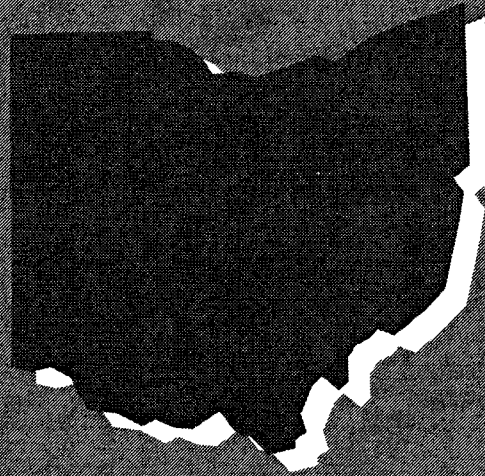


State of Ohio Environmental Protection Agency

State Solid Waste Management Plan 1995



**DIVISION OF
SOLID AND INFECTIOUS WASTE
MANAGEMENT**

**George V. Voinovich, Governor
Nancy P. Hollister, Lt. Governor
Donald R. Schregardus, Director
Barbara Brdicka, Division Chief**



Ohio Environmental Protection Agency

Division of Solid and Infectious Waste Management

State Solid Waste Management Plan 1995

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Printed on Recycled Paper

October 1995

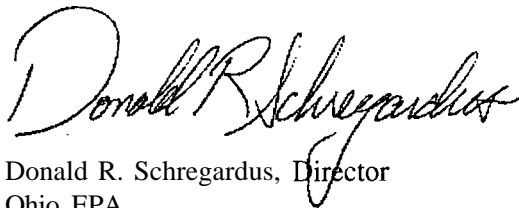
With the adoption of this revised state plan, Ohio is in the forefront of states with its goal to reduce or recycle 50 percent of the municipal solid waste generated per capita by the year 2000. Only 11 other states have set a recycling goal this high.

The original solid waste management plan, implemented in 1989, set a goal to reduce or recycle 25 percent of the solid wastes generated by 1994. The solid waste management districts surpassed that goal by reducing, recycling or minimizing 33 percent of the total amount of waste generated. However, local recycling rates range widely, from as low as 2 percent to as high as 75 percent. Achieving the goal has been easier for densely populated areas with a large number of industries. For the remainder of this century, state policy will focus on providing assistance to more rural areas, and on the development of markets for recycled materials.

The new plan will ensure our continued success in managing solid waste efficiently. It provides flexibility to solid waste management districts to reach our overall goal of reducing the amount of waste generated by 50 percent by the year 2000. Districts have two options for how they will reach this goal. The first option is to implement programs that reduce, recycle or minimize seven of 11 highly recyclable materials. The second option is to reduce, recycle or minimize the generation of municipal solid waste by 25 percent and the amount of industrial solid waste by 50 percent by the year 2000.

This state solid waste management plan has been revised thanks to the coordinated efforts of Ohio's local solid waste management districts, the Solid Waste Advisory Council, Ohio EPA's Division of Solid and Infectious Waste Management, businesses and Ohio citizens. By continuing to work together, we can reduce our reliance on landfills and be a national leader in waste reduction efforts.

Sincerely,

A handwritten signature in black ink, reading "Donald R. Schregardus". The signature is fluid and cursive, with the first name "Donald" being the most prominent.

Donald R. Schregardus, Director
Ohio EPA

Forward

On August 18, 1995, the State Solid Waste Management Advisory Council (SWAC) considered and duly adopted the State Solid Waste Management Plan. Before the plan was adopted, a comment period and public hearings were held in five cities across the state. Ohio law requires the Director of the Ohio Environmental Protection Agency and the SWAC to triennially review the State Solid Waste Management Plan and to prepare a revised plan if conditions warrant. This plan constitutes the first revision to the initial State Solid Waste Management Plan adopted in June of 1989. Any questions or comments concerning the State Solid Waste Management Plan should be directed to the Division of Solid and Infectious Waste Management, Ohio Environmental Protection Agency, PO. Box 1049, Columbus, Ohio 43216-1049. The phone number is (614) 644-2 6 2 1 .

Acknowledgements

On behalf of the Division of Solid and Infectious Waste Management (DSIWM), I would like to express our sincere thanks to those who participated in the development of this State Solid Waste Management Plan. Special appreciation is extended to the members of the State Solid Waste Management Advisory Council, whose names are listed in Appendix A, and to the many individuals who provided valuable insights and comments during the public comment period.

There were many employees of the Ohio Environmental Protection Agency and Department of Natural Resources who devoted countless hours to this effort. Carolyn Watkins and Michael McCullough of DSIWM, and Tom Davis of the Division of Recycling and Litter Prevention at the Ohio Department of Natural Resources provided leadership and direction in the development of the plan. Our appreciation is also given to Robert Large, Ildiko Pallos, Tonya Rees, Robin Smith, Robert Sproul and David White of DSIWM, and Collette Bouic and George Peters of the Division of Recycling and Litter Prevention, for providing valuable research, writing and editing on the draft and final plan. Our thanks are also given to Carol Hester and Heidi Gagnon of the Public Interest Center at Ohio EPA for editing and proofreading the final plan, and to Yvonne Foster-Smith for designing the final plan. We would also like to thank the Public Involvement Section of the Public Interest Center for their assistance with the public hearings and comments, and to the Office Management/Clerical Unit at DSIWM, for managing the considerable correspondence needed to make this process successful.

Barbara Brdiczka
Chief, Division of Solid and
Infectious Waste Management

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Chapter I

Historical Perspective

In 1988, Ohio faced a combination of solid waste management problems, including declining landfill capacity, ever-increasing generation of wastes to be disposed, environmental problems at many existing solid waste disposal facilities, and an influx of out-of-state waste. Citizen, government and private sector concern over these pressing problems forged a legislative coalition to create a comprehensive solid waste management program for Ohio. The resulting legislation, House Bill (H.B.) 592, dramatically revised the State's solid waste regulatory program and set in motion a local and state planning process to ensure adequate and environmentally sound management capacity, and efforts to reduce our generation of solid wastes.

House Bill 592 required the director of the Ohio Environmental Protection Agency (Ohio EPA), with the advice of the Solid Waste Management Advisory Council (SWAC), to prepare a State Solid Waste Management Plan to meet specific mandates established in the statute. A key mandate of the State Plan is to reduce our reliance on the use of landfills for the management of solid wastes. The first State Solid Waste Management Plan (State Plan) was adopted June 16, 1989, and established solid waste reduction objectives for the State and for local solid waste management districts (SWMDs). The objectives set in 1989 included reducing or recycling 25 percent of the generation of solid wastes by the year 1994, an annual increase in the amount of waste recycled, and an annual decrease in the amount of waste disposed.

Triennially, the Ohio EPA Director is required to conduct a thorough review of the progress made toward achieving these objectives, and to prepare and adopt a revised State Solid Waste Management Plan, if the findings show that one is warranted. This State Plan

represents the first revision to the objectives established in the initial State Plan. In this State Plan, the overall objective is to reduce or recycle 50 percent of the solid wastes generated by the year 2000. Specific objectives for the State and for local SWMDs are described in greater detail in Chapter III, along with a number of issues that warrant the revision of the initial State Plan. The remainder of this chapter gives an overview of the changes that have occurred since 1989 in the management of solid waste, and in the regulatory program for solid waste management facilities.

Generation and Management of Solid Waste

Solid and other types of nonhazardous waste are regulated under Subtitle D of the federal Resource Conservation and Recovery Act (Subtitle D wastes). Examples of Subtitle D wastes are identified in Table I-1. Although other wastes may occasionally be disposed of in landfills, the state and local planning processes focus on managing municipal (MSW) and industrial solid waste (ISW).

For the purposes of this document, municipal solid waste is defined as the products, packaging, yard trimmings and other solid, nonhazardous materials that enter the waste stream from residential, commercial, or institutional generators. Industrial solid waste is defined as the nonliquid, nonhazardous wastes generated at industrial or manufacturing plants.

Generation of Solid Waste in Ohio

Based on the amount of waste reported recycled and disposed in Ohio, or exported to other states, approximately 21.8 million tons of

solid waste were generated in Ohio in 1993. This amount of waste translates to 10.8 pounds per person per day (ppppd), for every person in the State of Ohio. Municipal solid waste generation in 1993 was 11.6 million tons, or 53 percent of total solid waste generation. The per capita generation of MSW in Ohio was approximately 5.8 ppppd in 1993. Industrial solid waste generation was 10.2 million tons (47 percent). The ISW per capita generation rate for Ohio was approximately 5 ppppd. The amount of MSW managed by recycling, incineration and landfilling for the years 1990-1993 is shown in Figure I-1. The variation in the quantities generated and managed by each method is likely the result of a combination of factors including fluctuating recycling markets and changes in economic activity.

The amount and types of waste generated among counties or SWMDs varies significantly. This variability is the result of many factors including population density, the number of businesses and institutions, and the types of commercial and industrial facilities present. The greatest variability is with respect to ISW, as it is highly dependent on the size and nature of the industrial and manufacturing entities located in an area. MSW is typically less variable than ISW from one area to the next with respect to its composition. The quantity of MSW generated typically varies depending on the population of an area.

Solid waste generation may also vary in quantity and composition from one year to the next in response to an expanding or contracting economy. It may also change gradually in response to demographic changes in an area, or changes in the types of products or packaging used. Because of the variety of factors that can affect the amount and type of solid wastes that are generated, plans for the management of solid waste must be dynamic and flexible in order to accommodate the variability among local solid waste management districts, and the changes that may take place over time.

The Development of Ohio's Regulatory Requirements

Like many states at that time, Ohio moved in 1968 to restrict open burning and open dumping, bringing local landfills under health department licensing and state oversight. Because many dumps were improperly closed, and existing landfills lacked proper environmental health and safety controls, revised state regulations were enacted in 1976.

