with your recycler to find out what other materials are unacceptable in your recycling program.

Now that you are familiar with the terms for the different types of office paper, you can get a general idea of the types and amounts of paper available in your office for recycling by:

- Visually surveying the contents of your waste paper baskets;
- Identifying the number of employees that your program will encompass;
- Identifying any large volume generators such as a computer room or an in-house print shop;
- Determining the current volume and frequency of waste pickup.

**NOTE:** In starting an office recycling program, a common tendency is to focus on business papers. However, newspapers and corrugated may comprise a significant portion of your office waste stream and should also be collected for recycling. You may also want to add glass, toner cartridges, aluminum and plastics to your office's recycling program.





## Getting Started

The next, and *most important* step in setting up a collection program is to investigate available recycling services and identify markets for your office paper. Look the yellow pages for recyclers, waste paper dealers and haulers under "Waste Paper" and "Recycling Centers." Your state or local solid waste, recycling, or public works department may also have information on local recycling services. Also check with your current waste hauler, since such firms frequently offer recycling services in addition to waste collection and disposal.

Most recyclers will assist you with the development of a recycling program and often provide containers and "how-to" materials. Once sorted and collected, there are several methods by which your recyclable paper may be removed, processed, and marketed:

- Pickup by a recycler, paper broker or hauler;
- Drop-off at a buy-back center or recycling center; or
- Coordinate with other businesses and/or your building manager for a joint recycling program.

## So, questions you will want to ask prospective recyclers, waste dealers, and haulers:

What grades of paper does the recycler collect?

What is the minimum amount required for a pickup?

Will the recycler help organize and promote your program?

What are the allowable contaminants?

Does the paper need to be consolidated into one main storage area?

Will the recycler supply recycling containers to use throughout the office and/or large bins for the main storage area?

Will the recycler provide scheduled or on-call pickups?

If you plan to take the material to a buy-back center, is it nearby and accessible?

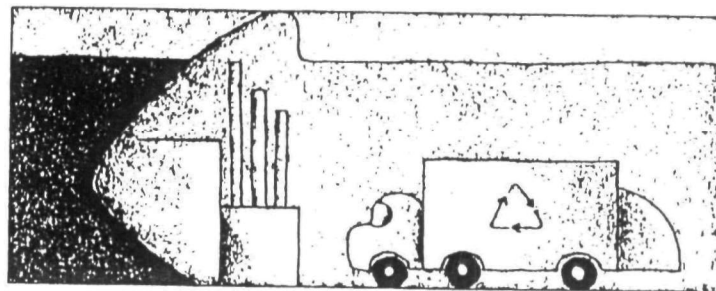
Will the recycler pay for the paper? If so, which pricing structure is used? Several types are available:

- A floating price that is tied to the paper industry market index (this method is most often used because it ensures the best deal for both you and the recycler);
- A fixed price for the term of the contract; or
- A periodic review and adjustment of prices.

Is the recycler willing to sign a long-term contract? (A multi-year agreement is recommended.)

Can the recycler ensure a continuing market for your paper?

*Remember that with whatever system and recycler you choose, you want to ensure the longevity of your program.*





## Implementing Your Collection Program

You and your recycler have now determined the focus of the collection program appropriate for your office. A guiding principle for a successful collection program is to keep it as simple and easy as possible. Maximizing participation is crucial.

### Collection and Storage

When evaluating how to collect and where to store your paper, keep in mind:

- The types, number, and locations of containers needed.
- The personnel responsible for separating recyclable paper and transporting it to the pickup point.
- The need for a central storage area to store material between pickups.
- Local fire codes for storing paper at intermediate and central storage locations.

Offices find that participation increases when collection begins at each desk (desk-side program). Furthermore, this type of program sorts paper at its source – the desk. Employees sort their recyclable paper into special containers beside or on their desks and deposit the remaining material in their regular waste baskets. Multiple containers may be provided, if required, to sort multiple grades of paper.

Desk-side containers are emptied into intermediate collection areas located throughout the office – one intermediate container for every 15 or 20 employees is a good rule of thumb. Good sites for intermediate collection centers include areas where materials are generated such as the copy room, computer centers, and other common areas. Trash cans should be available at these sites in order to minimize unwanted trash and make it easier for people to recycle.

*Make sure employees are fully versed on what materials are acceptable and unacceptable with your collection program. Doing so will help to avoid contamination. If a load is contaminated, your recycler may reject the load and you may have to pay to have the material disposed of. Furthermore, your recyclable paper is worth more when contaminants have been minimized.*

A central storage area is required to collect and store your paper between pickups. It should be easily accessible to both your recycling service (so material can be transported to the recycling facility) and to those responsible for transferring paper from the intermediate collection bins. This area must meet local fire codes. (Note: 400 pounds of paper will fill two 90-gallon drums).



### Working with Your Custodial Staff

Involve the custodial staff in planning your program; as they will play a critical role in eliminating contamination and transporting your recyclables.

Some businesses provide the custodial staff with collection carts that have two compartments – one for trash and one for recyclables. Others use existing equipment to collect trash and recyclables on alternate days. The custodial staff may simply assist with transferring recyclables from intermediate sites to the central collection point. Some offices do not involve the custodial staff at all: office employees are responsible for transporting recyclables to central areas where the recycler regularly picks up the materials.







## Selecting a Program Coordinator

A successful recycling program requires an enthusiastic coordinator who can foster a sense of teamwork and enlist the support of all the employees. Recycling experience isn't necessary, but the coordinator should have organizational experience and good communication skills. The coordinator's commitment and enthusiasm will be strengthened if he or

she is brought into the planning process as early as possible. Depending on the number of employees in your office, several monitors may be needed to keep the program running smoothly. Monitors need to have a good rapport with other staff and a thorough understanding of how the program works.



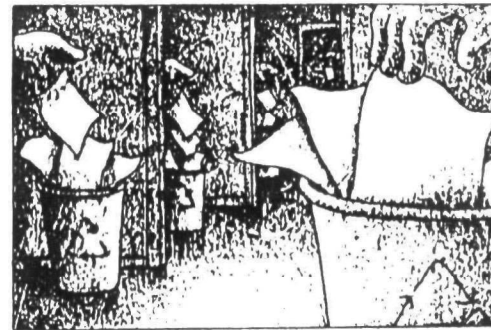
### Coordinator:

The responsibilities of the coordinator may include selecting a recycler, developing the collection system, educating fellow employees, and tracking the success of the program. The coordinator also may be the point of contact for the recycler or the building manager and should work with the purchasing department to establish a "buy recycled" program.

### Monitors:

Monitors may be given various responsibilities, including keeping containers contaminant-free, ensuring the containers are emptied periodically, and encouraging employees to participate.

Your recycling team also should include upper management, maintenance staff, department heads, and purchasing agents. Their support will help make the most of your program — in terms of both collection of recyclable waste paper and the use of recycled products.



## Getting Staff to Participate

Continual promotion is key to a successful program. Your fellow office workers will participate if they are well-informed about the program and its benefits. Explain the recycling process and how they can participate by collecting recyclables and by using products made from recycled materials. The support of your CEO or senior management is vitally important!

An effective promotional campaign includes:

### Kick-off memo:

A memorandum signed by your CEO and directed to all employees, highlighting the benefits of recycling and describing the program, is a good way to start your program.

### Education and Promotional sessions:

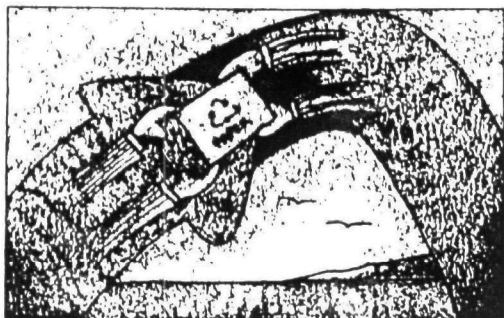
The kick-off memo should be supplemented by brief presentations to all employees. The "do's and don'ts" of the program and its benefits should be explained and questions answered. (Stickers with lists of what goes into each bin may be available from

your recycler and are helpful informational tools.) *Remember: Information on your recycling program should be included as part of the orientation of new employees.*

### Reinforcement and Follow-up:

It is important to reinforce the new recycling habit. Keep employees informed of your company's recycling efforts, highlight new recycled products that are purchased, participation rates, quantities of waste paper that are collected, revenue earned, disposal cost savings, and any problems encountered and/or solved in company memos or newsletters. Seek suggestions for program improvement.

A successful program requires time and effort to familiarize the employees and the custodial staff with the recycling program's objectives and requirements. Employees won't participate if they don't know how the program works.



## Close the Loop — Buy Recycled and Recyclable Products

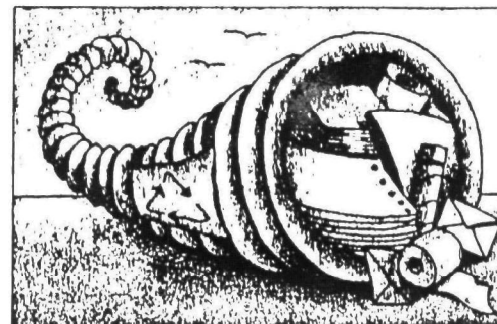
Office paper collection is not enough. Remember the third arrow in the recycling symbol: the purchase of recycled content products. Quite simply, recycling is the process of remanufacturing one end product (that would otherwise be thrown away) into another useful product. If the demand for these products is reliable and significant, more competitively priced recycled products will be produced and you will have played your part in creating markets for the paper you've collected.

Every business, individual and government office must take an active role in buying products that are made from recycled paper. This means standard business papers like stationery, envelopes, newsletters and publications, copy paper, fax paper, corrugated boxes, tissue products...and many more! When making purchases for your office, it is also important to make sure that all of the paper you purchase can be recycled as a part of your office recycling program. *Example: To purchase yellow legal pads when you have a white paper collection program is inappropriate.* If you collect recyclable paper, but do not purchase recycled products, you discourage manufacturers of

recycled products and contribute to the flooding of the waste paper market and discourage office paper recycling in the long run. Conversely, to purchase recycled paper products, but not to collect recyclable waste paper can cause recycled products to be more expensive than necessary. We must all work on closing the loop on recycling by committing to *both* the collection of recyclable waste paper and the procurement of recycled paper products. Recycling works only if marketable products can be made from collected materials.

By buying recycled paper products for your office, you join a growing number of businesses, institutions and government agencies who are helping complete the recycling loop. The more organizations that are willing to Buy Recycled, the more recycled products will be manufactured.

You can be proud to know that every time you buy recycled paper products you demonstrate your commitment to the environment, save landfill space and set an example for other institutions to Buy Recycled, too.



## Available Recycled Paper Products

Recycled paper products have come a long way since the 1970s. Today top quality products are available:

**Cellulose Insulation** — for office construction projects

**Computer Paper** — carbonless, continuous bond, form bond, and greenbar

**Office Supplies** — adding machine rolls, binders, dividers, files, folders, report covers, etc.

**Packaging Materials** — boxes, cushioning, kraft envelopes, mailing tubes, and other packing materials

**Paper Products** — absorbents, paper refuse bags, books/journals, calendars, coloring books, file boxes, office recycling containers, food service containers such as bowls, trays and plates

**Office Papers** — lined pads, loose leaf, note pads, spiral bound notebooks, telephone message pads, wrapping paper, etc.

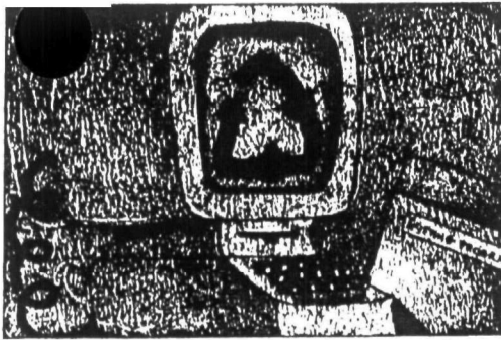
**Paperboard** — indexes, hanging files, kraft files, linerboard, corrugating medium, pressboard, and tube stock

**Printing Papers** — bond, book, coated offset, copy/xerographic, cotton fiber, cover stock, envelopes, business cards, label, mimeo, newsprint, offset, and text paper

**Tissue Papers** — industrial wipers, napkins, bath tissue, facial tissue, and paper towels

\*Source: *Recycled Products Guide, Volume 3, Number 1, Spring/Summer 1991, published by American Recycling Markets, Inc.*





## Strengthen Your Purchasing Policy

The first step in buying recycled paper products is for executive management to make a commitment to buy recycled paper products. Once a commitment is made, gather information about how your organization can do its share to protect the environment, without sacrificing cost effectiveness or quality. A good place to start is by reviewing your current purchasing programs:

1. Determine the types and quantities of paper products now being used and consider using a variety of recycled paper products. If you are already purchasing some recycled products, consider expanding your program to include additional products.

2. Investigate what recycled products are now available for your needs. Sources of information about recycled paper products include:

- Your present suppliers, including paper vendors and printers. Tell your suppliers you wish to buy recycled paper and other recycled paper products

and ask to be kept informed about future recycled paper products, which will become available as demand grows.

- Your state and local solid waste agencies that often maintain information on recycled paper manufacturers and suppliers.
- The Recycled Products Guide (RPG)\*, which lists over 3,000 manufacturers and vendors.
- CERMA's Recycled Products Information Clearinghouse\*, which maintains lists of recycled paper manufacturers and vendors. (\*See page 23 for details)

3. Maintain quality. With recent technological improvements, there's no need to sacrifice quality when buying recycled products.

4. Review existing specifications and standards to eliminate prohibitions or limitations against recycled products. Look for clauses that restrict the use of recycled materials such as "virgin only" or "recycled materials prohibited." It is not necessary to establish new standards for recycled paper products.

5. Put more subtle obstacles to using recycled products as:

- Brightness requirements or dirt counts. These restrictions are often overly stringent, relating only to aesthetics and not to performance. Note pads, for example, do not need the same brightness levels as bond paper.
- All-or-nothing clauses. Allow vendors of recycled products to offer one or more of the items covered by a solicitation rather than requiring them to submit a bid on every product. An all-or-nothing clause may prevent them from bidding.
- Quantity and availability. Recycled paper products may not be available in the quantities needed within short time frames. Therefore, allow reasonable lead times.
- Color matching. A paper matching requirement that requires recycled papers to be the same shade as existing papers may prevent recycled paper vendors from bidding.

6. Use common definitions when possible.

Commonly defined products are less expensive to produce and to purchase than custom-made items.

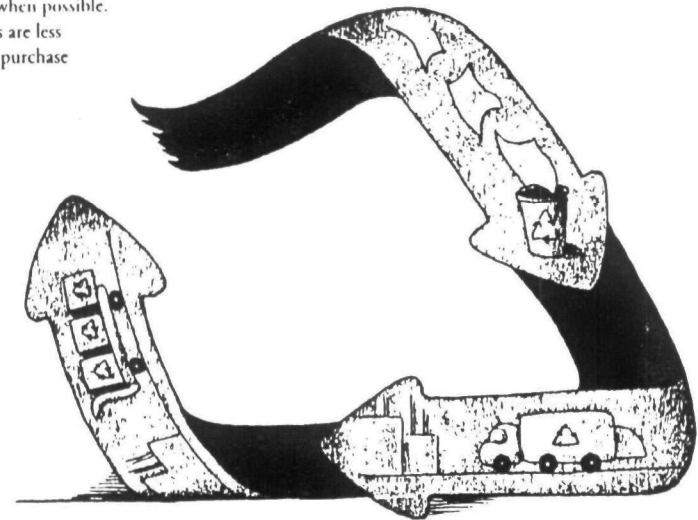
Because there are currently no nationally accepted definitions for recycled paper products, many purchasing agents use definitions and minimum content standards established by the EPA (see page 13). These standards are currently under review by the American Society for Testing and Materials, the National Association of State Purchasing Officials, the Recycling Advisory Council, and the

Environmental Protection Agency. Check to see whether your state has labeling or emblem statutes that establish definitions and minimum content standards.

7. Test recycled paper for a wide range of uses to determine how well it works in your equipment and fits your needs. Be fair. For example, do not expect recycled paper to meet higher quality standards than virgin products. Consider using a blind test so that recycled and virgin paper products can be compared without bias.

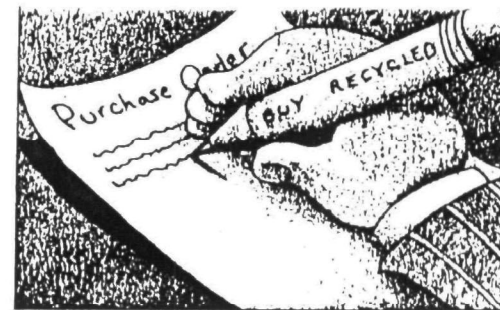
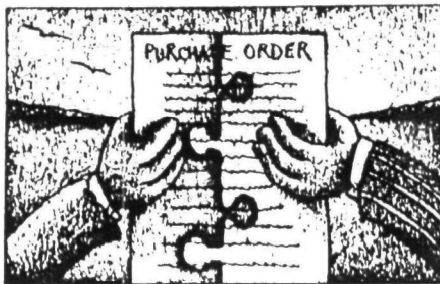
8. Most purchasing officers require vendors to certify minimum recycled content. You may wish to use a certification clause provided by the manufacturer or the sample certification included on page 14.

9. Boost the effect of your commitment to buy recycled by requiring your contractors, printers and other suppliers to use recycled paper and paper products.



Printed on recycled paper – of course!

page 13



## What's It Going To Cost?

Many recycled paper products are no more expensive than non-recycled, virgin products. Recycled paper, particularly printing and writing paper, may cost more than comparable virgin paper, with cost differentials varying from grade to grade, and from region to region, depending on the prevailing economic conditions.

Recycled printing and writing paper, often produced by small paper mills, costs more to manufacture than virgin paper produced at larger, fully integrated mills. Other factors, such as the supply of clean source-separated waste paper, the cost of raw materials, fluctuations in the international paper market, and the demand for finished products, also affect pricing.

One effective way to reduce costs is through cooperative purchasing. Cooperative purchasing increases the volume of recycled products purchased, helps ensure availability, establishes common definitions and percentages, and lowers the cost of producing and purchasing recycled products.

Even with higher costs, many businesses, institutions and government agencies recognize the need to

purchase recycled paper products and do so via preferential purchasing mechanisms, including:

1. Price preferences, which allow the purchase of recycled paper products even if they are more expensive than comparable virgin items. In general, price preferences are in the 5-10 percent range.
2. Set-aside programs that set specific percentage goals for the amount of recycled paper products to be purchased. These goals are often met by purchasing a variety of recycled products, including corrugated, tissue products, packaging, office products, and other paper products.
3. Dual track bids, which allow bids from both vendors offering recycled paper products and those offering virgin products. This system is particularly applicable to governmental bodies and larger, multi-department businesses where preferred vendors are established by bid. Approved vendors of both recycled and virgin products allow individual departments and offices a choice in meeting their paper product needs.

## Make a Commitment

A commitment by executive management to purchase and use recycled products is a positive statement of policy, sets an example for other organizations and sends a clear message to manufacturers to invest in recycling equipment and make more recycled products available.

This commitment may be expressed through

executive orders or corporate management directives for the purchase of recycled, reusable and recyclable paper products. State and local governments may express their commitment through ordinances and resolutions requiring their agencies and departments to purchase recycled paper products. Each employee should also make a commitment to buy recycled paper products for his or her needs.

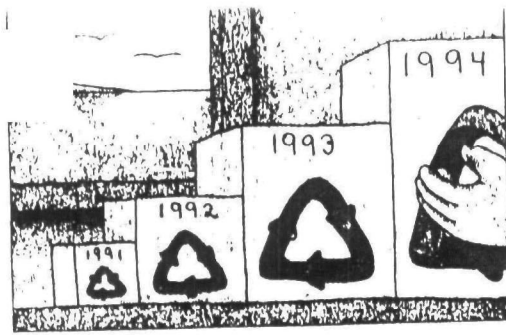
♦♦♦♦♦♦♦♦♦♦

### Others have ...

AT&T recently adopted a corporate environmental policy that calls for a growing percentage of the corporate paper purchasing budget to be directed toward the purchase of recycled paper products. McRecycle USA is McDonald's program through which the company has committed to an annual purchase of \$100 million of recycled materials for the construction and equipping of its restaurants. In its first year, 1990-1991, McDonald's exceeded that dollar amount by \$24 million, purchasing a total of \$124 million of recycled materials through McRecycle USA.

In addition, the company purchased more than \$80 million in recycled paper for the use in its restaurants and offices in 1990.

The United States Environmental Protection Agency (EPA) has established guidelines for federal agencies, as well as agencies and contractors using federal funds, to purchase recycled paper products. In addition, all 50 states, the District of Columbia, and more than 161 local governments now have laws, executive orders, or programs favoring the purchase and use of recycled paper. Many businesses, industries and non-profit organizations also have policies to purchase and use recycled paper products.



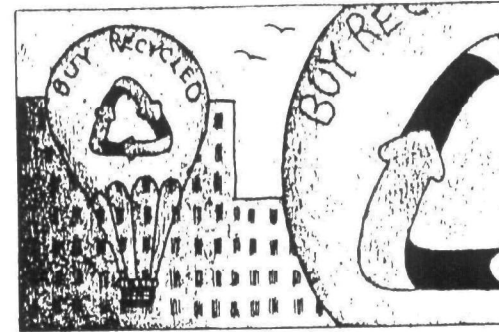
## Phase In Your Purchasing Effort

Many recycled paper products, such as packaging materials and tissue, are widely available and can be ordered in volume to suit your needs right away. Printing and writing paper, on the other hand, may be in varying supply.

If products are not available or inadequate supplies block you from meeting all your recycled paper needs all at once, don't be discouraged! The best approach is to maintain a regular dialogue with your suppliers

so you can purchase recycled products as they become available.

Keep insisting on recycled paper products from your suppliers. A consistent, long-term demand will persuade manufacturers that a strong market for recycled paper products exists and warrants their investment in equipment and facilities to produce recycled paper and paper products.



## Promote Your Program

Tell prospective vendors that you are committed to buying recycled, and if they want your business, they must be prepared to provide an increasing variety of recycled paper products on an established time schedule. Vendors will respond and, importantly,

they will let paper products manufacturers know what is happening in the consumer marketplace. As demand increases, so will the quality and range of available products, and, correspondingly, prices will decrease.

