# THE ROLE OF A SOLID WASTE RESOURCE GUIDE FOR WESTERN MASSACHUSETTS

by

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# CHAPTER 1

# INTRODUCTION

Most of the raw materials that enter the economies of the United States and other industrialized nations are destined to become waste. These societies have seen an unusually high increase in their generation of municipal solid waste (MSW) during the twentieth century. In a study by the Organization for Economic Cooperation -- a consortium of industrialized countries -- 14 of the 16 members for which data were available showed increases in solid waste generation between 1980 and 1985 (Table 1). Although the United States did not see as great an increase as some other nations during this period, it did generate almost twice as much garbage per person as West Europeans or the Japanese. Americans have developed a well recognized reputation as the greatest producer of garbage in the world.

The characteristics of waste in developed countries have also changed in the last few decades. Whereas substances like paper, glass and wood were the norm years ago, nonrenewable materials such as plastic are increasingly displacing the older, renewable substances. Plastics are being manufactured and consumed at tremendous rates. The tonnage of plastic in U.S. solid waste, for example, increased an average of 14 percent per year between 1960 and 1988 (EPA, 1989). Plastic also constitutes about 8 percent by weight and 25 percent by volume of all solid waste in the United States (Office of Technology Assessment, 1989). This increase has occurred despite the fact that the weight of plastics in many items has decreased during the same period.

**Table 1 Percent Change in Municipal Solid Waste Generation, Selected Countries, 1980-1985**

| Country | Total | Per Person |
|---|---|---|
| Ireland | +72 | +65 |
| Spain | +32 | +28 |
| Canada | +27 | +21 |
| Norway | +16 | +14 |
| United Kingdom | +12 | +11 |
| Switzerland | +12 | +9 |
| Denmark | +6 | +6 |
| Sweden | +6 | +5 |
| France | +7 | +5 |
| Italy | +7 | +4 |
| Portugal | +13 | +4 |
| United States | +8 | +3 |
| Austria | +3 | +3 |
| Luxembourg | +2 | +2 |
| Japan | 0 | -3 |
| West Germany | -10 | -9 |

Source: Young, 1991

The United States and many other countries follow a solid waste management hierarchy based on the most economically and ecologically efficient processing of materials. This hierarchy is accepted as the guiding principle for the management of garbage at all levels, from the United Nations Environment Programme to individual states to local jurisdictions. The responsible organization or agency is expected to prioritize its options as follows: 1) source reduction (avoiding or reducing the generation of waste); 2) reuse of products; 3) recycling; 4) incineration (with recovery of the energy) and 5) landfilling. This policy hierarchy has been adopted in the United States through the Resource Conservation and Recovery Act (RCRA) and in the state of Massachusetts through its Integrated Solid Waste Management Master Plan.

The U.S. is far from conforming to the solid waste hierarchy established in RCRA. It has been extraordinarily slow in implementing this 17-year-old policy when compared to other industrialized nations in Europe and in Japan. Recent statistics show that Japan incinerates 43 to 53 percent of its garbage and recycles 26 to 39 percent. Before unification, West Germany was incinerating 27 percent of its solid waste with plans to increase that figure to 50 percent by 1995. West Germans were recycling about one-third of their aluminum, glass and paper. Nations such as Denmark, France, Sweden and Switzerland send less than half of their waste to landfills (Young, 1991). The United States, as previously mentioned, landfills almost *three-quarters* of its solid waste, and its approach is ad hoc and uncoordinated. Most solid waste management decisions are left to the states, and the environment for making waste management decisions is too often one of crisis. Many states are closing their older, unsafe landfills, permitting very few new ones, and providing only cursory guidance for feasible alternatives.

**Landfilling**

The scale and character of waste being generated in the United States has brought this country dangerously close to the capacity of its existing landfills. A parallel tightening of restrictions on the siting of new landfills, along with a more discerning public, have exacerbated the landfill crisis.

Although landfilling is certainly preferable to the older method of open burning, it has many drawbacks. Nearly all landfills eventually pass "leachates" into the surrounding soil and groundwater. Leachates are formed from the mixing of rainwater and the decomposing contents of landfills, and they often contain toxic substances like heavy metals and organic chemicals. The lack of oxygen in underground decomposition also creates methane gas, a suspected contributor to global warming and a highly flammable explosive. The problem of toxins and landfills is such that over 20 percent of the hazardous waste sites on the Environmental Protection Agency's (EPA) Superfund list are municipal landfills (Office of Technology Assessment, 1989).

## Incineration

Incineration is the preferred method of disposal when compared to landfills. The combusted waste is reduced in volume by 80 to 90 percent and in weight by 65 to 75 percent (Young, 1991). Recent advances in the technology of burning trash have significantly reduced the harmful emissions that older facilities spewed into the air. Modern incinerators also benefit some communities by providing a source of energy, often referred to as co-generation in its earlier days.

There are, however, significant problems and misconceptions with the combustion of solid waste. Because of incinerator maintenance shutdowns and the presence of certain materials that can not be burned, the actual reduction in waste that is sent to landfills is around 60 percent by volume and 50 percent by weight. The energy that many incinerators produce is often less than the energy required to produce the items they burn. Recycling high density polyethylene (milk jugs and detergent bottles), for example, saves about twice as much energy as incineration. Reuse of a container saves even more energy. Newer, high-temperature incinerators do produce fewer harmful emissions, but they still have their problems. Sulfur and nitrogen oxides that result in acid rain are a by-product of waste combustion as are dioxins, carbon monoxide and 28 different kinds of heavy metals including lead and mercury. The ash that is produced from combustion must eventually be landfilled, thus continuing the country's reliance on that least preferred method of disposal. Incinerator ash, like the stack emissions, also contains toxic materials (EPA, 1989). Simply put, an incinerator has significant advantages over a landfill, but it does not recover materials, or eliminate the need for landfills, and it still pollutes the air and soil of the communities it services.

## Recycling

Recycling, the recovery and conversion of waste materials into new products, offers significant savings for communities compared to the alternative of incineration. A 1990 study by the Institute for Local Self-

Reliance in Washington, D.C., estimated that if the United States were to invest $8 billion in incinerators, the country would burn one-fourth of its estimated solid waste output in the year 2000. The same amount spent on recycling and composting could handle roughly three-fourths of the nation's trash (given strong recyclables markets) (Young, 1991).

Most community recycling programs only recover part of the waste stream. They usually are aimed at a few materials that are easy to collect and have strong secondary markets. Newspaper, glass bottles, and aluminum cans are typical examples. But the potential for such programs is far greater than what is now realized by most communities.

Intensive and comprehensive recycling can greatly reduce the need for incineration. Effective separation of materials, recovery of all reusable or recyclable items and composting of organic wastes is needed. Most of the literature on recycling estimates that 80 to 90 percent of the solid waste in the U.S. theoretically could be recovered through intensive recycling. Many consider this an unrealistic expectation for most municipalities, yet examples set by a small number of committed cities and towns show that high recovery rates are attainable.

Seattle has probably the best example of an effective, large-scale recycling program in the United States. The city's solid waste plan establishes a goal of reducing the waste stream 60 percent by 1998. In 1989, two years after the plan was implemented, Seattle had reached a recycling rate of 37 percent (Benner & Watson, 1992). Their success is augmented by ambitious goals for source reduction, recycling, and composting.

Smaller communities like Wellesley, Massachusetts, and Berlin Township, New Jersey, also have exemplary residential recycling projects. In 1989, these municipalities had recycling rates of 41 percent and 57 percent respectively (Young, 1991). The examples set by such towns reveal strong ingredients for successful recycling are ambitious yet realistic goals, a willing community, and committed recycling coordinators.

## Source Reduction

The Environmental Protection Agency has defined source reduction as, "the design, manufacture, and use of products so as to reduce the quantity and toxicity of waste produced when the products reach the end of their useful lives" (EPA, 1989). Source reduction may have the greatest potential for alleviating the problems associated with solid waste. It reduces the need for disposal, the extraction of virgin resources, and the energy use and pollution associated with incineration and landfilling.

Source reduction can be seen as an ethic that is used in a product's design, manufacture, sale, purchase and use. Each step requires a conscious effort by the manufacturer and consumer, an effort to reduce the amount of waste going to landfills, incinerators and to recycled items that may ultimately be discarded after their initial use. Source reduction may be achieved by minimizing toxic content in a product, using a minimum amount of material and designing the item for longer use. Familiar practices of source reduction for the consumer include using both sides of a piece of paper in the office, refusing to purchase items with excessive packaging, and reusing containers and packaging in the kitchen.

Packaging is the biggest target for source reduction and reuse. Most packaging in developed countries is discarded after one use and thus constitutes a large portion of the waste stream. Packaging made up 32 percent of U.S. solid waste in 1988 (Young, 1991). Reuse is an important component of source reduction, particularly with regard to rigid containers. It used to be a common practice with glass milk and soda containers, but a change back to such practices would require significant prodding of the industries involved. Unfortunately, little has been achieved at source reduction in the manufacturing arena. Further pressure by citizen's groups involved in recycling may someday convince state and federal governments to enact legislation that would effectively require industry to consider the cost of disposal when designing and manufacturing products.

### Western Massachusetts and SWEEP

The status of solid waste management in Massachusetts is not very different from that of the nation as a whole. Most existing landfills are closing, hauling and tipping fees have risen, and recycling markets are unstable. The legislature responded to these mounting pressures in the late 1980's with an omnibus law, Chapter 584 of the Acts of 1987 (the Solid Waste Act). As a result of this law, the Department of Environmental

Protection (DEP) produced the Integrated Solid Waste Management Master Plan. The plan adopts the hierarchy of source reduction, recycling, combustion and landfilling and establishes two main objectives: a solid waste volume reduction (through source reduction) of 10 percent from the 1990 per capita rate by the year 2000; and a 46 percent diversion rate of municipal solid waste through recycling and composting. A more detailed, itemized break-down of diversion rates is shown in Table 2.

There are also less prominent goals for combustion with energy recovery and land disposal. Incineration or combustion should only be relied on for the portion of the solid waste stream that can not be diverted through recycling and composting. In reference to land disposal, the plan establishes a goal of having a series of regional landfills that serve for the disposal of only non-recyclables and non-combustibles and the residue of composting, recycling, combustion and other processes.

The master plan set many more milestones for solid waste management in Massachusetts. DEP expects to achieve recycling rates of 34 percent by 1996 and 46 percent by 2000 by helping initiate town and regional recycling efforts, strengthening recyclables markets, and guaranteeing the success of such ventures as the Materials Recycling Facility in Springfield. Other milestones include scheduled bans on the disposal of certain materials in solid waste facilities. The plan banned leaf waste, large home appliances and unshredded tires in 1992. Yard waste, recyclable aluminum, metals and glass were banned at the end of 1992 and all grades of recyclable paper and single polymer plastics are to be banned by the end of 1994.