Table I-1
Municipal Solid Wastes in the
Universe of RCRA Subtitle D Wastes

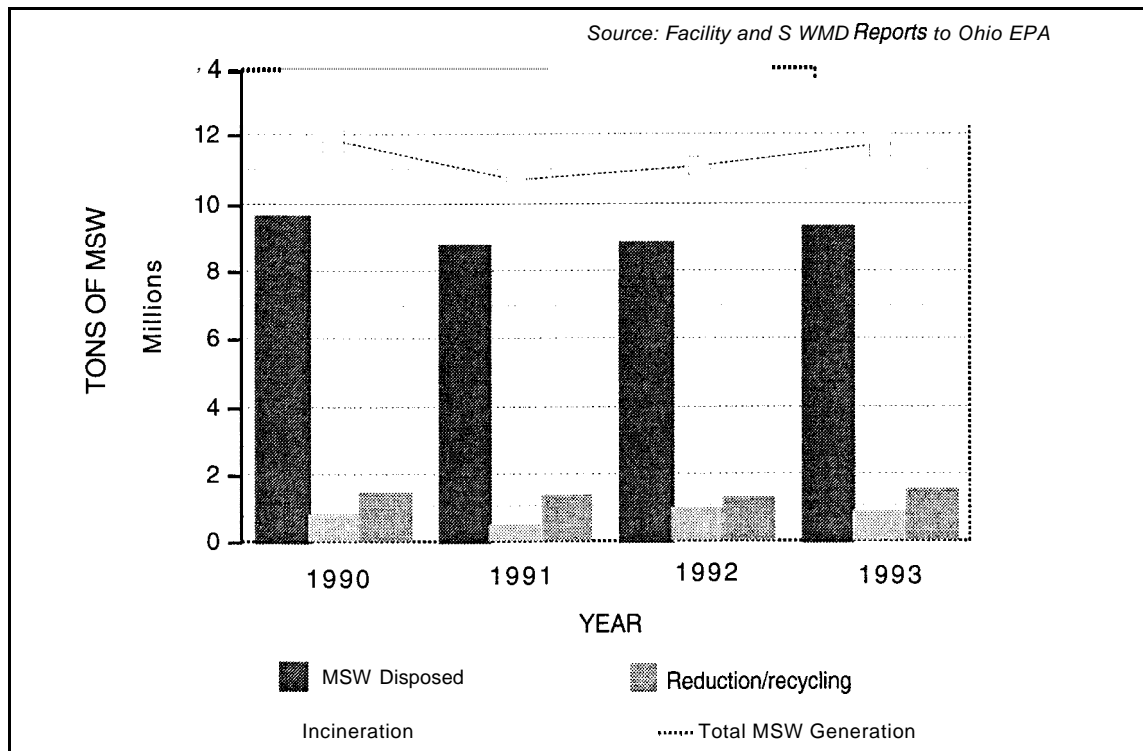
Municipal Solid Wastes*
Industrial Nonhazardous Solid Wastes*
Municipal Sludge
Construction and Demolition Wastes
Agricultural Waste
Oil and Gas Waste
Mining Waste

* Waste streams that are the primary focus of the State and local planning process.

Source: US EPA. "Characterization of Municipal Solid Waste in the United States, 1994 Update.
RCRA: Resource Conservation and Recovery Act.

In 1980, Ohio EPA began documenting public health, safety and environmental problems resulting from landfilling practices. Some of the problems documented were:

- ground water contamination due to lack of proper clay soils or synthetic liners at operating or improperly closed landfills;
- explosions due to migration of methane gas;
- poor operating history by some landfill operators and lack of consistent regulation and enforcement statewide;
- lack of planning for new solid waste facilities to offset decreasing disposal capacity; and

Figure I-1 Management Methods for MSW 1990-1993 (millions of tons)

- increasing public opposition to siting needed disposal facilities (both new facilities, and capacity expansions at existing facilities).

This information provided part of the impetus for passage of H.B. 592, requiring Ohio EPA to draft new, more stringent regulations for landfills. These regulations became effective in 1990. In addition, the current State regulatory program for solid waste also includes transfer stations, incinerators, and composting facilities.

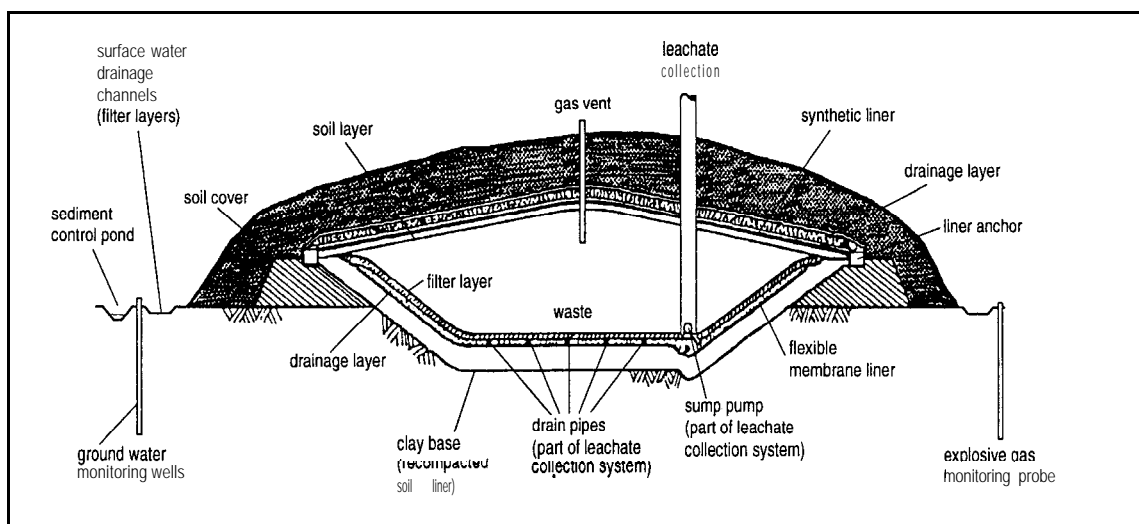
Upgrading Existing Landfills

House Bill 592 required owners and operators of landfills in operation before July 1, 1968 (grandfathered sites) to submit an application for a permit, and upgrade to meet new landfill regulations (Best Available Technology or BAT). Of 64 facilities, 32 submitted applications to continue or expand operations. Ohio EPA has completed review of these applications.

Facilities permitted between July 1, 1968 and January 1, 1980 were also required to upgrade existing plans and incorporate BAT. These 85 facilities are on a proposed call-in schedule for 1992-95, based upon rules that took effect in May 1991.

In 1994, new federal regulations governing municipal solid waste landfills took effect. These new regulations were created under Subtitle D of the federal Resource Conservation and Recovery Act (RCRA). Ohio made the necessary changes to maintain consistency with the federal rules in 1995. Some of the basic design requirements for new or expanding landfills are illustrated in Figure I-2. In addition to the new design requirements, Ohio has enacted restrictions on the location of new facilities or expansion of existing facilities to protect groundwater resources, human health and the environment. The criteria for the location of solid waste facilities are discussed in detail in Chapter V.

Figure I-2: Modern Standards for Solid Waste Disposal



Changing Trends in Disposal Capacity, Transportation of Wastes, and Imports of Out-of-State Waste

Beginning in 1982, Ohio EPA requested that landfill owners and operators complete an annual summary of operations which is used to track landfill use and remaining disposal capacity statewide. The Agency determined that landfill capacity was decreasing every year. By 1990, the State had approximately 76 publicly available landfills, less than half as many as in 1971. The remaining capacity at these facilities was estimated to be approximately 176 million cubic yards of gross airspace (volume available for waste plus cover material), or about six and one-half years by Ohio EPA estimation methods.

By 1994, the capacity situation statewide had changed dramatically. Although the number of publicly available landfills declined to approximately 57, the remaining capacity as measured in gross airspace increased to approximately 240 million cubic yards. The estimate for remaining years increased to slightly more than 11 years. The decline in the number of facilities at the same time the volume available for waste is increasing illustrates an ongoing trend from smaller local facilities to larger regional facilities. These changes are in part the result of the technological upgrades to the siting/design requirements mentioned previously.

As a result of this trend, the critical factors affecting local availability and assurance of disposal capacity may shift to transportation of wastes, as opposed to sufficient local facility capacity to dispose of wastes. However, another important factor affecting waste flows and available capacity is the amount of out-of-state waste Ohio receives. Out-of-state waste threatens to reduce remaining disposal capacity significantly, and has continually frustrated State and local efforts to manage solid waste responsibly.

Ohio has traditionally received small amounts of solid waste from contiguous counties of its neighboring states (western Pennsylvania, West Virginia, Kentucky, Indiana, and Michigan), and has shipped some waste to neighboring landfills in border counties of those states as well. These local transfers comprised approximately one-half of out-of-state imports in 1994, and are generally not controversial. However, most of the remaining out-of-state waste disposed in Ohio is from New York, New Jersey, and eastern Pennsylvania (Figure I-3). In addition, a number of other states and Ontario, Canada send waste to Ohio. This volume of interstate waste places an unacceptable burden on Ohio's ability to meet its own disposal needs, and makes it more difficult for SWMDs to meet the planning requirements in H.B. 592.

During the 1980s, Ohioans became aware of increasing volumes of east coast waste being disposed in Ohio facilities. Out-of-state waste disposed in Ohio landfills increased from 33,000 tons in 1986 to a high of 3.7 million tons in 1989. Since 1989, the amount of out-of-state waste coming into Ohio has actually declined by about half to 1.9 million tons in 1990 and 1.5 million tons in 1994.