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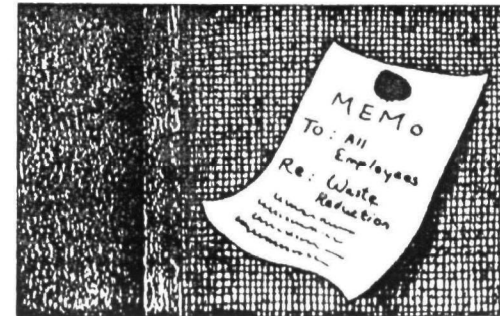
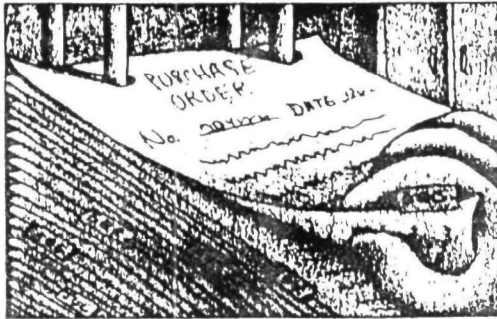
**Buying recycled and collecting** are nothing to hide! Be sure all employees are aware, and let your customers know that your organization is committed to closing the loop by buying recycled and collecting office waste paper. It is good business and will encourage others to join you. Include statements such as "Printed on Recycled Paper" where appropriate. Put announcements on the bulletin boards and office newsletters. Include references to your organization's buy recycled program in media

advertising, and consider sponsoring a public service announcement.

Most importantly, now that your recycling plans are complete, it is time to officially accept the

**National Office  
Paper Recycling Challenge!**

For information, call (202)223-3089.



Tell the rest of your organization about your commitment to buy recycled so that using recycled paper products becomes a healthy habit. You may wish to:

- Survey your office to identify and overcome any problems with quality, delivery, etc.
- Record purchases, keeping accurate records of recycled product purchases to identify program successes and failures.
- Survey market developments, staying in contact with your suppliers, state and local purchasing and recycling agencies, and trade publications to keep abreast of the latest in recycled paper and paper products. You may also wish to conduct or attend vendor shows on a regular basis to give your buyers and vendors a chance to discuss the latest innovations in recycled paper products.
- Train buyers and staff about the latest products on the market and any changes in regulations and specifications.
- Conduct annual program reviews of your **buy recycled** program, including information on purchases by grade, volume, price and availability. You may also wish to reassess goals for the coming year, reviewing products that could not be purchased before that may have become available.
- Let other organizations know about your success and encourage them to establish similar programs.

## Reduce Waste

You can support your office recycling efforts by promoting activities that reduce, avoid, or eliminate the generation of unnecessary waste. Less waste means lower waste collection and disposal costs and significant savings on future purchases. Here are some ideas:

- Make double-sided copies
- Place information on announcement boards and circulate memos rather than making multiple copies
- Share reports and periodicals instead of duplicating or purchasing multiple copies
- Update distribution/mailling lists periodically and remove those who no longer need the information
- Use scrap paper for notes and message pads
- Request reduced packaging in shipments
- Use non-glossy fax paper that does not require copying
- Use electronic mail
- Buy products that can be recycled in your office wastepaper collection program. (Check with your waste paper hauler to determine what is appropriate.)
- Remove your name from mailing lists of unwanted mailing lists

EPA Environmental Protection Agency Recommended Minimum (Recycled) Content Standards for Paper and Paper Products. These standards are currently under review by ASTM, NASPO, RAC, and EPA. Effective as of 1992.

	% Waste Paper
Line Paper	
Offset printing	50
Mimeo and Duplicator paper	50
Writing (Stationery)	50
Office paper (e.g. note pads)	50
Paper for high speed copiers	50
Envelopes	50
Form bond, including computer paper and carbonless	50
Book paper	50
Ledger	50
Cover stock	50
Cotton fiber paper	75
(25% recovered cotton fiber/50% waste paper)	
	% Postconsumer Recovered Material
Newsprint	40
Tissue and Towel	
Toilet tissue	20
Paper towels	40
Paper napkins	30
Facial tissue	5
Dishes	40
Industrial wipers	0
Boxes	
Corrugated boxes	35
Fiber boxes	35
Brown papers (e.g., bags)	5
Paperboard	
Recycled paperboard products including folding cartons	80
Pad backing	90

## Sample Certification

**Certification:** The offeror shall certify that all papers supplied under any contract resulting from this solicitation, will meet or exceed the minimum percentage of recovered materials indicated below.

(Offeror should only make entries that apply to this offer)

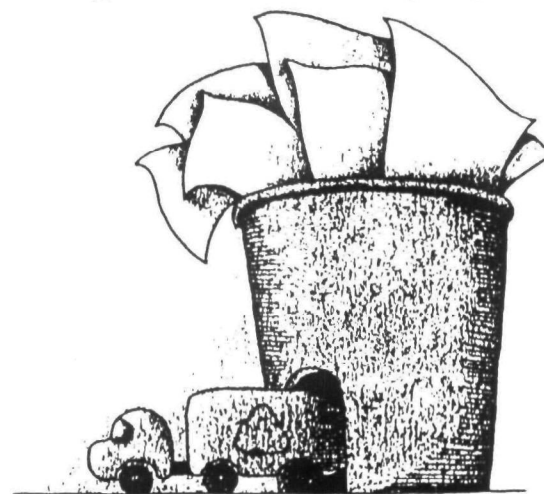
	Minimum %	Offeror's %	Weight of Paper
Waste paper content in offset and/or writing paper	_____	_____	_____
Postconsumer recovered materials content in newsprint	_____	_____	_____

We reserve the right to require proof of such certification prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

### Certificate of Waste Paper and/or Recovered Materials Content

The offeror hereby certifies that all papers proposed to be supplied under this contract will contain the percentage(s) in the column "offeror's percentage" above.

Bidder's Company  
Bidder (type or print)  
Bidder's Signature  
Title  
Date





## Resources on Recycled Products

**Guide to Commercial & Industrial Recycling**  
 Northeast Maryland Waste Disposal Authority  
 25 South Charles St. #2105  
 Baltimore, MD 21201-3330  
 FAX: (410) 333-2721

**National Buy Recycled Campaign**  
 The U.S. Conference of Mayors  
 1620 Eye Street, NW  
 Washington, DC 20006 (202) 293-7330  
 This EPA funded program offers local governments and interested parties technical assistance on implementing recycled product procurement programs.

**National Recycling Coalition**  
**Buy Recycled Campaign**  
 1101 30th St., NW  
 Washington, DC 20007 (202) 625-6406  
 Technical assistance to governments and businesses on buying recycled products; summaries of state/local laws.

**Recycled Products Guide**  
 P.O. Box 577  
 Ogdensburg, NY 13669 800-267-0707  
 Comprehensive list of several thousand recycled products from paper products to building materials.

**Recycled Products Information Clearing House**  
 Center for Earth Resources Management Applications  
 5528 Hempstead Way  
 Springfield, VA 22151 (703) 941-4452  
 Information on EPA guidelines; detailed lists of recycled paper and paperboard manufacturers, converters and distributors; recycled paper fact sheets, labeling information, trouble-shooting guide for printers; and technical assistance on buying recycled, waste reduction and collection programs.

**Recycleline**  
 National on-line computer database service listing recycled products, markets for recovered waste, and more.  
 (800)-461-0707

**SWICH / Solid Waste Information Clearinghouse**  
 P.O. Box 7219  
 Silver Spring, MD 20910 (301) 585-2898  
 SWICH is a complete database for solid waste and recycling issues. It can be accessed by modem or by voice phone.

**NOTE:** Your state or local solid waste department or regional EPA office may have additional resources.



## Paper Industry Publications

**American Recycling Markets**  
 P.O. Box 577  
 Ogdensburg, NY 13669  
 (315) 471-0707

**Paper Recycler**  
 500 Howard Street  
 San Francisco, CA 94105  
 (415) 397-1881

For information on paper markets:

**PaperMatcher**  
 MSW Resource Center  
 American Paper Institute, Inc.  
 1250 Connecticut Avenue, NW  
 Suite 210  
 Washington, DC 20036  
 1-800-878-8878

**Pulp & Paper Week**  
 Miller Freeman Publications  
 500 Howard Street  
 San Francisco, CA 94105  
 (415) 995-2424

**Fibre Market News**  
 G.I.E. Inc. Publishers  
 4012 Bridge Avenue  
 Cleveland, OH 44113  
 (800) 456-0707

**The Paper Stock Report**  
 McEntee Media Corp.  
 13727 Holland Road  
 Cleveland, OH 44142-3920  
 (216) 923-8042

# Number of Challengers Grows to 560

## *Are Your Suppliers on this List?*

*The following is a list of businesses and governments that have accepted The Challenge and committed to collecting office waste paper, purchasing recycled paper products, and setting goals for the coming year. The National Office Paper Recycling Project continues to salute them as leaders. Together we move toward our goal of tripling the amount of office waste paper recycled by 1995!*

3M	Brookstone Productions	City of Leominster MA
ALLSTATE	Broward County Parks and Recreation, FL	City of Louisville KY
ARC Professional Services Group	Broward Economic Development Council, Inc	City of Milwaukee, WI
AT&T	Broward Employment & Training (B E T A )	City of Modesto, CA
AT&T Power Systems	Brown County WI	City of Newark, CA
Abbott Laboratories	Brown Forman Corp	City of Newark, NJ
Aerotherm Corp.	Brown Land Co	City of Newton, MA
Aetna Life & Casualty	Brown-Forman Corporation	City of Norfolk, VA
Agway Inc	Browning-Ferris Industries	City of Omaha, NE
Air France	Building Owners and Managers Association of South Florida	City of Orlando FL
Alamo Rent-a-Car	CBS, Inc	City of Providence RI
All Makes Office Systems	CPA Network, Inc	City of Quincy IL
All Service Refuse Company, Inc	CPC International Inc	City of Richmond, IN
Allegheny Power Systems	Calvert Group	City of Richmond, VA
Allstate Insurance Company	Canon U S A Inc	City of Rockville, MD
American Airlines	Cargill, Incorporated	City of Salem OR
American Electric Power Service Corporation	Carolina Power & Light Company	City of San Antonio TX
American Express Co	Carpenter Company, Inc	City of Seattle, WA
American Forests	Castro Ramirez & Netsch	City of Suffolk - Public Works, VA
American Greetings Corp	Central Reserve Life	City of Tempe, AZ
Ames Department Stores Inc	Channel 39 Inc, W D Z L	City of Virginia Beach, VA
Amoco Corporation	Charles County Government, MD	City of Westminster, CO
Amurade International Bank	Chautauqua County, NY	City of Wilton Manors, FL
Anderson & Benjamin, PA	Chaves County, NM	City of York, PA
Anheuser Busch Cos Inc	Check Gallery	Clark County, WA
Anne Arundel County MD	Cheezem, Montello, Kenney	Clay County, MO
Appleton Papers Inc	Chemical Bank-Miami	Cleveland Clinic Hospital
Arrow Electronics, Inc	Chemical Leaman Tank Lines, Inc	Coastal States Mortgage Corporation
Assist Card of Florida, Inc	Chevron Corporation	Collier County Government, FL
Auglaize County, OH	Chief Auto Parts, Inc.	Cominex International, Inc
Avante Group, Inc	Childress Klein	Commonwealth of Pennsylvania
BDO Seidman	Chrysler Corporation	Community Press
BFGoodrich Company	Cigna Corporation	Concern, Inc.
Backus Turner & Partners, Inc	Cititrust Group Management-New World Tower	Consolidated Papers, Inc
Baltimore City Office of Recycling	City and County of Denver, CO	Consulting, Advertising and Research Services Inc
Baltimore County Government, MD	City of Albany, NY	Continental Airlines, Inc
Baltimore Gas & Elec Co	City of Alexandria, LA	Coors Brewing Company
Bank of America	City of Austin, TX	Cordant, Inc.
Barnett Bank of Broward County	City of Bangor, ME	Counsel Press
Barrett & Rogers	City of Carlsbad, CA	County Recycling
Barron County, WI	City of Clifton, NJ	County of Alameda, CA
Baskerville & Son	City of Columbia, SC	County of Albemarle, VA
Bass Reporting	City of Coral Springs, FL	County of Davie, NC
Bayshore Cafe Inc	City of Danbury, CT	County of Saginaw, MI
Bell Atlantic	City of Dayton, OH	Crown Cork & Seal Company, Inc
Beneficial Management Corporation	City of Deerfield Beach, FL	Cummins Engine Company
Best Buddies	City of Elmhurst, IL	Daily Business Review
Betterworld Inc.	City of Escondido, CA	Daka Restaurants
Billing Support Services	City of Falls Church, VA	Dallas County, TX
Black & Fect	City of Fort Lauderdale, FL	Danville Community College
Blount Inc	City of Fort Wayne, IN	Data Archive Services, Inc.
Bob Woolf Associates, Inc.	City of Fredericktown, MO	Data Management Inc.
Boeing Commercial Airplane Group	City of Fremont, CA	Decora Office Furniture/Supplies
Boise Cascade Corporation	City of Gainesville, FL	Deere & Company
Bowater Communication Papers Inc.	City of Gilroy, CA	Deja Inc
Bowne of Miami	City of Hayward, CA	Del Monte Foods
Branch Banking & Trust	City of Hollywood, FL	Delaware County, OH
Brickell Bay Tower Ltd., Inc	City of Houston, TX	Dexter Nonwovens Corp
Bridgewater Township	City of Jacksonville, FL	Dinner Key Advisors
British Airways, FL	City of Kettering, OH	Disneyland Resort
British Consulate, FL	City of Lauderhill, FL	Dow Chemical Company
Brooke Group #3200		



Dow Corning Corp  
 Dow Jones & Co Inc  
 Du Pont Merck Pharmaceutical Co  
 Duke Power Company  
 Earth Sense Products  
 Eastman Kodak Company  
 Eli Lilly and Company  
 Emerson Electric Co  
 Emerson House Apartments  
 Enviro Printing  
 Environmental Elements Corporation  
 Environs/Ley Interiors  
 Esprit Business Services  
 Estee Lauder Companies  
 Executive Health Club  
 FYI Bookkeeping  
 Fair Lakes Management/H/P Companies  
 Fauchild Communications  
 Fairfax County, VA  
 Fannie Mae  
 Federal Home Loan Mortgage Corporation  
 Fidelity Federal Bank  
 Fidelity Investments  
 Financial Planning Consultants, Inc  
 Fine, Jacobson, Schwartz, Nash & Block  
 First Christian Church  
 First National Bank of Chicago  
 First Virginia Banks, Inc.  
 Florida Atlantic University  
 Florida Department of Insurance  
 Florida Power and Light  
 Florida Testing & Engineering, Inc  
 Fontainebleau Hilton Resort  
 Fort Howard Corporation  
 Fort Lauderdale Marriott North  
 Franklin Associates, Ltd  
 Freddie Mac  
 G G Landscapes  
 GEICO  
 Galveston County TX  
 Garden State Paper Company, Inc  
 Gene A. Whidden Adult Center  
 General Motors Corporation  
 Gerber Products Co  
 Giant Food Inc  
 Gillette Capital Corporation  
 Goldfarb & Gold PA  
 Goodway Graphics of VA, Inc  
 Goodyear Airship Operations  
 Goodyear Tire & Rubber Co  
 Granite Rock Company  
 Grass Valley Disposal, Inc  
 Gray Line/Airocar  
 Greater Boca Raton Chamber of Commerce, Inc.  
 Greater Ft Lauderdale Chamber of Commerce  
 Greater New York Waste Paper Association  
 Green Bay Packaging Inc  
 Greene County, OH  
 Greer, Homer & Bonner  
 Grenadier Associates Ltd  
 Gwinnett County, GA  
 HIG Capital Management

HRS Board County Public Health Unit  
 Hamilton County, TN  
 Hands-On Workshop, Inc  
 Harford County Govt MD  
 HarperCollins Publishers  
 Harris County, TX  
 Hastings & Hastings  
 Hazen and Sawyer, PC  
 Helene Curtis Inc  
 Hensche, Inc  
 Herman Miller, Inc  
 Hi-Rise Recycling Systems  
 Highlands County Solid Waste Department  
 Holland & Knight  
 Hollywood Chamber of Commerce  
 Hollywood Medical Center  
 House of Doors, Inc  
 Howe Solomon & Hall  
 Hudsonville Inc  
 Humboldt State University  
 Hunton & Williams  
 Illiana Disposal & Recycling Inc  
 Illinois Power Co  
 Imaging LSA, Inc  
 Indian River County, Solid Waste Disposal District, FL  
 Indiana County Group Homes, Inc  
 Inland Steel Company  
 Innovations  
 Innovative Health of Kansas, Inc  
 Insilco Corp  
 Inter - Continental Hotel  
 JPBT Advisors Inc  
 Jackson and Coker  
 James River Corporation  
 Jasmin Productions  
 Jefferson County, KY  
 Jordan Burt Berenson & Klingensmith  
 Kalamazoo County, MI  
 Kellogg Company  
 Ketchum Asociados  
 King County, WA  
 Klein Tazner & Cohen P A  
 Kos Pharmaceuticals, Inc  
 Kroll & Tract  
 Kyo-Ya Company, Ltd  
 Laser-Tone International  
 Law Offices of J Robert Miertschin  
 Law Offices of Sotorno & Rundle  
 League of Women Voters of U S  
 Legacy Personnel Group  
 Lehigh Press Cadillac  
 Leon County, FL  
 Lever Brothers  
 Lewis and Clark County Government, MT  
 Lexmark International Inc  
 Lighting Affiliates, Inc  
 Long Island Lighting Company  
 Long Island Rail Road  
 Loretta Fabricant, CPA  
 Louisiana Pacific Corporation  
 Lubin and Gano, P A  
 MAC Papers  
 MBIA

MBNA America  
 MJ Whitman  
 Madison County Commission, AL  
 Madison County IL  
 Magma Copper Company  
 Malin, Haley, DiMaggio & Grosby  
 Mandler & Silver, P A  
 Manpower, Inc  
 Marathon Oil Company  
 Mancopa Community College  
 Mancopa County AR  
 Martin Marietta Corporation  
 Mary Washington College  
 Mattel, Inc  
 McDonald's Corp (Home Office)  
 Mecklenburg County NC  
 Merrill Lynch & Co Inc  
 Merrill Lynch FL  
 MetLife  
 Metro Portland District  
 Metro Traffic Controls  
 Metropolitan Dade County, FL  
 Miami Center/ Lincoln Property Co  
 Microdisk Services  
 Midland County MI  
 Miles, Inc  
 Millipore Corp  
 Milwaukee County - DPWD, WI  
 Minolta Advance Technology Inc  
 Miranda Victor  
 Monroe County Recycling Department, FL  
 Monsanto Company - World Headquarters  
 Montgomery County, MD  
 Moore Business Communication Services  
 Morrison International  
 Motorola Paging Products Group  
 Moyers Lawn Service & Landscaping  
 Mutual of New York  
 NYNEX Corporation  
 Nation Wide Security Inc  
 National Aquarium in Baltimore  
 National Association for Humane and Environmental Education  
 National Association of Counties  
 National Conference of State Legislatures  
 National League of Cities  
 National Naval Medical Center  
 National Telephone Corp Association  
 National Westminster Bancorp Inc  
 National Wildlife Federation  
 Navy-Marine Corps Relief Society  
 New England Mutual Life Insurance Co  
 New York State Electric & Gas  
 Newstop  
 Niagara Mohawk Power Corporation  
 North Broward Hospital District  
 Northeast Maryland Waste Disposal Authority  
 Northern States Power Company  
 Northwestern Mutual Life Insurance Co  
 Occidental Chemical Corporation  
 Office Connection Inc  
 Office Depot  
 Offiserve, Inc



Ogemaw County Dept. of Social Services,  
 MI  
 Ohio Edison Company  
 Orange County, FL  
 Orden Service  
 Organic Waste Technologies, Inc.  
 Outboard Marine Corporation  
 P H Glatfelter Co  
 PAB Consultants, Inc.  
 PL&P Adverusing  
 Paccar Inc  
 Pacific Bell  
 Pacific Environmental Services, Inc.  
 Pacific Mutual  
 Paune Webber Inc  
 Panavian Travel Service  
 Paper Chasers, Inc  
 Paramount Pictures  
 Parker-Hannifin Corporation  
 Peacemaking Associates  
 Phillips & Reid  
 Pier Sixty Six Resort and Marina  
 Pima County, AZ  
 Pine Banking Corporation  
 Pine Financial Services  
 Pine Jog Environmental Education Center  
 Pollution & Recycling Control Information  
 Center  
 Popham Haik Schnobrich & Kaufman Ltd.  
 Port Everglades Authority  
 Portsmouth Litter Prevention  
 Potomac Electric Power Co  
 Presidential Fitness Club  
 Price Waterhouse  
 Prince George's County, MD  
 Prince William County, VA  
 Proexport-Columbia  
 Prospect/Hinson Office Products  
 Prudential Insurance Company  
 Publix Super Markets Inc  
 Pulaski County, AR  
 R R & R Consultants  
 R.R. Donnelley & Sons Company  
 RTKL Associates Inc  
 Racal-Datcom  
 Rajala Lumber Company  
 Randolph-Macon College  
 Realtron Corporation  
 Recycle America - Broward  
 Recycling Services Inc  
 Regency Realty Group, Inc.  
 Resource Conservation Management  
 Reuters - FL  
 Reuters America - FL  
 Reynolds & Reynolds Co.  
 Riviana Foods  
 Roadway Express, Inc.  
 Rockwell International Corp  
 Round 2 Recycling, Inc.  
 Roy's Phones-N-Things  
 Ruden, Barnett, McClosky, Smith, Schuster,  
 & Russell  
 S.A.I.D. Inc.  
 SEMCO Products

Safra Bank  
 San Diego County  
 Scandinavian Marine  
 Shade/Allied, Inc.  
 Shea & Gardner  
 Shredderman  
 Signet Tower Trammell Crow Company  
 Simco Recycling Corp  
 Smith Office Supply  
 Smurfit Recycling Co -Ft. Lauderdale  
 Solomon Brothers  
 South Florida Water Management District  
 Southern California Edison Company  
 Southern Sanitation Service  
 Southwest Airlines  
 Springfield Offset  
 Sprint Communications  
 St David Catholic Church  
 St. Francis Home South  
 St. Lucie County Utility Services Dept., FL  
 St Paul Federal Bank of Savings  
 Standard Register Co  
 Stanislaus County, CA  
 State Farm Insurance Companies  
 State of Florida  
 State of Louisiana  
 State of Maryland  
 State of New York  
 State of North Carolina  
 State of Ohio  
 State of Pennsylvania  
 State of Texas  
 State of West Virginia  
 Sun Belt Precision Products Inc  
 Sun Life of Canada  
 Sun-Sentinel  
 Sunrise Publications, Inc  
 Sweetheart Cup Company Inc.  
 TTI  
 Taplin Canada & Habacht  
 Taylor & Mathis  
 Taylor and Mathias, FL  
 Taylor, Brian, Buker & Greene  
 Tennessee Valley Authority  
 Texaco, Inc  
 Texas Instruments Inc  
 Texmaco USA, Inc  
 The Alexandria Symphony Orchestra  
 The Boeing Co  
 The Clorox Company  
 The Fast-Est Corporation  
 The Financial Times of London  
 The Hibbert Group  
 The Palace Cafe  
 The Paper House/Southern Paper  
 The Principal Financial Group  
 The Reader's Digest  
 The School Board of Broward County, FL  
 The Toledo Hospital  
 The United States Conference of Mayors  
 Thermo Electron Corp.  
 Town of Greenwich, CT  
 Towson State University  
 Transamerica Life Companies

Tredegar Industries  
 Tri-County Commuter Rail Authority  
 Tuulvex  
 U.S. Environmental Protection Agency  
 U.S. Steel - MINNTAC  
 U.S. Steel Group  
 U.S. Steel Group-Employee Relations  
 U.S. Steel Group-Southern Area Sales  
 U.S. Steel Mining Co., Inc.  
 UMDNJ, New Jersey's University of Health  
 Sciences  
 US West Cellular  
 USF&G  
 USS Clairton Works  
 USS Gary Works  
 USS-Midwest Area Sales  
 USS-PGH Service Center  
 USS-Traffic Department  
 Unicorn Village  
 Union Camp Corporation  
 Unisys Corporation - Plant 4  
 United Way of Howard County, Inc.  
 VALIC  
 VOC Analytical  
 Van Dee Mailing Service Inc.  
 Vangel Paper Inc.  
 Very Fine Products, Inc.  
 Village of Valley Stream  
 Virginia Power Company  
 Virginia Tech (VA Polytechnic Institute &  
 State University)  
 Visiting Home Healthservices  
 Volusia County, FL  
 WR Grace & Company - Conn. Research  
 Division  
 WBFS-TV33  
 WLD Enterprises  
 Wall Street Northwest  
 Wallace, Engels, Perlmutter et al  
 Walt Disney Imagineering  
 Walt Disney Studios  
 Walt Disney World Company  
 Washington County, MN  
 Washington Hilton and Towers  
 Waste Management Inc.  
 Weadon Printing Services  
 Weil, Gotshal & Manges  
 Wells Fargo & Company  
 Westbridge Condo Assoc Inc  
 Westinghouse Electric Corp  
 Weyerhaeuser Company  
 Wheat First Securities  
 Whirlpool Corporation  
 Wicker, Smith, et al  
 Willamette Industries Inc.  
 Winn Dixie Stores, Inc.  
 Winnebago Software Company  
 Winthrop Management Int. Place  
 Xerox Corporation  
 Yakima County Board of Commissioners  
 Yellow Freight System of Delaware  
 Zang's Printing

# To register for the *Paper Recycling Challenge*:

Simply fill out the registration form below and send it to:

The National Office Paper Recycling Project  
U.S. Conference of Mayors  
1620 Eye Street NW, 4th Floor  
Washington, D.C. 20006.  
or, Fax to (202)-429-0422.