**Table 2 Goals for Municipal Solid Waste Diversion in Massachusetts for the Year 2000**

| Product | Total Prod. In Tons | Diversion Rate | Tons Diverted |
|---|---|---|---|
| Leaf/Yard | 1,283,784 | 81% | 1,039,865 |
| Other Organic | 493,243 | 6% | 29,595 |
| Aluminum | 59,795 | 72% | 43,784 |
| Steel Cntnr. | 81,081 | 72% | 58,378 |
| Glass Cntnr. | 432,432 | 72% | 311,351 |
| Plastic Cntnr. | 155,405 | 72% | 111,892 |
| Other Plastic | 168,919 | 0% | 0 |
| Newspaper | 445,946 | 72% | 321,081 |
| Corrugated | 635,135 | 72% | 457,297 |
| Office Paper | 297,297 | 72% | 214,054 |
| Mixed Paper | 445,946 | 72% | 321,081 |
| Other Paper | 810,811 | 6% | 48,649 |
| White Goods | 114,865 | 81% | 93,041 |
| Tires | 67,568 | 81% | 54,730 |
| Mixed MSW | 1,256,757 | 0% | 0 |
| TOTAL | 6,750,500 | 46% | 3,104,798 |

Source: Massachusetts DEP, 1990

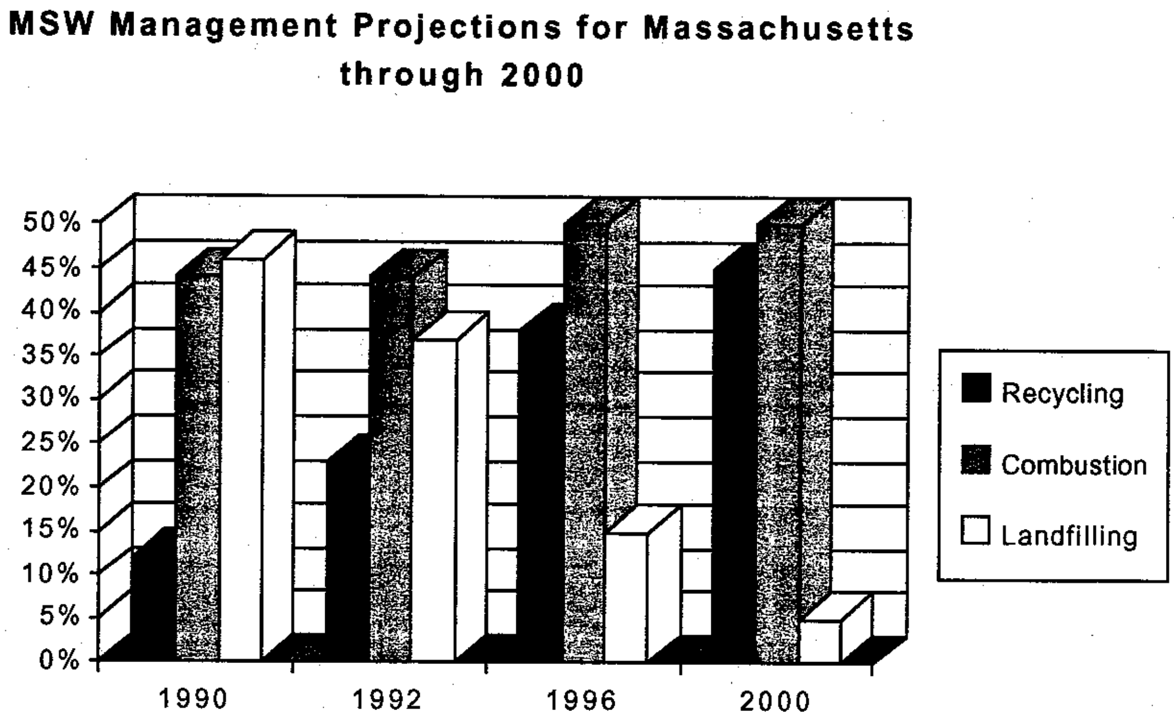


**Figure 1.**
Source: Massachusetts DEP, 1990

Western Massachusetts, as is true for the rest of the state, must attempt to meet the goals of the Integrated Solid Waste Management Master Plan. A problematic issue for the four western counties in Massachusetts is the loss of state subsidies at the regional Material Recycling Facility (MRF) in Springfield starting in 1995. These subsidies have allowed the 92 member communities and their 750,000 residents to use the facility at no charge other than the cost of hauling materials to the site. Once the Springfield MRF comes under private management and ownership, tipping fees will inevitably be established, thus driving up the cost of recycling in western Massachusetts. Since its opening in January of

1990, over 200,000 tons of newspaper, corrugated cardboard, kraft paper, residential white paper, bottles, aluminum cans/foil, steel cans, drink boxes and milk/juice cartons have been processed and marketed through the MRF, however, the MRF does not accept from commercial operations.

Western Massachusetts has a number of other region-specific characteristics which affect the way solid waste is managed. Many of the communities are rural, distant from major highways and rail lines, and isolated from recycling markets and facilities. The marketing and transportation of recyclables are sometimes deterred by cost. Because of their predominantly rural nature, many towns rely on transfer stations as the collection method for recycling.

Four solid waste districts were formed in western Massachusetts during the late 1980s to address these and related solid waste issues. Collectively they include 55 communities throughout Berkshire, Franklin, and Hampshire counties. They were formed with the idea that the towns in any particular district could save money with joint contracts and could shop for better services. These associations include the Northern Berkshire Solid Waste Management District, the Southern Berkshire Solid Waste Management District, the Franklin County Solid Waste Management District and the Hilltown Resource Management Cooperative. In light of all the previously mentioned pressures, the directors for each of the solid waste districts have recognized the need for broader and stronger coordination among their territories. Although the districts have been well served, all those involved agree that much more could be accomplished through their activities.

The directors of the four solid waste districts, the director of the Franklin County Community Development Corporation and the Center for Rural Massachusetts (CRM) formed the Western Massachusetts Solid Waste Education and Enterprise Program (West Mass SWEEP) in 1992. With funding from the U.S.D.A./Farmer's Home Administration, this program is attempting to improve the function of the solid waste districts by: 1) developing a database of recyclables markets and sources for recycled products; 2) distributing a Resource Guide with region-wide, district-specific, town-specific and business-specific information; and 3) generating public awareness through various outreach opportunities.

* * *

This Master's project is a result of the work conducted by the author at the Center for Rural Massachusetts. The author was involved in the production of the SWEEP Resource Guide and database, parts of which are included in the appendices. The author also assembled a library at CRM that contains a wide variety of information on solid waste issues, particularly recycling and source reduction.

This project discusses the status of solid waste management in western Massachusetts, shows how other parts of the country are promoting recycling, helps define the role of SWEEP, and focuses on CRM's (and the author's) contributions to the SWEEP program.

The following chapter, "Selected Efforts at Recycling and Source Reduction", outlines recycling programs in other states that the literature considers as successful models. Examples of cooperative marketing and technical assistance by both non-profit organizations and state governments are included. The next chapter shows the development and purpose of SWEEP and profiles its participants. Chapter 4 traces the development of the Resource Guide and database and discusses the structure of each. Sample sections and pages from the Resource Guide and database are included in Appendices A and B. The fifth and final chapter summarizes the project and provides some conclusions.

This Master's project helps to underscore the importance of local and regional solutions to solid waste management. At the national level of government, the United States plays an advisory role with minimal involvement in implementation. Most states reflect the federal government in this respect. Hence the bulk of effective action comes at the regional and local level, as exemplified by the Western Massachusetts Solid Waste Education and Enterprise Program.

# CHAPTER 2

## Selected Efforts at Recycling and Source Reduction

Planning, funding, and regulation for solid waste management in Massachusetts is conducted mainly by the Division of Solid Waste Management in DEP. DEP has been active since the mid-1960s with the development of effective strategies for processing the Commonwealth's trash. Grant and loan programs have been a part of the scheme, as well as state-funded feasibility studies examining collection and disposal options.

Regionalization has always been encouraged by the state as a means of reducing costs. Massachusetts towns have realized for years the economic benefits of collectively managing solid waste collection and disposal and now are realizing the same cost-cutting advantage that regionalization holds for recycling. Groups like the Hilltown Resource Management Cooperative (HRMC) in western Hampshire County have established collection programs for certain materials. The HRMC now collects two grades of plastic from its 11 member communities and bales them at the transfer station in Williamsburg. By combining these materials, these western Massachusetts towns are reducing transportation costs for delivery of plastic to market.

This chapter examines recycling and source reduction efforts in other states. Examples of cooperative marketing in New Hampshire, the Southwest, New York, and Wisconsin are presented, as are state-run programs in New York and Rhode Island. With intelligent and well-planned integration, the Commonwealth could benefit from some of the strategies used in these states.

## Cooperative Marketing

Cooperative marketing is a concept that has been used in agriculture for many generations. Farmers combine their goods to generate enough volume to enter larger markets and to get better prices for their products. This idea recently has been successfully transferred to the marketing of recyclables. It allows participating communities and certain businesses to maintain a greater degree of control over their recycling costs and revenues than if they attempted to market individually. They are able to decide what materials to market as well as where and how they may best recycle. Possibly the oldest and most successful example of cooperative marketing of recyclables is the work done by the New Hampshire Resource Recovery Association, a non-profit organization based in Concord, New Hampshire.

### New Hampshire Resource Recovery Association

The New Hampshire Resource Recovery Association (NHRRA) began its activities in 1983 with five towns recycling 386 tons of waste paper. Today, 90 percent of the cities and towns in New Hampshire are members, along with 129 non-profit, government, business, and individual "associate" members. NHRRA now handles

25,000 tons per year of paper, corrugated cardboard, scrap metal, used tires, aluminum and steel cans, glass, and plastics through a variety of marketing programs. Two-thirds of the state's municipal recyclables are directed through NHRRA (NHRRA, 1992). The Association also manages a program that recycles office paper and other items for some New Hampshire businesses, institutions and government agencies. Future projects include recycling of used oil and construction debris, and programs to remove refrigerants (CFC's) and PCB capacitors from appliances collected by municipalities (Holmes, 1992).

Through its programs, NHRRA sells specific recyclables to a single buyer, conducts market research, negotiates contracts with buyers, schedules shipments of materials from local collection points to market, handles all the necessary paperwork and resolves disputes (Watson, 1991). By offering large volumes and steady supplies, the Association is able to give communities access to long-term, stable contracts with buyers. In turn, it helps buyers coordinate their purchase and collection schedules, and it guarantees quality material through its own inspection program.

In addition to marketing assistance, the New Hampshire Resource Recovery Association provides educational and technical support to its members. A peer education program, for example, matches experienced recycling coordinators with those requesting help. NHRRA also has a critical skills training program that instructs teachers how to include solid waste and recycling into an environmental curriculum. It organizes expositions of solid waste handling and recycling equipment throughout New Hampshire. The Association has provided technical assistance not only to communities and groups in New Hampshire, but to organizations in many other states including Maine, Wisconsin, New York, Arizona, Tennessee, and Massachusetts (NHRRA, 1992). NHRRA organizes the annual New England Resource Recovery Conference, a nationally-recognized and popular event that features workshops on the most recent waste management strategies, tours of the host state's facilities and a large display of recycling services and products. The Association provides a large number of workshops and site visits, and conducts telephone interviews and written surveys to meet its educational, technical and marketing assistance goals.

NHRRA is a member-directed organization, with a volunteer Board of Directors elected annually by the membership. The Board sets Association policy, manages staff activity and approves contracts. Representatives from member communities serve on the Marketing and Technical Assistance/Education Committees which orchestrate programs, advise staff and oversee general activities (NHRRA, 1992).

### Southwest Public Recycling Association

Another model of cooperative marketing was established more recently in six southwestern states. The Southwest Public Recycling Association (SPRA) was formed in February 1992 by the governors of five states who wanted to divert trash from their nearly-filled, leaking landfills. Cities, counties and Native American tribes from Arizona, Colorado, Nevada, New Mexico, Utah and West Texas now claim membership (Holmes, 1992).