Despite the decline from the 1989 level, out-of-state waste remains a serious problem for implementation of solid waste management plans in Ohio for a number of reasons:

- Citizens oppose landfills that are perceived as servicing primarily out-of-state waste. This opposition is hampering the siting of facilities that are needed to provide disposal capacity for Ohio's own waste.
- Citizens are reluctant to reduce or recycle waste when they believe their efforts will only serve to provide additional space for trash from another state.
- Perhaps most importantly, the decline in waste imports may be only temporary because of the new federal regulations on

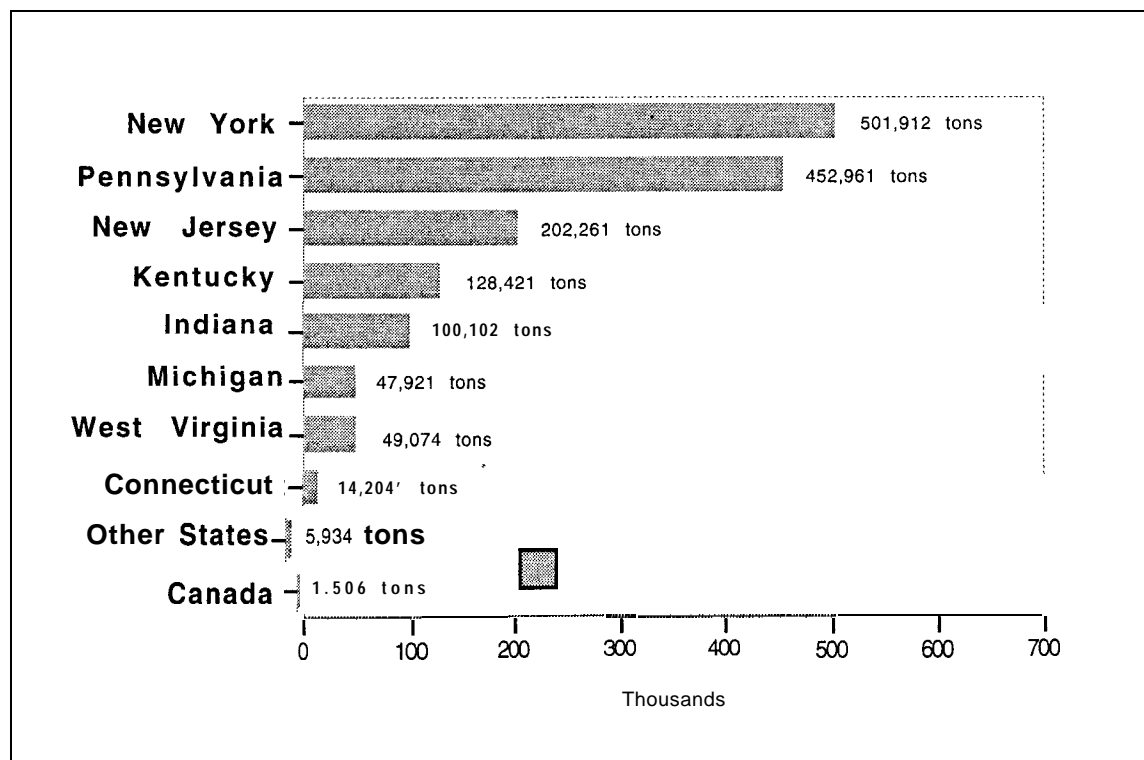
landfills. Other states will now be forced to do what Ohio has already done voluntarily. As these states close down older substandard facilities, they may seek to utilize newer, more environmentally protective disposal capacity in Ohio in the interim, until their own capacity can be developed.

In 1994, Ohio exported approximately 501,746 tons of solid wastes to the states with whom we share borders. Some counties in southeastern Ohio currently face a shortage of disposal capacity and are temporarily dependent upon landfills in West Virginia. Likewise, the other border states (Pennsylvania, Kentucky, Indiana and Michigan) also receive some solid waste from neighboring counties in Ohio.

Fees and Flow Control

When H.B. 592 was passed in 1988, it was expected that a small number of large solid waste management districts would carry out the planning effort. Initially, however, 48 districts were formed, 32 single-county and 16

Figure I-3: Out-of-State Waste Imports in 1994 by Place of Origin



multi-county solid waste districts. As planning proceeded, several districts underwent reconfigurations, so that there are now 52 districts statewide.

It was also expected that each district would include at least one solid waste landfill, and disposal fees from that facility would cover the costs of the planning effort. However, as landfill regulations were upgraded and older facilities reached capacity and closed, a number of districts were left with no active disposal facility from which to receive disposal fee revenues. The waste disposal industry expressed concern that differences among district fees were affecting the ability of facilities to compete fairly with one another. Municipal and industrial generators have been concerned with the overall cost of solid waste disposal. In response to these and other concerns, the disposal fee structure set out in H.B. 592 has now been legislatively revised a number of times, most recently in 1993 when disposal fees were capped within a specific range, and a generation fee mechanism was established to fund districts with no active disposal facility.

H.B. 592 also included mandatory control over the flow of solid waste: each solid waste management district was required to designate a list of disposal and recycling facilities in its plan, and no one was allowed to deliver district waste to a facility that was not designated. Flow control has been the subject of controversy in many parts of the country, as well as in Ohio. Facility designations may direct waste to one facility while disposal and transportation costs, the local fee structure, and liability concerns may cause the generator to want to send waste to a different facility. Generators and transporters of solid waste have expressed concerns about limitations on their disposal choices. As a result, Ohio's statute was revised in 1993 to make flow control permissive for solid waste districts rather than mandatory, and to incorporate more provisions for public notice and involvement before flow control is initiated. A U.S. Supreme Court decision in 1994 overturning a local flow control ordinance in New York on constitutional grounds has prompted the U.S. Congress to take up both the flow control issue and interstate shipments of solid waste.

Because of these and other issues, Ohio's solid waste statute has been legislatively revised 18 times since passage of H.B. 592 in 1988, and further changes are possible.

Existing Infrastructure for Alternative Management of Solid Wastes

Ohio EPA encourages communities and SWMDs to apply the concept of integrated waste management to their planning process. Integrated waste management refers to reducing or managing solid wastes through the use of several different practices that can be tailored to the needs of a community. The hierarchy of components of integrated waste management, from the most to the least preferred, are:

- source reduction
- reuse
- recycling
- composting
- waste combustion (with energy recovery)
- incineration
- landfilling

Throughout the state, new activities and facilities to reduce, recycle and compost solid wastes have been initiated since the adoption of the initial State Plan. For example, informational and technical assistance efforts by the State of Ohio and local SWMDs to promote source reduction have grown. The number of communities that have drop-off or curbside recycling services has increased dramatically since 1990, and new facilities to recover recyclables from mixed waste, or to process collected recyclables have been constructed and are now operating in several SWMDs. (See Chapter II for more detailed descriptions of the activities implemented by the State and SWMDs.)

The markets for recovered recyclable materials have also changed dramatically since the early 1990s. Recently, prices for several recovered materials such as corrugated cardboard, newspaper, PETE plastic, and others,

have experienced significant increases. (See Chapter IX for a more detailed discussion of market development activities.)

Activities to manage specific wastes have also increased. For example, Ohio now has more than 200 registered sites for the composting of yard wastes and a new law governing the management of scrap tires (See Chapter VII). In addition, several SWMDs have implemented programs to collect and manage household hazardous wastes (See Chapter VIII).

We have learned a great deal in six years, and that learning process will continue as the planning process shifts fully into the implementation stage and as we strive to continue to reduce, reuse, recycle and minimize our wastes. Ohioans can be very proud of the comprehensive programs in our state, and of the efforts underway that will benefit ourselves and future generations.

Summary of the Requirements of the Solid Waste Management Planning Process

The State Solid Waste Management Plan

The purpose of the State Plan and local Solid Waste Management District Plans is to ensure that adequate management capacity at environmentally sound facilities is available, and that effective and practical solutions to reduce our generation and disposal of solid wastes are implemented. The State Plan is to be prepared by Ohio EPA, with the advice of the Solid Waste Management Advisory Council.

The State Plan must address eight specific mandates:

- Reduce reliance on the use of landfills for management of solid wastes;
- Establish objectives for solid waste reduction, recycling, reuse, and minimization;

- Establish restrictions on the types of solid waste disposed of by landfilling for which alternative management methods are available;
- Establish revised general criteria for the location of solid waste facilities;
- Examine alternative methods for the disposal of fly ash and bottom ash resulting from the burning of mixed municipal wastes;
- Establish a statewide strategy for managing waste tires;
- Develop specific recommendations for legislative and administrative action to promote markets for products containing recycled materials and to promote the use by state government of products containing recycled materials;
- Establish a program for the proper separation and disposal of hazardous waste generated by households.

The objectives for reducing, recycling and minimizing solid wastes established in the State Plan become mandatory elements of SWMD plans.

Requirements of the County and Joint County Solid Waste Management Districts

H. B. 592 required Boards of County Commissioners to establish single- or joint-county solid waste management districts. A total of 52 districts currently exist, encompassing all 88 Ohio counties. These districts do not necessarily correspond to local “wastesheds,” or disposal routes and markets. (Figure I-4)

District policy committees must prepare, adopt, and submit a solid waste management plan to Ohio EPA. The plan must provide for the safe and sanitary management of solid wastes generated within the SWMD for a minimum of 10 years. The district plan must also show how the SWMD will meet the mandates and requirements of the State Plan.

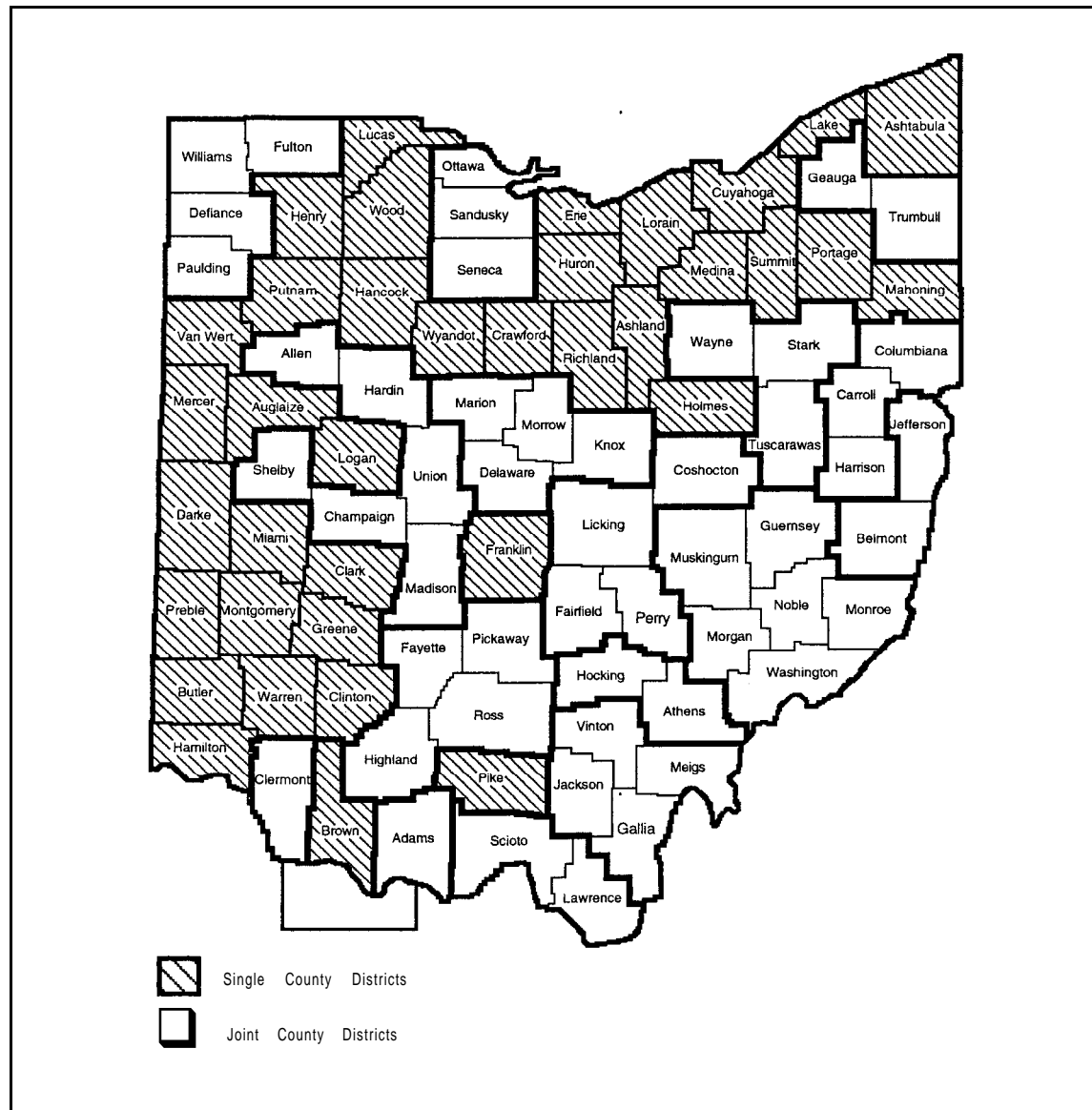
The planning process involves extensive research, expense, and discussion among various levels of government. The district plan