## General Information

Name of the organization: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Principal Contact \_\_\_\_\_

Type of Organization \_\_\_\_\_

Number of Employees \_\_\_\_\_

Number of participating facilities \_\_\_\_\_

\_\_\_\_\_ Yes. Include my name in your annual contact directory.

## Part I. Waste Paper Collection

Please provide information for  
calendar year 1993.

What percentage (0%-100%) of your  
waste paper did you collect for  
recycling?

Estimate as needed:

\_\_\_\_\_

### Collection Goals

What is the goal for your waste paper  
collection for 1994? State the  
percentage of total waste paper you  
intend to  
collect: \_\_\_\_\_

Date goal is to be achieved by:

\_\_\_\_\_

Signature \_\_\_\_\_

## Part II. Buying Recycled Products

What percentage (0%-100%) of your  
total paper purchases in 1993  
consisted of paper and paper products  
containing recycled paper fiber?:

Estimate as needed:

\_\_\_\_\_

### Purchasing Goals

What is your 1994 goal for your  
recycled paper purchasing program?  
Estimate percent of total purchases:

\_\_\_\_\_

Date goal is to be achieved by:

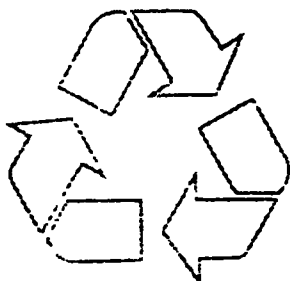
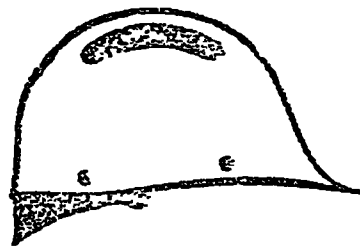
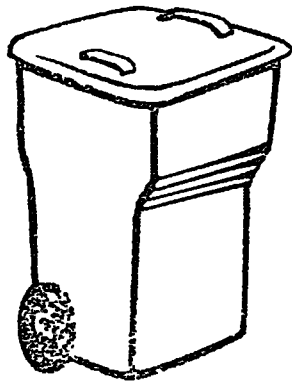
\_\_\_\_\_

Date: \_\_\_\_\_

(NOPRP)



# Jobs Through Recycling Initiative



Across America, more individuals, organizations, businesses, and governments are collecting materials for recycling than ever before. In fact, the number of curbside recycling programs has increased 500 percent over the past five years, to over 6,600 nationwide! Existing and new businesses can put these valuable resources to work producing new recycled products.

In addition to diverting materials from landfills, these recycling businesses also create employment opportunities. Recycling is estimated to create nearly five times as many jobs as landfilling. To support the growth of recycling businesses and to stimulate job creation, the U.S. Environmental Protection Agency (EPA) has launched its *Jobs Through Recycling Initiative*.

## What Is the Goal of the Initiative?

*Jobs Through Recycling* fosters businesses that:

- Put to productive use recovered materials that would otherwise be landfilled or incinerated.
- Employ innovative technologies to use recovered materials collected in recycling programs.
- Stimulate economic growth and create jobs.

## How Are Jobs Being Created?

EPA is supporting state, tribal, and national efforts to provide technical, financial, and other assistance to businesses that process and use recovered materials. Growth in these recycling businesses creates new jobs, ranging from low- and semi-skilled jobs in material sorting and processing, to skilled jobs in the manufacturing

sector and related fields. Recycling research and development efforts create jobs for engineers and chemists. Building new processing and manufacturing plants creates jobs for construction workers, equipment suppliers, transportation companies, planners, and consultants. Urban areas, especially, have large supplies of recovered materials, an available labor force, and underutilized buildings that can be used to address unemployment and solid waste problems simultaneously.

## How Are Recycling Businesses Being Fostered?

The *Jobs Through Recycling Initiative* is helping states and Native American Tribes to provide technical and business assistance to recycling enterprises. EPA is funding selected states and tribes to establish Recycling and Reuse Business Assistance Centers (RBACs) and Recycling Economic Development Advocate (REDA) positions. The initiative also will create a recycling technology information network to aid recycling businesses.



**Recycled/Recyclable**  
Printed with Soy/Canola Ink on paper that  
contains at least 50% post-consumer recycled fiber

## Recycling and Reuse Business Assistance Centers

A is funding the states of California, Minnesota, New York, and North Carolina to establish Recycling and Reuse Business Assistance Centers (RBACs). Each center provides a unique mix of technical, business, financing, and marketing assistance to existing and new recycling enterprises.

### California's RBAC – Integrated Waste Management Board

In partnership with California's Trade and Commerce Agency Business Environmental Center, 30 Small Business Development Centers, and 40 Recycling Market Development Zones, the state's Integrated Waste Management Board will provide one-stop financing, process engineering, technical, and regulatory assistance to recycling businesses.

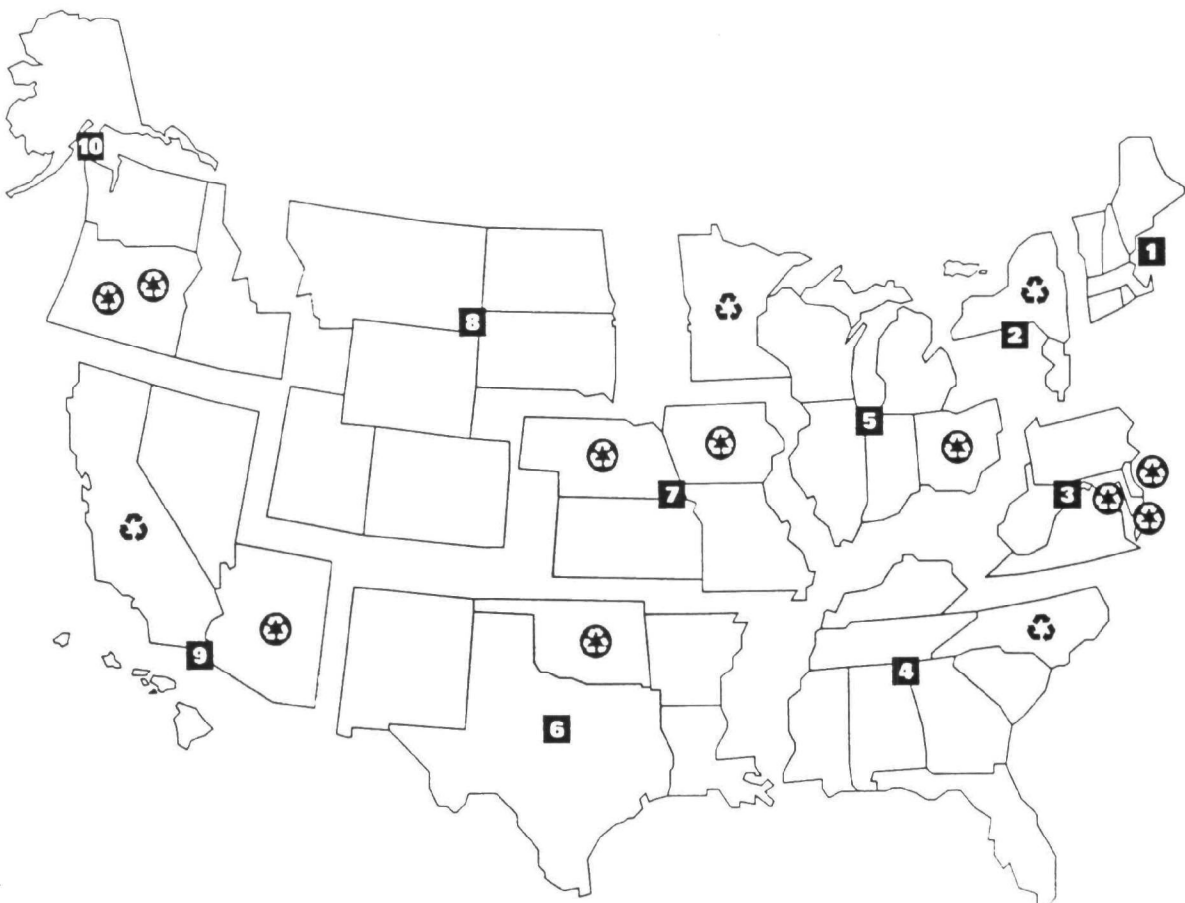
### New York's RBAC – Department of Economic Development

New York's Department of Economic Development will work with a local community

development corporation to initiate public-private joint ventures to implement paper recovery programs, reduce the disposal burden associated with recycled paper mill sludges, develop wood reclamation and recycling facilities, assist businesses in source separating and marketing selected materials, initiate research and development to advance recycling of durable plastics, and build a more efficient postconsumer plastics infrastructure within the state.

### North Carolina's RBAC – Department of Environment, Health, and Natural Resources

In North Carolina, the state's Department of Environment, Health, and Natural Resources will work with the state Department of Commerce to provide technical assistance to recycling businesses and manufacturers in using recovered materials. It will also provide training to foster understanding and communication between the recycling and economic development communities, and expand existing capacity for recyclable and reusable materials through a demonstration project targeting difficult-to-market commodities.



Minnesota's Office of Environmental Assistance will partner with the state's Department of Trade and Economic Development and Technology Extension Center to remove barriers to increased use of recovered materials in the wood fiber, plastics, and composites industries.

## **Recycling Economic Development Advocate**

The initiative is also funding a Recycling Economic

Development Advocate (REDA) in nine states and one tribe. The REDA is a business development professional with a recycling background. Located in the state or tribal economic development office, each REDA will focus on recycling market development as a job creation and economic development strategy. To assist new and existing recycling businesses, REDAs also will provide coordination among their offices, solid waste programs, manufacturing extension services, and other business development efforts within the state or tribe.

Each of the following states and tribe is hosting a REDA:

**Arizona**—Department of Commerce

**Delaware**—Development Office

**District of Columbia**—Office of Economic Development

**Iowa**—Department of Economic and Employment Development

**Maryland**—Department of Economic Development

**Nebraska**—Department of Economic Development

**Ohio**—Department of Development

**Oklahoma**—Department of Commerce

**Oregon**—Economic Development Department

**Siletz Tribe (Oregon)**—Economic Development Office

## **Partnership's National Network**

The *Jobs Through Recycling Initiative* is supporting the development of a national information network to facilitate the sharing of innovative recycling technologies and other technical information. EPA is partnering with the National Recycling Coalition and the National Institute of Standards and Technology (NIST), within the Department of Commerce, to establish and operate this national network as part of NIST's Recycling Technology Assistance Partnership (ReTAP). The recycling information network will include an easily accessible

database on recycled materials use practices, new technological developments, and innovative applications for recovered materials.

Through the network, EPA will identify barriers to the use of recovered materials and develop an agenda to find solutions through government, industry, and university research programs. The National Network will be a valuable information resource for manufacturers, businesses, innovators, and entrepreneurs. It will be linked electronically to NIST's network of manufacturing extension centers. NIST will develop 100 of these centers across the nation by 1997 to help small and mid-size manufacturers become more competitive. The engineers in the NIST centers will have the information necessary to identify opportunities for manufacturers to use recovered materials in place of virgin materials. Use of recovered materials can make a manufacturer more efficient and therefore more competitive, and strengthens markets for these materials.

## **For Additional Information**

The RBACs and REDAs will begin operating in October 1994. For additional information on this initiative, contact your EPA Regional Office. For information of ReTAP's National Network contact the National Recycling Coalition at 202 625-6406.

## **EPA Regional Office Contacts for the *Jobs Through Recycling Initiative***

**EPA Region 1** (CT, MA, ME, NH, RI VT)  
JFK Federal Building  
(HER-CAN6)  
Boston, MA 02203-2211  
Cynthia Greene  
617 223-5531

**EPA Region 2** (NJ, NY, PR, VI)  
26 Federal Plaza  
(II-AWN)  
New York, NY 10278  
Jenine Tankoos  
212 264-1369

**EPA Region 3** (DE, DC, MD, PA, VA, WV)  
841 Chestnut Street  
(3HW53)  
Philadelphia, PA 19107  
Theresa Martella  
215 597-7936

**EPA Region 4** (AL, FL, GA, KY, MS, NC, SC, TN)  
345 Courtland Street, NE.  
(4WD-RCRAFF)  
Atlanta, GA 30365  
Robin Mitchell  
404 347-3555 X6425

**EPA Region 5** (IL, IN, MI, MN, OH, WI)  
77 West Jackson Boulevard  
(HRP-8J)  
Chicago, IL 60604  
Paul Ruesch  
312 886-7598

**EPA Region 6** (AR, LA, NM, OK, TX)  
1445 Ross Avenue, Suite 1200  
(68-HH)  
Dallas, TX 75202-2733  
Ed Curran  
214 655-6723

**EPA Region 7** (IA, KS, MO, NE)  
726 Minnesota  
(RCRA-SPG)  
Kansas City, KS 66101  
Dave Flora  
913 551-7523

**EPA Region 8** (CO, MT, ND, SD, UT, WY)  
999 18th Street  
(8HWM-RJ)  
Denver, CO 80202-2405  
Ayn Schmit  
303 293-1845

**EPA Region 9** (AZ, CA, HI, NV)  
75 Hawthorne Street  
(H-3-1)  
San Francisco, CA 94105  
Kivi Leroux-Duncan  
415 744-2080

**EPA Region 10** (ID, OR, WA, AK)  
1200 6th Avenue  
(HW-107)  
Seattle, WA 98101  
John Dumas  
206 553-6522

**EPA Headquarters**  
401 M Street, SW (5306)  
Washington, DC 20460  
Tim Jones  
202 260-7920  
Kim Carr  
202 260-7600



# WasteWise Tip Sheet

## Buying or Manufacturing Recycled Products



### WasteWise Program Elements

- Waste Prevention
- Recycling Collection
- **Buying or Manufacturing Recycled Products**

#### What Is "Buying Recycled"?

"Buying recycled" means purchasing recycled products (products made with recovered materials). A necessary precedent to "buying recycled" is that manufacturers purchase recovered materials and use them in lieu of virgin materials in the manufacture of new products.

#### What Are the Benefits of Buying or Manufacturing Goods with Recycled Content?

Purchasing recycled products or recovered materials for manufacturing conserves valuable landfill space by using goods made from materials that otherwise would have been discarded. Using recycled products and packaging also conserves natural resources and energy. In addition, purchasing recycled products promotes the continued manufacture of these products and helps strengthen markets for collected materials.

#### How Does Purchasing Recycled Products and Recovered Raw Materials Fit into the WasteWise Program?

This component of the WasteWise program helps to "close the recycling loop" by encouraging the manufacture and purchase of products containing recovered materials, thus providing more customers for the recyclable materials that companies and communities are collecting.

Companies in the WasteWise program commit to purchasing products with *preconsumer* or *postconsumer* recycled content in lieu of products manufactured from virgin materials. If a company is already buying recycled products, it also has the option of purchasing products with an increased percentage of *preconsumer* or *postconsumer* recycled content. Participants are asked to monitor their progress over the calendar year and report annually on the amount of money spent on the purchase of recycled products.

Manufacturers also have the option of increasing the percentage of *postconsumer* content in a product or product line they manufacture. Manufacturers who choose this option will monitor their progress over the calendar year and report annually on the increase of *postconsumer* content in each product or product line selected.

Other elements of the WasteWise program include a commitment to implement significant waste prevention activities and to expand or improve programs to collect recyclable materials.



Recycled/Recyclable

Printed on paper that contains at least 50% recycled fiber.

## What Do Recycled Content Terms Mean?

The terminology used to refer to recycling, recycled products, and recovered raw materials can seem confusing. The following definitions are provided to help clarify some of these terms.

- **Recycled content.** The portion of a product, by weight or volume, that is composed of preconsumer and/or postconsumer recovered materials.
- **Preconsumer materials.** Materials recovered for recycling prior to use by the consumer, excluding materials and by-products generated from and commonly reused within an original manufacturing process. Examples of preconsumer recovered materials are envelope cuttings and scrap from plastic manufacturing.
- **Postconsumer materials.** Materials that have served their intended use as consumer items and have been recovered or diverted from solid waste for recycling. Examples of postconsumer recovered materials include used beverage containers and old computer printouts.

The percentage of recovered materials used in a product or within product categories can vary significantly. For example, corrugated boxes can be made from 0 to 40 percent postconsumer materials. Generally, higher levels of recycled content are desirable, but other factors, such as performance requirements, will likely need to be considered in your purchase decision.

Although WasteWise does not require that you seek out products with postconsumer content, EPA encourages businesses to do so in order to create markets for materials that have been collected by businesses and communities. Manufacturers that choose to increase the recycled content in their products as their WasteWise commitment are required to select *postconsumer* materials in order to help build markets for materials collected by businesses and communities.

## What Kind of Products Are Available with Recycled Content?

A wide variety of products are now available with recycled content, including:

- |                                 |                          |
|---------------------------------|--------------------------|
| ■ Paper and paperboard products | ■ Bicycle racks          |
| ■ Retread tires                 | ■ Wall panels            |
| ■ Oil                           | ■ Sign posts             |
| ■ Insulation                    | ■ Garbage bags           |
| ■ Road building materials       | ■ Fiberboard             |
| ■ Erasable boards               | ■ Furniture              |
| ■ Mulch                         | ■ Fences and fence posts |
| ■ Geotextiles                   | ■ Sign posts             |
| ■ Plastic pipe                  | ■ Office products        |
| ■ Plastic desk accessories      | ■ Wastebaskets           |
| ■ Outdoor benches and tables    | ■ Carpeting              |
| ■ Playground equipment          | ■ Binders                |



## **Do Products and Raw Materials with Recovered Material Content Cost More Than Virgin Products and Materials?**

The cost-competitiveness of recovered materials and products is highly variable and dependent on the specific product or material, and supply and demand market forces. For example, in the past, paper made with recovered content was often considerably more expensive than virgin paper. Today, however, the price of many types of recycled paper is comparable to that of virgin paper. As more recycled products of all types are purchased, manufacturers increasingly will realize economies of scale, and prices should tend to decrease and stabilize.

## **Are Recycled Products and Recovered Raw Materials of High Quality?**

In the past, some recycled products did not perform as well as their virgin counterparts. Today, however, recycled products are manufactured to meet the same performance standards as virgin products. Work with your vendors to purchase recycled products that meet your needs and specifications. When considering any new product, whether it is made from virgin or recovered materials, it is advisable to obtain samples and, if necessary, to test the products on your equipment and with your end users.

When using recovered raw materials to manufacture recycled products, the key to quality is securing reliable quantities of clean, homogenous materials. The quality of recovered materials should meet your operation's technical specifications. Be sure to consider performance standards or applicable regulations before switching to recovered raw materials.

## **How Do We Start or Improve Our "Buy Recycled" Program?**

A program to preferentially purchase recycled products should involve end users, operations staff, and company purchasing managers. You can start buying recycled by determining which products and raw materials used by your company are available with recycled content. Select these as an alternative to virgin products or materials, where possible. To get started, you may want to begin with one or a few product categories.

You should review contract specifications and revise them to encourage suppliers to provide recycled content products and raw materials. Companies sometimes require more stringent product specifications than are actually needed. For example, many companies have very high paper brightness standards for applications where high brightness is not necessary. Reviewing and revising paper brightness standards would facilitate the purchase of recycled paper.

## **Sources of Additional Information**

**The Buy Recycled Guide.** This guide describes the basics of purchasing products with recycled content and provides state information and contacts.

Buy Recycled Business Alliance  
National Recycling Coalition  
1101 30th Street NW., Suite 305  
Washington, DC 20007  
202 625-6406

**The Official Recycled Products Guide.** \$155 per single issue, \$275 per year for updates and a monthly newsletter. This is a comprehensive catalogue of recycled products, indexed by product category and recovered material content. It also contains an extensive reference section

American Recycling Market, Inc.  
P O Box 577  
Ogdensburg, NY 13669  
800 267-0707

**McDonald's McRecycle USA, March 1992. Free.** This 206-page reference provides information focused on recycled construction materials and products.

McDonald's Corporation  
McDonald's Plaza  
Oak Brook, IL 60521  
800 220-3809

**Buy Recycled Training Manual, December, 1993.**

**\$20.00.** Although the audience for this training manual is government agencies, the information also is applicable to the private sector.

Richard Keller  
The Northeast Maryland Waste Disposal Authority  
25 South Charles Street, Suite 2105  
Baltimore, MD 21401  
410 333-2730

**The Business and Government Buyers Guide to Recycled Products, 1992. \$24.95.** This 166-page document provides general information on buying recycled with specific information on markets in California.