In some ways, SPRA is similar to its New Hampshire counterpart. It helps members set up long-term contracts and it directs materials to and from a large array of sites. These southwestern states, however, have their own unique circumstances. Due to its large size geographically, more than one buyer is contracted per material. The region also has a number of large cities where private haulers do their own sorting and baling.

But the Southwest Public Recycling Association is different from the New Hampshire model in another important way. Among its daily activities, the staff of SPRA is trying to construct a network of buyers and manufacturers to create new markets for secondary materials. They are attempting to attract industries that are partly or completely dependent on recyclable materials as part of their operations (Holmes, 1992). The benefits of such a strategy are local job creation and stronger markets for the utilized materials within the region.

<u>Other Efforts</u>

Variations on the NHRRA model of cooperative recycling exist in other states including New York and Wisconsin. In New York, the Long Island Regional Recycling Cooperative was formed to circumvent an expensive $20 to $40 per ton fee for recycling newspapers in the towns of Babylon, Huntington, Islip, and Oyster Bay. These four towns generate about 60,000 tons of newspaper every year (Holmes, 1992). Shortly after the cooperative was formed in 1990 with matching state grants and in-kind donations, the towns began to negotiate contracts to be paid $15 to $20 per ton for their old newspaper (Watson, 1991). An expanded volume of material and staff to land the contract were the key factors that turned around the newspaper market in these communities. Co-op members are hoping to eventually expand to include other materials like steel cans, glass, and plastic.

Seventeen counties in Wisconsin have set up a NHRRA-style cooperative through the State Cooperative Extension Service. Buyer contract negotiation and routing of materials are some of the roles of this Wisconsin model. Member communities are also trying to share shredders, balers and other equipment so that neighboring towns and counties are not duplicating expensive, capital purchases (Holmes, 1992).

Organizers or planners attempting to establish a marketing cooperative should be mindful of the existing recycling infrastructure in their area. The Association of Vermont Recyclers failed when they tried to set up a cooperative for scrap metal because there were already enough private vendors dealing in scrap metal and a largely satisfied group of municipalities (Patullo, 1992). When there is an obvious shortfall in the marketplace, cooperative marketing of recyclables makes sense. The benefits of such agreements make them attractive for both the buyer and the member: with steady supplies, buyers can achieve greater operating efficiency, while members get better prices for their materials, and the contracts negotiated by the cooperative guarantee relatively long-term stability for the market.

## State Government Assistance and Market Development

Many states have agencies that specifically address solid waste management. Fewer have agencies that are attempting creative alternatives that go beyond the development of larger incinerators or improved landfills. New York is one of the most advanced states in terms its comprehensive and effective recycling and reuse programs; it chose to treat recycling as an economic development tool and to encourage its growth as such. Through the Office of Recycling Market Development (within the state Department of Economic Development), the state provides businesses and communities with financial and technical assistance, demand and supply-side market development, and policy development and research.

Financial assistance from the Office of Recycling Market Development (ORMD) is offered through grants and a low-interest loan program: Feasibility Study Grants, Targeted Grants, and Recycling Technology Financing. Feasibility Study Grants are awarded for projects that will evaluate recycling technologies, systems, processes or products made from recycled materials. Up to

$50,000 is available from these funds. Targeted Grants go to special market development or waste reduction projects. These have been given, for example, to start marketing cooperatives and to help manufacturing consortiums implement recycling and waste reduction proposals. Recycling Technology Financing is applied to capital acquisition or the building of recycling facilities. Loans of up to $500,000 are available with interest rates that never exceed three-quarters of the Prime lending rate (Gallaway, 1991).

New York's Office of Recycling Market Development has staff at three different locations throughout the state and all are trained to provide technical assistance for businesses and towns (Gallaway, 1991). They locate market outlets and advise how best to market recyclable materials. Their technical assistance can be categorized into four areas: market information, marketing advice, marketplace intermediary service, and market research.

*Market information* is provided mainly by a 27,000-company listings database that is constantly being updated. The database contains information on recycling companies that are brokers, processors, end-users and manufacturers. The listing for each company contains:

Name
Address
Phone/FAX
Contact and contact's title
Business type (broker, processor, end-user, manufacturer)
Material
Contract?
Type of transportation for materials

End use of material
Minimum and maximum amounts of material required
Acceptable and non-acceptable contaminants
State of material and packaging requirements
Geographic restrictions
Pre-consumer and post consumer status
Miscellaneous information (Oettinger, 1992).

*Marketing advice* is given by the Office to help towns and businesses maximize the value of their recyclables. They make available some intelligent and well-planned strategies and options in order to realize this objective. *Marketplace intermediary service* simply brings together materials suppliers and users, as well as sellers and buyers of products made with recycled content. *Market research* involves monitoring the markets for all grades of materials and publishing analyses of the near-future trends of these markets.

The ORMD is able to provide financial and technical assistance with funding through State appropriations, federal monies and grants from the U.S. Environmental Protection Agency.

Within a market there are consumers (demand-side) and producers (supply-side). The ORMD recognizes this and conducts its activities accordingly. As a source of guidance for the Office's market development programs, the staff at the ORMD are working toward the following objectives:

<u>Demand Development</u>

• to develop the State's industrial capacity for making use of recyclable materials in production processes;

• to indirectly influence the development of similar industrial capacity outside of the state; and

• to assist companies in identifying and developing markets for products they manufacture using recycled materials

Supply Development

• to assist municipalities and businesses with identifying and securing outlets for their recyclable materials;

• to foster the development of a supply infrastructure in New York that is capable of transforming the materials collected through municipal and commercial programs into readily usable industrial inputs; and

• to assist municipalities and businesses in developing materials collection programs and marketing strategies that position them as reliable suppliers of quality raw materials. (New York Dept. of Economic Development, 1991)

Market research is an important part of ORMD's activities. It provides answers that allows them to more effectively apply their loans, grants, and marketing assistance. An example of such research is a 1991 study entitled *Policy Options for Promoting the Demand for Recycled Products in New York State: Case Studies of Products Made from Used Office Paper, Used Oil, and Scrap Tires*. Final recommendations included instituting financial incentives for de-inking facilities in the State, offering technical assistance to increase the reliability and quality of supply of office paper waste, and establishing a "Buy Recycled" campaign aimed at corporations and government offices (New York Dept. of Economic Development, 1991).

*Market Potential for Office Wastepaper in the Northeast* analyzes the supply and demand of office waste paper in the region. It found good demand for the material and recommended a 51 percent recovery rate goal by the year 2000 and economic incentives for the installation of de-inking and pulping equipment. Another study on paper, *Developing Markets for Recycling the Components of Residential Mixed Paper*, found good potential for use of this hard-to-market material in tissue, towel and boxboard operations (New York Dept. of Economic Development, 1991).

One other example of ORMD research is a study commissioned by the State to look at the use of crushed glass and used tires in the production of pavement. *Issues and Avoided Costs Associated with the Use of Recycled Materials as Components of Paving Materials* analyzes the investment, disposal costs and environmental hazard associated with a pavement program using recycled glass additives (New York Dept. of Economic Development). Although the figures generated in this report are only estimates, they give the state and handlers of used tires and glass a benchmark from which to plan future investments and activities.

**Rhode Island: One State with Mandatory Recycling**

Rhode Island adopted the first mandatory statewide recycling program in the United States in 1986. The Rhode Island Solid Waste

Management Corporation (RISWMC) completely funds this effort and administers it with the help of the Department of Environmental Management (DEM). Twenty-four out of the state's thirty-nine cities and towns are presently recycling under the mandatory program. Two more will become part of the program in the near future while the rest of the municipalities are recycling independently. The independent communities are expected to be included in the state-wide program within a year of this writing (Marino, 1993).

Commercial Recycling

Rhode Island has close to 28,000 commercial establishments and institutions, all of which are required to recycle under state law. There is also an impressive mandate that businesses and institutions with over 50 employees submit annual recycling reports to DEM (McCabe, 1991). A detailed waste generation and composition analysis is not required, but the general studies that are conducted still provide the state with important data and force businesses to think about reducing the trash that they generate. State agency offices also fall under the guidelines for commercial recycling.

Businesses are expected to recycle the following materials:
- yard waste
- telephone directories
- white goods
- automobiles
- lead-acid batteries
- wood waste
- used oil
- newspaper
- office paper
- old corrugated cardboard

• aluminum scrap
• steel cans
• glass containers
• plastic milk jugs and soft drink bottles (McCabe, 1991).

Under the mandatory recycling law, garbage trucks arriving at Rhode Island's Central Landfill in Johnston (the state's only landfill) with more than 20 percent of these commercial recyclables will be turned away. Fines may also be charged against non-complying businesses (Lynch, 1991).

Although DEM is mainly a regulatory agency, it does provide businesses with technical assistance. It gives commercial operations information on the location of recyclables markets and how to set up a recycling program. The state also helps to find innovative approaches to specific waste problems. DEM recently set up an exchange where retailers send their used hangers to dry cleaners rather than continue to throw them out with the rest of the trash. DEM also helps businesses and institutions complete the forms that are necessary for their annual recycling reports (Lynch, 1991).

The RISWMC is a non-profit agency that funds and runs the statewide recycling program, the state's only MRF and its only landfill. RISWMC is also attempting to build at least one waste-to-energy facility. The Rhode Island Solid Waste Management Corporation traditionally has had an enforcement role with respect to commercial recycling. It enforces, for example, the 20 percent restriction on commercially-generated recyclables. The RISWMC now goes beyond enforcement and offers technical assistance for companies with fewer than 50 employees. It will help small businesses with waste audits, or to start cooperative marketing schemes and other collection options. The Corporation also is working with at least 25 school districts. It provides curricula and other materials for teachers, financial and technical assistance to the schools and recycling bins for cafeterias and classrooms (RISWMC, 1992).

Municipal Recycling

Rhode Island's municipal recycling program reaches over 700,000 residents in 34 towns and cities. Between 15 and 18 percent of the state's solid waste is recovered through the program (Marino, 1993). Most municipalities are participating in mandatory curbside recycling while the rest have voluntary drop-off locations. As mentioned previously, every town should be part of the mandatory recycling program by the end of 1994.

The curbside program has been designed so that it is as easy as taking out the weekly garbage. Residents are given 14-gallon plastic containers in which they can put steel and aluminum cans, glass bottles, plastic soda bottles, milk jugs and newspaper. No separation is required. The haulers have two bins on their trucks: one for newspapers and one for mixed recyclables. Recycling pick-up in most cities and towns is coordinated so that is done on the same day that curbside trash is collected (Enos, 1990).

A great variety of solutions to the rising costs of solid waste disposal are evident throughout the United States. Recycling and source reduction are being addressed by a combination of non-profit and state run programs. The New Hampshire Resource Recovery Association was active early on in the effort to coordinate sellers and buyers of recyclables. Most small municipalities in New Hampshire and other states don't have the expertise to market a material or to write an effective Request for Proposal to prospective haulers. The NHRRA has made that possible for most towns in their state. New York's ORMD has brought recycling into the realm of economic development - a strategy that should strengthen New York's recycling infrastructure and benefit the overall economy. And Rhode Island has proven that mandated recycling can work where there is coordination among the responsible agencies and sufficient technical assistance for both municipalities and businesses.

# CHAPTER 3

## West Mass Solid Waste Education and Enterprise Program (SWEEP)

Western Massachusetts has faced many tough issues in solid waste management during the last few years: most of the small, single-town landfills are mandated for closure by 1995, no new incinerators have been planned, and markets for many recyclables have been less than adequate. The result of these and other factors is that waste collection and disposal is increasingly expensive for residents of western Massachusetts. Source reduction and strengthening local markets for recyclables are two areas that have been getting much attention by those concerned with solid waste management in the region.