is prepared by a policy committee that includes representatives of counties, municipalities, townships, health districts, industrial and commercial solid waste generators and the public. The plan must be ratified by the board of county commissioners in each county within the SWMD, the largest city in each county in the SWMD and legislative jurisdictions representing 60 percent of the SWMD population, prior to submitting the plan to Ohio EPA for final review. District plans with a 10-year planning period are required to be amended every three years; district plans with a 15-year planning period (or longer) must be amended every five years.

Requirements for Solid Waste Management District Plans

In order to demonstrate access to adequate solid waste management capacity for 10 years, district plans must contain:

- projections of waste generation in the district, broken down by residential/commercial and industrial composition of the waste;
- an inventory of existing disposal, resource recovery and recycling facilities, as well as open dumps, tire dumps, and captive industrial disposal facilities;
- an inventory of existing collection systems, routes, and transfer facilities;
- projections of population changes for the planning period;
- identification of future solid waste facilities needed, their costs, and a siting strategy;
- a plan implementation schedule, including identification of facilities that will receive district waste;
- strategies to meet the goals and objectives established in the State Plan for reducing, recycling and minimizing solid wastes;
- strategies to manage household hazardous waste generated in the district;
- methods of financing facilities and programs; and,
- an allocation of local disposal fees to the uses authorized by the Ohio Revised Code.

Figure I-4: Map of Solid Waste Management Districts

State law requires the Director of Ohio EPA to “...establish objectives for solid waste reduction, recycling, reuse, and minimization and a schedule for achieving those objectives...” (Ohio Revised Code Section 3734.50). The 1989 State Plan established objectives to meet these requirements, and focused on reducing reliance on landfills as a solid waste management alternative. The three objectives, all designed to reduce reliance on landfilling, are set forth in the initial State Plan as follows:

- reduce, reuse, recycle at least 25 percent of the waste generated per capita by June 24, 1994. (This has become known as the “25 percent goal.”);
- annual per capita reductions in the amount landfilled; and
- annual per capita increases in waste reduction and recycling.

These objectives were established not only for the state as a whole, but also for each individual solid waste management district (SWMD). Each SWMD was required to prepare a solid waste management plan in accordance with the criteria discussed in Chapter I, including strategies or programs designed to meet the three objectives listed above.

The remainder of this chapter reviews Ohio’s efforts and experience towards meeting the three objectives established in the 1989 State Plan, including a discussion of the status of recycling/waste reduction in Ohio and the problems faced by SWMDs as they attempted to comply with these goals.

The Status of Recommended State Strategies in the 1989 State Plan

The 1989 State Plan established statewide objectives for waste reduction and recycling and included recommendations for state agencies designed to increase recycling and reduce reliance on landfilling. Some state strategies from the 1989 State Plan have been fully implemented, while others are on-going or being considered for future implementation. As stated above, the State Plan also included requirements for SWMDs. (See page 8 in Chapter I for a listing of the mandatory elements of SWMD plans as required by Ohio law.) The 1989 State Plan also included suggested strategies that SWMDs could use to reach the objectives.

While the 1989 State Plan included a total of 15 state strategies, some progress has been made on almost all of these recommendations. Each strategy is discussed briefly below, including the status of efforts towards implementation. The recommended strategy from the 1989 State Plan is shown in *italics*. (Many of the programs listed in this section are also discussed in Chapter IX, Recycling Market Development.)

1989 State Plan Strategy #1

Revise State buying policies to require the use of materials made with recycled or reused materials. Private industries should use reusable resources as substitutes for raw materials.

Considerable progress has been made to implement this strategy, including passage of House Bill 25 in 1993.

1989 State Plan Strategy #2

Develop a data and information base on the current levels of waste reduction and recycling to serve as a reference to future planning programs.

The statewide database of information from local district plans and annual district reports (ADRs) is currently in development, and will be completed by Ohio EPA upon receiving the 1995 ADRs. These annual reports are submitted by each SWMD and include recycling and disposal information, and a summary of plan implementation for the previous calendar year. This database will be updated as plans are implemented and amended and ADRs are submitted. Ohio EPA will make this information available in a summary report on an annual basis.

1989 State Plan Strategy #3

Give technical assistance to waste management districts and local governments to plan and implement waste reduction/recycling programs. Assistance may be given through trained technical staff, manuals and guidebooks, resource centers, workshops and seminars, bibliographies and directories.

Staff from Ohio Department of Natural Resource's (ODNR's) Division of Recycling and Litter Prevention (DRLR) and Ohio EPA's Division of Solid and Infectious Waste Management (DSIWM) and the Office of Pollution Prevention (OPP) have been and will continue to be available to provide waste reduction/recycling and pollution prevention assistance. (For other resources provided by these agencies, see the sidebar on the next page.)

1989 State Plan Strategy #4

Provide technical assistance to waste districts and local governments to establish yard waste composting programs, and give information to homeowners on how to reduce and compost yard waste on their own property. The Cooperative Extension Service (OCES) of

*The Ohio State University will provide implementation guides **for** leaf composting projects in Ohio. As a potential provider **of** educational programs, the Cooperative Extension Service also can help to develop the plans **for** yard waste compost.*

Staff from Ohio EPA's (DSIWM) and Ohio Cooperative Extension Service (OCES) have been available to provide assistance on composting questions. A study group including Ohio EPA, ODNR, Ohio Department of Development (ODOD), Ohio Department of Agriculture (ODA), and state universities worked to develop operational criteria for yard waste composting facilities, with input from the regulated community. Regulations for composting facilities were promulgated by Ohio EPA and took effect June 1, 1992 (Ohio Administrative Code Rules 3745-27-40 through -47) and were revised in 1993. Ohio EPA also published a lengthy *Yard Waste Management Guidebook **for** Ohio Communities* in 1992. The Cooperative Extension Service in particular continues to be involved in proper yard waste management education at the local level.

1989 State Plan Strategy #5

*Develop solid waste composting standards **for** metals, pH, soluble salts, and carbon-to-nitrogen ratios. These may be established based upon experience in sewage sludge composting in Ohio and solid waste composting in other states.*

Statutory authority to develop composting standards was granted by the Ohio General Assembly with passage of House Bill 723 in December 1992. Ohio EPA has been working with other state agencies, Ohio State University, composting experts in Ohio and around the United States to develop compost quality standards for all types of solid waste composting.

1989 State Plan Strategy #6

Provide grants to local governments to help pay the start-up costs for recycling programs.

Resources Developed by Ohio EPA & ODNR

- Waste Reduction Guide for Ohio's Business and Industry
- Ohio Recycling Information and Communication System (ORICS)
- Ohio Directory of Recycling Opportunities
- Directory of Secondary Materials Markets
- Office Paper Recycling Guide
- Recycling Basics Guidebook
- Office Guide to Recycling and Buying Recycled Products
- Directory of Ohio Vendors of Recycled Products
- Annual Recycling Confer&es in 1990, 1991, 1992, 1993, and 1994
- Annual publication of Facility Data Report tracking waste flows and tonnages and disposal capacity available statewide
- Ohio Industrial Solid Waste: Trends in Recycling and Conserving Resources
- Fact Sheets on Household Hazardous Waste Management and recycling
- Telephone Hotline Manual for Household Hazardous Waste Management
- Written guidance on planning issues, state policies and procedures, and district flow, control powers
- Updated version of the *District Solid Waste Management Plan Format* incorporating recent legislation, policy changes, and additional planning guidance;
- Case studies, fact sheets, and other information regarding pollution prevention activities.

Between 1990-1994, the Division of Recycling and Litter Prevention (DRLP) at ODNR awarded over 700 grants totaling \$14 million to Ohio local governments and solid waste districts for the implementation of

recycling programs, including: citywide curbside recycling programs, countywide drop-off recycling programs, district-owned/operated materials recovery facilities (MRFs), cooperative material marketing programs, and community-specific recycling education and awareness programs.

The Ohio Water Development Authority (OWDA) provides financing to local communities for solid waste facilities including recycling projects, composting facilities, MRFs, waste-to-energy projects and landfills. OWDA loans can fund specific planning and engineering costs. Medina County was the first to apply for and receive both a planning loan and a construction loan for its MRF.

1989 State Plan Strategy #7

Develop funding and technical assistance programs for waste management and recycling businesses to help foster the expansion of recycling services. Ways to provide help may include technical assistance transfer networks, workshops, seminars, bibliographies and directories.

ODNR-DRLP developed the Waste Reduction Guide for Ohio Business and Industry, and participated in regional workshops around the state to promote increased recycling and reduction by Ohio's businesses.

Ohio EPA is a financial sponsor of the Northeastern Industrial Waste Exchange. This multi-state organization publishes a catalog which provides businesses with a vehicle for marketing their waste products to other businesses for use as a raw material.