Buy Recycled Campaign  
Californians Against Waste Foundation  
926 J Street, Suite 606  
Sacramento, CA 95814  
916 443-8317

**Resource Guide to Office Products Manufacturers, Recycling, Products, and Programs, 1993. \$20.00.**

This 71-page book lists companies that sell recycled-content office products.

National Office Products Association  
301 N. Fairfax Street  
Alexandria, VA 22314  
703 549-9040

**WASTE  
WISE**



WasteWise is a partnership between EPA and America's leading businesses. Participants set their own waste prevention, recycling, and recycled product purchasing goals. WasteWise supports company efforts through technical assistance and recognition of participants' successes.

For more information about any aspect of WasteWise, call 800 EPAWISE (800 372-9473).

## Recycling and Reuse Business Assistance Centers

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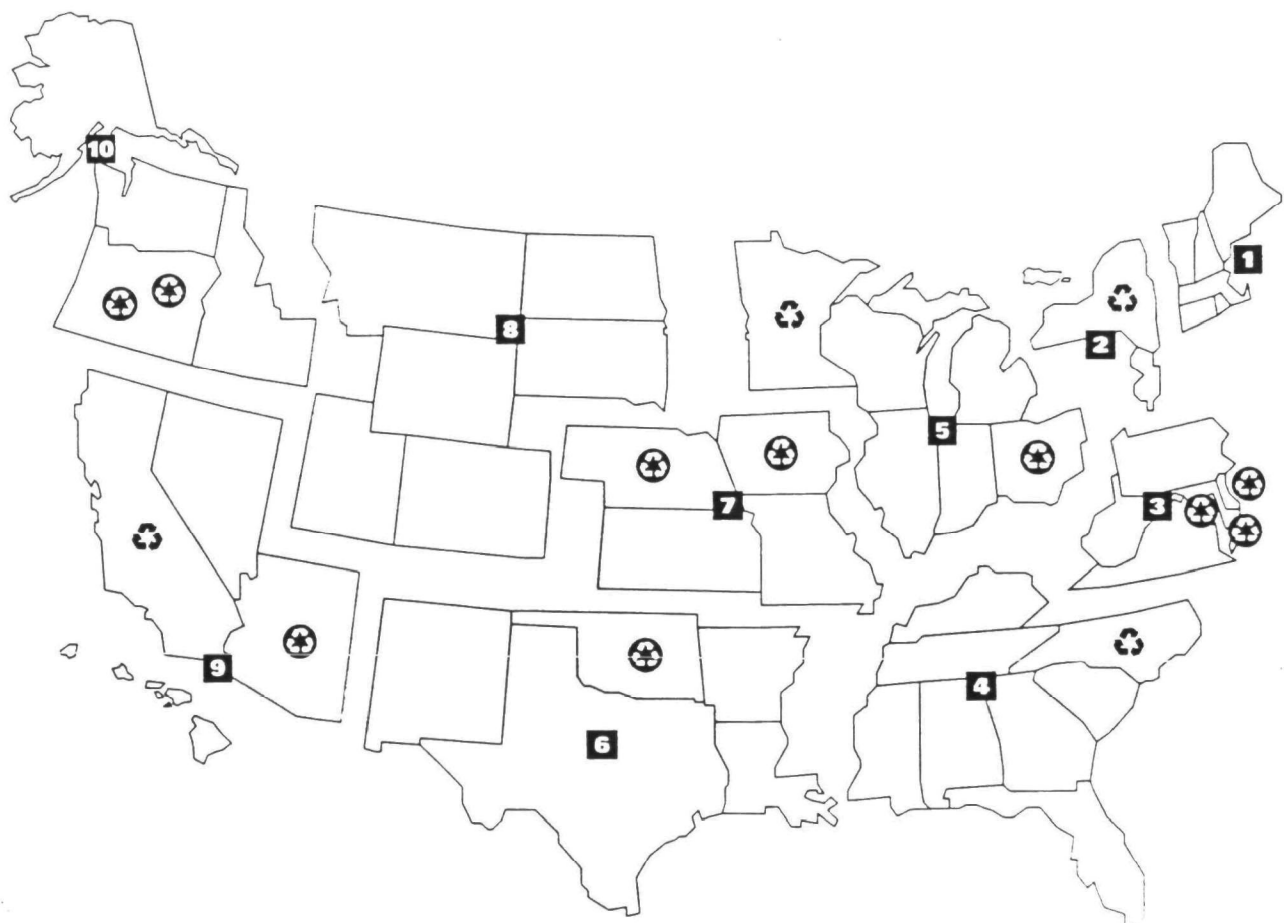
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# CHARTER MEMBERS

WASTE  
WISE



COMMITMENT TO  
ENVIRONMENTAL LEADERSHIP



WASTE  
WISE



# Welcome

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*June 17, 1994*

*Thanks to the leadership and initiative of the 281 companies listed here, EPA's WasteWiSe program is off to a running start. I am pleased to welcome each of our Charter Members and commend them for their commitment to solid waste reduction as demonstrated by participation in the WasteWiSe program.*

*WasteWiSe is another outstanding partnership between EPA and the business community. Participating companies reduce waste through programs which they design to fit their operations, and gauge their progress each year. EPA provides WasteWiSe members with technical assistance and recognition for their efforts. We will also keep the public informed of these companies' collective achievements. WasteWiSe members take action in three areas: waste prevention, collecting materials for recycling, and increasing the purchase or manufacture of recycled products. Through waste reduction we have the opportunity to make significant environmental and economic gains because reducing, reusing, and recycling materials conserves natural resources and energy and reduces greenhouse gas emissions.*

*While each of the three waste reduction areas is critical to a holistic program, I am especially enthusiastic about the opportunities we have to prevent waste in the first place. As with other types of pollution prevention, waste prevention is the most effective way to cut pollution and conserve resources, and usually results in substantial cost savings that can reach millions of dollars per year. I urge WasteWiSe members, and all other organizations, to aggressively implement waste prevention programs by working with customers, employees, and suppliers to trim waste at the source whenever practical.*

*WasteWiSe charter members can be proud of their commitment and their leadership role in waste reduction. We at EPA applaud them and pledge our support as they strive for success in their waste reduction efforts.*

*Sincerely,*

A handwritten signature in cursive script, appearing to read "Carol M. Browner".

Carol M. Browner  
Administrator, Environmental Protection Agency



# Introduction

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With the registration of these charter members, the WasteWiSe program begins its inaugural year with a great promise. The same promise spurred the creation of other successful EPA voluntary partnerships: by working together in partnership, EPA and the business community can achieve impressive environmental gains efficiently and at a rapid pace. The fact that these actions to prevent pollution also bring major cost savings further strengthens the mutual benefit of voluntary programs to business and the public.

The organizations listed here represent a diverse range of operations, size, and previous experience in solid waste reduction efforts. About half of our WasteWiSe charter members are Fortune 500 or Service 500 companies. The remainder include other large companies as well as single-facility operations, trade associations, and small offices. Business operations covered include the manufacture of consumer products, automobiles, electronics, textiles, forest products, and heavy equipment; electric utilities; communications; medical services, hotels and restaurants, and other services.

Most of the charter members have some experience in one of the three areas of waste reduction, especially collection of recyclables and, to a lesser extent, buying recycled products. Some have sophisticated waste prevention programs, and others are eager to find the waste prevention opportunities in their organizations. The next steps for each WasteWiSe member are to conduct a facility assessment as needed, determine their waste reduction goals and communicate them to EPA, and begin the real work of making waste reduction happen at their facilities.

To support the efforts of WasteWiSe members, EPA will provide program support, specific opportunities for recognizing achievements, and technical assistance materials with a special emphasis on waste prevention. We will need to work together to make the WasteWiSe program an outstanding success over the next several years. We invite all WasteWiSe members to suggest how we can better support your waste reduction efforts. To do so, please call the WasteWiSe hotline at 1-800-EPAWISE.



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# Charter Members

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## AEROSPACE

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### **B.F. Goodrich Aircraft Evacuation Systems**

Phoenix, AZ

Gran/Spencer, WV, Miami, FL,  
Seattle, WA ..... 530 employees

### **Boeing Company**

Seattle, WA

WA & OR facilities ..... 83,000

### **Martin Marietta Corp.**

Littleton, CO

All US facilities ..... 92,786

## AIRLINES

---

### **American Airlines**

DFW Airport, TX

All domestic locations ..... 87,896

## BANKING, FINANCIAL AND SAVINGS

---

### **Bank of America**

San Francisco, CA

All locations ..... 96,000

### **Barnett Banks, Inc.**

Jacksonville, FL

Corporate headquarters ..... 200

### **Commerce Bank of St. Louis**

St. Louis, MO

Corporate headquarters &  
area branches ..... 4,500

### **Deposit Guaranty National Bank**

Jackson, MS

Corporate headquarters ..... 500

### **Fannie Mae**

Washington, DC

5 locations ..... 2,800

### **Fidelity Federal Bank**

Glendale, CA

Corporate, administration, & all  
branches ..... 1,000

### **First Commerce Corp. of Louisiana**

New Orleans, LA

All locations ..... 4,500

### **First Virginia Banks, Inc.**

Falls Church, VA

Corporate headquarters & regional  
offices ..... 3,500





## CHARTER MEMBERS

### BANKING, FINANCIAL AND SAVINGS (CONTINUED)

---

#### **Fleet Financial Group**

Providence, RI

Corporate & regional facilities ..... 20,000 employees

#### **Freddie Mac**

McLean, VA

Corporate headquarters ..... 2,500

#### **MBNA Corp.**

Newark, DE

All locations ..... 8,000

#### **Mellon Bank Corp.**

Pittsburgh, PA

Headquarters ..... 10,000

#### **Peoples Bank**

Bridgeport, CT

Corporate headquarters ..... 1,400

#### **Republic National Bank**

New York, NY

All locations ..... 4,000

#### **Signet Banking Corp.**

Richmond, VA

Corporate headquarters & operations center ..... 2,000

#### **Society Bank**

Cleveland, OH

Corporate headquarters ..... 2,500

#### **State Street Bank & Trust Company**

Boston, MA

Adams, Quincy, Palmer & Willard Buildings ..... 5,700

#### **Wachovia Corp.**

Winston Salem, NC

Data centers, operations centers, branches ..... 15,000

### BEVERAGES

---

#### **Anheuser-Busch Companies, Inc.**

St. Louis, MO

Corporate headquarters ..... 3,500

#### **Anheuser-Busch, Inc.**

St. Louis, MO

All 13 breweries ..... 13,000

#### **Coors Brewing Company**

Golden, CO

All plants ..... 6,000

#### **Glass Packaging Institute**

Washington, DC

DC headquarters & regional offices ..... 21

#### **National Soft Drink Association**

Washington, DC

Association offices ..... 40

#### **Pepsi-Cola Company**

Purchase NY

Corporate headquarters & plants ..... 1,800

#### **The Coca-Cola Company**

Atlanta, GA

Corporate headquarters ..... 4,500

#### **Very Fine Products**

Westford, MA

All facilities ..... 500



## CHARTER MEMBERS

### BUILDING MATERIALS

---

#### **American Standard Inc.**

New York, NY

12 facilities . . . . . 2,000 employees

#### **Lafarge Corp.**

Reston, VA

Corporate & regional offices . . . . 300

### CHEMICALS AND PHARMACEUTICALS

---

#### **Abbott Laboratories**

Abbott Park, IL

Corporate headquarters, N Chicago &  
K Complex facilities . . . . . 14,000

#### **Allergan, Inc.**

Irvine, CA

All worldwide manufacturing  
facilities . . . . . 1,000

#### **BASF Corp.**

Parsippany, NJ

Container Coatings R&D site . . . 77

#### **Dow Corning Corp.**

Midland, MI

All US sites . . . . . 5,000

#### **E.I. duPont de Nemours & Company, Inc.**

Wilmington, DE

All US facilities . . . . . 90,000

#### **Eli Lilly & Company**

Indianapolis, IN

Indianapolis plant sites . . . . . 5,500

#### **Hercules, Inc.**

Wilmington, DE

Corporate headquarters . . . . . 900

#### **Hoffman-La Roche Inc.**

Nutley, N.J.

Nutley facility . . . . . 5,500

#### **Johnson & Johnson Corporate**

New Brunswick, NJ

Corporate-wide . . . . . 80,000

#### **Monsanto Company**

St. Louis, MO

Corporate headquarters . . . . . 7,500

#### **Monsanto Company - Environmental Health Laboratory (EHL)**

St. Louis, MO

EHL . . . . . 90

#### **Monsanto Company - Luling Plant**

Luling, LA

Luling plant . . . . . 620

#### **Morton International, Inc.**

Chicago, IL

Cincinnati facility . . . . . 175

#### **Muralo Company, Inc.**

Bayonne, NJ

All plants . . . . . 150

#### **Nutrasweet**

Augusta, GA

Augusta site . . . . . 400

#### **S.C. Johnson & Son, Inc.**

Racine, WI

Corporate headquarters & Waxdale,  
SC manufacturing plant . . . . . 2,600

#### **Searle & Company**

Skokie, IL

Northern IL  
operations . . . . . 2,000 employees



## CHARTER MEMBERS

### CHEMICALS AND PHARMACEUTICALS (CONTINUED)

---

#### **Shell Oil Company**

Houston, TX

Shell Development Co. .... 1,200

#### **Sterling Chemicals, Inc.**

Houston, TX

Corporate headquarters & Texas City  
facility. .... 1,200

#### **The DuPont Merck Pharmaceutical Company**

Wilmington, DE

All plants .... 4,148

#### **The Hall Chemical Company**

Wickliffe, OH

Wickliffe, OH & Arab,  
AL plants .... 150

#### **The Lubrizol Corp.**

Wickliffe, OH

Corporate headquarters & R&D  
facility. .... 1,500

#### **The Lubrizol Corp.**

Painesville, OH

Manufacturing facility .... 500

#### **Union Carbide Corp.**

Danbury, CT

All US facilities .... 10,000

#### **VANEX, Inc.**

Mt. Vernon, IL

One manufacturing plant, warehouse,  
office, lab .... 30

#### **Warner-Lambert Company**

Morris Plains, NJ

All plants .... 6,000

#### **Wellman, Inc.**

Shrewsbury, NJ

All plants .... 3,400

### COMMUNICATIONS

---

#### **AT&T**

New York, NY

All facilities .... 250,000

#### **Bell Atlantic Corp.**

Philadelphia, PA

All facilities .... 73,000

#### **BellSouth Corp.**

Atlanta, GA

Corporate headquarters .... 700

#### **BellSouth Telecommunications, Inc.**

Atlanta, GA

All facilities .... 75,000

#### **NYNEX Corp.**

New York, NY

All telecommunications  
facilities .... 80,000

#### **Sentinel Communications Corp.**

Orlando, FL

All plants .... 1,400

### COMPUTERS, OFFICE EQUIPMENT

---

#### **Compaq Computer Corp.**

Houston, TX

All plants .... 7,000

#### **Hewlett Packard Company**

Palo Alto, CA

All US  
operations .... 58,000 employees



## CHARTER MEMBERS

### COMPUTERS, OFFICE EQUIPMENT (CONTINUED)

---

#### **UNISYS Corp.**

Blue Bell, PA

Corporate headquarters, Twin Cities  
operations..... 5,000

### CONSULTING AND RESEARCH SERVICES

---

#### **Access Research Corp.**

Carlsbad, CA

Corporate headquarters..... 40

#### **Americlean Environmental Services**

Long Beach, CA

All facilities ..... 500

#### **Battelle Memorial Institute**

Columbus, OH

Corporate headquarters..... 3,000

#### **Betterworld, Inc.**

Lauderdale, FL

Office ..... 7

#### **Cape Environmental Management, Inc.**

Atlanta, GA

Corporate headquarters..... 35

#### **Center for Applied Engineering, Inc.**

St. Petersburg, FL

Corporate headquarters..... 116

#### **Don Clay Associates, Inc.**

Washington, DC

Corporate offices ..... 8

#### **Environmental Engineering Consultants**

Whitman, MA

All plants & clients ..... 100

#### **For the Future**

Linwood, NJ

Office ..... 4

#### **Garbage Collection**

Oakland, CA

All facilities . . . . . 9

#### **ICF Inc.**

Fairfax, VA

Corporate headquarters ..... 2,000

#### **Longwood Environmental Management Inc.**

Belmont, MA

Corporate facilities ..... 5

#### **NOVA Environmental Services, Inc.**

Craska, MN

All offices..... 62

#### **Patrick Engineering, Inc.**

Springfield, IL

Regional office..... 9

#### **Prete Wilmot Associates**

Nashville, TN

Main office..... 5

#### **Recycle Resources, Inc.**

Durham, NC

Office ..... 11

#### **Resource Strategies Corp.**

Eden Prairie, MN

2 office locations ..... 8

#### **The Sear-Brown Group, Inc.**

Rochester, NY

Corporate  
headquarters ..... 220 employees

#### **Tunheim Santrizos Company**

Bloomington, MN

One office..... 34



## CHARTER MEMBERS

### EDUCATION

---

#### **Keep Texas Beautiful**

Austin, TX

Office ..... 8

#### **Minnesota Chamber of Commerce**

St. Paul, MN

Offices ..... 22

#### **University of Colorado**

Boulder, CO

Boulder campus ..... 8,000

### ELECTRONICS AND ELECTRONICS EQUIPMENT

---

#### **Advanced Micro Devices, Inc.**

Sunnyvale, CA

Sunnyvale & Santa Clara, CA;  
Austin, TX ..... 5,700

#### **AMP, Inc.**

Marysburg, PA

Corporate headquarters & all  
domestic facilities ..... 14,000

#### **E-Systems, Inc.**

Dallas, TX

All plants ..... 16,000

#### **ESCOD Industries, Inc.**

Taylorsville, NC

Taylorsville plant ..... 125

#### **Goulds Pumps, Inc.**

Seneca Falls, NY

All facilities in Seneca Falls ... 2,000

#### **Grote Industries, Inc.**

Madison, WI

Madison plant ..... 900

#### **LSI Logic Corp.**

Milpitas, CA

Fremont, Milpitas &  
Santa Clara, CA sites ..... 1,500

#### **MAYTAG**

Newton, IA

Clarence, Galesburg, Herrin,  
Indianapolis, Jackson, Jefferson City  
& Newton sites ..... 8,160

#### **Mitsubishi Electric America, Inc.**

Cypress, CA

All plants ..... 4,000

#### **Motorola, Inc.**

Schaumburg, IL

All 30 US manufacturing  
facilities ..... 50,000

#### **NEC Electronics**

Roseville, CA

Roseville plant ..... 1,700

#### **OECO Corp.**

Milwaukee, OR

Corporate headquarters ..... 500

#### **Rockwell International Corp.**

Seal Beach, CA

Seal Beach world  
headquarters site ..... 2,000

#### **Stewart Connector Systems, Inc.**

Glen Rock, PA

Glen Rock plant .... 252 employees

#### **Texas Instruments, Inc.**

Dallas, TX

All plants ..... 30,000

#### **Thomson Consumer Electronics**

Indianapolis, IN

Corporate  
headquarters ..... 220



## CHARTER MEMBERS

### ENTERTAINMENT

---

#### **Busch Entertainment Corp.**

St. Louis, MO

All facilities ..... 15,000

### FOOD AND GROCERY STORES

---

#### **AG Processing, Inc.**

Omaha, NE

Selected plants ..... 500

#### **ARA Services, Inc.**

Philadelphia, PA

Corporate headquarters ..... 1,000

#### **Campbell Taggart, Inc.**

St. Louis, MO

All plants ..... 17,000

#### **General Mills, Inc.**

Minneapolis, MN

Corporate headquarters, all food  
& R&D facilities ..... 10,000

#### **Giant Food, Inc.**

Lancaster, MD

Corporate headquarters  
& all stores ..... 24,000

#### **Hawkeye Food Systems, Inc.**

Iowa City, IA

All plants ..... 200

#### **Land O' Lakes, Inc.**

Arden Hills, MN

Corporate headquarters & specific  
plants ..... 1,000

#### **Larry's Markets**

Seattle, WA

All facilities ..... 770

#### **Stonyfield Farm Yogurt**

Londonberry, NH

All facilities ..... 100

#### **The Great A&P Tea Company, Inc.**

Montvale, NJ

Corporate headquarters ..... 800

#### **Tidyman's**

Greenacres, WA

Corporate office & 10 stores in  
WA, ID, MT ..... 1,563

### FOREST PRODUCTS

---

#### **3M**

St. Paul, MN

Corporate headquarters  
& all plants ..... 40,000

#### **Fort Howard Corp.**

Green Bay, WI

All facilities ..... 5,600

#### **Georgia-Pacific Corp.**

Atlanta, GA

Corporate headquarters, regional  
office buildings, and selected  
manufacturing  
sites ..... 3,000 employees