Education and awareness are important components of any source reduction and recycling campaign. In order for such a campaign to be successful, the education component should be comprehensive so that the individual, municipal and business levels are addressed. A coalition of solid waste districts and community assistance organizations formed the Western Massachusetts Solid Waste Education and Enterprise Program (SWEEP) as a means to strengthen source reduction and recycling in the area through a coordinated education and outreach effort.

In 1992, four solid waste districts, the Center for Rural Massachusetts and the Franklin County Community Development

Corporation received funding from the Farmers Home Administration (FmHA) for SWEEP. The goals of the program are to help municipalities and businesses better manage their solid waste and to produce environmental and economic benefits through source reduction and stimulation of the region's recycling infrastructure.

The products of this one-year grant include 1) a database of recyclables markets in and around western Massachusetts and of companies that sell products made with recycled content; 2) a resource guide that contains specific information about waste management in each district town and the "how's" and "why's" of source reduction and recycling; 3) workshops and other educational materials that instruct businesses in the region on waste reduction and recycling; and 4) public outreach to member towns in each district.

Each of the organizations involved in the SWEEP program has taken on distinct tasks. The role of the solid waste districts has been public outreach, e.g., newspaper articles, presentations, and direct technical assistance. The Center for Rural Massachusetts has been responsible for production of the database and resource guide. The Franklin County Community Development Corporation has organized and run the business workshops. The Center for Ecological Technology, a non-profit group based in Pittsfield, also participated in the development of the database and production of the business workshops. A more detailed description of all the SWEEP participants and their activities comprises the rest of this chapter.

## The Solid Waste Districts

The idea for regionalizing solid waste management dates back to 1965 when Congress enacted the Solid Waste Disposal Act (later amended in 1970 by the Resource Recovery Act). This act encouraged multi-jurisdictional waste management and funded surveys and programs to reach that end.

The Massachusetts State Legislature responded in 1965 by amending Chapter 40 in order to allow towns and cities to form solid waste districts. A number of studies were conducted in the years following the Chapter 40 amendment. They recommended regionalization in order to reduce collection, disposal, and facility operation costs. Some unsuccessful attempts were made at forming solid waste districts in the Commonwealth until 1973 when the Carver, Marion, Wareham Regional Refuse Disposal District was formed (Johnson, 1990). Few solid waste districts have formed since that time.

In recent years, however, economics have forced a harder look at regionalization, especially in western Massachusetts. It now has a disproportionately large number of towns joined into districts when compared to other parts of the state. Some of these were developed in response to the Massachusetts Solid Waste Act of 1987, which authorized $265 million for the clean-up and capping of landfills, as well as the development of regional recycling and composting programs and regional solid waste facilities. Only municipalities with regional plans or projects have access to the Act's funds (Johnson, 1990). The Solid Waste Act was the first significant incentive by the Commonwealth for towns to develop regional programs and facilities.

Four of these solid waste districts--Northern Berkshire Solid Waste Management District, Southern Berkshire Solid Waste Management District, Franklin County Solid Waste Management District, and the Hilltown Resource Management Cooperative--are participants in West Mass SWEEP. program. Each of the districts see themselves as a facilitator of cooperative solid waste management that emphasizes environmental sensitivity and economic prudence. Below is a brief profile of each organization.

Northern Berkshire Solid Waste Management District

The formation of the Northern Berkshire District was the result of a number of factors. A study done in the early 1980s projected that within the next decade, Adams, North Adams and Williamstown would have to cap their old landfills and site new ones. The cost of doing this for each municipality was prohibitively expensive. Williamstown also experienced a scare in 1986 when residents reported that leachates from the landfill were seeping into a nearby pond. An expensive study followed which discovered that no such phenomenon was occurring. While it was later found that this was not true, the prospect of leachates leaking into the ground and surface waters raised significant concern among residents and town officials. Also during this time, the rural communities of Florida, Cheshire, and Savoy had closed their landfills and were paying high prices to dispose of their trash in commercial landfills (Johnson, 1990).

A study to look at regionalization of solid waste disposal in Northern Berkshire was the first step in organizing the solid waste district. The study was conducted by a task force of eleven towns in the region with funding by the Bureau of Solid Waste (within the Department of Public Works). Technical assistance was also provided by the Bureau and the Department of Environmental Quality Engineering (DEQE) (Johnson, 1990). The study, like many others around the state, concluded that these towns would have to regionalize their handling of solid waste or face prohibitively high disposal costs.

The legislation forming the Northern Berkshire Solid Waste District was passed in the summer of 1988--the first solid waste district formed after the Solid Waste Act of 1987(Johnson, 1990). Twelve communities voted in favor of membership: Adams, Cheshire, Clarksburg, Florida, Hancock, Lanesborough, New Ashford, North Adams, Peru, Savoy, Williamstown and Windsor. The town of Hinsdale has since joined the District.

The Northern Berkshire District has used the SWEEP grant to its advantage by strengthening communication with its member towns and gathering town-specific solid waste data that it had not previously assembled.

Southern Berkshire Solid Waste Management District

A private recycling facility that would accept construction and demolition debris from local towns was proposed for the town of Sheffield in the early 1980s. Some residents questioned the environmental risks associated with such an operation, especially since some of the waste would be coming from outside the region. Citizens for Safe Recycling formed in opposition to the proposed facility and decided to look for safer waste disposal alternatives. They saw regionalization as an environmental and economic necessity. Many of the landfills in Southern Berkshire County were under order by DEQE to close, and towns without landfills were paying high hauling costs to truck their waste out of the region (Johnson, 1990).

With all these factors at play, the Bureau of Solid Waste Management decided to encourage regionalization in Southern Berkshire with a study for a municipal solid waste composting facility (Johnson, 1990). This proposal greatly influenced the creation of the Southern Berkshire Solid Waste Management District, formed in 1989. Eleven towns are now members of the District: Alford, Becket, Egremont, Monterey, Mount Washington, New Marlborough, Otis, Sandisfield, Sheffield, Washington and West Stockbridge. These towns saw a number of advantages in forming a solid waste district, including siting of a regional landfill, planning for the collection of household hazardous waste, coordinating the transportation of recyclables to the Springfield MRF, and pushing for source reduction measures.

A composting facility still has yet to be built, but a feasibility study is underway for one to handle MSW, septage and wastewater treatment plant sludge. A feasibility study was also conducted for the siting of a MRF in Lee. There are no active landfills in any of the member towns and all non-recycled MSW is taken a considerable distance to Chicopee. The

District estimates that 25-30 percent of the cost of waste disposal is in hauling (Southern Berkshire Solid Waste Management District, 1992). The District's recyclables are collected either at transfer stations or through curbside collection. Some of the recyclables go to the Springfield MRF while others go to private processors.

The activities conducted by the Southern Berkshire District under the SWEEP grant have been varied and innovative. The District helped in the production of a play called "Rats", which was performed by and for local school children in three different towns. The show was based on the Broadway musical "Cats" and involved animal characters forced to find creative alternatives for dealing with the trash that people throw away. The Southern Berkshire District also produced a set of four recycling signs for each of the eleven towns in the District. They were designed for placement at landfills and transfer stations. Three of the signs give detailed instructions on recycling paper, glass and plastic while the fourth describes what materials cannot be placed in the compactor.

Franklin County Solid Waste Management District

The Franklin County Solid Waste Management District is the largest of the districts in western Massachusetts. Its 21 member towns include Bernardston, Buckland, Charlemont, Colrain, Conway, Deerfield, Erving, Gill, Greenfield, Hawley, Leyden, Montague, New Salem, Northfield, Orange, Rowe, Shelburne, Sunderland, Warwick, Wendell, Whately. The District was established in July 1989.

A major impetus for the formation of a district in Franklin County came in 1986 when DEQE refused an operational permit for a waste-to-energy facility in Holyoke. Eight towns in Franklin County had already signed a contract with the project and felt somewhat directionless after the permit was refused (Johnson, 1990). These communities had no alternative, long-term plans for solid waste disposal.

Another catalyst was dwindling landfill capacity. In the late 1980s, Franklin County had 10 municipal landfills serving 12 towns. Nine were estimated to reach capacity by 1995, but expanding a landfill at the local level was an extraordinarily expensive proposition (Rottenberg, 1993). Communities consequently were interested in the savings that regional, long-term solid waste planning had to offer.

During the planning process for the development of the District, an Integrated Solid Waste Plan was presented to the Franklin County Solid Waste Planning Board. The plan specifically looked at source reduction, recycling, municipal solid waste composting, incineration and the siting of a regional landfill. Of these issues, composting and incineration seemed to be the topics of greatest interest for the Planning Board. The Board decided to put their research toward MSW composting because Massachusetts had a moratorium on incinerators at the time, attempts at implementing incineration in recent years had failed, and it was not clear whether state funding for an incinerator would be available when the moratorium was lifted. A subsequent study also showed composting to be cost-competitive with incineration (Rottenberg, 1993).

The siting of a compost facility has been ongoing since 1988. It is still being pursued by the District Administrator who hopes to establish an operation in the near future. Two studies have indicated that a co-composting facility to process MSW and the District's sewage sludge is also feasible and recommended. Along with developing a co-composting site, the District has also been working toward the establishment of a regional landfill to relieve the long-term disposal need of District towns (Franklin County Solid Waste Management District, 1992).

The District has actively pursued the collection of recyclable plastics. It began a plastics program in the fall of 1991 which served 18 municipalities. In the program's first year, 20 tons of plastic was collected and marketed (Franklin County Solid Waste Management District, 1992). The program has grown and is expected to expand into new markets.

The most successful collection of household hazardous waste ever held in Franklin County was run by the Solid Waste District in the fall of 1992. Seven thousand gallons of various toxic substances were gathered from 713 households representing fifteen towns. A careful analysis of other household hazardous waste collection programs helped insure the success in Franklin County (Franklin County Solid Waste Management District, 1992).

Education is a priority concern for the Franklin County Solid Waste Management District. An Educational Coordinator responsible for public outreach was hired partially under the SWEEP grant. She is responsible for much of the education that is necessary for a successful campaign; whether it be in household hazardous waste collection, home composting or plastics collection.

Hilltown Resource Management Cooperative

The towns of Hampshire County have faced the same solid waste management challenges as those in other counties. DEP regulations for closing of unlined landfills and increased hauling costs due to longer travel distances forced municipalities in western Hampshire County to consider regionalization of services.

The city of Northampton expanded its landfill in the mid-1980's to accommodate continued use. Construction was completed in 1987 and Northampton was eager to pay back the money it had borrowed for the project. (Landfill expansion grants were available from the Department of Environmental Quality Engineering, but were contingent upon a community proving that 10 or more towns would be using the landfill.) The city negotiated with the eleven towns that now make up the Hilltown Resource Management Cooperative (HRMC) and with Easthampton for their solid waste (excluding recyclable materials). A Memorandum of Understanding (MOU) was signed and the city acquired state funding for the landfill (Weiss, 1993).

The eleven hilltowns continued to meet and plan for a regional solid waste management district. Most of these towns managed their solid waste independently. They also had weak recycling programs and only a few of them had transfer stations. Each town had its own landfill, but they were all due to close by 1995. The hilltowns agreed that a district should be formed that would work toward a strategy of source reduction and recycling as well as joint contracts with haulers to reduce costs (Weiss, 1993).