The Ohio Department of Development (ODOD), through existing grant and loan programs, has provided some funding for expansion of various recycling businesses in Ohio.

ODNR-DRLP developed and distributes the first six publications listed under Strategy #3, co-sponsored with such organizations as the Association of Ohio Recyclers, the Steel Recycling Institute, the National Soft Drink Association, and other regional recycling groups.

1989 State Plan Strategy #8

Develop a loan program to provide money to private businesses to assist in the expansion of recycling services, particularly when these services directly relate to the implementation of district recycling plans.

The Ohio Water Development Authority can provide tax-exempt financing to certain privately owned solid waste and recycling facilities. The facility can serve either a public or private purpose, or both. Tax-exempt financing allows a private entity to raise capital at a cost that is about 25 percent less than it would be if done on a taxable basis.

ODOD provides fixed asset financing, technical assistance through its network of small business development centers, and grants for joint research projects between Ohio universities and businesses. (A list of recycling projects funded by ODOD between 1989-1991 is shown in the sidebar on the next page.)

1989 State Plan Strategy #9

Help Ohio businesses and industries determine additional ways to minimize waste, reuse materials, and exchange wastes.

See Strategy #7. Ohio EPA's Office of Pollution Prevention (OPP) has collected numerous case studies of successful examples of source reduction of nonhazardous industrial, commercial and medical wastes. These case studies have been organized into a library system to facilitate providing assistance to any company wishing to pursue pollution prevention activities. OPP also encourages source reduction statewide through seminars, mailings, and site visits. A source reduction database will be developed and annually updated. In addition, ODNR has included a waste exchange component in the on-line Ohio Recycling Information Communication System.

1989 State Plan Strategy #10

Give awards to recognize outstanding waste reduction and recycling programs operated by business, industry, nonprofit organizations, and local governments.

The Governor's Awards for Outstanding Achievement in Pollution Prevention annually recognize Ohio businesses, groups and individuals for their waste reduction and recycling programs. ODNR and the League of Ohio Sportsmen cooperate to annually recognize outstanding recycling and litter prevention programs. ODNR-DRLP's Recycle, Ohio/Keep Ohio Beautiful annual awards program (affiliated with the Keep America Beautiful program) recognizes Ohio communities for outstanding recycling programs.

1989 State Plan Strategy #11

Establish waste reduction and recycling programs and expand salvage programs in all government agencies, including state technical schools and universities.

Via ODNR's "Recycle Ohio" program, approximately 168 state agency locations, including all seven state office towers (and involving over 32,000 state employees) are implementing office paper recovery programs.

State salvage laws were modified via 1993's House Bill 25 in reference to recyclable wastes and a Recycled Materials Fund was established to assist state agencies in implementing recycling programs.

The Great Lakes Recycling Agreement and Executive Order 92-174V require the Ohio Department of Administrative Services (ODAS) to make available recycled copy paper and rerefinned motor oil for use by all state agencies. The Order also requires all state departments and agencies to actively participate in additional recycling initiatives developed. (See Chapter IX for further discussion of this topic.)

1989 State Plan Strategy #12

Expand the statewide education and awareness program concerning the benefits of waste reduction and recycling. This could include paid and public service media announcements, publicity, events, including "Ohio Recycling Month" activities, and printed education materials.

The Ohio Environmental Education Fund, (OEEF), at Ohio EPA, was created in 1990 to provide grants to increase and expand environmental education programs throughout Ohio. Many OEEF-funded projects contain components involving waste reduction and recycling.

ODNR developed an interdisciplinary environmental studies activity guidebook (*Super Savers Investigators*) about solid waste and recycling for grades Kindergarten through eight. An activity guidebook (*Investigating Solid Waste Issues*) for grades nine through 12 was developed in 1994. Over 275 in-service training sessions for Ohio teachers and local program managers have been conducted since 1989.

ODNR and the Ohio Academy of Sciences publish a collection of recycling-related science project suggestions for teachers to use in guiding student research and science fair projects. The Governor's Award for Excellence in Student Research in Litter Prevention and Recycling is awarded annually at the State Science Fair.

Recycling Month is celebrated annually in Ohio in October. Posters, brochures, television and radio public service announcements and many other education and awareness activities are performed during this month. ODNR presented 88 Ohio counties with recycled plastic park benches in an effort to promote recycling and the purchase of recycled-content products by county governments. During 1995, ODNR is presenting plastic picnic tables to all Ohio two-year technical colleges. Other activities conducted by ODNR include:

- a statewide recycling awareness campaign during 1995 in conjunction with the Turner Broadcasting Network and the National Recycling Coalition;

- a statewide recycling and buying recycled awareness campaign in conjunction with the national Environmental Defense Fund;
- an Earth Day poster contest for school children in grades one through 12 co-sponsored by ODNR-DRLP and the Institute of Scrap Recycling; and
- an environmental fair and two-day visit by children's celebrity "Barney" for Earth Day.

1989 State Plan Strategy #13

Give education and awareness materials to waste management districts and local governments to promote local reduction and recycling education programs. Materials may include public service announcements for print and broadcast media, curriculum materials for schools, and brochures.

Ohio EPA's Environmental Education Fund and ODNR's local government litter prevention and recycling grants programs have helped many local governments and SWMDs develop

Recycling Projects Funded by ODOD

- Aluminum recycling: Technical assistance provided to Grossman Industries, Columbus
- Steel waste recycling/reprocessing: Fixed asset financing to Recotech, Aurora. Company resells zinc salvaged from steel waste (sludge) recycling. Financing to commercialize technology processing oily steel rolling mill scale and sludge for use as feeder stock for sinter plants.
- Scrap metal recycling: The ODOD-funded Jefferson County Small Business Center assisted CAMCO Recycling, Inc. of Dillonvale in developing the company's business plan and securing \$675,000 financing. CAMCO is the second largest processor of scrap metal in the Ohio Valley and employs more than 20 people
- Plastics recycling: The ODOD-funded Wood County Small Business Development Center assisted Starbrook Recycling, Inc. of Bowling Green in identifying a constant and dependable source of recyclable plastics and helped secure financing for the start-up company.

continued on next page

Recycling Projects Funded by ODOD

(continued from previous page)

- Starbrook converts PET soda bottles and milk jugs into pellets and flakes for re-manufacturing.
- Solid waste recycling: ODOD provided Enterprise Bond financing of \$3.276 million to R.C. Miller Refuse Services of Canton for an addition and renovations to the existing facility and equipment to recover recyclables from the solid waste stream, and to make compost and fuel pellets.
- Composting: Provided Edison Seed Development Funding of \$50,000 to Kurtz Brothers, Inc. of Independence for research with the Ohio State University to develop higher quality compost from yard wastes. Also provided Edison Seed Development Funding of \$249,423 to N-Viro Energy Systems, Ltd. of Toledo to work with the Medical College of Ohio in developing a new soil/compost using cement kiln dust to stabilize sludge produced by municipal sewage treatment plants. Proposed treatment will reduce public health risks associated with application of municipal sewage sludge to croplands, eliminate odor in processing, and reduce volume.
- Used Oil Recycling: Provided Edison Seed Development Funding of \$50,000 to Clark Processing, Inc. of Dayton to work with Miami University to examine ion exchange methods for removal of transitional metals from used oils. If successful, the process will improve quality of re-refined oils.

their own community-specific waste reduction and recycling materials. In addition to publications listed under Strategy #3 above, ODNR-DRLP has provided a Reduce-Reuse-Recycle brochure, *Super Savers Investigators Activity Guidebook*, Keep Ohio Beautiful posters, *Investigating Solid Waste Issues* guidebook, and Girl Scout recycling patches. ODNR-DRLP also has available numerous fact sheets, slide shows and video tapes on recycling and waste reduction.

1989 State Plan Strategy #14

Support research to improve and expand collection and processing in recycling systems, including public/private partnerships to utilize the research capabilities of state technical schools and universities.

ODNR funded an OCES research project to determine the suitability of shredded newsprint for livestock bedding.

ODNR and Ohio EPA funded a study to estimate the volume of industrial solid waste being generated and recycled in Ohio, published in December 1991.

The University of Toledo received funding from ODNR to document existing and potential new product applications for recycled plastic resin. The University received additional funds to evaluate markets for products made from recycled plastic, and to establish a database of plastics recycling in Ohio.

The University of Akron's Polymer Research Center is receiving funding through the implementation of Senate Bill 165, passed by the Ohio General Assembly in 1993, to research alternative uses of scrap tires.

ODNR provided funding to Battelle Memorial Research Laboratory for plastic pallet recycling research, plastic lumber research and standards development for recycled-content plastic products. ODNR has also worked with a group of northeastern universities to establish American Society of Testing and Materials (ASTM) specifications for recycled-content plastic drainage tile.

See other projects listed under Strategy #8 in this section.

1989 State Plan Strategy #15

Require all retail merchants that sell motor oil to collect used motor oil for recycling. Six months after legislation is passed mandating this collection, used motor oil should be banned from disposal in landfills.

Since used oil is a liquid, it is prohibited from landfill disposal. Legislation addressing landfill disposal and collection of used oil has not been passed by the Ohio General Assembly. However, used oil recycling opportunities and collection programs in Ohio have greatly improved since the 1989 State Plan was adopted. Several major automotive oil-change businesses, automotive maintenance establishments, and retail stores accept used oil from residents changing oil in their own vehicles. See Chapters IV and IX for further discussion of used oil.

Local Plan Preparation

The sidebar on this page shows the actual language from the 1989 State Plan regarding the requirements for SWMDs. As a part of demonstrating that it has met the objectives of the State Plan, a SWMD must prepare a plan covering at least 10 years. Much of the effort required for developing SWMD plans has been associated with obtaining data in order to complete the required inventory of facilities, estimate waste generation, document disposal, recycling and waste reduction amounts, and estimate projections of waste generation, disposal, waste reduction and recycling. The planning process needs all of this information in order to determine appropriate strategies for meeting the State Plan objectives.

However, several factors have complicated the efforts of local districts to make the necessary measurements for recycling and reduction levels, and to monitor progress toward the three objectives. The State of Ohio does not regulate recycling, and there are no reporting requirements for many private sector recycling entities. Most licensed solid waste facilities such as landfills and transfer stations do report amounts recycled at those sites (73,000 tons in 1993). In contrast, Ohio SWMDs reported a total of almost 7.25 million tons of waste reduction and recycling in the residential/commercial and industrial sectors during 1993.