#### **Gerster Farms, Inc.**

White Plains, NY

Corporate headquarters & regional  
facilities ..... 15

#### **Ketchikan Pulp Company**

Ketchikan, AK

Ketchikan, Annette Henlock mills;  
logging camps; flight dept. .... 1,000

#### **Louisiana-Pacific - Western Division**

Samoa, CA

All Western Division  
plants ..... 1,200



## CHARTER MEMBERS

### FOREST PRODUCTS (CONTINUED)

---

#### **NEPTCO, Inc.**

Pawtucket, RI

All domestic plants ..... 400

#### **Phoenix Paper Products**

Lostant, IL

Plant and offices ..... 10

#### **Recycled Office Products Company**

Peabody, MA

Corporate headquarters ..... 6

#### **Scott Paper Company**

Philadelphia, PA

All US facilities ..... 15,000

#### **Sonoco Products Company**

Hartsville, SC

Corporate headquarters & Hartsville  
production facility ..... 2,200

#### **Stone Container Corp.**

Chicago, IL

All facilities ..... 20,000

#### **Valiant Paper & Packaging**

Moonachie, NJ

All facilities ..... 15

#### **Weyerhaeuser Company**

Tacoma, WA

Various pulp, paper & packaging  
businesses ..... 16,500

#### **Wisconsin Tissue**

Menasha, WI

All Menasha facilities ..... 1,300

### FURNITURE

---

#### **Haworth, Inc.**

Holland, MI

West Michigan facilities ..... 2,948

#### **Office Plan, Inc.**

St. Paul, MN

Office ..... 21

### HOTELS AND RESTAURANTS

---

#### **Admiral Fell Inn**

Baltimore, MD

Inn ..... 38

#### **Baldpate Inn, Ltd.**

Estes Park, CO

All facilities ..... 35

#### **Detlef's Honolulu**

Honolulu, HI

Restaurant ..... 20

#### **Gilbert/Robinson Restaurants**

Kansas City, MO

Corporate headquarters & 95  
restaurants ..... 8,000 employees

#### **Green Gables Inn & Restaurant**

Beach Haven, NJ

Inn & Restaurant ..... 12

#### **Haussner's Restaurant**

Baltimore, MD

Restaurant ..... 121

#### **La Cazuela Restaurant**

Northampton, MA

Restaurant ..... 30

#### **Marquette Hotel**

Minneapolis, MN

Hotel ..... 190

#### **McDonalds Corp.**

Oak Brook, IL

All 9,300 US restaurants .... 750,000



## CHARTER MEMBERS

### HOTELS AND RESTAURANTS (CONTINUED)

---

#### **McLouis Restaurant, Inc.**

Montvale, NJ

Restaurant ..... 20

#### **Miami Valley Restaurant Association**

Kettering, OH

Education association ..... 200

#### **Mt. Bachelor Ski Summer Resort**

Bend, OR

Corporate office, all lodges,  
restaurants & facilities ..... 800

#### **Perry Restaurant Group**

Shelburne, VT

Corporate headquarters &  
7 restaurants ..... 350

#### **Wyndham Hamilton Northwest Chicago**

Itasca, IL

Northwest Chicago facility ..... 450

### INDUSTRIAL AND FARM EQUIPMENT

---

#### **Harnischfeger Industries, Inc.**

Brockfield, WI

All US facilities ..... 7,500

#### **Ingersoll-Rand Company**

Woodcliff Lake, NJ

All manufacturing plants ..... 25,000

#### **Kennametal, Inc.**

Latrobe, PA

All facilities ..... 500

#### **Link-Belt Construction Equipment Company**

Lexington, KY

Corporate headquarters & Lexington,  
KY facility ..... 600

#### **Lockheed Commercial Electronics Company**

Hudson, NH

Commercial Electronics Company  
location ..... 475

#### **Parker Hannifin Corp.**

Cleveland, OH

Corporate headquarters ..... 350

#### **United Technologies Carrier**

Indianapolis, IN

Residential Products Group -  
2 plants ..... 2,400 employees

#### **United Technologies Corp.**

Hartford, CT

Corporate headquarters ..... 600

### INSURANCE

---

#### **Aetna**

Hartford, CT

All locations ..... 42,000

#### **Marsh & McLennan Companies, Inc.**

New York, NY

Corporate headquarters ..... 2,200

#### **Massachusetts Mutual Life Insurance Company**

Springfield, MA

Corporate headquarters ..... 4,000

#### **New York Life Insurance Company**

New York, NY

Corporate headquarters ..... 5,000





## CHARTER MEMBERS

### INSURANCE (CONTINUED)

---

#### **State Farm Mutual Automobile Insurance Company**

Bloomington, IL

Corporate, regional and  
field offices ..... 64,000

#### **The New England Mutual Life Insurance Company**

Boston, MA

Corporate Headquarters ..... 2,000

#### **UNUM Life Insurance Company of America**

Portland, ME

Corporate headquarters & all  
Portland facilities ..... 3,500

#### **USF&G Corp.**

Baltimore, MD

Corporate headquarters ..... 2,000

### MEDICAL SERVICES

---

#### **Columbia Presbyterian Medical Center**

New York, NY

All facilities ..... 7,500

#### **Humana, Inc.**

Louisville, KY

Regional facility ..... 2,700

#### **North Jersey Nursing Center**

Wayne, NJ

All facilities ..... 100

#### **Passaic Beth Israel Hospital**

Passaic, NJ

Hospital ..... 800

#### **Regional Medical Center**

Madisonville, KY

Medical Center ..... 1,200

#### **Robert Wood Johnson University Hospital**

New Brunswick, NJ

Hospital ..... 2,500

#### **St. Mary's Hospital**

Passaic, NJ

Hospital ..... 900

### METALS AND METALS PRODUCTS

---

#### **American Iron & Supply Company**

Minneapolis, MN

Minneapolis facility ..... 50

#### **Amsted Industries, Inc.**

Chicago, IL

Corporate headquarters ..... 74

#### **Bath Iron Works Corp.**

Bath, ME

Main yard, Hardings plant, East Brunswick  
manufacturing facility & Portland  
yard ..... 8,000

#### **Bethlehem Steel Corp.**

Bethlehem, PA

Corporate headquarters ..... 1,000

#### **Blount, Inc.**

Montgomery, AL

Corporate headquarters & all US  
plants ..... 4,500

#### **Crown Cork & Seal Company, Inc.**

Philadelphia, PA

All plants ..... 12,151



## CHARTER MEMBERS

### METALS AND METALS PRODUCTS (CONTINUED)

---

#### **Coeur d'Alenes Company**

Spokane, WA

All facilities including Stock  
Steel ..... 75

#### **Hillenbrand Industries, Inc.**

Batesville, IN

All facilities ..... 10,000

#### **Holston Defense Corp.**

Kingsport, TN

Holston Army Ammunition  
plant ..... 800

#### **Inland Steel Company**

East Chicago, IN

Indiana Harbor  
Works ..... 9,000

#### **Kaman Aerospace Corp.**

Bloomfield, CT

Bloomfield aerospace  
operations ..... 1,000

#### **LTV Steel Company**

Cleveland, OH

Corporate headquarters ..... 800

#### **Metal Container Corp.**

St. Louis, MO

Corporate headquarters &  
all plants ..... 2,000

#### **Phelps Dodge Corp.**

Phoenix, AZ

Corporate headquarters ..... 255

#### **Steel Recycling Institute**

Pittsburgh, PA

Corporate headquarters ..... 23

#### **United Scrap Metal, Inc.**

Cicero, IL

All offices and plants ..... 50

#### **U.S. Steel Clairton Works**

Clairton, PA

USS Clairton Works ..... 1,600

#### **U.S. Steel Gary Works**

Gary, IN

USS Gary Works ..... 8,053

#### **U.S. Steel - Minntac**

Mountain Iron, MN

Minntac facility ..... 1,750

#### **Weirton Steel Corp.**

Weirton, WV

Env'tl Control Dept .. 90 employees

#### **Zurn Industries, Inc.**

Erie, PA

All facilities ..... 2,600

### MINING, CRUDE OIL PRODUCTION

---

#### **ARCO Alaska, Inc.**

Anchorage, AK

AAI-Alaska facilities ..... 2,400

#### **ASARCO, Inc.**

New York, NY

Salt Lake City facilities ..... 100

#### **Oryx Energy Company**

Dallas, TX

Corporate headquarters ..... 1,093

#### **Texaco, Inc.**

White Plains, NY

8 facilities ..... 5,000



## CHARTER MEMBERS

### MOTOR VEHICLES AND PARTS

---

#### **Chrysler Corp.**

Highland Park, MI

All facilities ..... 128,000

#### **Ford Motor Company**

Dearborn, MI

Ford Twin Cities plant, 4 engine  
operation plants, climate control  
division..... 13,700

#### **General Motors Corp.**

Detroit, MI

All plants ..... 300,000

#### **Mercedes Benz of North America, Inc.**

Montvale, NJ

Corporate headquarters..... 700

#### **Navistar International Transportation Corp.**

Chicago, IL

All US operations..... 12,500

#### **Varity Corp.**

Buffalo, NY

Corporate headquarters..... 48

### PETROLEUM REFINING

---

#### **CITGO Petroleum Corp.**

Tulsa, OK

Corporate headquarters..... 1,000

#### **Kerr McGee Corp.**

Oklahoma City, OK

Corporate headquarters..... 1,500

#### **Mobil Corp.**

Reston, VA

Corporate headquarters and 55  
other facilities ..... 32,295

#### **Murphy Oil Corp.**

El Dorado, AR

Corporate  
headquarters ..... 300

#### **Pennzoil Company**

Houston, TX

Corporate headquarters & selected  
refineries ..... 2,000

#### **Quaker State Corp.**

Oil City, PA

All facilities ..... 2,000

#### **Tesoro Petroleum Corp.**

San Antonio, TX

Corporate  
headquarters ..... 150 employees

#### **Total Petroleum, Inc.**

Denver, CO

Corporate headquarters ..... 300

### PRINTING AND PUBLISHING

---

#### **Educational Development Specialists**

Lakewood, CA

Distribution office..... 8

#### **McGill/Jensen Graphic Arts**

St. Paul, MN

One facility ..... 400

#### **Scott Publishing, Inc.**

Edmonds, WA

Corporate headquarters ..... 8

### RETAIL

---

#### **Bunzl USA**

Edison, NJ

Corporate office..... 4



## CHARTER MEMBERS

### RETAIL (CONTINUED)

---

#### **Frigidaire Company - Freezer Products**

St. Cloud, MN

Freezer Products  
facility..... 1,600

#### **Johnsons Department Store**

Monticello, MN

Three facilities..... 50

#### **Minnesota Retail Merchants Association**

St. Paul, MN

Office ..... 5

#### **Target Stores**

Minneapolis, MN

All stores ..... 100,000

#### **Wal-Mart Stores, Inc.**

Bentonville, AR

Corporate headquarters & regional  
facilities ..... 520,000

### RUBBER AND PLASTICS PRODUCTS

---

#### **HIE Corp.**

Brenham, TX

All plant locations..... 50

#### **M.A. Hanna Company**

Cleveland, OH

All business units ..... 6,334

#### **O'Sullivan Corp.**

Winchester, VA

All plastics division facilities;  
VA, MA, PA, NV ..... 869

### SCIENTIFIC AND PHOTOGRAPHIC EQUIPMENT

---

#### **Acuson Corp.**

Canoga Park, CA

Canoga Park facility ..... 35

#### **Baxter International Inc.**

Deerfield, IL

All facilities ..... 40,000

#### **EG&G, Inc.**

Wellesley, MA

All facilities ..... 30,000 employees

#### **Eastman Kodak Corp.**

Rochester, NY

Kodak Park.... 17,000

#### **Millipore Corp.**

Bedford, MA

Burlington, Milford, MA;  
Jaffrey, NH; Cidra, PR..... 1,500

#### **Perkin-Elmer Corp.**

Norwalk, CT

Norwalk and Wilton, CT sites. 1,500

#### **Polaroid Corp.**

Cambridge, MA

All Massachusetts facilities ... 7,500

#### **Xerox Corp.**

Stamford, CT

All facilities ..... 95,000

### SOAPS AND COSMETICS

---

#### **Clorox Company**

Oakland, CA

All facilities ..... 6,000



## CHARTER MEMBERS

### SOAPS AND COSMETICS (CONTINUED)

---

#### **Lever Brothers Corp.**

New York, NY

Corporate headquarters . . . . . 1,000

#### **Proctor & Gamble Company**

Cincinnati, OH

Corporate headquarters and  
selected manufacturing  
facilities . . . . . 30,000

#### **Safety-Kleen Corp.**

Evanston, IL

All US facilities . . . . . 5,300

### TEXTILES

---

#### **Avondale Mills**

Syracusa, AL

Corporate office & all plants . . . 3,800

#### **Burlington Industries, Inc.**

Greensboro, NC

All plants . . . . . 25,000

#### **Cone Mills Corp.**

Greensboro, NC

Corporate headquarters &  
all plants . . . . . 8,000

#### **Copland Fabric, Inc. and Copland, Inc.**

Burlington, NC

All plants . . . . . 650

#### **Dan River Inc.**

Danville, VA

Manufacturing facility . . . . . 5,000

#### **Dyersburg Fabrics, Inc.**

Dyersburg, TN

Dyersburg facility . . . . . 1,350

#### **Galey & Lord Industries, Inc.**

Greensboro, NC

All plants . . . . . 3,500

#### **New Cherokee Corp.**

Sevierville, TN

Harris, Spindale &  
Sevierville . . . . . 1,380 employees

#### **Opp & Micolis Mills**

New York, NY

All facilities . . . . . 1,050

#### **Russell Corp.**

Alexander City, AL

Corporate headquarters & AL  
manufacturing facility . . . . . 8,000

#### **Southern Mills, Inc.**

Union City, GA

Corporate office and all  
manufacturing facilities . . . . . 600

#### **Springs Industries, Inc.**

Fort Mill, SC

All plants . . . . . 20,000

#### **Textile Rental Services Association**

Hallandale, FL

Corporate headquarters . . . . . 22

#### **The Apparel Group**

Louisville, KY

Manufacturing plant &  
warehouse . . . . . 1,000

#### **Wellington Sears Company**

Vailey, AL

Corporate office . . . . . 100

### TOYS AND SPORTING GOODS

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#### **HASBRO, Inc.**

Pawtucket, RI

All facilities . . . . . 7,000



## CHARTER MEMBERS

### TOYS AND SPORTING GOODS (CONTINUED)

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#### **Nike, Inc.**

Beaverton, OR

Corporate headquarters . . . . . 2,500

#### **Radio Flyer, Inc.**

Chicago, IL

Plant . . . . . 110

#### **Wilson Sporting Goods**

Fountain Inn, SC

Fountain Inn manufacturing  
plant . . . . . 450

### TRANSPORTATION

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#### **CSX Transportation, Inc.**

Jacksonville, FL

All shops &  
offices . . . . . 31,000

#### **Federal Express Corp.**

Memphis, TN

Corporate headquarters  
& major hubs . . . . . 40,000

### TRANSPORTATION EQUIPMENT

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#### **Andrew Corp.**

Orland Park, IL

Corporate headquarters . . . . . 1,200

#### **St. Louis Refrigerator Car Company**

St. Louis, MO

All facilities . . . . . 425

### UTILITIES

---

#### **American Electric Power Service Corp.**

Columbus, OH

Corporate headquarters & 10 operating  
offices . . . . . 3,762 employees

#### **Baltimore Gas & Electric Company**

Baltimore, MD

Corporate headquarters, regional  
facilities & all plants . . . . . 8,000

#### **Colonial Pipeline Company**

Atlanta, GA

Corporate headquarters . . . . . 200

#### **Commonwealth Edison Company**

Chicago, IL

All facilities . . . . . 18,000

#### **Consumers Power Company**

West Olive, MI

J.H. Campbell Complex . . . . . 380

#### **Detroit Edison Company**

Detroit, MI

All facilities . . . . . 8,900

#### **El Paso Natural Gas Company**

El Paso, TX

Corporate headquarters . . . . . 1,200

#### **Enserch Corp.**

Dallas, TX

All facilities . . . . . 3,000

#### **Florida Power & Light**

North Palm Beach, FL

Central reclamation  
& salvage facility . . . . . 12,400

#### **Florida Power Corp.**

St. Petersburg, FL

Corporate headquarters . . . . . 1,000



## CHARTER MEMBERS

### UTILITIES (CONTINUED)

---

#### **Illinois Power Company**

Decatur, IL

All facilities ..... 4,000

#### **Long Island Lighting Company**

Hicksville, NY

All facilities ..... 6,500

#### **Northeast Utilities Service Company**

West Springfield, CT

All facilities ..... 10,000

#### **Northern States Power Company**

Minneapolis, MN

28 facilities in Minnesota,

South Dakota & North

Dakota ..... 5,000

#### **PECO Energy**

Philadelphia, PA

Corporate headquarters and

selected facilities ..... 2,000

#### **Public Service Electric & Gas Company**

Newark, NJ

All facilities ..... 12,000

#### **The Southern Company**

Atlanta, GA

All facilities ..... 30,000

#### **Virginia Power**

Chen Allen, VA

All facilities ..... 12,000

#### **Western Resources**

Topeka, KS

All areas ..... 5,200 employees

### WASTE MANAGEMENT

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#### **Browning-Ferris Industries, Inc.**

Houston, TX

Corporate

headquarters ..... 750

#### **WMX Technologies, Inc.**

Oak Brook, IL

Corporate headquarters ..... 1,100

#### **Auto-Chlor System**

Memphis, TN

All plants ..... 300

 Recycled/Recyclable.

Printed on paper that contains at least  
10% post-consumer recycled fiber.

*from:*

**COMPENDIUM OF NEW ENGLAND RECYCLING DIRECTORIES**

**OCTOBER, 1993**

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# **RECYCLING SERVICES DIRECTORY**

## **and Markets Guide for Massachusetts**

**August 1993**

Massachusetts Executive Office of Environmental Affairs  
Department of Environmental Protection  
Division of Solid Waste Management  
One Winter Street, 4th Floor  
Boston, MA 02108

The *Recycling Services Directory* lists vendors who accept, collect or purchase recyclable materials from Massachusetts communities and businesses. This resource supplements local yellow pages by describing markets for recyclables which go beyond the local area code. The Department of Environmental Protection (DEP) welcomes additions and corrections to either the recyclable material or vendor categories. Please complete and return the attached "update form".

To receive additional copies of the *Recycling Services Directory*, call 617-292-5960 or return the attached order form. The directory is free to public officials and municipal recycling committee members. Listings are subject to change, and do not represent endorsement by the DEP.

### **Contents:**

	<b><u>Page</u></b>
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List of End-Markets, Mills, and MRF Operators	9
Other Sources of Recycling Market Information	10
Massachusetts Regional Recycling Associations	11
Update / Order Forms	12

## Description of Materials Recycled in Massachusetts:

### ANTIFREEZE

page 6

See "Special Wastes."

### ASPHALT

page 7

See "Wood and Construction Debris". Prices charged range from \$2 to \$4/ton.

### BOTTLES AND CANS

page 4

Food and drink containers are grouped together because many companies collect both bottles and cans. Deposit containers are the easiest to recycle - take them back to your grocer, or look under "redemption" in the yellow pages. Non-deposit containers, such as juice bottles, steel (tin) cans, and aluminum trays should be rinsed and free of stray materials.

### CAR BATTERIES

page 6

See "Special Wastes." Individual car batteries can be returned to their place of purchase. For larger quantities, most battery hauling and recycling firms will require that batteries be stacked on a pallet and be free of cracks or leaks. Some firms require that all wet cell caps be intact and that the pallet be banded, boxed or otherwise held in place. The seller may also have to provide a forklift for loading the buyer's vehicle.

Because they can cause serious harm to watertables, car batteries have been banned from disposal at landfills and incinerators as per regulation CMR 19.017. For more information, please refer to DEP's Lead Acid Batteries Ban For Solid Waste Disposal Facilities ... Guidance Document #1, 1990. Call (617) 292-5960.

### CONSTRUCTION & DEMOLITION DEBRIS

page 7

See "Wood and Construction Debris". Also known as "C & D" debris, the category includes bricks, concrete and other masonry materials, soil, rock, wall coverings, drywall, plumbing fixtures, insulation, roofing shingles, asphalt, glass, metal, wood waste and electrical wires. On-site sorting of debris by material allows for the best reuse of material.

### COMPUTER and OFFICE SUPPLIES

page 4

See "Office Supplies, Computers". Today, the number of laser cartridge refurbishing companies has expanded faster than our list. Empty cartridges can either be sold or donated for refilling, or exchanged for refilled cartridges. Entire computers can also be "recycled" — more accurately, they are repaired or sold for precious metals scrap.

### CURBSIDE CONTRACTORS

page 4

See "bottles and cans". Companies who contract their own multi-material collection vehicles for picking up many different recyclable materials at from residents' homes. Towns can expand their options by leasing their own collection vehicles, or by contracting separately for newspaper collection. See "rubbish", "garbage", or "waste hauling" in the yellow pages.

### DEPOSIT CONTAINERS

page 5

By state law, carbonated beverage containers must bear a 5¢ deposit, redeemable at retail establishment which sells the containers (so long as the container is empty, clean, and uncrushed). Vending machine operators will often redeem empty containers wherever they refill vending machines. In addition, many deposit "Redemption Centers" exist solely or primarily to redeem deposits. Check the yellow pages or the listing in this directory.

### GLASS

page 4

See "Bottles and Cans". The glass industry requires that colored and clear glass be separated and clean of all foreign objects. Never try to recycle ceramics (dinner plates), stone, gravel, dirt, plastic, or metal with glass. The glass industry identifies glass colors as follows: flint is clear, amber is brown, and emerald is green.

### HAZARDOUS WASTES

Not listed

Hazardous waste possesses at least one of four characteristics: ignitability, corrosivity, reactivity or toxicity, or it appears on special EPA lists. Questions regarding hazardous waste should be directed to the Office of Technical Assistance for Toxic Use Reduction at (617) 727-3260 x696 or DEP Division of Hazardous Waste at (617) 292-5859.

### METAL

page 6

See "Ferrous and Non-Ferrous Metals, Auto Parts". Ferrous metal will stick to a magnet. Non-Ferrous does not. Most non-ferrous metals retain a significant scrap value. Scrap automobiles account for most of the ferrous metal recycled in Massachusetts; most scrap auto yards will take other ferrous metal as well. Collectors who specialize in non-ferrous metals usually pay cash for moderate quantities of material.

Ferrous examples:  
Steel, Cast Iron,  
"Tin"

Non-Ferrous examples:  
Aluminum, Brass,  
Copper, Lead

## MOTOR OIL

page 6

See "Special Wastes." By law, automotive stores must accept back the motor oil they sell if accompanied by a receipt. Sears Automotive and some Mobil and Exxon stations will take it without a receipt. Call the DEP Used Oil Hot-line to learn the location of the nearest drop-off: (617) 556-1022.

## PAPER

page 4

Paper recyclers usually require paper to be separated by grade. The general grades are listed and defined below.

High Grades:	Low Grades:
Computer print-out (CPO)	Cardboard (OCC)
White ledger (office paper)	Newspaper & Magazines
Colored ledger (office paper)	Mixed office paper

Not all low grade recyclers accept every low grade.

## PLASTIC

page 5

Single plastic resin containers are the easiest to recycle. Used plastic containers need to be cleaned and separated by resin to be marketed. The numbers listed below identify the plastic resin from which the containers have been made. The numbers are surrounded by three chasing arrows and appear at the bottom of the containers. Unfortunately, the numbers do not tell the whole story — different HDPE plastics, for example, sometimes go to different end-users. Many recyclers refer to items specifically (e.g. clear milk jugs) to ensure easy separation.

#1 PETE	Polyethylene Terephthalate. Most PET is recyclable through deposit. (e.g. soda bottles)
#2 HDPE	High Density Polyethylene. Clear HDPE is easier to recycle than colored. (e.g. milk & water jugs, detergent bottles)
#3 PVC	Vinyl/Polyvinyl Chloride (e.g. vegetable oil, shampoo and window cleaner bottles)
#4 LDPE	Low Density Polyethylene (e.g. trash bags, 6-pack rings, flexible lids)
#5 PP	Polypropylene (lids, closure caps, snack food wrap)
#6 PS	Polystyrene (i.e. styrofoam, clear brittle cups)
#7 Other	All other resins and layered multi-material

## TIRES

page 6

See "Special Wastes". Whole tires have been banned from disposal at landfills. DEP provides information on scrap tire management in a document entitled Scrap Tire Management In Massachusetts: Questions And Answers For Municipal Waste Management Officials. This document also includes information on tire shredding. The document is available by calling (617) 292-5960.

## WHITE GOODS

page 6

See "Special Wastes". White goods are large appliances which include water heaters, dishwashers, refrigerators, freezers, gas and electric ranges, clothes washers and dryers. The ferrous metals in the white goods are easy to recycle. However, the electrical cords and capacitors have caused headaches for some scrap metal dealers, so we have listed this category separately from scrap metals. Many retailers will offer to haul away old appliances when they deliver new ones — the old ones get recycled in bulk.