The Hilltown Resource Management Cooperative was established in February of 1989 by the towns of Ashfield, Chesterfield, Cummington, Goshen, Hatfield, Huntington, Middlefield, Plainfield, Westhampton, Williamsburg and Worthington. The Cooperative has had a number of accomplishments:

• Standardization of specifications and sharing of hauling contracts have significantly reduced costs for member towns. Hauling fees for trash were reduced an average of 40 percent by 1992. Similarly, the hauling of recyclables has been cheaper than if the towns contracted haulers individually (HRMC, 1992).

• The HRMC has been operating its own plastics recycling program since July 1990. A baler was installed in Williamsburg where #1 and #2 plastics are sorted and baled for market (HRMC, 1992).

• An intensive household hazardous waste (HHW) education program also has been established. The traditional HHW collection days were found to be too expensive for the Cooperative ($125 per household), so the Director conducts an ongoing education campaign for residents and schools. The program teaches individuals how to reduce their reliance on toxic substances and provides ideas for non-toxic alternatives (HRMC, 1992).

• The Director has also acted as a liaison between the HRMC towns and the Department of Environmental Protection. There are myriad issues involving state regulations and many small towns simply don't have the staff to keep fully updated (HRMC, 1992).

• Education and public outreach to residents and businesses in member communities comprise most of the Directors activities. Direct communication with schools, town meetings or community groups about waste disposal and environmental issues is done on a weekly basis (HRMC, 1992).

Efforts at increased recycling in the Hilltowns have proven effective. In 1990, the HRMC helped save member towns $104,520 in waste hauling costs by diverting 39 percent of their waste stream from the Northampton landfill. This amounted to 1,608 tons of recyclables (Weiss, 1993).

The Cooperative has used its portion of the SWEEP grant to bolster its ongoing programs in education and public outreach. It has also paid for the Director's time in organizing and directing SWEEP's activities in the second half of the grant period (the Center for Rural Massachusetts took responsibility as the SWEEP program director for the first half of the one-year grant period).

## Franklin County Community Development Corporation

The Franklin County Community Development Corporation (CDC) was established in 1979 to strengthen the local economy and to guarantee quality housing for those who could not afford it. The CDC is a non-profit corporation that has secured state and federal grants as well as private donations over the years to run programs that assist small businesses and provide housing opportunities.

The CDC is located in Greenfield at The Venture Center, which provides incubator space for start-up businesses and expansion space for existing ones. The CDC also gives tenants administrative and technical assistance as part of their rent. Another aid to small businesses in the region includes low interest loan programs and packages.

Very little information and assistance in terms of recycling and source reduction has been available for western Massachusetts businesses. The solid waste districts mostly have been concerned with municipal recycling. Area businesses have few outlets for their recyclables because commercial recyclables are prohibited from the Springfield MRF. SWEEP members saw the Franklin County CDC as the best choice for presenting information about recycling to the region's commercial, industrial and institutional establishments.

The Franklin County CDC has contributed a great deal to the efforts of SWEEP. Its main task has been to run a series of workshops for businesses in western Massachusetts and to produce supplementary materials for the workshops. A summer intern was hired to produce these business workshops.

Two workshop series were conducted. The first was held in late June and involved four workshops - one in each solid waste district. The second series also was held in each solid waste district and scheduled in late July and early August.

The first series of workshops were based on the theme of "Waste Reduction and Waste Audits". With help from the Center for Ecological Technology, these workshops taught attendants about the principle of source reduction and how it could be accomplished in their particular businesses. Open dialogue was encouraged -- a source of positive feedback from participant evaluations. A step-by-step description of running a waste audit was also presented.

The second series stressed the theme of "Recycling and Buy Recycled". A discussion of markets, barriers to them and ways around barriers were outlined first. This included issues involving contracts with haulers. The topic of buying products made from recycled content was stressed within the context of the recycling "loop"; i.e., finding markets for a business' recyclables is interdependent on businesses buying products made from those recyclables. The markets and products databases that the Center for Rural Massachusetts developed also were presented at this workshop. All businesses attending any of the eight workshops will receive the database information from CRM.

Printed material was given to all participants at each workshop. Articles and other informational materials were included in packets that fit the theme of each series. A larger item, "SWEEP Business Guide to Solid Waste Management", a guide produced by Franklin County CDC, covered information pertinent to both workshop series as well as other areas of recycling for businesses. The Guide contained such sections as conducting a waste audit, starting a recycling program, finding markets and sample press releases.

**Center for Rural Massachusetts**

The Massachusetts General Court established the Center for Rural Massachusetts in 1984 with help from the Legislative Rural Caucus. Senator John Olver and State Representative Christopher Hodgkins co-filed the enabling legislation that set up the Center in the College of Food and Natural Resources at the University of Massachusetts at Amherst.

The mission of CRM is to conduct applied research and act as a clearinghouse of information for local and state officials on issues facing rural communities in Massachusetts. In the Center's initial years, growth management was the most pressing concern for small towns in the Commonwealth. A robust economy presented great pressures for local planning boards. Along with the prosperity of the "Massachusetts miracle" of the mid-1980's came rapid land development. Some small towns saw irreversible changes in their landscape and unwise use of natural resources due to unchecked commercial and residential development.

Others who were unable to deal with the rapid growth, instituted unpopular building moratoria. Research and technical assistance conducted by the Center for Rural Massachusetts has attempted to appease developers and preservationists by providing intelligently conceived methods of development for the small towns of Massachusetts.

Rural economic development is another part of the Center's mission. This topic has become a much larger concern for small town officials since the recession of the early 1990's. Growth is no longer a prominent problem in many communities. CRM consequently has seen more requests for economic development projects. Promotion of the specialty foods industry in western Massachusetts is one area towards which CRM has devoted its resources.

Many experts in the field of solid waste management are developing the belief that recycling is a tool of economic development. It is with this idea and a concern for conservation that the Center for Rural Massachusetts co-wrote the grant for SWEEP.

CRM has been an integral participant in the SWEEP program. The Assistant Director acted as the program coordinator during the first half of the one-year grant period. The Center hired a database coordinator to program and develop the recyclables markets and recycled products databases. It also hired two graduate students from the Department of Landscape Architecture and Regional Planning at the University to research and write the Municipal Resource Guide and develop a central resource library on the topic of solid waste and recycling. A full description of the SWEEP products that have been developed by the Center for Rural Massachusetts is contained in the following chapter.

# CHAPTER 4

# THE RESOURCE GUIDE AND DATABASE

The SWEEP project's overriding objective is to provide education and awareness about source reduction and recycling to individuals, municipalities and businesses. The Resource Guide and Database developed by the Center for Rural Massachusetts achieve that end. The Resource Guide is intended mainly for officials and residents of the waste district towns in western Massachusetts while the database directories are aimed at businesses in the region with the hope of strengthening the area's recycling infrastructure.

## The Resource Guide

The activities and products of the SWEEP project are a direct result of concerns expressed by the communities and businesses of western Massachusetts. The Resource Guide is no exception to this. Town officials wanted a reference for questions about solid waste management in their town, solid waste district, or the region. The Center for Rural Massachusetts has responded with a document that is informative, flexible and relevant to the needs of town officials and residents.

Two graduate students, Nat Cohen and the author, were hired to write and design the Guide (and to aid CRM's Database Coordinator when necessary). They began with an intensive collection of materials ranging from journal articles to EPA handbooks. Guides produced in other regions were also collected. The structure of the SWEEP Guide was modeled after a combination of other similar guides. The most prominent of these were the "Newton Green Pages" from Newton, Massachusetts, and the "Guide to Commercial & Institutional Recycling" published by the Northeast Maryland Waste Disposal Authority.

The contents of the Resource Guide include an introduction to the SWEEP project and sections explaining source reduction, energy conservation, water conservation, household hazardous waste, backyard composting and an expanded section on recyclable materials. Each town also will receive a municipal profile detailing such information as transfer station hours, recyclables accepted at the transfer station, services provided by the solid waste district, and other relevant facts. The markets and products directories that were produced from the database are included as appendices to the Resource Guide.

Each section is structured so that a general discussion of the topic is presented first, along with information pertaining to western Massachusetts. The purpose of this is to familiarize the reader with the relevant issues and problems. The section ends with references for further inquiry or assistance. The used oil section, for example, lists DEP's hotline telephone number for used oil questions and complaints.

The entire document, except for the database appendices, was written in Microsoft Word 5.1. This program proved too confining for inclusion of graphics and creative page layout so the document was transferred to QuarkXPress, a Macintosh desktop publishing program. Manipulation of graphics, fonts and layout was much simpler in the new program.

A unique aspect to this Guide compared with others that were studied is that it will be published in loose-leaf form. This will allow a town administrator or official to add sections in the future. The loose-leaf form also allows the town to easily remove pages or sections for photocopying. A section could be photocopied for posting at particular events or for a resident who wants it for his or her own use.

Two hundred copies of the Resource Guide are being published. Distribution to town offices will be done by each district leader and should be completed by early October.

Appendix A contains the paper, plastics, used oil, and household hazardous waste sections of the SWEEP Resource Guide.

**The Database**

Two directories are being published by CRM for the region's businesses. One directory, the "markets" directory, is a listing of businesses in and around western Massachusetts that are involved in any aspect of recycling. This includes brokers of materials, processors, importers and exporters, haulers and composters. The other directory, the "products" directory, contains companies that sell products made with recycled content, as well as a listing of the products themselves. Both are a result of the database developed over the past year.

In the fall of 1992, the Center began research into database software packages. There is a wide array of database packages on the market. The software choices are available on a spectrum. On one end, the packages are user-friendly yet limited in their capabilities. On the other end, they are extremely powerful and versatile but difficult to program and manipulate. It was decided that the requirements of the SWEEP database would not be excessively demanding yet there should be power in the software so that future additions and requests could be made. A package somewhere in the middle of the spectrum was the ideal choice.

The selection of a software package then became somewhat easy. The Paradox program was being offered at no charge with the purchase of the hardware for this project. Paradox was well reviewed in the consumer literature and fell in the middle of the user-friendly/versatility spectrum. It is also a relational database - an important requirement for the SWEEP project. A relational database has the capability of cross referencing tables of information. For example, the user could request which companies in Berkshire County accept brown glass cullet (the pulverized form of glass that is necessary for re-manufacturing), who are the contact persons at each company and what is their telephone number. If this information is not available on a single table in the database, the relational program could access all the tables from which it is available and produce a new table containing the requested information.

Early in the planning for the database, SWEEP members wanted to make the system available electronically by modem. Paradox and the hardware purchased by the Center has this capability. However, it was soon decided that this would be an expensive requirement and probably would not get the amount of use to warrant the added capability. Members agreed that distributing a printed directory from the database was a more effective approach for reaching area businesses.

The other research conducted in the fall involved finding databases and printed directories of a similar nature in other states or regions. CRM acquired directories published by Massachusetts DEP and the states of Vermont, Connecticut and New York. The New Hampshire Resource Recovery Association also provided listings. The Center analyzed these directories and compiled a preliminary list of materials to be included in the SWEEP database and printed directory.

In January of 1993, Steve Anderson was hired by CRM as Database Coordinator. His job essentially was to build the database. This involved developing a survey and a list of businesses to be included in the SWEEP database. Steve had to decide what information was most important for businesses in the region and develop appropriate tables. He also had to research and develop the portion of the database that listed companies that manufacture and sell products made with recycled content.