These figures suggest that only one percent of the solid waste reduced or recycled in Ohio during 1993 can be at least partially verified by the State. The difference between this figure and the statewide total of 33 percent reported by SWMDs for 1993 is made up of recycling not reported to Ohio EPA or the Ohio Department of Natural Resources, but is nevertheless being accomplished by individual citizens, businesses, manufacturing facilities, local governments, and private recycling entities such as scrap dealers. Much of this recycling is being estimated and documented for the first time in the local district solid waste management plans and annual reports submitted to Ohio EPA by SWMDs. Nevertheless, many recyclers and recycling brokers do not respond to district attempts to obtain recycling information, due to concerns regarding confidentiality and a fear of compromising their competitiveness in the market place.

Language from the 1989 State Plan

"...to reduce, reuse and recycle at least 25 percent of the waste generated per capita in Ohio by June 24, 1994. Every district must show an annual per capita reduction in landfilling and an annual per capita increase in recycling. Recycling includes solid waste composting. Yard waste cannot be counted toward the 25 percent recycling goal..."

"...should be considered a planning objective, not an inflexible standard...It is hoped that the goal will act as a guide and incentive and not inhibit efforts to recycle more than 25 percent of the waste stream..."

"...Waste minimization at the source is to be stressed as a waste management method. Local districts are encouraged to aggressively work with local businesses, commercial, governmental, and residential operations to prevent waste from being generated in the first place..."

"...All incinerator and waste-to-energy facilities are required...to assure the separation of potential sources of hazardous constituents, such as lead-acid batteries and metals, prior to incineration. These reclaimed materials should be recycled. In addition, all districts which have or will have incineration and waste-to-energy facilities in the future shall to the greatest extent practical recycle materials, such as glass, which are not usable as fuels, materials which may have greater value if recycled, or materials which may interfere with efficient incinerator operation if not removed. These plans need not consider the recycling of materials with obvious fuel values, such as paper..."

"...Separation and recycling may be met through community-based programs such as curbside, dropoff or other programs, or by a program initiated at the incinerator or waste-to-energy facility itself..."

All SWMDs have also been required to survey industrial generators of solid waste while preparing their plan, in an effort to project the amounts of waste being generated, recycled or potentially able to be recycled. Unfortunately, the response by industrial generators to the voluntary surveys has been quite low in some districts, with fewer than half of a district's industries responding. This made the task of projection difficult, particularly in some large districts. Districts have been encouraged to base their projections on the number of employees in industries in different standard industrial classification, (SIC) categories, and on national average recycling rates in the different industries, as

projected by Franklin and Associates for U.S. EPA. Because of these uncertainties, appropriate caution should be used in analyzing the amount of recycling projected in individual districts and in the state as a whole.

Another difficulty in measuring recycling involves determining the amount of industrial recycling that can be credited toward meeting the statewide reduction and recycling goal. The 25 percent goal is part of the overall goal of House Bill 592 and the 1989 State Plan to reduce reliance on landfills. During 1990, the Solid Waste Management Advisory Council (SWAC) considered this issue, and concluded that only those industrial waste streams that have recently been disposed in landfills should be credited for new reductions in landfill utilization. SWAC adopted a policy that previous industrial recycling will be credited to the 25 percent goal if it began after January 1, 1985. Industrial waste which was being disposed in a landfill after January 1, 1985, and since that time has been recycled, will be counted towards the 25 percent goal. In order not to penalize districts that have industries that were aggressively recycling prior to 1985, however, district plans now may also deduct the amount of waste recycled by the industries prior to 1985 from the total amount they report of industrial waste generated in the district.

Although the "pre-1985 industrial recycling policy" intended to maintain the focus on reducing reliance on landfills, implementing this policy has been difficult. Many industries cannot determine the date when materials were first recycled rather than landfilled; their records do not contain this type of information.

Another measurement problem has involved the estimation of waste generation for the residential/commercial sector. Waste generation must be estimated since it is used to determine the waste reduction/recycling rate. Many SWMDs have found that the national averages for waste generation in the residential/commercial sector are not especially accurate. The averages are too high for rural areas and typically too low for dense urbanized areas such as Cuyahoga County. The alternatives to using national averages usually involve considerable survey work with unknown response rates, or estimating generation by adding disposal plus waste reduction/recycling.

Implementing Local Plans

Most SWMDs began implementing their plans in 1991 or 1992 after gaining Ohio EPA approval. As of June 1995, 50 out of 52 SWMDs were operating under approved local plans. In addition, 24 SWMDs are expected to submit their draft triennial plan updates during 1995. Although it is difficult to assign causality with complete certainty, Ohio's statewide recycling rate did increase from 24.6 percent in 1990 to 33.3 percent in 1993 (29 percent if incineration is excluded), a large increase occurring simultaneously with district plan implementation. Clearly, some of the increase from 1990 to 1993 is due to better and more complete reporting by industries, recyclers, and recycling brokers. However, a comparison of recycling infrastructure for 1990 and 1993 shows a significant increase in curbside recycling programs, drop-off recyclable collection systems and a greater number of material recovery facilities (MRFs).

Districts have used a variety of strategies to meet the objectives in the 1989 State Plan. Some have constructed facilities such as material recovery facilities, while others have relied entirely upon the private sector to provide the services needed. A limited number of districts have used grant programs as incentives to promote greater participation in recycling and establish more infrastructure. Table II-1 shows a summary of the types of programs adopted by SWMDs designed to meet the waste reduction/recycling objectives. (Although this table represents information reported to Ohio EPA by the SWMDs, it is likely that these figures greatly understate the actual number of district programs taking place in each category.)

Progress Towards the 25 percent Goal

As indicated previously, Ohio essentially met the 25 percent goal statewide in 1990 if reductions achieved through incineration are included. (The percentage was 19.5 percent if incineration is excluded.) By 1993, the waste reduction/recycling (WRR) rate was estimated at 33 percent statewide (29 percent if incineration is excluded). However, the success in

Table 11-1 Solid Waste Management District Strategies Used to Meet the Waste Reduction/Recycling Objectives ^a

Strategy/Program	# of Programs ^b	Strategy/Program	# of Programs ^b
Education		Material Recovery Facility ^d	10
general education	12		
newsletter	6	Volume-based Rates	1
oral presentations	6		
workshops for teachers	3	Residential/Commercial Recycling	
model community ^c	1	Financial Support/Grants/Incentives	11
county fair displays	6		
poster contest	3	drop-off programs	21
brochures/pamphlets	4	curbside recycling programs	395 communities
in-school programs	10	commercial office programs	8
		phone book recycling	4
Industrial		auto batteries	4
waste audits	3	white goods	3
seminars	3	tires	10
newsletter	1	commercial waste audits	1
technical assistance	1		
commercial/business/industry councils, networking mtgs.	4		

^a The primary objective of this table is to show the variety of strategies and programs used by SWMD. The information has been taken directly from annual reports from SWMDs submitted for calendar year 1993.

^b The "number of programs" indicates the number of SWMDs using that type of strategy or program. In reality, the numbers shown are most certainly too low, however, they represent the information reported to Ohio EPA.

^c "Model Community" is a program developed by a non-profit organization in Illinois, focusing on source reduction and recycling in businesses, offices, grocery stores, agriculture, etc.

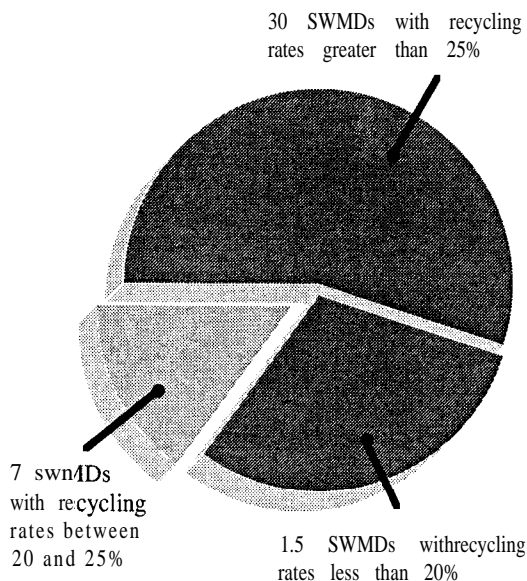
^d In this instance, "Material Recovery Facility" includes facilities that recover recyclables from mixed waste, facilities processing only recyclables, and drop-off sites which also process recyclables.

meeting the 25 percent goal is extremely varied when examined for each individual SWMD. Figure II-1 shows that 30 SWMDs (or 58 percent) achieved a WRR rate of 25 percent or more by the end of 1993. A total of 22 districts did not reach the 25 percent goal by 1994. In addition, the WRR rate ranged from approximately two percent to just over 75 percent in 1993.

If the WRR rates for districts are examined separately for the industrial sector and then the residential/commercial sector, the differences are much more striking. The heavy dark line moving upward from left to right in Figure II-2

represents the total WRR rate for each SWMD. The lighter-colored line on this graph shows the portion of the total waste reduction and recycling percentage that is contributed by the industrial sector. For example, the SWMD indicated with an arrow shows a total WRR rate of 20 percent based on the heavy, dark line. The lighter-colored line illustrates that industrial waste reduction/recycling alone contributes approximately 19 percent of the 20 percent total for this district. Most of the other districts show similar relationships between the total WRR rate and the amount of the total contributed by the industrial sector. Over 70

Figure II-1. Number of SWMDs Above 25 Percent (1993)