DEP provides information on white goods management in a document entitled White Goods Management In Massachusetts: Questions And Answers For Municipal Waste Management Officials. Call (617) 292-5960.

## YARD WASTE & COMPOSTING

page 7

Includes prunings, bulky wood yard waste (i.e. trees, large branches, and stumps), leaves and grass clippings. These materials are often ground up by landscaping and nursery businesses. DEP's Composting Program has more information available — call (617) 292-5834.



## BOTTLES AND CANS

Also refer to your local yellow pages or business yellow pages under:  
 "Recycling", "Redemption Centers", or "Rubbish Haulers"

A.G. Battencourt, Inc	Glass	Westport	(508) 636-4009
A.W. Martin, Inc.	Glass	New Bedford	(508) 993-4359
All-Brands Container Recovery	Alum, Glass	Wakefield	(617) 246-9970
Anchor Glass Container Corp.	Glass - All Colors	Dayville, CT	(203) 774-9636
Automated Recycling	Alum, Glass, Tin, Curbside	W. Bridgewater	(800) 640-7565
Boston Food Coop	Alum, Glass, Tin	Allston	(617) 787-1417
Boston Can	Alum, Glass	Boston	(617) 247-3120
Brockton Iron & Steel Co.	Alum, Tin Cans	Brockton	(508) 586-4640
Browning-Ferris Industries	Alum, Glass, Tin, Curbside	Boston	(617) 265-0500
Browning-Ferris Industries	Alum, Glass, Tin, Curbside	Brockton	(508) 580-1511
Burlington Recyclers	Glass - All colors	Burlington	(617) 229-5790
C.B. Trucking	Curbside	Medway	(508) 533-4584
Callahan Trucking	Alum, Glass, Tin, Curbside	Pittsfield	(413) 442-8390
Clean Environment Co.	Alum, Glass, Tin, Curbside	N. Billerica	(508) 250-4800
Conigliaro Industries	Alum, Glass, Tin	Framingham	(508) 872-9668
Container Recycling Alliance	Glass - All Colors	Mansfield	(508) 339-6067
Container Svcs. (A Waste Mgt. Co)	Alum, Glass, Tin, Asceptic	Walpole	(508) 660-1804
Day's Recycling	Alum, Glass, Tin, Curbside	Greenfield	(413) 772-0364
E. L. Harvey	Alum, Glass, Tin	Westborough	(800) 321-3002
Environmental Action	Alum, Glass, Tin, Curbside	North Adams	(413) 664-4936
Foster Forbes	Glass - All Colors	Milford	(508) 478-2500
Frank Rubbish Removal	Alum, Glass, Tin, Curbside	Millbury	(508) 865-5935
Hudson Trucking	Alum, Glass, Tin	Greenfield	(413) 773-9677
Jet-A-Way	Alum, Glass, Tin	Roxbury	(617) 541-4000
Laidlaw	Alum, Glass, Tin, Curbside	Revere	(617) 289-0500
Maine Beverage Container	Alum, Glass	Portland, ME	(207) 774-0735
No. Atlantic Recycling Svcs.	Alum, Glass	North Andover	(508) 682-5442
P.E. Allen & Sons	Alum, Tin	Northampton	(413) 584-3040
Patriot Metals	Tin Cans	Worcester	(508) 798-3333
Pine Street Inn	Alum, Glass	Boston	(617) 482-4944
Prins Recycling Center	Alum, Glass, Tin, Curbside	Charlestown	(617) 242-7746
Recycling Enterprises	Glass	Oxford	(508) 949-2797
Regional Resource Recovery	Curbside	Worcester	(508) 752-3223
Resource Recovery Systems Inc.	Alum, Glass, Tin, Asceptic	Essex, CT	(203) 767-7057
So. Shore Recycling (Waste Mgt. Co)	Glass	Plymouth	(508) 830-0030
The Master Garbologist	Alum, Glass, Tin	New Marlboro	(413) 229-3442
Vining Co/Environmental Ideas	Alum, Glass, Steel, Curbside	Stoneham	(617) 279-0006
Waste Management of Central MA	Alum, Glass, Tin, Curbside	West Boylston	(800) 698-8785
Wood Enterprises	Glass - Clear only	Whately	(413) 665-7634

## OFFICE AND COMPUTER SUPPLIES

Also refer to your local yellow pages or business yellow pages under:  
 "Computer Supplies" or "Office Supplies"

Boston Can	Laser Printer Cartridges	Boston	(617) 247-3120
Copy Inks	Laser Printer Cartridges	Canton	(617) 344-2679
Earthworm, Inc. GBR	Laser Printer Cartridges	Somerville	(617) 628-1844
Electronics Processing Assocs.	Computers, Electron. Equip.	Lowell	(508) 970-2700
Laser Perfect	Laser Printer Cartridges	Peabody	(508) 532-4600
Laser-Mate	Laser Cartridges, Fax Paper	Waltham	(617) 894-MATE
LaserSaver	Laser & Copier Toner Carts.	Bridgewater	(508) 697-2888
LaserStar	Laser Printer Cartridges	Woburn	(617) 932-8667
LaserTone	Laser Printer Cartridges	Wayland	(508) 358-5626
Media Recovery Inc.	MagTape, Comp. Ribbons, Cartr	Canton	(617) 821-2350
Nashua Corporation	Laser Printer Cartridges	Exeter, NH	(800) 333-3439
Omni, Inc.	Computer Keyboards & mice	Lowell	(508) 934-5004
Print Recovery Concepts	Ink Ribbons, Pr Cartridge	Waterboro, ME	(800) 397-7269
Recycling Technologies Int'l	Laser Printer Cartridges	Springfield	(413) 739-8889

## PAPER RECYCLERS

Also refer to your local yellow pages or business yellow pages under:  
 "Recycling", "Rubbish Haulers", or "Waste Paper"

A.W. Martin, Inc.	All Grades	New Bedford	(508) 993-4359
AAA Paper Recycling	High Grades	N. Oxford	(508) 987-0186
Acme Metals and Recycling	High Grades	Springfield	(413) 737-3112
American Paper Recycling Corp.	All Grades	Mansfield	(508) 339-5551
Automated Recycling	Alum, Glass, Tin, Curbside	W. Bridgewater	(800) 640-7565
Basic Waste Systems	High Grades, OCC	Medford	(617) 396-1177
Bay State Paper Recycling	High Grades, OCC	E. Douglas	(508) 476-3212

COMPANY NAME:	MATERIALS:	CITY:	TELEPHONE:
Berkshire Clean-Way	High Grades, OCC	Dalton	(413) 684-0165
Browning-Ferris Industries	All Grades	Boston	(617) 265-0500
Browning-Ferris Industries	All Grades	Brockton	(508) 580-1511
Callahan Trucking	All Grades	Pittsfield	(413) 442-8390
Capital Paper Recycling	High Grades	Plympton	(617) 585-4901
Center House	High Grades	Boston	(617) 426-3535
Conigliaro Industries	High Grades, OCC	Framingham	(508) 872-9668
Container Svcs. (A Waste Mgt. Co)	High Grades	Walpole	(508) 660-1804
Corrugated Recycling Inc.	OCC	Weymouth	(800) 427-5765
Data Destruction/OPRS	High Grades	Woburn	(800) 762-6765
Day's Recycling	All Grades	Greenfield	(413) 772-0364
E. L. Harvey	All Grades	Westborough	(800) 321-3002
Earthworm, Inc. GBR	High Grades	Somerville	(617) 628-1844
Elm Fibers	All Grades	E. Longmeadow	(413) 567-1759
Environmental Action	OCC, News	North Adams	(413) 664-4936
Essex Waste Paper Co./P&T	All Grades	Lawrence	(508) 521-7419
F.M. Fibers	High Grades	Salem	(617) 242-0809
Ginsberg, B. & Co.	High Grades	Brockton	(508) 583-5700
Hanna Paper Recycling	High Grades	Sharon	(617) 784-5155
Harry Goodman & Sons	All Grades	Springfield	(413) 785-5331
Hudson Trucking	All Grades	Greenfield	(413) 773-9677
Jet-A-Way / Remble Waste	All Grades	Boston	(617) 541-4000
Laidlaw	All Grades	Revere	(617) 288-2841
Leominster Recycling	High Grades	Leominster	(508) 534-3269
Malden Waste Paper	High Grades	Malden	(617) 322-2337
Marcial	All Grades	Elmwood Pk, NJ	(201) 796-4000
McGinnis Recycling/City Shred	High Grades, OCC, News	Quincy	(617) 773-9901
Miller Recycling Corporation	All Grades	No. Attleboro	(800) 783-6766
NJM/Environmental	All Grades	Wollaston	(617) 570-0818
National Fiber Insulation	Newspaper	Belchertown	(413) 283-8747
National Recycling, Inc.	High Grades	Attleboro	(508) 226-1700
North Shore Recycled Fibers	All Grades	Weymouth	(617) 337-9800
North Shore Recycled Fibers	All Grades	Salem	(617) 289-9400
North Shore Recycled Fibers	All Grades	Webster	(508) 943-0853
Northeast Recycling Corp	All Grades	Ludlow	(413) 568-4500
Office Paper Recovery Systems	High Grades	Wilmington	(508) 694-1450
P. Allen & Sons	All Grades	Northampton	(413) 584-3040
Partyka Resource Management	High Grades, OCC	Chicopee	(413) 785-1581
Prins Recycling Center	All Grades	Charlestown	(617) 242-7746
Samuel Mirsky Corp	All Grades, OCC	New Bedford	(508) 993-9988
Save That Stuff	OCC	Boston	(617) 482-3878
Schirmer Paper Corp.	All Grades	Boston	(617) 723-5588
Second Chance Recycling	High Grades	Brattleboro, VT	(802) 254-9456
Shapiro & Sons, Inc.	All Grades	North Adams	(413) 663-6525
Sonoco Waste Paper Recycling	All Grades	Holyoke	(413) 536-9080
So. Shore Recycling (Waste Mgt. Co)	OCC, News	Plymouth	(508) 830-0030
Spiegel S. Co. (A Waste Mgt. Co)	All Grades, Phonebooks	Avon	(800) 696-9921
Sterling / C & J Trucking	All Grades, OCC, News	Billerica	(508) 663-7700
The Master Garbologist	OCC	New Marlboro	(413) 229-3442
The White Paper Project	High Grades	Boston	(617) 727-6223
Turner Trucking	All Grades	Lynn	(617) 595-3741
Vel-A-Tran	High Grades	Billerica	(508) 663-7266
Vining Co, Enviro. Ideas	All Grades	Stoneham	(617) 279-0006
Waste Management of Central MA	All Grades, OCC	West Boylston	(508) 835-6001
Waste Systems	High Grades	Cranston	(800) 972-4545
Wastepaper Corp of Worcester	All Grades	Webster	(508) 943-0727
West Lynn Recycling Co. Inc.	OCC, News	Lynn	(617) 592-0378
Wood Enterprises	All Grades	Whately	(413) 665-7634

# PLASTIC RECYCLERS

Also refer to your local yellow pages or business yellow pages under: "Recycling", "Rubbish Haulers", or "Scrap Plastic". Most need trailerload quantities

A.W. Martin, Inc.	HDPE, PET, PS	New Bedford	(508) 933-4359
ABC Disposal	PS	New Bedford	(508) 995-0544
Asian Export Inc.	HDPE, LDPE, PVC, PP, PS	Newton	(617) 332-7929
Berkshire Clean-Way	HDPE	Dalton	(413) 684-0165
Boston Food Coop	HDPE	Allston	(617) 787-1417
Brave New Garden	HDPE	Cambridge	(800) 853-2525
Browning-Ferris Industries	HDPE, PET	Brockton	(508) 580-1511
Casella Waste Management	HDPE, PET	Rutland, VT	(802) 775-9908
Clean Environment Co.	HDPE, PET, PS	No. Billerica	(508) 250-4800
Clean Environment Co.	HDPE, PET, PS	Chicopee	(413) 593-1306
Conigliaro Industries	HDPE, LDPE, PET, PP, PS	Framingham	(508) 872-9668
Denton Plastics, Inc.	HDPE, LDPE, PET, PP, PS, PVC	Portland, OR	(503) 257-9945
Diversified Svcs. In Plastics	HDPE, LDPE, PET, PP, PS	Leominster	(508) 537-4380
E. L. Harvey	HDPE, PET	Westborough	(800) 321-3002
Electronics Processing Assocs.	Engring Plastics-ABS, PS	Lowell	(508) 970-2700
EnviroPlastics	HDPE	Auburn	(508) 832-5095

## COMPANY NAME:

Environmental Resins Ltd.  
George Apkin & Sons, Inc.  
Goodwill Industries Plastic  
Jet-A-Way/Kemble  
L. Fine & Company  
Laidlaw  
Metropolitan Processed Mat'ls  
N. Atlantic Rec. Ser., Inc  
National Polystyrene Recycling  
North Shore Recycled Fibers  
Nyconn  
PET Recycling Services  
P.E. Allen & Son  
Plastic Resale Corp.  
Plastics Recovery Corp.  
Plastic Recyclers Inc.  
Prins Recycling Center  
Pro Pel Plastics  
PTI America Co.  
R2B2 (Resource Recovery)  
Recycling Enterprises  
RST Reclaiming, Inc.  
Samuel Mirsky Corp  
Save That Stuff  
Sherman Disposal  
Somers Sanitation  
So.Shore Recycling(Waste Mgt.Co)  
The Master Garbologist  
Vining Co, Enviro. Ideas  
Waste Management of Central MA  
wTe Recycling/Star  
Wood Enterprises

## MATERIALS:

HDPE, LDPE  
HDPE, PET, PVC  
HDPE, LDPE, PVC, PP, PS  
HDPE, PET  
HDPE, LDPE  
HDPE, PS  
HDPE, PET, PP, PS, PVC  
HDPE, PET  
Info on PS  
HDPE  
PET  
PS  
HDPE, PET  
All Plastic  
All Plastic  
HDPE  
HDPE, PET  
HDPE, LDPE, PET  
HDPE, PET, PVC  
HDPE, PET, PP, PS, PVC  
PET  
Computer Plastic  
HDPE  
HDPE  
HDPE, LDPE, PET, PP, PS  
PS  
HDPE, PET  
HDPE, PET, PP, PVC  
HDPE  
PET  
HDPE, PET  
HDPE

## CITY:

Marlborough  
North Adams  
Greenfield  
Roxbury  
Peabody  
Revere  
Somerville  
North Andover  
Bridgeport, NJ  
Weymouth  
New York, NY  
Haverhill  
Northampton  
W. Springfield  
New Haven, CT  
New Bedford  
Charlestown  
Whately  
Berlin  
Bronx, NY  
Oxford  
Lowell  
New Bedford  
Boston  
Boston  
E.Windsor, CT  
Plymouth  
New Marlboro  
Stoneham  
West Boylston  
Bedford  
Whately

## TELEPHONE:

(508) 568-9156  
(413) 664-4936  
(413) 774-3040  
(617) 541-4000  
(508) 532-2112  
(617) 289-0500  
(617) 623-3917  
(508) 682-5442  
(609) 467-9377  
(617) 337-9800  
(718) 392-1177  
(800) 692-0009  
(413) 584-3040  
(413) 739-1508  
(203) 785-0458  
(508) 991-8880  
(617) 242-7746  
(413) 665-3379  
(508) 838-0223  
(212) 731-3931  
(508) 949-2797  
(508) 453-3425  
(508) 993-9988  
(617) 482-3878  
(617) 442-6965  
(203) 623-2070  
(508) 830-0030  
(413) 229-3442  
(617) 279-0006  
(508) 835-6001  
(617) 275-6400  
(413) 665-7634

## SCRAP METAL RECYCLING

Also refer to your local yellow pages or business yellow pages under:  
"Junk", "Recycling", "Rubbish Haulers", or "Scrap Metal"

A.W. Martin, Inc.  
Alco Recycling Company  
Atlas Metals, Inc.  
Bay State Scrap  
Berlin Auto Parts  
Berkshire Clean-Way  
Bokser's Junk Shop  
Brockton Iron & Steel Co.  
Burlington Recyclers  
Castle Metal Co.  
Champagne Auto Exchange  
Day's Used Auto Parts  
Dupre's Salvage/Recycle  
Empire Scrap Metals, Inc.  
Enos Metals  
Faulkner Scrap Metal  
Framingham Salvage  
Frank Miller & Son  
General Metals and Smelting  
George Apkin & Sons, Inc.  
Ginsberg, B. & Co.  
Goldstein Scrap Metal  
H. Cohen & Sons  
J. Broomfield & Sons  
J. P. Carroll  
James Grant Co.  
John C. Tombarello & Sons  
Kramer Scrap Division  
Lenox Junk  
Lemonister Recycling  
Leroy & Co., Inc.  
M. Burnstein Co, Inc  
M. Kaplan & Co.  
M. Sugarman, Inc  
ML Norwood Auto Recycling  
Mid City Scrap & Salvage  
National Auto Clearing House  
Nissenbaum Auto  
P.E. Allen & Sons  
Patriot Metals  
Philip Lewis & Sons  
Prolerized New England

Non-Ferrous  
Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Auto Parts  
Ferrous & Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Non-Ferrous  
Auto Parts  
Auto Parts  
Auto Parts  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Auto Parts  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous, Auto  
Non-Ferrous  
Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Auto Parts  
Ferrous & Non-Ferrous  
Auto Parts  
Auto Parts  
Non-Ferrous  
Auto Parts  
Non-Ferrous  
Ferrous

New Bedford (508) 933-4359  
Edison, NJ (908) 225-9550  
Somerville (617) 666-8440  
Worcester (508) 753-3926  
Berlin (508) 838-2991  
Dalton (413) 684-0165  
Medford (617) 395-8810  
Brockton (508) 586-4640  
Burlington (617) 229-5790  
Boston (617) 482-7332  
Auburn (508) 832-6669  
Millbury (508) 756-2850  
No. Brookfield (508) 867-9898  
Worcester (508) 752-7750  
Taunton (508) 824-5425  
Worcester (508) 791-4802  
Framingham (508) 872-4393  
No. Attleboro (508) 695-0211  
Roxbury (617) 442-2050  
North Adams (413) 664-4936  
Boston (617) 426-5698  
Worcester (508) 754-5711  
South Boston (617) 542-3300  
Providence, RI (401) 785-2040  
Lexington (617) 861-6060  
Readville (617) 361-2716  
Lawrence (508) 682-5226  
Greenfield (413) 774-3103  
Dorchester (617) 288-2841  
Leominster (508) 534-3269  
Worcester (508) 752-1790  
Chelsea (617) 884-7700  
Everett (617) 389-4775  
Quincy (617) 479-1637  
North Grafton (508) 839-5934  
Westport (508) 675-7831  
Worcester (508) 755-6978  
Somerville (617) 776-0194  
Northampton (413) 584-3040  
Worcester (508) 798-3333  
Roxbury (617) 442-1250  
Everett (617) 389-8300

## COMPANY NAME:

## MATERIALS:

## CITY:

## TELEPHONE:

Prospect Iron and Steel  
R&R Industries  
Reisner, WM Corp  
Samuel Mirsky Corp  
Shapiro & Sons, Inc.  
Somerset Junk  
Starr Scrap Metal, Inc.  
State Line Scrap Co.  
Steel Searing & Baling Corp.  
Tewksbury Industries  
The Master Garbologist  
Universal Salvage  
West Lynn Recycling Co. Inc.  
Williamsett Waste Co.  
Winthrop Steel  
Wood Recycling, Inc.

Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous, Auto  
Ferrous  
Ferrous & Non-Ferrous  
Ferrous  
Non-Ferrous  
Non-Ferrous, Auto Parts  
Ferrous & Non-Ferrous

Somerville (617) 666-3405  
Springfield (413) 733-2118  
Clinton (508) 365-4585  
New Bedford (508) 993-9988  
North Adams (413) 663-6525  
Somerville (617) 623-9579  
Worcester (508) 791-0086  
So. Attleboro (508) 399-8300  
Worcester (508) 799-2133  
Tewksbury (508) 851-5946  
New Marlboro (413) 229-3442  
Salem (508) 744-0124  
Lynn (617) 595-3741  
Williamsett (413) 532-5315  
Fitchburg (508) 343-3627  
Peabody (508) 535-4144

## SPECIAL WASTES: CAR BATTERIES, FLUORESCENTS, MOTOR OIL, PAINT, TIRES, AND WHITE GOODS

See "Junk" or "Scrap Metal" in the yellow pages.