Figures 2 and 3 are the final versions of the business surveys for the markets and products directories. The Center decided that the surveys conducted by phone. This would insure a response and ultimately require less time and effort than a mailed survey. Mailed surveys, it was assumed, would not get close to a 100 percent response and would require follow-up mailings and phone calls.

Over 200 companies were called for the markets portion of the database. Geographic restrictions were applied to the companies that were contacted. Only companies that fell within the boundaries of the four solid waste districts and a 50 mile radius around them were included in the database.

A total of 700 markets directories and 700 products directories are being published on paper with post-consumer recycled content. Two hundred copies of each directory are being included as appendices to the Resource Guide while 500 of each will be distributed to area businesses by the waste district leaders and Franklin County CDC. Sample pages from these directories are found in Appendix B of this Master's project.

CET
NY 27

## REGIONAL MARKETS FOR RECYCLABLES QUESTIONNAIRE

Company name J.C. PAPER Co, INC. Contact person ______

Mailing address 57 FULTON ST. POUGHKEEPSIE, NY 12601

Physical address "

County DUTCHESS

Phone # 914-454-2170 FAX# 2171

Business hours: 8-5PM M-F

Type of Business:

X Broker
X Processor
X Import/Export
___ Manufacturer/end-user
___ Hauler
___ MRF
___ Composter
DIRECT MILL SUPPLIER Other

Material Categories

Please refer to the enclosed Materials Categories sheet and check all of the materials that your business accepts. If the categories are not specific enough, please use the space provided below to clarify your materials' specifications.

**Figure 2.**

## Services and Facilities

1. Do you require a minimum quantity to pick up materials?
   Yes ______ No __X__ Minimum quantity ______

2. If you do pick up materials in Western Massachusetts, do you pick up from
   a) curbside collections ______ (check all that apply)
   b) transfer stations __X__
   c) commercial locations __X__

3. What types of collection containers, if any, do you provide to businesses?
   CANVAS STYLE RECYCLING HAMPERS

4. Does your company lease balers? Yes __✓__ No ______

5. When can materials be dropped off at your facility?
   7AM - 3$^{30}$ PM M-R 7AM - 2$^{30}$ PM FRI

6. Is your facility accessible by rail? Yes __X__ No ______

7. Does your facility have truck scales? Yes __X__ No ______

   If not, what is the distance to the nearest certified truck scale which your customers can use? ______

8. Does your business provide off-loading assistance?
   Yes __X__ No ______

9. What are your payment options?
   ______ C.O.D. __X__ Check __X__ Contract ______ N/A

10. Can you provide approximate revenues and/or tipping fees for the materials you accept?

RECYCLED CONTENT PRODUCTS DIRECTORY PHONE SURVEY

ller: Steve Anderson (413) 545-0152 Date:__________ Busy ___ Machine ___

N/A ___ Call Back AT _____

MPANY: **A. Shapiro & Sons, Inc.** I.D.#: B108

TREET: 341 Ashland St.

TOWN: N. Adams STATE: MA Zip: 01247

DUNTY: Berkshire

NTACT: Mr. Shapiro

PHONE: 413-663-6525 FAX: 413-663-6527 800-

| oduct | Tot. Rcycld Contnt % | Post-cnsmr % | Pre-cnsmr% | Brand |
|---|---|---|---|---|
| | | | | |
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| | | | | |
| | | | | |

market directly ________. Minimum order ______________________

market via retailers/dealers _________ distributors/wholesalers ________

catalogues/mail order __________, or OTHER ____________________

NAME

R/DIST #1: ______________________________________________

Address ____________________ __________ ______ ______

R/DIST #2: ______________________________________________

Address ____________________ __________ ______ ______

R/DIST #3: ______________________________________________

Address ____________________ __________ ______ ______

ll you send me a pricelist ______, brochure/promo _____, catalogue ______,

list of your Westmass dealers _______ or distributors _________ ?

**Figure 3.**

# CHAPTER 5

# CONCLUSIONS

Collection of recyclables in this country did not start in earnest until the 1980's and only a few programs existed previously. It is true that metal recycling had been established by scrap yards for years and aluminum cans were being collected because of the value of the material, but only a few programs existed before the last decade for anything else that was recyclable. Solid waste collection and disposal was not problematic in many communities. The proliferation of landfills was seen as a panacea to the air quality problems of open-burning dumps or the toxic emissions of incinerators. Any municipality that had a couple hundred acres on the edge of town could open its own landfill. One or two public works garbage trucks (if it was a small town) could collect residents' garbage with little stress on the town budget.

The 1980's provided a rude awakening for most communities in the United States and, more immediately, Massachusetts. The solutions for solid waste management were no longer easy. Many landfills were unlined and began to drain leachates into aquifers that held drinking water. Lakes, ponds and streams started showing contamination from these landfills. New regulations set deadlines for the closing and capping of old, unlined landfills. The regulations also required that any new landfills or the expansions to older ones must be lined in order to contain their leachates.

Such a requirement proved too expensive for many communities, particularly smaller towns like those in western Massachusetts.

With fewer landfills available, the distances that haulers traveled increased, thus increasing the rates charged to customers. The law of supply and demand dictated that the landfills still in operation could charge more to those who were using them. Consequently, hauling *and* tipping fees increased.

Most professionals and experts in solid waste management recognize that source reduction and recycling are needed to alleviate the rising cost of waste disposal. These strategies have obvious environmental benefits as well. Fewer virgin resources are required for manufacturing of products and the pollution from incineration is minimized. Japan and much of western Europe have already shown that effective campaigns are possible on a nation-wide scale.

Perhaps the most convincing argument for recycling is its potential for boostering local, state and even national economies. The value added of recyclables, for example, is significant. A recent Massachusetts DEP study estimated that for every 1 million tons of recyclables collected for feedstock in the Commonwealth (roughly the amount collected yearly), $588 million is added to the economy. Stated more simply, this is the manufactured value of 1 million tons of recyclabes after they are processed and re-manufactured. When the retail sale of the final products manufactured from that 1 million tons is considered, the figure increases to $700 million. Added jobs, sale of the materials, state tax revenues, use of collection services and expenditures on recycling equipment all figure into the value added (Ingenthron, 1992). If Massachusetts were to completely abandon the collection of recyclables, the state would face a potential loss of $700 million.

The same DEP study figured that recycling in Massachusetts may be supporting as many as 10,000 jobs within the Commonwealth. These are not subsidized or "created" jobs, they are sustainable jobs so long as there are recyclables to collect. Recent waste bans on recyclables going to landfills or incinerators and the addition of more recycling programs in the state should result in even more sustainable jobs for the future.

Chapter 1 of this Master's project noted that the role of the U.S. federal government with regard to solid waste management is mainly advisory and has a minimal effect on source reduction and recycling efforts and state governments tend to be more active. The examples set by New York and Rhode Island are proof that state government can significantly affect the way municipalities and businesses handle their trash and divert their recyclables. In the instances where state government has failed or is negligent, regional and non-profit groups have proven effective. The New Hampshire Resource Recovery Association is one strong example of this.

Massachusetts has many tools available for improving the state's recycling infrastructure, i.e., strengthening recyclables markets. Tax incentives, procurement policies, minimum content legislation and grants and loans to manufacturers that use recyclable materials are just a few ideas. Some are in use, but many more could be utilized. The members of SWEEP decided more could be done to influence recyclables markets in their region. Making recycling easier through education and public outreach and making available a directory of markets and products for the business sector are big steps.

The next challenge for the SWEEP group is to create strong secondary markets locally. The relatively low value of recyclables makes it impractical to ship them to distant markets. If entrepreneurs and some of the existing industries in western Massachusetts could commit to using recyclable materials as a regular source for their feedstock, the recycling loop would be strong and complete. Collection programs, education, and technical assistance provided by the solid waste districts and the activities of SWEEP are helping to build a steady supply of recyclable materials. It is now time for the SWEEP members and the state to create an environment which is conducive for the secondary markets that are so sorely needed in the region.

# APPENDIX A

## SELECTED RESOURCE GUIDE SECTIONS

Paper

Plastics

Used Oil

Household Hazardous Waste

## PAPER

In the United States, about three-quarters of paper and paperboard is thrown away, making up at least 40% of our municipal solid waste stream. The White House alone discards one ton of wastepaper every day. The pollution generated to produce this one ton of paper consists of 84 pounds of air pollutants, 36 pounds of water pollutants, and 176 pounds of solid waste. On a world-wide scale, currently 35% of the trees harvested in all countries are used in making paper products, with that figure possibly rising to 50% by the year 2000.

Recycling paper makes sense for a number of different reasons. It reduces our reliance on manufacturing from virgin pulp wood, which uses more bleaches and chemicals than manufacturing from recycled paper. It also conserves trees, which provide wildlife habitat, cleaner air, and recreational opportunities. Almost one-half of our waste stream by volume is composed of paper.

How is paper made? The trees that are selected for cutting (usually softwoods such as balsam fir and red spruce) are debarked and chipped. The chipped wood is then put into a pressurized "digester" with some caustic chemicals to reduce the wood to its basic component of cellulose fiber. The fiber is rinsed, mostly with water, resulting in a "slurry" that is set on screens and shaken to produce a crude form of paper. This paper is subsequently put through a series of rollers and driers to create a final, usable product. A mill designed to use wastepaper in this process instead of virgin pulp can save the paper company from 50% to 80% in manufacturing costs.

One obstacle to recycling paper is the fact that many large paper companies own their own forests. They have their own cheap supply of raw material and therefore have little incentive to use recycled content. Consumer demand for recycled paper products is slowly changing this situation and should be encouraged.

Today there are literally dozens of types of paper in daily use. These include telephone books, photocopy paper, magazines, newspapers, shoe boxes, grocery bags, and computer paper. Newspaper, corrugated cardboard, high-grade office paper, and mixed papers are the most common categories. You can find a discussion of newspaper in another section of this guide.

### Corrugated Cardboard

Corrugated material is the most commonly recycled grade of paper in this country. Approximately 50% of the corrugated boxes produced in the United States were recovered for recycling in 1988. The corrugated flute in the center of the material is usually made of 100% recycled paper. Corrugated cardboard made from recycled components is essentially the same quality as that made from virgin-grade. Most of this material is generated by commercial enterprises. Corrugated cardboard often composes up to half of the waste that comes from a retail business. The success of recovering this material is a good example of how well industry and business can work together in recycling.

To recycle corrugated cardboard:

- Ask your solid waste district what the current procedure is for recycling corrugated boxes in your district and also if you can include brown shopping bags: the two can be recycled together.

- Reuse cardboard boxes.

- If local opportunities for recycling corrugated cardboard are not available, ask a nearby commercial establishment such as a grocery store if it will take material from the public.

- Flatten and stack boxes before giving them to a recycler.

**High-Grade Paper**

High-grade paper, also called white paper or office paper, constitutes such products as computer printouts, copy paper, and white stationery. Desirable characteristics for the recycling of high-grade paper are that it is strong, requires little processing, and can easily be used again for high-grade paper, tissue paper, and many other paper products. Easy reuse of high-grade paper historically has guaranteed stable and profitable secondary markets for this material.

Ironically, the recycled content of white paper is the lowest of any grade of paper. One obstacle to using more recycled content in high-grade paper is the misconception that it produces an inferior product. With proper separation at the time of collection and with good quality control during processing, white paper made from high-grade recycled content is indistinguishable from virgin paper.

To recycle high-grade paper:

- Organize paper recycling at your workplace. Offices are the largest generators of high-grade paper.

- Buy recycled white paper products for the office and home. This will encourage producers to use more recycled content.