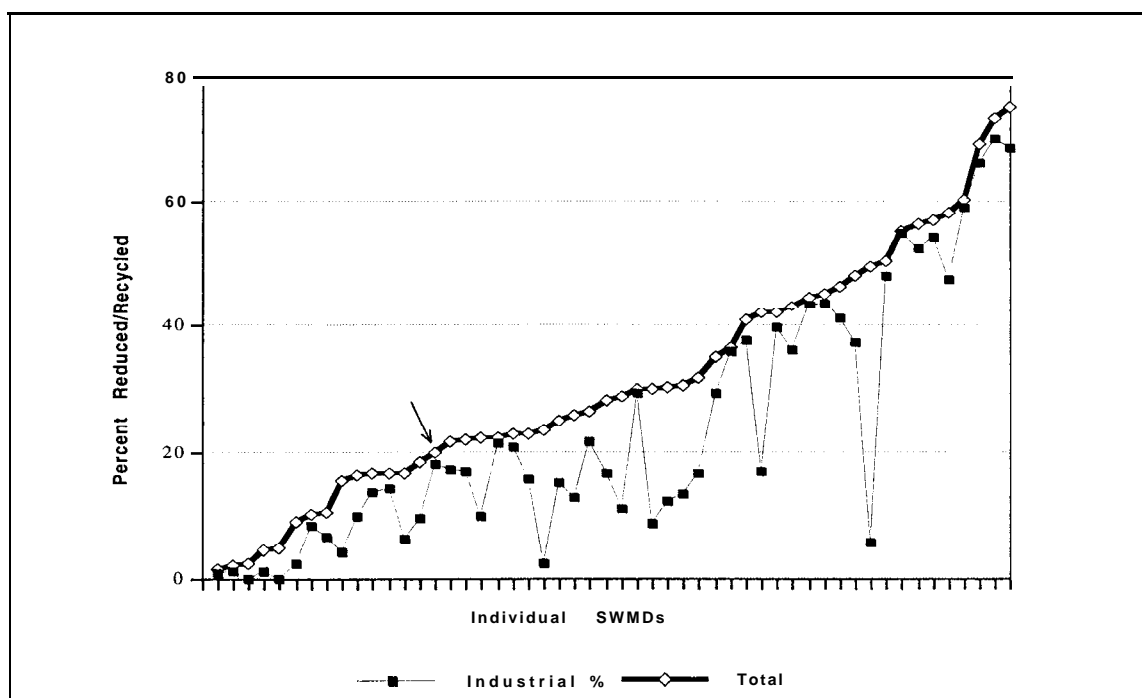
percent of the SWMDs have more than one-half of their WRR rate contributed by the industrial sector. Of the total amount statewide that is reduced or recycled, over 67 percent represents industrial waste.

In contrast, a much smaller amount of the residential/commercial (R/C) waste stream is reduced or recycled, and the overall percentage of R/C waste reduced or recycled is much less

than it is for industrial waste. For example, the 1993 WRR rate for industrial waste was only 48 percent while the WRR rate for R/C waste was 21 percent. Examining each SWMD shows that only seven districts achieved the 25 percent goal if industrial waste is not included in the WRR rate calculations. (See Figure 11-3) In addition, exactly one-half of the SWMDs had a R/C waste reduction/recycling rate of less than 10 percent. It seems clear from this data that there is more room for growth in WRR in the R/C sector compared to the industrial sector, especially when one considers that large portions of the industrial waste stream consist of specialized waste streams such as sludges that are generally difficult to recycle.

It should be noted that the waste reduction/recycling figures on page 19 are based on calculations which exclude yard waste and pre-1985 industrial recycling, according to the 1989 State Plan and a 1990 SWAC policy. There has been widespread criticism that yard waste cannot be counted in calculating progress toward the 25 percent goal, in part because it does not encourage the development of composting programs or other alternative management options for yard waste. In addition, many communities and SWMDs

Figure 11-2. Percent of Waste Reduced/Recycled in 1993 by SWMD



throughout Ohio have invested considerable effort and financial resources to implement yard waste programs, and feel that these efforts should be included in calculation of the 25 percent goal. For similar reasons, SWMDs and local industries believe that reduction and recycling efforts by industry should be credited towards the 25 percent goal regardless of the initiation date of the WRR program.

Incineration is also an important factor to consider when explaining the differences in WRR rates among SWMDs. The three districts having the highest R/C waste reduction/recycling rate during 1993 operated solid waste incinerators. Each district had a WRR rate greater than 30 percent for the R/C sector.

Although population density may be a factor in determining the WRR rate, it appears to be somewhat unpredictable. Districts with population densities greater than 1,000 persons per square mile had WRR rates ranging from 15 percent to 50 percent. Nine SWMDs, all rural districts, had WRR rates greater than 50 percent. For the R/C sector alone, five of 11 districts with the highest WRR rates had population densities greater than 1,000 persons per square mile.

In general, rural districts have experienced more difficulty achieving the 25 percent goal than highly urbanized districts. However, the most important factor appears to be the reduction and recycling activities of large industrial generators of solid waste. A handful of districts met the 25 percent goal solely on the basis of reported recycling and reduction by only one or two companies.

Progress Towards the Annual Increase in Recycling

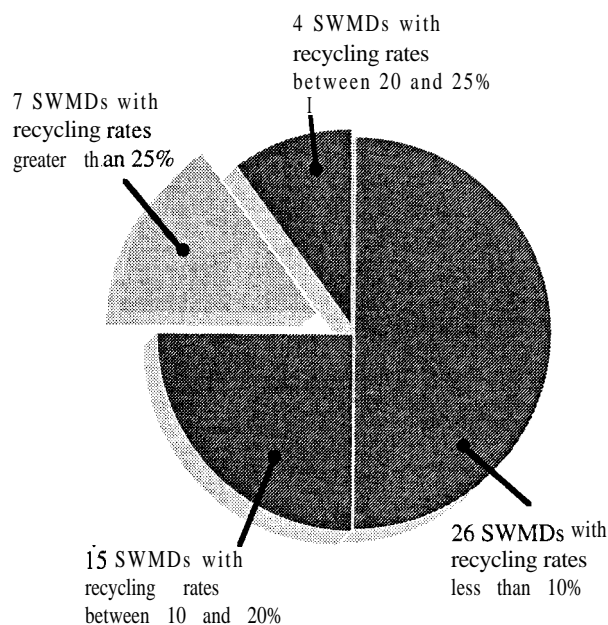
In late 1991, the House Energy and Environment Committee of the Ohio General Assembly held hearings around the State on the implementation of House Bill 592. While many suggestions for improvements were offered, there was widespread consensus that the law as a whole was a good one, and that the programs set in motion by House Bill 592 should be given a chance to work before major changes were mandated.

Dozens of solid waste districts testified about their efforts to meet the recycling and reduction goal and the other requirements of the law.

According to the Summary Findings of this Committee, "...Comments on the 25 percent waste reduction goal were consistent among communities across the state. There was minimal concern expressed regarding the ability of districts to meet the June 1994 deadline. Testimony before the Committee indicated that many communities already have been able to achieve reductions of more than 25 percent, well before the 1994 deadline. However, concerns were expressed regarding the ability of solid waste districts and communities within them to achieve further reductions beyond the current 25 percent goal..."

The feasibility of further reductions beyond the 25 percent goal continues to be debated. Conceptually, it would seem to be even more difficult to meet the requirement for annual increases in the WRR rate, especially for those districts already well beyond the 25 percent goal. As more waste is reduced or recycled, less material would be available for future increases. In addition, the materials

Figure 11-3.
Number of SWMDs Above 25 Percent:
Residential/Commercial Sector Only



easiest to reduce or recycle are likely to be addressed first, which supports the idea that continual increases in recycling will become more difficult as the overall WRR rate goes up. From 1992 through 1993, 26 SWMDs increased their WRR rate. However, due to the differences in the number of SWMD survey respondents and the difficulty in quantifying WRR, changes in the calculated WRR rate from one year to the next should be viewed with caution. The statewide WRR rate increased from 29 percent in 1992 to 33 percent in 1993.

Progress Towards the Annual Decrease in Landfill Utilization

Annual decreases in landfill utilization (based upon tons disposed per person) were achieved in 22 SWMDs from 1992 through 1993. Overall, Ohio experienced an insignificant increase in the amount of waste landfilled from 1992 through 1993. In 1992, the statewide landfill disposal rate was 7.6 pounds per person per day. In 1993, this figure changed slightly to 7.63 pounds per person per day. Although there are concerns regarding the accuracy, landfill data shows that the 1993 disposal rate for R/C waste was 4.6 pounds per person per day. This suggests that Ohio's generation of residential/commercial waste may be considerably higher than the national average.

Several factors make it difficult for SWMDs to achieve this objective. First of all, waste generation is projected to continue

increasing. U.S. EPA's *Characterization of Municipal Solid Waste in the United States: 1992 Update* noted that in 1990, 195.7 million tons, or 4.3 pounds per person per day of municipal solid waste were generated in the United States. Without additional source reduction, generation is expected to reach 222 million tons, or 4.5 pounds per person per day by the year 2000. The per capita figure for the year 2000 constitutes a five percent increase over 1990 levels. Assuming that these projections are correct, SWMDs must continue to reduce/recycle at increasing rates in order to meet this objective.

Partially as a result of interest in slowing or even reversing this continuing increase in waste generation, strong suggestions have been made that local and state planning efforts are too focused on recycling and not sufficiently directed at waste reduction or source reduction, which is officially Ohio's top priority. In partial response to these suggestions, the House Energy and Environment Committee recommended that "...when district plans undergo the first statutorily required revision, a program for working with solid waste generators to reduce the creation of waste should be required to be included in the revised plans. Districts should have the discretion to select which categories of generators are to be included in the source reduction program." This recommendation has also been given the force of law by passage of House Bill 723.

The goals outlined in this section revise those established in the initial State Solid Waste Management Plan, adopted in 1989. These revisions are being made to address the problems identified in the previous chapter, and to ensure that Ohio continues moving forward regarding reducing our reliance on landfilling. While each of the seven goals in this section are important, more effort and resources will likely be needed to meet the requirements of Goal #1 or #2. In addition, Ohio EPA will consider Goals #1 and #2 more important when evaluating a SWMD plan for approval or disapproval.

In order to address several of the previously identified differences among SWMDs, two methods of demonstrating compliance with waste reduction and recycling goals are offered. Although meeting both goals should be the intent, SWMDs will have the option of demonstrating compliance with Goal #1 *or* Goal #2. After Goals #1 and #2 have been presented, the relationship between these goals is discussed in greater detail.

Goal #1

Program Standards for SWMDs:
Ensure the Availability of Reduction,
Recycling and Minimization
Alternatives for Municipal,
Solid Waste

In order to obtain an Ohio EPA approved plan, SWMDs must demonstrate that the waste reduction, recycling or minimization programs or activities in existence or scheduled to be implemented will be available by the year 2000 for a minimum of seven of the 11 materials identified in Table 111-1 as highly amenable to recovery from municipal solid waste (MSW). It is expected that these programs and activities

may include a combination of public sector and private sector efforts. SWMDs need not directly provide services in order to comply with this objective. The alternative management activities should also meet the following criteria:

- a) each sector of waste generators (residential, commercial, and institutional, see Table III-2) should have access to recycling or other alternate management methods for at least four of the minimum seven materials which are addressed in the district;
- b) the SWMD can demonstrate that participation by generators using the alternate management methods will meet or exceed minimum levels of participation or waste diversion; or the SWMD can demonstrate that incentives for generators to participate in recycling or alternative management methods are in place or scheduled for implementation; and
- c) for SWMDs relying on incineration and/or solid waste composting, a minimum of three of the seven minimum materials must be non-compostable and non-combustible (e.g. steel, aluminum or glass food and beverage containers, and lead-acid batteries).