A&A Waste Oil  
A.W. Martin, Inc  
Acme Auto Salvage  
Acme Metals and Recycling  
Ad Tire Recycling, Inc.  
Advanced Environmental Technol.  
American Metals Rec., Inc.  
American Waste Oil  
Atlas Metals, Inc.  
Berlin Auto Parts  
Bill Murphy's Waste Oil  
Bob's Tire Company  
Brockton Iron & Steel  
Connecticut Waste Oil, Inc.  
Curboy Salvage  
E. L. Harvey  
Ecology Tire Co.  
Exeter Energy Project  
Exide Corporation  
F&B Enterprises, Inc.  
Framingham Salvage  
Full Circle Ballast  
George Apkin & Sons, Inc.  
Goldstein Scrap Metal  
J. P. Carroll  
John C. Tombarello & Sons  
Kidney Foundation Car Campaign  
Kramer Scrap Division  
Lenox Junk  
Linsky Recycling, Inc  
Main Line Tires  
Mayflower Salvage Co.  
Mid City Scrap & Salvage  
Millis Used Auto Parts  
Murphy's Waste Oil Service  
Nissenbaum Auto  
Oil Energy Recovery Inc.  
Oxford Tire Recycling  
Partyka Resource Management  
Phillip Lewis & Sons  
R & R Industries  
Roland's Tire Service  
Routhier & Sons, Inc.  
Shapiro & Sons, Inc.  
State Line Scrap, Inc.  
Tewksbury Metals  
The Green Paint Co.  
The Master Garbologist  
The Tire Pond  
Tires Into Recycl. Energy Sources  
Tolman Construction Services  
Trotta & Son Rubbish Removal  
Turner Trucking  
West Lynn Recycling Co. Inc.  
William F. Sullivan Co, Inc  
Wood Enterprises

Motor Oil  
White Goods  
Car Batteries  
Car Batteries  
Tires  
Fluorescent Lamps  
White Goods  
Motor Oil  
Car Batteries  
Car Batteries  
Antifreeze, Motor Oil  
Tires  
Car Batteries, White Goods  
Motor Oil, Oil Filters  
Car Batteries, White Goods  
Car Batteries  
Remould Tires  
Tires  
Car Batteries  
Tires  
Car Batteries  
Fluorescent Ballasts  
Car Batteries, White Goods  
Car Batteries, Non-Ferrous  
Car Batteries  
White Goods  
Unwanted cars & trucks  
Car Batteries, White Goods  
Car Batteries  
Car Batteries, Tires, White  
Tires  
Motor Oil  
White Goods  
Tires, White Goods  
Antifrz, Motor Oil & Filters  
Car Batteries  
Oil, Specification Fuel  
Tires  
Tires, White Goods  
Car Batteries, Non-Ferrous  
Tires, White Goods  
Tires  
Tires  
Car Batts, Textiles, Wh Gds  
Car Batteries, White Goods  
Car Batteries, White Goods  
Latex & Oil Base Paint  
White Goods  
Tires  
Tires  
Oil Filters  
White Goods  
White Goods  
White Goods  
White Goods  
White Goods

Waltham (617) 899-3348  
New Bedford (508) 993-4359  
No. Dartmouth (508) 993-7362  
Springfield (413) 737-3112  
Quincy (617) 773-8846  
Marlboro (508) 460-9960  
East Freetown (508) 763-9325  
Pawtucket, RI (401) 861-6243  
Somerville (617) 666-8440  
Berlin (508) 838-2991  
Woburn (617) 933-4928  
New Bedford (508) 997-8545  
Brockton (508) 586-4640  
Meriden, CT (203) 235-8889  
Sturbridge (508) 347-9650  
Westborough (800) 321-3002  
Acton (800) 597-3342  
Sterling, CT (203) 564-7000  
Reading, PA (215) 378-0500  
New Bedford (508) 999-4124  
Framingham (508) 872-4393  
Cambridge (617) 876-2229  
North Adams (413) 664-4936  
Worcester (508) 754-5711  
Lexington (617) 861-6060  
Lawrence (508) 682-5226  
Dedham (800) 542-4001  
Greenfield (413) 774-3103  
Dorchester (617) 288-2841  
Gloucester (508) 283-1893  
Acushnet (508) 995-0690  
Raynham (508) 880-6002  
Westport (508) 675-7831  
Millis (508) 376-8700  
Woburn (617) 272-4211  
Somerville (617) 776-0194  
Rollinsford, NH (603) 897-6040  
Plainfield, CT (800) 873-8473  
Chicopee (413) 785-1581  
Roxbury (617) 442-1250  
Springfield (413) 733-2118  
Fairhaven (508) 997-4501  
Littleton (508) 772-4251  
North Adams (413) 663-6525  
So. Attleboro (508) 399-8300  
Tewksbury (508) 851-5948  
Manchaug (508) 476-1992  
New Marlboro (413) 229-3442  
North Haven, CT (203) 288-5604  
Eliot, ME (207) 439-5974  
Baldwinville (800) 231-4873  
Worcester (508) 798-2271  
Lynn (617) 595-3741  
Lynn (617) 592-0378  
Holyoke (413) 539-9664  
Whately (413) 665-7634

COMPANY NAME:

MATERIALS:

CITY:

TELEPHONE:

## TEXTILES

See also scrap wool, scrap cotton in the yellow pages.

E. Butterworth & Co., Inc.	Textiles, cuttings, remnants	Dracut	(508) 957-3500
Ecosmith	Textiles	New Boston, NH	(603) 487-2339
ERC Wiping Products	Mill ends, machinery waste	Canton	(617) 821-6300
Goodman Wiping Cloth Co., Inc.	Textiles, mill ends, remnants	Auburn, ME	(207) 784-5779
Industrial Wiper & Paper Corp.	Textiles	Chelsea	(617) 884-5550
Jeffco Fibres Inc.	Textiles	Webster	(508) 949-0288
Massachusetts Export	Textiles	Worcester	(508) 752-5496
Salvation Army	Textiles	Saugus	(800) 626-1122
Shapiro & Sons, Inc.	Textiles	North Adams	(413) 663-6525

## WOOD DEMOLITION AND CONSTRUCTION DEBRIS

Also refer to your local yellow pages or business yellow pages under:  
 "Demolition", "Rubbish", "Trees", "Wood Waste"

American Reclamation	Asphalt, C & D Debris	Charlton	(508) 248-3777
Bardon Trimount	Asphalt, Concrete, Soil	Burlington	(617) 221-8400
Brox Industries	Asphalt, Tree Stumps	Dracut	(508) 454-9105
Cardi Construction	Asphalt, Concrete, Soil	Warwick, RI	(401) 739-8300
Deloury Construction Co., Inc.	Concrete, Asphalt, Brick	Andover	(508) 475-8153
Dontar Gypsum	Gypsum Wall Board	Newington, NH	(800) 828-9161
E. L. Harvey	Wood	Westborough	(800) 321-3002
Environmental Action	C & D Debris	North Adams	(413) 664-4936
Fuel Technologies, Inc.	C & D Debris	Lewiston, ME	(207) 783-2941
Jacques Construction Inc.	Asphalt, Concrete	South Hadley	(413) 539-9331
James Grant Co.	C & D Debris, Soil	Readville	(617) 361-2716
Jet-A-Way	C & D Debris	Roxbury	(617) 541-4000
Lou Guarino Construction	C & D Debris, Concrete	Canton	(617) 821-0170
Vining Co/Environmental Ideas	C & D Debris	Stoneham	(617) 279-0006
Wood Enterprises	Wood	Whately	(413) 665-7634
Wood Recycling, Inc.	C & D Debris, Wood	Peabody	(508) 535-4144
Worcester Fiber Recovery, Inc.	Clean Wood Waste	No. Oxford	(508) 892-8353

## YARD WASTE AND LEAF COMPOSTING

These companies service organic yard waste only. For other WOOD, see above  
 "Wood, Demolition, and Construction Debris", or "Landscaping" in the yellow pages

Agresource	Leaves, Yard Waste	Merrimac	(508) 346-9286
Arthur Schofield, Inc.	Wood, Leaves, Stumps	Natick	(508) 358-2503
Browning-Ferris Industries	Leaves, Yard Waste	Fall River	(508) 678-8860
Cape Resources Company	Wood, Leaves, Stumps	Barnstable	(508) 428-2613
Cat Ridge Farm	Wood, Stumps	East Sandwich	(508) 833-0732
Earthgrow Compost Services	Leaves, Grass, Yard Waste	Framingham	(508) 788-0623
Fine Tree Farm	Leaves, Yard Waste	Rehoboth	(508) 226-3734
High Acres Associates	Leaves, Yard Waste	Hopkington	(508) 435-5927
Horacio Purtado Landscaping	Leaves, Yard Waste	New Bedford	(508) 996-6677
Laidlaw	Wood, Stumps, Leaves	Revere	(617) 289-0500
Lion's Head Organics	Leaves, Yard Waste	Braintree	(617) 356-2122
New England Recycling Co.	Wood, Stumps	Taunton	(508) 822-4345
Organic Recycling Inc.	Leaves, Yard Waste	RI+Melrose, MA	(401) 884-1455
Pine Meadow Landscape	Leaves	Canton	(617) 575-9119
Recycled Wood Products	Wood, Leaves	Woburn	(617) 933-3818
S & J Exco, Inc.	Wood, Leaves	South Dennis	(508) 398-9206
Sam White and Sons	Leaves, Yard Waste	Medfield	(508) 359-7291
Westwood Nurseries	Leaves, Yard Waste	Westwood	(617) 329-4822



COMPANY NAME:

MATERIALS:

CITY:

TELEPHONE:

IMPORTANT and OUT-OF-STATE MARKETS

The following companies represent END-MARKETS accepting only DENSIFIED shipments of large quantities. Trucking services must be arranged with a 3rd party shipper.

AMG Resources	Ferrous & Non-Ferrous	Pittsburgh, PA
American Tissue	All Grade Paper	Baldwinville
Anchor Glass	Clear and Brown Glass	Dayville, CT
Ash Trading Corp.	High Grades	Latham, NY
Cascade Diamond	Newspaper	Thorndike
Crane & Co.	High Grade Paper	Dalton
CRInc.	Materials Recovery Facili	Johnston, RI
Crocker Technical Papers	High Grade Paper	Fitchburg
Eaglebrook Plastics, Inc	HDPE, LDPE, PET	Chicago, IL
Erving Tissue	High Grade Paper	Erving
Esleek Manufacturing	High Grade Paper	Turners Falls
PCR Inc.	Materials Recovery Facili	Stratford, CT
Federal Paperboard	All Grade Paper	Connecticut
Foster Forbes	Clear and Brown Glass	Milford
Garden State Paper	Newspaper	New Jersey
James River Corp/Adams/Pepperell	High Grade Paper	Adams
M A Polymers	HDPE, PET	Georgia
Herrimac Paper Co.	High Grade Paper	Lawrence
Midwest Plastics	HDPE	Stoughton, WI
N. American Plastic Rec Corp	HDPE, LDPE	Fort Edward, NY
Newark Paperboard/Haverhill	All Grade Paper	Haverhill
Newark Paperboard/Lawrence	All Grade Paper	Lawrence
Newark Paperboard/Natick	All Grade Paper	Natick
Patriot Paper	High Grade Paper	Hyde Park
Perkit Folding Box	Low Grade Paper	Mattapan
Plastican	Pelletized HDPE	Leominster
PureTech	PET, Custom PET	Springfield
R2B2	Paper, Glass, Plastics	New York
Resource Recovery Systems Inc.	Materials Recovery Facili	Old Lyme, CT
RRT Inc.	Materials Recovery Facili	New York
Rising Paper Co.	High Grade Paper	Housatonic
Roland-Fitchburg Paper	High Grade Paper	Fitchburg
Seaman Paper Co.	High Grade Paper	Baldwinville
Sonoco Products Co.	High Grade Paper	Holyoke
Southworth Co.	All Grade Paper	W. Springfield
St. Jude Polymer	High Grade Paper	Frackville, PA
Statler Tissue	PET	Maine
Stevens & Thompson Tissue	High Grade Paper	New York
Strathmore Paper Co.	Baled High Grade Paper	Woronoco
Texon USA	High Grade Paper	Russell
WTE 'Corp.	High Grade Paper	Bedford
Wellman Company	Materials Recovery Facili	So. Carolina
Westfield Paper/Lee/Russell	PET	Lee
	High Grade Paper	

# Other Sources of Recycling Market Information

- American Plastics Council (800) 2 - HELP - 90  
Washington, DC

Provides market information for recyclable plastics, and offers technical assistance for establishing recycling programs.

■ New Hampshire Resource Recovery Association (603) 224 - 6996  
Concord, NH 03301

Cooperative marketing of recyclables. Membership is \$.03/capita/municipality.
- American Recycling Markets (800) 267 - 0707

Call to order a printed directory and reference manual covering 15,000 recycling businesses.

■ Northeast Industrial Waste Exchange (315) 422 - 6572  
620 Erie Blvd. West, Suite 211 FAX 422 - 4005  
Syracuse, NY 13204

Publishes a quarterly "Listing Catalog" which matches industrial hazardous and solid waste generators with scrap users in the Northeast.
- Center For Environmental Technology (CET) (413) 445 - 4556

Provides Western Mass. with services and information on energy and waste management.

■ Paper Matcher: A Directory of Paper Recycling Markets (AFPA) (212) 340 - 0600  
260 Madison Ave  
New York, NY 10016-2499

A directory of paper recycling markets in the United States including mills consuming waste paper, waste paper dealers, and recycling centers.
- Earthworm, Inc. GBR (617) 628 - 1844  
Somerville, MA

Provides Eastern Mass. with guidance on commercial and municipal recycling programs.

■ Solid Waste Information (800) 67 - SWICH  
Clearinghouse (SWICH)  
Silver Springs, MD

Offers a database for solid waste and recycling issues, accessible by modem or voice phone.
- Environmental Defense Fund (800) CALL-EDF  
New York, NY

Offers information on recycling by zip-code.

■ Steel Recycling Institute (508) 266-1847  
Boxboro, MA

Promotes steel can recycling.
- Fundamental Action to Conserve Energy (FACE) (508) 345 - 5385

Provides conservation information on energy and recycling issues in North Central Mass.

For a more complete list of recycling information lines, call the DEP Recycling Education Coordinator: 617-292 - 5745
- MassRecycle (617) 338 - 0244  
P.O. Box 3111  
Worcester, MA 01613

Publishes a newsletter with Massachusetts market information. Membership represents citizens, business, non-profits and government in recycling.

■ National Office Paper Recycling Project FAX (202) 293 - 2352  
U.S. Conference of Mayors  
1620 Eye Street NW, 4th FL  
Washington, DC 20006

Publications on office paper recycling.

## Periodicals on Recycling:

- BioCycle (215) 967 - 4135
- Fibre Market News (800) 456 - 0707
- Garbage (718) 788 - 1700
- Paper Stock Report (216) 923 - 8042
- Recycled Paper News (703) 642 - 1120/116
- Recycling Times (202) 659 - 4813
- Recycling Today (800) 456 - 0707
- Resource Recycling (503) 227 - 1319
- Waste Dynamics Northeast (603) 624 - 1442

## MASSACHUSETTS REGIONAL RECYCLING ASSOCIATIONS

### Anawan Region Solid Waste Committee

Attleboro, Berkeley, Easton, Foxborough, Mansfield, Norton, Rehoboth, Seekonk, Somerset, Swansea, Taunton

**CONTACT:** *Michael Van Splinter, 155 Gilbert St., Mansfield, MA 02048, (508)339-9865.*

### Cape Cod Commission (Marketing Cooperative)

Barnstable, Bourne, Brewster, Chatham, Dennis, Eastham, Falmouth, Harwich, Mashpee, Orleans, Provincetown, Sandwich, Truro, Wellfleet, Yarmouth

**CONTACT:** *David Hall, Waste Management Coordinator, 3225 Main St., Barnstable, MA 02630, (508)362-3828.*

### Central MA Resource Recovery Committee

(CMRRC) (Marketing Cooperative)

Auburn, Grafton, Holden, Leicester, Millbury, Northborough, Oxford, Rutland, Shrewsbury, Southborough, Webster, Westborough, West Boylston, Worcester

**CONTACT:** *Bob Fiori, Worcester DPW, 20 East Worcester St., Worcester, MA 01604, (508)799-1430.*

### Coalition for North Central Waste Management

(CONCEWM) (Marketing Cooperative)

Ashby, Ayer, Clinton, Fitchburg, Gardner, Groton, Harvard, Hubbardston, Leominster, Lunenburg, Pepperell, Petersham, Phillipston, Princeton, Shirley, Sterling, Templeton, Townsend, Westminster, Winchendon

**CONTACT:** *Don Leistikow, 28 Maple St., Ayer MA 01432, (508)772-3490.*

### Eastern Massachusetts Recycling Association

(EMRA)

48 communities in the Route 128/95 area belong to this organization.

**CONTACT:** *Don Marshall, P.O. Box 12, Bedford, MA 01730, (617)275-0637.*

### Hilltown Resource Management Cooperative

Ashfield, Chesterfield, Cummington, Goshen, Hatfield, Huntington, Middlefield, Plainfield, Westhampton, Williamsburg, Worthington

**CONTACT:** *Eric Weiss, Coordinator, P.O. Box 630, Williamsburg, MA 01096, (413)268-3845.*

### North Central Consortium

Ashby, Ashburnham, Gardner, Hubbardston, Petersham, Princeton, Templeton, Townsend, Winchendon

**CONTACT:** *Edward Wirtanen, Board of Health, City Hall, Rm. 29, Gardner, MA 01440, (508)630-4013.*

### Millis Consortium (Marketing Cooperative)

Ashland, Dedham, Foxborough, Framingham, Franklin, Holliston, Hopedale, Hopkinton, Mansfield, Medfield, Medway, Millis, Natick, Needham, Norfolk, Norwood, Sherborn, Walpole, Westwood, Wrentham, Upton

**CONTACT:** *Matt Zettek, 83 Central St. # Framingham, MA 01701, (508)877-7827.*

### Northeast Regional Recycling Committee (NERRC)

Amesbury, Boxford, Georgetown, Groveland, Haverhill, Ipswich, Merrimac, Middleton, Newbury, Newburyport, Rowley, Salisbury, Topsfield, West Newbury

**CONTACT:** *Karen Sheridan, 10 Sheffield Rd., Boxford, MA 01921, (508)887-5519.*

### North Shore Regional Recycling Committee

(Marketing Cooperative)

Beverly, Boxford, Danvers, Gloucester, Hamilton, Ipswich, Lynn, Lynnfield, Manchester, Marblehead, Melrose, Nahant, Peabody, Reading, Revere, Rockport, Salem, Saugus, Swampscott, Wilmington, Winthrop

**CONTACT:** *Rebecca Curran, Chair, 7 Widger Rd., Marblehead, MA 01944, (617)659-4909.*

### South Central Recycling Association of Massachusetts (SCRAM)

Brimfield, Brookfield, East Brookfield, Hardwick, Leicester, New Braintree, North Brookfield, Spencer, Sturbridge, Ware, Warren, West Brookfield

**CONTACT:** *John Alphin, 27 Ashley Rd., North Brookfield, MA 01535, (508)867-9491.*

### South Shore Regional Refuse Disposal Board

(Marketing Cooperative)

Cohasset, Duxbury, Hanover, Hingham, Hull, Marshfield, Norwell, Rockland, Scituate, Weymouth

**CONTACT:** *Ken Pelletier, Marshfield DPW, 870 Moraine St., Marshfield, MA 02050, (617)834-5559.*

### Western Massachusetts Materials Recycling Facility (Marketing Cooperative)

92 communities in western Massachusetts

**CONTACT:** *Steve Ellis, DEP, 436 Dwight St., Springfield, MA 01103, (413)784-1100 Ext. 239.*

# Massachusetts Processors of Recyclables

7

## Textiles Only

E. Butlerworth & Co., Inc.  
Jaffco Fibres Inc.  
Massachusetts Export

1931 Lakeview Ave.  
Hawes Ave.  
Quincy/McMond Ave.

Dorset  
Milbury  
Worcester

MA 01826 (508)957-3500  
MA 01527 (508)663-8568  
MA 01606 (508)732-3498

Textiles  
Textiles

## Mult-Material Processors

Avon Fibers  
A.W. Martin, Inc.  
Conigliaro Industries  
Essex Waste Paper Co./P&T  
E. L. Harvey  
Frank Rubbish Removal  
Miller Recycling  
N. Atlantic Recycling Services  
Prime Recycling  
P. Allen & Son  
Samuel Mirsky Corp  
Shapiro & Sons, Inc.  
South Shore Recycling

655 Bodwell Est  
1200 Shawmut Ave  
701 Waverly St  
207 Marston St.  
Route 135  
9 Church Street  
435 Mount Hope St.  
1939 Turnpike Street  
410 Rutherford Ave  
Easthampton Rd/Pk110  
756 S. Water St.  
341 Ashland St.  
7 Jan Sebastian Way, Unit D

Avon  
New Bedford  
Framingham  
Lawrence  
Westborough  
Milbury  
North Attleboro  
North Andover  
Charlestown  
Northampton  
New Bedford  
North Adams  
Sandwich

MA 02322 (508)588-7888  
MA 02746 (508)993-4358  
MA 01701 (508)872-9888  
MA 01840 (508)521-7419  
MA 01581 (800)321-3002  
MA 01527 (508)865-5635  
MA 02780 (508)865-0211  
MA 01845 (508)682-5442  
MA 02129 (617)242-7746  
MA 01080 (413)584-3040  
MA 02746 (508)993-9888  
MA 01247 (413)663-6525  
MA 02563 (508)888-6056

Alum, Glass, Tin, Curbolds  
Glass  
Alum, Glass, Tin  
All Grades  
Alum, Glass  
Tin Cans  
All Grades  
Alum, Glass, Tin  
Alum, Glass, Tin, Curbolds  
All Grades  
Non-Ferrous  
All Grades  
Corrugated, News

## ANALYZED SEPARATELY (NOT ON DOR LIST)

A.G. Betancourt, Inc.  
Browning-Ferris Industries  
Browning-Ferris Industries  
Clean Environment Co.  
Clean Environment Co.  
Container Recycling Alliance  
Container Services  
Foster Forbes  
Goodwill Industries Plastic  
Jet-A-Way / Kemble Waste  
Malden Waste Paper  
North Shore Recycled Fibers  
Partyka Resource Management  
Prioritized New England  
Recycling Enterprises  
Sherman Disposal  
Sonoco Waste Paper Recycling  
Waste Systems  
Wastepaper Corp of Worcester

821 Main Rd  
100 Mallot St.  
1080 Airport Road  
74 Salem Rd.  
2323 Westover Rd.  
241 Francis Ave  
P O 531  
1 National Ave.  
340 Chapman St.  
31-47 Kemble St.  
1130 Eastern Ave  
53 Jefferson Ave  
645 Shawinigan Dr  
Rover St  
Old Webster Road  
71 Proctor St  
Recycling Center  
Cudworth Road

Westport  
Boston  
Fall River  
N Bitterica  
Chicopee  
Mansfield  
Walpole  
Milford  
Greenfield  
Roxbury  
Malden  
Salem  
Chicopee  
Everett  
Oxford  
Boston  
Holyoke  
Attleboro  
Webster

MA 02790 (508)636-4009  
MA 02134 (617)265-0500  
MA 02722 (508)878-8880  
MA 01862 (508)867-0096  
MA 01020 (413)503-1306  
MA 02048 (508)339-6067  
MA 02081 (508)660-1804  
MA 01757 (508)478-2500  
MA 01301 (413)774-3040  
MA 02111 (617)268-7131  
MA 02148 (617)322-2337  
MA 01570 (508)943-0633  
MA 01013 (413)785-1581  
MA 02149 (617)369-8300  
MA 01540 (508)949-2797  
MA 02119 (617)442-6993  
MA 01040 (413)336-9060  
MA 02703 (800)972-4545  
MA 01570 (508)943-0727

Alum, Glass, Tin  
Glass  
Leaves, Yard Waste  
Alum, Glass  
HDPE, PET, PS  
Alum, Glass, Tin  
High Grades  
Alum, Glass, Tin, Curbolds  
HDPE, LDPE, PVC, PP, PS  
C & D Debris  
High Grades  
All Grades  
High Grades, OCC  
Auto Parts  
PET  
PS  
All Grades  
High Grades  
All Grades

## OUT-OF-STATE (NOT ON DOR LIST)

Anchor Glass Container Corp.  
Casella Waste Management  
Connecticut Container Recycling  
Denton Plastics, Inc.  
J. Broomfield & Sons  
M & O Waste Company  
Maine Beverage Container  
Marcel  
Merrimack Metals  
Nysonn  
Plastics Recovery Corp.  
R282 (Resource Recovery)  
Second Chance Recycling  
Somers Sanitation

Rt 4  
8 New York Ave  
4427 NE 158th Ave.  
473 Allene Lane  
191 Sochi St  
80 Rand Rd  
Market St  
4-11 47th Ave  
92 Howland Ave  
1809 Carter Ave  
139 Main St  
137 Prospect Hill Rd 00088

Dayville  
Rutland  
Framingham  
Portland  
Providence  
Woonsocket  
Portland  
Elmwood Park  
S Merrimack  
New York  
New Haven  
Bronx  
Barnstable  
E Windsor

CT (203)774-8636  
VT (802)775-9908  
CT (203)646-7573  
OR (503)237-9945  
RI (401)785-2040  
RI 02695  
ME (207)774-0735  
NJ (201)796-4000  
NH (603)862-8164  
NY (718)392-1177  
CT (203)785-0458  
NY (212)731-3931  
VT 05361 (802)234-9456  
CT (203)823-2070

All Colors  
HDPE, PET  
PET  
HDPE, LDPE, PS  
Ferrous & Non-Ferrous  
High Grades  
Alum, Glass, Tin, Curbolds  
All Grades  
PET  
All Plastic  
HDPE, PET, PP, PS, PVC  
High Grades  
PS

# Scrap Metal Only

Acme Auto Salvage  
Acme Metals and Recycling  
American Metals Rec., Inc.  
Apkin Environmental  
Atlas Metals, Inc.  
Bay State Scrap  
Belchertown Salvage Co.  
Bokser's Junk Shop  
Brookton Iron & Steel Co.  
Castle Metal Co.  
City Auto Wrecking Co.  
Curboy  
Empire Scrap Metals, Inc.  
Faullover Scrap Metal  
Frammingham Salvage  
General Metals and Smelting  
Gittin Brothers  
Goldstein Scrap Metal  
H. Cohen & Sons  
I. Solomon  
John C. Tombarello & Sons  
Kane Scrap Iron & Metal  
Kramer Scrap Division  
Lenox Junk  
Leroy & Co., Inc.  
Linsky's, Inc.  
Metals Recovery Co.  
Mid City Scrap  
Mills Used Auto Parts  
M. Burnstein Co., Inc.  
M. Kaplan & Co.  
M. Sugarman, Inc.  
Nissenbaum Auto  
N.A. Nichols Co., Inc.  
Patriot Metals  
Philip Lewis & Sons  
Prospect Iron and Steel  
Reisner, WM Corp  
R&R Industries  
Saltaty Alloys Inc.  
Somerset Junk  
South Shore Recycling  
Starr Scrap Metal, Inc.  
State Line Scrap Co.  
Steel Sealing & Baling Corp.  
Tewksbury Industries/Metals  
West Lynn Recycling Co. Inc.  
William F. Sullivan Co. Inc.  
Williamson Waste Co.