- Be diligent in separating different grades of paper. Recycled high-grade paper requires quality content. Also, remove plastic envelope windows and adhesive labels.

**Mixed Paper**

Mixed paper is unsorted and can contain newspaper, magazines, paper bags, colored paper, and even high-grade paper. The market for mixed paper is relatively poor compared with corrugated and high-grade markets. Mixed paper often contains materials such as clay, latex adhesives, and heat-set inks, which are difficult to remove in de-inking plants. There are some uses for mixed paper that do not require de-inking. Such uses as cellulose insulation and paperboard are further described in the section on newspaper. Check with your solid waste district to find out what types of paper are being recycled in your region.

# PLASTICS

By weight, plastics make up about 8% of all the trash that we generate, but the weight of plastic is not really a concern. The concern is the volume of plastic in our trash--about 25% by most accounts (as more towns institute "pay by the bag" fees, increased volume means increased household disposal costs). Plastic is now the fastest growing segment of the waste stream. Its growing popularity has resulted in a reduction in the use of more recyclable materials like glass, aluminum, and paper.

Plastic has many positive attributes. It is waterproof, lightweight, strong, resilient, versatile, and usually inexpensive. It is used for such important items as contact lenses, artificial hearts, and more fuel-efficient automobiles. Production and disposal of plastics, however, raise a number of problematic issues. The material is non-degradable and produced from non-renewable petroleum resources, and the production of plastic has some serious pollution considerations.

Plastic is more than a common litter item. Every year, approximately 45,000 tons of it is dumped into ocean waters. The Center for Marine Conservation in Washington, D.C., estimated that 100,000 marine mammals, a great number of sea turtles, and possibly 1 million seabirds are killed every year by plastic debris. Wildlife and fish either become entangled in it or mistake it for food.

The production of plastic creates significant pollution. The EPA has developed a list of chemicals that create the most hazardous waste. The plastics industry uses five of the top six chemicals on that list. Oil, the main component of plastic, not only is non-renewable but also is a pollutant when used in the production of plastic.

The incineration of plastic provides some of the most heat per pound of any waste item. But incineration of plastics also produces toxic wastes. PVC, a plastic used in vegetable oil containers, food wrap, and curtain rods, emits chlorine when it is burned. This may add to dioxin levels in the environment as well as combine with hydrogen to form hydrogen chloride gas, a strong acid when exposed to moisture.

Plastics have many characteristics that make recycling difficult. Sorting the various types of plastic has been a problem in the past, as has developing markets for the material. The use of plastic in packaging and other applications is growing by 8% per year, which means it could double in less than ten years. Currently, local plastics collection programs outpace the demand by manufacturers for this material. Use of recycled plastics in the manufacturing process needs to expand at a faster rate.

## Making Sense of Plastic Products

On the bottom of most plastic containers is a small triangle with a number located inside it that identifies what category of plastic is used in the container. This coding system allows the consumer and recycler to sort their plastic items. A list of these code numbers and their accompanying material type follows.

#1. PETE: polyethylene terephthalate (PET)--soda bottles, peanut butter jars, and liquor bottles

#2. HDPE: high-density polyethylene--milk jugs, detergent bottles, and yogurt containers

#3. V: vinyl/polyvinyl chloride (PVC)--salad oil containers

#4. LDPE: low-density polyethylene--squeeze bottles and cellophane wrap

#5. PP: polypropylene--used in packaging, coating, and pipes

#6. PS: polystyrene--"Styrofoam" products such as packing pellets, egg cartons, coffee cups, and take-out containers

#7. Other: other resins and multi-layered material

As of this writing, the Springfield MRF accepts plastic milk and juice containers. Odds are high that your local transfer station or curb-side pickup program is taking these items. You should make sure that the containers are rinsed, drained, and flattened and that all caps are removed to help the hauler and processor.

The markets for recycling plastics are prone to change. One type of plastic that is recyclable today may not be recyclable 6 months from now. By using plastic products with recycled content and encouraging others to do so, the markets for recyclable plastic will strengthen and stabilize. In the meantime, keep an eye open for changes in recyclable plastics at your transfer station, with your solid waste district, or check with the contacts that follow.

## RESOURCES

**For the latest information on which plastics the Springfield MRF is accepting, contact DEP at (413) 784-1100, ext. 293.**

**Other sources of plastic information include:**

**American Plastics Council**
**1275 K Street, NW**
**Suite 400**
**Washington, DC 20005**
**1-800-2-HELP-90**

**Center for Plastic Recycling Research**
**Rutgers University**
**Bush Campus, Building 3529**
**Piscataway, NJ 08855**
**(201) 932-3683**

## USED OIL

The EPA estimates that people who change their own motor oil generate over 200 million gallons of used oil per year. Of those do-it-yourselfers, only 10% recycle their oil. Consequently, over 180 million gallons of used oil (roughly 15 times the amount spilled from the Exxon Valdez tanker accident in 1989) is poured down sinks, thrown into the trash, and usually landfilled or poured on the ground and into storm drains every year in this country. Pouring oil down sinks creates problems because conventional sewage treatment does not break it down, and pouring it into storm drains often sends it directly into streams and other water bodies. The problem with throwing used oil into the trash is that it either ends up in a landfill, where it may seep into surface or groundwater with other discarded oil, or it is incinerated, emitting toxic substances. What are the real effects of discarding used oil?

Consider these facts:

- Used motor oil contains heavy metals and toxins like lead, cadmium, chromium, arsenic, benzene, naphthalene, and chlorinated hydrocarbons, which are picked up as the oil circulates around the engine.

- The EPA estimates that 1 gallon of used oil (typically one oil change from an automobile) can contaminate 1 million gallons of fresh water--enough to supply 50 people for a year.

- Rerefining 1 gallon of used oil produces 2.5 quarts of "new" motor oil, whereas 42 gallons of crude oil are required to make the same 2.5 quarts.

- If all the used oil in this country were recycled, we would save *1.3 million barrels of oil per day.*

Returning your used oil to the store or gas station does not necessarily mean it will be rerefined for use as a lubricant (recycled). More than 90% of the oil we return actually is incinerated. Although incineration is preferred to landfilling or pouring oil into drains, it still releases harmful substances into the air and permanently eliminates a non-renewable resource. Unfortunately, the EPA decided last year not to designate used oil as a hazardous waste, a move that would have put much tighter controls on incineration. They feared that such a step would have encouraged individuals to dump even more oil on the ground or into the garbage. If stronger restrictions were imposed on incineration, the cost of combustion would increase, and recycling used oil would become comparatively cheaper and more widely practiced.

Massachusetts has been near the national forefront with respect to the collection of used motor oil. We have a used oil return law that mandates all stores that sell motor oil must accept and recycle the oil if it is returned with a valid sales receipt. Compliance with the law started slowly but has increased significantly during the last couple of years. DEP has convinced some retailers in the eastern half of the state to accept used oil without a sales receipt, but few service stations and businesses do this in western Massachusetts. Many towns now collect used oil at their trash transfer stations. Used oil also is usually collected at regional household hazardous waste collection events.

What can you do?

- Never throw away or dump out your used oil.

- Save the oil you collect from your car, truck, motorcycle, lawnmower, boat, etc. in a plastic container with a secure lid. Containers that the new oil came in work well, as do most soda bottles and milk jugs. Use a funnel to prevent spillage, and store out of the reach of children.

- Do not mix with any other substances such as water, gas, antifreeze, or transmission fluid.

- Return the oil with a receipt (you can use the receipt from your new oil if the old one is lost) to the place where you bought it. Contact your solid waste district for any facilities in the area that might take the oil without a receipt.

- Try to buy motor oil with a recycled content.

- Call DEP's Used Oil Hotline with any questions or problems.

**<u>RESOURCES</u>**

**Department of Environmental Protection**
**Division of Hazardous Waste Management**
**436 Dwight St.**
**Springfield, MA 01103**
**(413) 784-1100 ext. 231**

**DEP Used Oil Hotline**
**(617) 556-1022**

**To buy used oil with a recycled content, contact:**

**Seventh Generation**
**10 Farrell St.**
**South Burlington, VT 05403**
**(802) 658-7770**

# HOUSEHOLD HAZARDOUS WASTE

Anything in your home can be considered hazardous if it has ingredients that are ignitable, corrosive, reactive, or toxic. Detergents, cleaners, furniture polishes, pesticides, paints, thinners, and solvents are just a few examples. Used oil and home and automotive batteries (which are described in other sections of this guide) are also common hazardous substances.

Massachusetts residents generate about 6,000 tons of household hazardous waste every year. The adverse effects of this waste are great. The majority of these substances are either thrown in the trash or poured down the drain, where they can seep into groundwater. They may be incinerated and released into the air we breathe. Pesticides can be very toxic, and not all of them have been fully tested for their effects on human health. It should be stressed that children are at an extra risk of injury from improperly stored or disposed toxic materials.

Collection days, collection stations, and waste exchanges are three ways in which household hazardous waste can be collected. Collection days have been conducted in some communities in western Massachusetts in the recent past. This involves members of the community bringing their household hazardous wastes to a specific location, where certified waste handlers collect and haul away the materials for little or no charge. It is often done over the course of a weekend.

Permanent collection stations are the most effective method for collection but are not as yet a common occurrence in this part of the state. Fire stations, landfills, and other town property are usual sites for permanent stations.

Household hazardous waste exchanges are a way that communities can "recycle" such items as cleaners, paints, batteries, and some types of pesticides. The products are brought to a collection site, where they may be "swapped" with other members of the community. The risk of being held liable for injury or damage caused by the items swapped or the potential of incorrectly labeled or contaminated products has inhibited many communities from sponsoring such events. Paint is probably the safest and most commonly swapped material.

The most effective way to reduce exposure to household hazardous waste is simply to cut back on your use of toxic substances. This section contains some alternatives to commonly purchased hazardous products. Finally, contact your solid waste district for information on the area's latest efforts in collecting household hazardous waste.

## Nontoxic Alternatives to Hazardous Household Products

(Adapted from "A Healthy Environment Starts at Home," a pamphlet produced by the Massachusetts Water Resources Authority)

### Cleansers

Drain Openers

- Try using a plunger or metal snake. Avoid clogging by using a drain strainer and pouring boiling water directly down the drain every week.

Oven Cleaners

- Clean often with 3 tbsp. baking soda, 1 cup warm water, and steel wool. Placing a small dish of ammonia in the oven overnight softens burnt spills.

Chlorine Bleach

- Use dry bleach or borax. Don't mix with ammonia.

Window Cleaner

- Use 2 tsp. vinegar to 1 qt. water, let dry, and wipe with newspaper.

Toilet Bowl Cleaner

- Clean with borax and lemon juice or with baking soda.

Tile and Surface Cleaner

- Use baking soda and water.

Linoleum Cleaner and Wax

- To remove dull film, mop with 1 cup white vinegar and 2 gallons of water. Polish with club soda.

**Paints and Solvents**

Furniture Polish

- Wash with oil soap or castile soap and water. Remove water marks by rubbing with toothpaste. Polish with 1 tsp. lemon oil dissolved in 1 pint of mineral oil.

Shoe Polish

- Rub with lemon juice and buff with soft cloth.

Metal Polish

- Silver--soak in 1 quart boiling water, 1 tsp. baking soda, 1 tsp. salt, and a piece of aluminum foil. Polish with toothpaste and rinse.
- Copper--rub with salt and lemon juice or vinegar.
- Brass--cover object with 1/2 tsp. salt, 1/2 cup white vinegar, and enough flour to make a paste. Leave for 25 minutes to 1 hour, then wipe clean.
- Aluminum--soak in 1 quart boiling water and 2 tsp. cream of tartar.