544 Hinville Rd.  
64 Rear Napier  
565 Rounsville Rd  
60 State St  
475 Columbia St  
8 New Street  
Bay Road  
70 Locust Street  
45 Freight Street  
464 Albany Street  
Delaney St  
Curboy Road  
35 Herman St  
9 Welton Ave  
120 Waverly St  
47 Tojoka Street  
40 Margaves St  
51 Harding  
527 Dorchester Ave  
  
207 Marston Street  
Cabotville Ind. Park  
P O Box 588  
1170 Mass. Ave  
567 Franklin  
40 Sargent Street  
195 Mulberry St  
548 State Road  
1465 Main St  
47 Gerrish Ave  
413 Second St  
799 Centre St  
460 Columbia St  
Railroad Ave Box 28  
30 Ballard Street  
90 Kemble St  
40 Bennett Street  
33 Elm St  
195 Rocue Street  
18-20 Dana  
508 Columbia St  
P O Box 1593  
753 Millbury  
Bacon Street  
542 Southbridge  
860 East St  
247 Commercial St  
PO Box 381  
87 Melvin

N Dartmouth  
Springfield  
Rochester  
North Adams  
Somerville  
Worcester  
Belchertown  
Medford  
Brookton  
Boston  
Westfield  
Sturbridge  
Worcester  
Worcester  
Frammingham  
Roxbury  
Fall River  
Worcester  
South Boston  
Lynn  
Lawrence  
Chicopee  
Greenfield  
Dorchester  
Worcester  
Gloucester  
Brookton  
Westport  
Mills  
Chelsea  
Everett  
Quincy  
Somerville  
Amesbury  
Worcester  
Roxbury  
Somerville  
Clinton  
Springfield  
Taunton  
Somerville  
Sandwich  
Worcester  
South Attleboro  
Worcester  
Tewksbury  
Lynn  
Methuen  
Williamstown

MA 02747  
MA 01104  
MA 02770  
MA 01247  
MA 02143  
MA 01608  
MA 01007  
MA 02156  
MA 02401  
MA 02111  
MA 01806  
MA  
MA 01608  
MA 01608  
MA 01701  
MA 02111  
MA 02723  
MA 01608  
MA 02122  
MA  
MA 01840  
MA 01014  
MA 01301  
MA 02124  
MA 01608  
MA 01930  
MA 02402  
MA 02790  
MA 02054  
MA 02150  
MA 02149  
MA 02169  
MA 02143  
MA 01913  
MA 01608  
MA 02111  
MA 02143  
MA 01510  
MA 01104  
MA 02780  
MA 02143  
MA 02563  
MA 01608  
MA 02703  
MA 01608  
MA 01878  
MA 01901  
MA 01040  
MA 0  
(508)983-7362  
(413)737-3112  
(508)763-9325  
(413)664-4836  
(617)868-8440  
(508)753-3926  
(413)323-6639  
(617)393-8810  
(617)588-4840  
(617)482-7332  
(413)568-0242  
(508)347-9850  
(508)752-7750  
(508)791-4802  
(508)872-4393  
(617)442-2060  
(508)673-5884  
(508)754-5711  
(617)542-3300  
(617)581-7000  
(508)662-3226  
(413)594-5160  
(413)774-3103  
(617)288-2841  
(508)752-1790  
(508)283-1877  
(508)587-3010  
(508)675-7831  
(508)376-8700  
(617)884-7700  
(617)389-4775  
(617)479-1637  
(617)776-0194  
(508)368-8639  
(508)798-3333  
(617)442-1250  
(617)868-3405  
(508)366-4885  
(413)733-2118  
(508)824-8425  
(617)823-8579  
(508)888-8881  
(508)791-0088  
(508)399-8300  
(508)798-2133  
(508)851-5946  
(617)592-0378  
(413)539-9884  
(413)523-8315

Car Batteries  
White Goods

Non-Ferrous  
Ferrous & Non-Ferrous

Non-Ferrous  
Ferrous  
Non-Ferrous

Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous

Ferrous & Non-Ferrous  
Ferrous

Ferrous & Non-Ferrous, Auto

Ferrous & Non-Ferrous  
Non-Ferrous  
Non-Ferrous

Ferrous & Non-Ferrous  
Tree, White Goods  
Ferrous & Non-Ferrous  
Non-Ferrous  
Ferrous & Non-Ferrous  
Auto Parts

Glass  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Non-Ferrous  
Auto, Glass, Tin, Curbside  
Non-Ferrous  
Ferrous & Non-Ferrous  
Ferrous & Non-Ferrous  
Auto Parts  
OCC, News  
White Goods  
All Grades

### Paper Only

AAA Paper Recycling  
American Paper Recycling Corp.  
Basic Waste Systems  
Bay State Paper Recycling  
B. Greenblatt Co.  
Capital Paper Recycling  
Corrugated Recycling Inc.  
Data Destruction/OPRS  
Elm Fibers  
F.M. Fibers  
Ginsberg, S. & Co.  
Hanna Paper Recycling  
Harry Goodman  
Leominster Recycling  
McGinnis Recycling/City Shred  
National Fiber Insulation  
National Recycling, Inc.  
Office Paper Recovery Systems  
Spiegel S. Co. Inc.  
Sterling  
Vel-A-Tran  
William Goodman & Sons

P O 597  
87 Central  
15 Cooper St  
P O Box 434  
231 Tanner  
42 Prospect Rd  
P O Box 416  
8-G Oil Street  
P O Box 481  
53 Jefferson Ave  
64 E. Canton Street  
1150 General Edwards Hwy  
203 Tremont St  
320 Central St  
206 Riedluf Drive  
  
40 Forest St  
21 Industrial Way  
175 E Ashland  
160 Ringeway  
3 Brick Kiln Rd  
State St

N Oxford  
Mansfield  
Medford  
E Douglas  
Lowell  
Plympton  
Weymouth  
Woburn  
East Longmeadow  
Salem  
Boston  
Sharon  
Springfield  
Leominster  
Quincy  
Belcherstown  
Attleboro  
Wilmington  
Brockton  
Billerica  
Billerica  
Ludlow

MA 01537 (508)987-0188  
MA 02048 (508)339-8551  
MA 02155 (817)396-1177  
MA 01516 (508)478-3212  
MA 01852 (508)453-6111  
MA 02367 (817)585-4801  
MA 02180 (800)427-6785  
MA 01801 (800)762-6765  
MA 01028 (413)567-1759  
MA 01970 (817)242-0809  
MA 02111 (817)426-6898  
MA 02067 (817)784-6155  
MA 01104 (413)785-8331  
MA 01453 (508)534-3269  
MA 02189 (817)773-9901  
MA 01007 (413)283-8747  
MA 02703 (508)228-1700  
MA 01887 (508)694-1450  
MA 02401 (508)586-8385  
MA 01821 (508)663-7700  
MA 01862 (508)663-7286  
MA 01056 (413)589-7811

High Grades  
All Grades  
High Grades  
High Grades  
High Grades, OOC  
High Grades  
OOC  
High Grades  
All Grades  
High Grades  
Non-Ferrous  
High Grades  
All Grades  
High Grades  
High Grades  
Newspaper  
High Grades  
High Grades  
All Grades  
  
High Grades  
All Grades

### Plastics Only

ABC Disposal  
Asian Export Inc.  
Environmental Resins Ltd.  
EnviroPlastics  
L. Fine & Company  
Metropolitan Processed Materials  
Plastic Recyclers Inc.  
Plastic Resale Corp.  
PTI America  
wTe Recycling/Star

P O Box 50540  
11 Suban Rd  
420 Northboro Road  
P O Box 383  
148 Lynnfield Street  
34 Madison St  
295 Phillips Ave  
380 Union St #20  
  
7 Alfred Circle

New Bedford  
Newton  
Marlborough  
Auburn  
Peabody  
Somerville  
New Bedford  
West Springfield  
Berlin  
Bedford

MA 02745 (508)995-0544  
MA 02181 (817)332-7929  
MA 01752 (508)568-9156  
MA 01601 (508)832-8095  
MA 01980 (508)532-2112  
MA 02143 (817)623-3917  
MA (508)991-8480  
MA 01089 (413)582-7591  
MA  
MA 01730 (817)275-8400

PS  
HOPE, LDPE, PVC, PP, PS  
HOPE, LDPE  
HOPE  
HOPE, LDPE  
HOPE, PET, PP, PS, PVC  
HOPE  
All Plastics  
  
HOPE, PET

## I. Paper Manufacturers

AMERICAN TISSUE MILLS OF MA., MILL ST., PO BOX 25, BALDWINVILLE, MA 01436, Tel:(508) 939-5359, Fax:  
 ID: BAL011P00 Business type(s): MA Employees: 77 Org: NEIWE DIR, New: PAPERM  
 Materials handled: pulp subs

CASCADES DIAMOND INC., CHURCH STREET PO BOX 627, THORNDIKE, MA 01079, Tel:, Fax:  
 ID: CAS038P00 Business type(s): MA Employees: 250 Org: NEIWE DIR, New: MA DIR  
 Materials handled: ONP

CRANE AND COMPANY, 30 S. ST., BYRON WESTON DIV., DALTON, MA 01226, Tel:(413)684-2600, Fax:  
 ID: CRA013P00 Business type(s): MA Employees: 1300 Org: NEIWE DIR, New: PAPERM  
 Materials handled: NG paper, pulp subs

CROCKER TECHNICAL PAPERS, 431 WESTMINSTER ST., FITCHBURG, MA, 01420, Tel (508) 345-7771:, Fax:  
 ID: CROMA00P0 Business type(s): MA Employees: 52 Org: MA DIR, New:  
 Materials handled: NG paper

DECORATIVE SPECIALITIES INTL., FRONT ST, PO BOX 6001, WEST SPRINGFIELD, MA 01090-6001, Tel:, Fax:  
 ID: DECHAO0P0 Business type(s): MA Employees: 200 Org: PAPERM, New:  
 Materials handled: ONP, pulp subs

ERVING PAPER MILLS, P.O. BOX 158, ERVING, MA 01344-0158, Tel:(508) 544-2711, Fax:  
 ID: ERV003P00 Business type(s): MA Employees: 200 Org: NEIWE DIR, New: PAPERM  
 Materials handled: NG paper, pulp subs

ESLEECK MANUFACTURING CO., PO BOX 717, CANAL STREET, TURNERS FALLS, MA 01376, Tel:, Fax:  
 ID: ESL002P00 Business type(s): MA Employees: 125 Org: NEIWE DIR, New: PAPERM  
 Materials handled: NG paper, pulp subs

HAVERHILL PAPERBOARD CO., SOUTH KIMBAU BOX 31, HAVERHILL, MA 01830, Tel:, Fax:  
 ID: HAV003P00 Business type(s): MA Employees: 250 Org: NEIWE DIR, New: PAPERM  
 Materials handled: cardboard, ONP, mix paper, pulp subs

JAMES RIVER CORP/ADAMS MILL, 115 HOWLAND AVE., ADAMS, MA 02122, Tel:, Fax:  
 ID: JAM054P00 Business type(s): MA Employees: 120 Org: NEIWE DIR, New: PAPERM  
 Materials handled: pulp subs

JAMES RIVER-FITCHBURG DIV., OLD PRINCETON RD., FITCHBURG, MA 01420, Tel:(508) 345-2161, Fax:  
 ID: JAM019P00 Business type(s): MA Employees: 200 Org: NEIWE DIR, New: PAPERM  
 Materials handled: cardboard, mix paper, ONP

KIMBERLY CLARK CORP., SPECIALITY PRODUCTS, LEE, MA 01238, Tel:, Fax:  
 ID: KIMMA00P0 Business type(s): MA Employees: 322 Org: PAPERM, New:  
 Materials handled: pulp subs

MERRIMAC PAPER CO., 9 S. CANAL STREET, LAWRENCE, MA 01842, Tel:, Fax:  
 ID: MER047P00 Business type(s): MA Employees: 142 Org: NEIWE DIR, New: PAPERM  
 Materials handled: ONP, mix paper

← JAMES RIVER-PETTERELL, 508SID OF:  
 MERRIMACK PAPER CO. INC., MAIN ST. PO BOX 1370, E. PEPPEREL, MA 01463, Tel:, Fax:  
 ID: MER038P00 Business type(s): MA Employees: 119 Org: PAPERM, New:  
 Materials handled: mix paper

NEWARK ATLANTIC PAPERBOARD CO, 250 CANAL STREET, LAWRENCE, MA 01842, Tel:, Fax:  
 ID: NEW121P00 Business type(s): MA Employees: 120 Org: NEIWE DIR, New: PAPERM  
 Materials handled: cardboard, ONP, mix paper, pulp subs

NEWARK BOXBOARD COMPANY, NORTH MAIN ST. PO BOX 89, NATIK, MA 01760, Tel:, Fax:  
 ID: NEW095P00 Business type(s): MA Employees: 65 Org: NEIWE DIR, New: PAPERM  
 Materials handled: cardboard, mix paper, ONP

PERKIT FOLDING BOX CORP., 36 PLYMOUTH ST., NATTAPAN, MA 02126, Tel:, Fax:  
 ID: PER023P00 Business type(s): MA Employees: 75 Org: NEIWE DIR, New: PAPERM  
 Materials handled: cardboard, ONP, mix paper, pulp subs

RISING PAPER COMPANY, PARK STREET, HOUSATONIC, MA 01236, Tel:, Fax:  
 ID: RIS009P00 Business type(s): MA Employees: 160 Org: NEIWE DIR, New: PAPERM  
 Materials handled: pulp subs

ROLAND FITCHBURG PAPER CO., 642 RIVER ST., FITCHBURG, MA 01420, Tel: 508-345-0309, Fax:  
 ID: FIT004P00 Business type(s): MA Employees: ..... Org: NEIWE DIR, New: MA DIR  
 Materials handled: NG paper

SEAMAN PAPER CO. OF MASS. INC., MAIN ST., PO BOX 21, OTTER RIVER, MA 01436, Tel.: Fax:  
ID: SEAM00PO Business type(s): MA Employees: 150 Org: PAPERM, New:  
Materials handled: HG paper

SONOCO PRODUCERS COMPANY, PO BOX 631, 2 SARGEANT ST., HOLYOKE, MA 01041, Tel:413 536 9080, Fax:413 536 0903  
ID: SON014PO0 Business type(s): MA Employees: 150 Org: NEIWE DIR, New: PAPERM  
Materials handled: cardboard, GMP, mix paper, pulp subs

THWORTH COMPANY, FRONT STREET, WEST SPRINGFIELD, MA 01089, Tel:413-732-5141, Fax:  
SOU194PO0 Business type(s): MA Employees: 770 Org: NEIWE DIR, New: MA DIR  
Materials handled: HG paper

STRATHMORE PAPER CO., 160 WAGONWOOD, MA 01097, Tel.: 413-568-9111, Fax:  
ID: STR021PO0 Business type(s): MA Employees: 120 Org: NEIWE DIR, New: MA DIR  
Materials handled: HG paper

TEXON USA, RUSSELL, MA 01071, TEL: 413-862-3652, 1190 Huntington Rd, Box 365  
ID: TEX000PO Business Type (MA) Org: MA DIR  
Materials handled: HG paper  
Emp: 120

WESTFIELD RIVER PAPER CO., 16 STATION RD, RUSSELL, MA 01071, Tel.: Fax:  
ID: WES000PO Business type(s): MA Employees: 440 Org: PAPERM, New:  
Materials handled: pulp subs  
(413) 862-3636

STRATHMORE PAPER CO.  
HILL RD  
MILLERS FALLS, MA.

01349  
(413) 659-3911  
EMP: 120

Also:  
S. BROAD ST, WESTFIELD,  
MA 01085  
(413) 568-9111  
EMP: 1,000

## II. Plastic Manufacturers

COMPLAY PRODUCTS, 44 SUFFOLK ST, WORCESTER, MA 01604, Tel:508-756-8353, Fax:  
ID: COM000PO Business type(s): MA Employees: 300 Org: RW BECK, New:  
Materials handled: plastic

CONIGLIARO INDUSTRIES INC, 701 WAVERLY ST., FRAMINGHAM, MA 01701, Tel.: Fax:  
ID: CON000PO Business type(s): MA Employees: ..... Org: RW BECK, New:  
Materials handled: plastic

ENVIRO TECH, 670 CANTON ST., NORWOOD, MA 02062, Tel.: Fax:  
ID: ENV000PO Business type(s): MA Employees: ..... Org: RW BECK, New:  
Materials handled: plastic

WEBSTER INDUSTRIES, 58 MULASKI STREET, PEABODY, MA 01960, Tel:(508)532-2000 EXT. 369, Fax:(508)532-6963  
ID: WEB009PO0 Business type(s): MA Employees: 250 Org: NEIWE DIR, New: BAG DIR  
Materials handled: plastic

WILTECH INC., 35 TISDALE AVE, LECHMINSTER, MA 01453, Tel:508-537-1497, Fax:  
ID: WIL000PO Business type(s): MA Employees: 120 Org: POLYSTYR DIR, New:  
Materials handled: plastic

## III. Tire Manufacturers

D & J FARMS, 1702 PROVIDENCE RD., NORTHBRIDGE, MA 01534, Tel.: Fax:  
ID: D&J000PO Business type(s): MA Employees: ..... Org: SCRAP TIRE, New:  
Materials handled: tires

F & B ENTERPRISES, INC., PO BOX C-117, NEW BEDFORD, MA 02741, Tel:(508)992-0635, Fax:(508)999-7220  
ID: F&B002PO0 Business type(s): MA Employees: ..... Org: NEIWE DIR, New: SCRAP TIRE  
Materials handled: tires

## VI. Textile Manufacturer

JOHN R LYMAN CO, PO BOX 157, 60 DEPOT, CHICOPEE, MA 01013, Tel:413-598-8344, Fax:  
ID: JOH015PO0 Business type(s): MA Employees: 100 Org: NEIWE DIR, New: ARM DIR  
Materials handled: textiles

## V. Glass Manufacturer

FOSTER-FORBES GLASS CO., AMERICAN NAT'L CAN, PO BOX 398, MILFORD, MA 01757, Tel:(508)478-2500, Fax:  
ID: FOS010PO2 Business type(s): MA Employees: 150 Org: NEIWE DIR, New:  
Materials handled: glass



BROWNING FERRIS INDUSTRIES, , FALL RIVER, MA , Tel:508-678-8860, Fax:  
ID: BRO107P01 Business type(s): MA Employees: ..... Org: MA DIR, New:  
Materials handled: yard waste

LION'S HEAD ORGANICS, , BRAINTREE, MA , Tel:617-356-2122, Fax:  
ID: LIOH00P00 Business type(s): MA Employees: ..... Org: MA DIR, New:  
Materials handled: yard waste

ORGANIC RECYCLING INC., , MELROSE, MA , Tel:401-884-1455, Fax:  
ID: RECH00P00 Business type(s): MA Employees: ..... Org: MA DIR, New:  
Materials handled: yard waste

RECYCLED ORGANICS INC., , FRAMINGHAM, MA , Tel:508-788-0623, Fax:  
ID: ORGH00P00 Business type(s): MA Employees: ..... Org: MA DIR, New:  
Materials handled: yard waste

SAN WHITE AND SONS, , MEDFIELD, MA , Tel:508-359-7291, Fax:  
ID: SAMH00P00 Business type(s): MA Employees: ..... Org: MA DIR, New:  
Materials handled: yard waste

ENVIRONMENTAL RECOVERY  
SYSTEMS, INC.  
1400 BRAYTON POINT RD  
SOMERSET, MA 02725  
(508) 677-0252  
EMP: 90

IFAFARD CONRAD, INC.  
711 SILVER ST.  
AGAWAM, MA 01001  
(413) 786-4393  
EMP: 75

IV. Metal Manufacturers

BAY STATE SMELTING, 15A BLEACHERY COURT, BOX 127, SOMERVILLE, MA 02143, Tel:617-625-3460, Fax:  
ID: BAY029P00 Business type(s): MA Employees: 25. Org: NEIWE DIR, New: ARM DIR  
Materials handled: non-ferr

NEW ENGLAND SMELTING WORKS INC, 502 UNION ST., PO BOX 29, W SPRINGFIELD, MA 01089, Tel:413-734-6491, Fax:  
ID: NEW068P00 Business type(s): MA Employees: ..... Org: NEIWE DIR, New: ARM DIR  
Materials handled: non-ferr

HARCON CORP., 111 DEVONSHIRE ST, BOSTON, MA 02109  
(617) 542-3300  
EMP: 7

SALITSKY ALLOYS, INC., 65 GARDNER ST., WORCESTER, MA 01610  
(508) 791-2444  
EMP: 55

UNIVERSAL METALS CORP, 345 SHREWSBURY ST.  
WORCESTER, MA 01604 (508) 754-6841  
EMP: 38

UNIVERSAL STEEL & TRADING CORP, 297-305 BRIDGE ST.  
SALEM, MA 01970 (508) 744-0124  
EMP: 10