Spot Removers

- Fruit juice, tea, gravy, ketchup, mud--club soda
- Blood--cold water immediately
- Ink, perspiration--lemon juice
- Leather stains--beaten egg whites

Paint Removers

- Commercially made, nontoxic removers are available.

Paint

- Use latex or water-based paints.

**Pest Control for Home and Garden**

Ants

- Leave cream of tartar, red chili powder, paprika, or dried peppermint leaves at place of entry.

Roaches

- Put bay leaves around cracks in walls and floors. Other deterrents are equal parts of baking soda and powdered sugar; oatmeal flour and plaster of paris; chopped bay leaves and cucumber skins; or crushed tobacco and water.

Garden Problems
- Do not allow standing water near garden or lawn where insects will breed.

- Find out about organic gardening practices such as netting or companion planting.

Herbicides/Fungicides
- Plant disease-resistant seeds. Pull weeds. To suppress weed germination, cover garden with plastic in the fall.

Insect Spray
- Mix 6 cloves of crushed garlic, 1 minced onion, 1 tbsp. dried hot pepper, 1 tsp. pure soap, and 4 quarts of hot water. Soak for 1-2 days, and strain before using. Or put 1 cigarette in a quart of water overnight, strain, and spray.

Snails and Slugs
- Place a shallow pan of beer in the garden or lay broken seashells around the plants.

Chemical Fertilizers
- Apply peat moss, compost, blood and fish meal, or composted manure instead of chemical fertilizers.

Houseplant Insecticide
- Wash leaves with soapy water and rinse.

Flea Products
- Feed your pet brewer's yeast, garlic tablets, or vitamin B. Baths with fennel, rue, or rosemary also help repel fleas.

Moth Balls
- Use cedar chips or blocks, newspaper, or dried lavender.

# APPENDIX B

# DATABASE DIRECTORY SAMPLE PAGES

## Alger Enterprises

A3 — Processor, broker, auto salvage

125 Eagerville Rd. — A3 — Contact:Buster Alger

Orange MA 01364 — Phone:508-5750433

FAX:

| MATERIALS ACCEPTED | TYPES / COMMENTS |
|---|---|
| Batteries | Paying $1.00 each 5/93 |
| Scrap metal | All ferrous and non-ferrous, autos, trucks, clean 55 gal. drums |
| White Goods | Capacitors and freon must be removed. |

SERVICES/FACILITIES: Pick-up, off-loading assistance
PAYMENT OPTIONS: Check
SERVICE AREA: 25 mile radius of Orange
OFFICE HOURS: M-F 8-4 Sat 8-4

## American Tissue, Inc.

MA3 — Manufacturer

P.O. Box 25, Mill St. — MA3 — Contact:Brian Casey

Baldwinville MA 01436 — Phone:508-939-5359

FAX:508-939-4338

| MATERIALS ACCEPTED | TYPES / COMMENTS |
|---|---|
| High Grade Paper | all (no payment offered) |
| Mixed Paper | loose or baled, no glossies or egg cartons |
| Newspaper | |

SERVICES/FACILITIES: Off-loading assistance.
PAYMENT OPTIONS: n/a
SERVICE AREA: New England
OFFICE HOURS: M-F 7:00-2:30, by appt.

## Anchor Glass

ct21 — Manufacturer/end-user

Route 101 — ct21 — Contact:Harry Bautista

Dayville CT 06241 — Phone:203-774-9636

FAX:

| MATERIALS ACCEPTED | TYPES / COMMENTS |
|---|---|
| Glass | Clear, brown, green, separated by color. |

SERVICES/FACILITIES: Scales, weight slips,
PAYMENT OPTIONS: C.O.D. or check in 45 days
SERVICE AREA: New Jersey to Maine
OFFICE HOURS: M-F 8am-3pm

DRAFT COPY: SWEEP Directory of Recycling Services and Markets, by County

CARDBOARD

| State | County | Town | Company | Phone | Types / Comments |
|---|---|---|---|---|---|
| CT | Litchfield | Canaan | Bawana Farm Compost | 203-824-1148 | All types, including waxed cardboards |
| CT | Tolland | E. Windsor | Somers Sanitation Service | 203-623-2070 | OCC |
| CT | Tolland | Manchester | Ostrinsky Inc. | 203-643-5879 | OCC |
| MA | Berkshire | Adams | Greylock Ice & Fuel | 413-743-1020 | OCC |
| MA | Berkshire | Becket | Universal Disposal & Recycling Co. | 413-623-6021 | OCC, kraft bags. |
| MA | Berkshire | Dalton | Berkshire Clean-Way Rubbish Removal | 413-684-0165 | OCC |
| MA | Berkshire | Great Barrington | Roger Trucking Co. | 413-528-3590 | OCC, kraft bags |
| MA | Berkshire | Lanesboro | Black Diamond Trucking | 413-447-7741 | OCC, boxboard, kraft bags. |
| MA | Berkshire | Lee | Daley & Sons Trucking | 413-243-3656 | OCC, boxboard, kraft bags. |
| MA | Berkshire | N. Adams | A. Shapiro & Sons, Inc. | 413-663-6525 | OCC, boxboard, kraft bags |
| MA | Berkshire | Pittsfield | Callahan Trucking | 413-442-8390 | OCC, kraft bags. |
| MA | Berkshire | Pittsfield | Commercial Disposal Co., Inc. | 413-443-9474 | OCC, kraft bags |
| MA | Berkshire | Williamstown | Robert E. Smith Trucking | 413-458-4453 | OCC |
| MA | Franklin | Greenfield | Day's Recycling Service | 413-772-0364 | OCC, boxboard |
| MA | Franklin | Greenfield | Hudson Trucking | 413-773-9677 | OCC, boxboard |
| MA | Hampden | Chicopee | Partyka Resource Management | 413-785-1581 | OCC |
| MA | Hampden | E. Longmeadow | Elm Fibers | 413-567-1759 | OCC (baled, 20-ton minimum). |
| MA | Hampden | Holyoke | Sonoco Products Co. | 413-536-4546 | OCC, (clean, no wood or plastic or food contamination) |
| MA | Hampden | Springfield | Acme Metals & Recycling | 413-737-3112 | OCC (baled, no drop-off) |
| MA | Hampden | Springfield | Harry Goodman, Inc. | 413-785-5331 | OCC, boxboard, kraft bags |
| MA | Hampden | W. Springfield | Commercial Disposal Company, Inc. | 413-737-1129 | OCC |
| MA | Hampshire | Hatfield | Duseau Waste Industries | 413-586-4100 | OCC, wax coated juice containers |
| MA | Hampshire | Hatfield | Dave Wickles Trucking | 413-247-9231 | OCC, boxboard |
| MA | Hampshire | Northampton | P. Allen & Son, Inc. | 413-584-3040 | OCC, boxboard, kraft bags. Tipping fee. Segragated, large amounts |
| MA | Worcester | W. Boylston | Waste Management of Central MA | 508-835-6001 | OCC |
| MA | Worcester | Worcester | Trotta & Son Rubbish Removal | 508-798-2271 | OCC |
| NH | Cheshire | Keene | Pinetree Waste Corp. | 603-357-4586 | OCC |
| NH | Hillsborough | Manchester | J. Schwartz Motor Transport. | 603-627-4191 | |
| NH | Sullivan | Claremont | Recycling Services, Inc. | 603-542-8755 | OCC, boxboard, kraft bags |
| NH | Sullivan | Claremont | APC Paper Company | 603-542-0411 | OCC, kraft bags, double-lined kraft cuttings. Material must be baled. |
| NY | Albany | Albany | Kruger Recycling Inc. | 518-433-0020 | OCC,boxboard, kraft bags. |
| NY | Albany | Chatham | Columbia Corp. | 518-392-4000 | OCC, boxboard. Must be delivered baled. |
| NY | Duchess | Red Hook | Red Hook Paper Inc. | 914-758-9200 | OCC (no tape or staples) |
| NY | Dutchess | Newburgh | Hudson Baylor | 914-562-8411 | OCC |
| NY | Montgomery | Amsterdam | Sonoco Products Co. Inc. | 518-842-1010 | OCC, must be baled. |
| NY | Orange | Newburgh | Formisano Recycling Ctr. | 914-562-1792 | OCC, boxboard, kraft bags |
| NY | Rensselaer | Castleton | Fort Orange Paper Co. | 518-732-7722 | Boxboard and kraft bags only. |
| NY | Rensselaer | Latham | BFI, Inc. | 518-785-7030 | All types |
| NY | Saratoga | S. Glens Falls | James River Corp. | 518-793-5684 | OCC, kraft bags, sample required. |
| VT | Rutland | Rutland | Casella Waste Management | 802-775-9908 | OCC |

Printed on 100% post-consumer recycled paper.

# RECYCLED CONTENT PRODUCTS DIRECTORY

8/24/93

| Product | Product options | Brands | TRC * | PCC * | Company | Phone |
|---|---|---|---|---|---|---|
| **Commercial Products** | | | | | | |
| **Glass** | | | | | | |
| Bottles & jars | Customer specifications | | 50% | 50% | Anchor Glass Container Corp. | 203-774-9636 |
| Bottles & jars | Customer specifications | | 50% | 50% | Foster Forbes Glass Company | 508-478-2500 |
| **Paper** | | | | | | |
| Boxes | Customer specifications | | 100% | Var | Fort Orange Paper Co. | 518-732-7722 |
| Towels | Rolls, single, multi, and c-fold, bleached & natural | Tagsons | 100% | Var | Tagsons Paper Inc. | 800-TAGSONS |
| **Plastic** | | | | | | |
| Mud flaps | | | 100% | 100% | Clearvue Polymers | 518-842-7134 |
| Tubes | Paper roll core | | 100% | 100% | Clearvue Polymers | 518-842-7134 |
| Washers | Customer specifications | | | | Plastic Resale Corp. | 413-739-1508 |
| **Industrial Products** | | | | | | |
| **Paper** | | | | | | |
| Boxboard | Clay-coated | | 100% | Var | Fort Orange Paper Co. | 518-732-7722 |
| Tissue | Textile, toilet, facial | | | | G.E. Robertson & Co. | 603-336-5981 |
| Chipboard | Customer Specifications | NA | 100% | 98% | Red Hook Paper Inc. | 914-758-9200 |
| Paperboard | Binder, cover and file stock | Genuine Pressboard | 50% | 30% | Specialty Paperboard, Inc. | 800-451-4378 |
| Paperboard | Cover, binder, and file stock | PRESS-GUARD | 50% | 30% | Specialty Paperboard, Inc. | 800-451-4378 |
| Paperboard | Cover, binder, file and card stock | REPRISE | 70% | 50% | Specialty Paperboard, Inc. | 800-451-4378 |
| Paperboard | Filing Grades | REPRISE | 100% | 50% | Specialty Paperboard, Inc. | 800-451-4378 |
| Paperboard | Type II Pressboard | GUIDEX | 70% | 25% | Specialty Paperboard, Inc. | 800-451-4378 |
| Paperboard | Type III Pressboard | | 70% | 25% | Specialty Paperboard, Inc. | 800-451-4378 |
| Boxboard | | NA | 100% | ? | Strathcona Paper Co. | 613-378-6672 |
| **Plastic** | | | | | | |
| Pellets | Polyethylene | | 100% | 100% | Clearvue Polymers | 518-842-7134 |

# BIBLIOGRAPHY

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