In the district plan, SWMDs are required to provide an inventory of the sources, composition and quantities of solid wastes generated in the district. In addition, the inventory must include all waste management and recycling facilities that provide service to the SWMD, and all waste collection systems and entities collecting waste in the district. The information gathered in compiling these inventories should enable a solid waste management district to show which materials are targeted for alternative management, the type of collection and management methods available, the extent to which generators have access to alternative management options, and the extent

to which generators are utilizing the alternative management methods.

To meet the established objectives, the SWMD provides in the plan a reduction/recycling needs assessment. Specifically, the needs assessment evaluates the existing activities to: (a) determine whether any sector of generators does not have access to alternative management options; (b) identify any area or political jurisdiction within the district where a sector of generators does not have access to alternative options; and (c) determine whether available alternative management options are under utilized.

The SWMD identifies the needs and presents a schedule of programs and activities to address these needs in its plan. Ohio EPA in turn evaluates the data and inventories presented, and the activities scheduled for implementation to determine whether the existing and proposed management options meet or exceed the criteria described above. To assist in evaluating and determining stan-

dards for access and participation to alternative management (criteria (a) through (c)), Ohio EPA will solicit the involvement and advice of SWMDs, ODNR's Division of Recycling and Litter Prevention, and other interested parties. Once drafted, Ohio EPA's recommended standards will be submitted to the Solid Waste Advisory Council (SWAC) for approval. These standards may be specific to the type of collection or management activity, and the type of generator and area served. In evaluating a solid waste management plan with regard to compliance with these objectives, Ohio EPA may also take into consideration local conditions that may affect a district's ability to meet the access and participation standards. (Access and participation program standards will be established in conjunction with the revision of the rules governing SWMDs and the District *Solid Waste Management Plan Format*.)

The focus of this new objective is on identifying and evaluating management options available within a district for solid wastes, and

Table III-1
Materials in the Municipal Solid Waste Stream
Highly Amenable to Alternative Management

Product, Packaging or Material in MSW	Percent of Total MSW	Materials Recovery	Composting	Refuse Derived Fuel/ Incineration
Corrugated Cardboard	12.7	H	H	H
Office papers	3.4	H	L	H
Newspapers	6.3	H	H	H
Glass beverage and food containers	5.9	H		
Steel beverage and food containers	1.3	H		
Aluminum beverage and other containers	0.8	H		
Plastic containers	1.5	H		H
Wood Packaging	4.6	H	H	H
Lead Acid Batteries	0.8	H		
Major Appliances	1.7	H		
Yard Wastes	15.9		H	L
Total	54.9			
Highly Amenable (H) Less Amenable (L) Least Amenable (-) Sources: Appendix B. Percentage composition of Municipal Solid Wastes is from <i>Characterization of Municipal Solid Waste</i> in the <i>United States, 1994 Update</i> . Franklin Associates for US EPA.				

Table III-2
Sources and Examples of Municipal and Industrial Solid Wastes

Residential/Commercial Sector/Municipal Solid Waste	
<u>Source</u>	<u>Example Materials</u>
<i>Residential</i> (Single and Multifamily Homes)	newspapers, clothing food packaging, cans and bottles, food scraps and yard trimmings
<i>Commercial</i> (Office Buildings, Retail and Wholesale Establishments)	corrugated boxes, food wastes, office papers, disposable tableware, paper napkins, yard trimmings
<i>Institutional</i> (Schools, Libraries, Hospitals, Prisons)	cafeteria and restroom trash can wastes, office papers, classroom wastes, yard trimmings
Industrial Sector/Industrial Solid Waste	
<i>Manufacturing Plants</i>	filter cake, rubber, air pollution control dust, industrial sludge, corrugated boxes, wood pallets
<p>* The waste materials and categories defined above are for the purposes of measuring progress toward the waste reduction and recycling goals established in the State Plan. These definitions are not the same as those used to define the types of solid waste that are acceptable at municipal, industrial, or residual solid waste disposal facilities in Ohio. Definitions of the different types of solid waste that may be accepted at Ohio disposal facilities may be found in Ohio Administrative Code Sections 3745-27-01, and 3745-29-01.</p>	

developing activities to improve the access, availability or participation in these alternative management options. This focus differs from that in the 1989 State Plan. Under the initial plan, compliance with the waste reduction objectives was based primarily on documenting the quantities of waste that were being recycled or projecting the quantities of waste to be reduced or diverted through new or existing facilities and activities. The new objective should allow solid waste management districts that have had difficulty in obtaining quantitative measurements of reduction and recycling efforts to demonstrate compliance by showing that sufficient management opportunities are being utilized or are planned for the district.

Goal #2

Reduce and/or recycle at least 50 percent of the total generation of solid waste statewide by the year 2000.

The amount of MSW and industrial reduction and recycling as determined for objectives #1 and #2 described below will be added together to determine the total statewide WRR rate. In order to meet the 50 percent statewide goal, the Solid Waste Advisory Council has also established two objectives for SWMDs. The SWAC recognizes that great

variation exists among SWMDs in terms of the WRR percentage. Some districts may exceed the 25 percent MSW objective, while many may be well below this level. It is likely that districts will reach the 50 percent industrial objective somewhat more easily than the 25 percent MSW objective. However, SWAC believes that each SWMD should make every effort to continue increasing the amounts reduced and recycled, and decreasing the amounts landfilled. Objectives #1 and #2 have been established to help SWMDs continue moving forward in this manner.

Objective #1 - 25 Percent MSW Objective for SWMDs: Reduce, Reuse, Recycle or Minimize 25 percent of the Generation of Municipal Solid Wastes by the year 2000.

SWMDs must demonstrate that existing and/or new programs, implemented in order to comply with Goal #1 (and any additional programs), will reduce and/or recycle at least 25 percent of the generation of municipal solid wastes, including yard wastes, by the year 2000.

This 25 percent goal differs from the 25 percent goal established in the 1989 State Plan in that the following are now creditable toward the goal:

- documented recycling of yard wastes at centralized composting facilities or other operations such as land application and Christmas tree chipping;
- used motor oil collected from residential "do it yourselfers" and recycled;
- household hazardous wastes that are recycled;
- scrap tires that are recycled or beneficially used.

In addition, SWMDs relying on incineration and/or municipal solid waste composting must also demonstrate that recovery activities are available for a minimum of three non-combustible or non-compostable materials that are identified in Table III-1 as amenable to materials recovery. As a point of reference, U.S. EPA's *Characterization of Municipal Solid Waste in the United States: 1994 Update*

estimates that approximately 25 percent of MSW will be recycled nationwide by the year 2000.

Objective #2 - 50 Percent Industrial Goal for SWMDs: Reduce or Recycle 50 percent of the Generation of Industrial Solid Wastes by the year 2000.

Industrial solid waste is the solid nonhazardous waste that is generated by industries. SWMDs must demonstrate that existing and/or new programs will reduce and/or recycle at least 50 percent of the generation of industrial solid wastes by the year 2000. In calculation of this percentage, SWMDs will no longer use the "pre-1985 industrial recycling policy" discussed in Chapter II. However, development of the revised *District Solid Waste Management Plan Format* will include a short list of materials which cannot be credited towards the industrial WRR goal. This list will be determined by examining the types of materials typically recycled by the industrial sector and the percentages typically landfilled. Input from ODNR-DRLP, SWMDs, SWAC and other interested parties will also be solicited when this list is developed.

Solid waste management districts will be required to provide in their plan a description of the ongoing or proposed activities which will address the reduction, reuse, and recycling of industrial solid waste and result in meeting this objective. The strategies and activities to be implemented may include, but are not limited to, informational or technical assistance activities, waste audits, industrial waste seminars, and industrial waste exchanges.

In order to reduce the emphasis on data collection and reporting requirements, the SWMD will not be required to survey industrial generators when preparing their triennial district plan updates. (Allowing the industrial survey to be a permissive part of plan preparation instead of mandatory in no way changes the SWMD's responsibility to ensure the availability of programs to reduce and recycle waste produced in the industrial sector.) Instead, the district may use other sources of information such as recycling centers, recycling brokers, scrap dealers, solid waste facilities and solid waste haulers to obtain

Table III-3
Goal #1 vs. Goal #2 and Plan Approval

Scenario	Goal #1 met?	Goal #2 met?	Plan approval? *
1	yes	yes; district at or above both 25% for MSW and 50% for industrial.	yes
2	yes	no; district sets reasonable targets.	yes
3	no	yes; district at or above both 25% for MSW and 50% for industrial.	yes
4	no	no; district sets targets.	disapproval possible; district must explain why Goals #1 and #2 cannot be met, and propose aggressive remedies.
* Discussion of plan approval in this column assumes that all other requirements for the plan have been satisfied.			

disposal and recycling information. Districts are encouraged to develop strategies such as waste audit programs to establish and maintain industrial waste databases showing the types of waste generated, the amount disposed, documentation of source reduction activities, and the amount available for recycling. Such programs allow much greater in-depth analysis of each industry than possible through a mail survey.

Even though plan preparation no longer mandates it, a certain degree of industrial sector surveying is probable. Some districts will likely determine that a periodic or partial survey of their industrial generators is necessary in order to verify data collected from other sources and to have sufficient information to design strategies such as waste audits.

Relationship between Goals #1 and #2

In order to put more emphasis on program implementation and access to services, and in order to reduce the resources devoted to data collection, meeting the requirements of Goal #1 should be the initial focus for SWMDs. Complying with the requirements of Goal #1 should help the SWMD meet Objectives #1 and #2 under Goal #2, and help the state as a whole meet Goal #2.

Some SWMDs will undoubtedly face a serious challenge in meeting Objectives #1 and #2 under Goal #2. In addition, some districts may find it difficult to fulfill all the requirements of Goal #1. Table III-3 shows the various scenarios that are possible concerning Goals #1 and #2, and their relationship to plan approval. If Goals #1 and #2 are met (Scenario 1), the district will obviously receive an approved plan, providing all other aspects of the plan are acceptable.

Most districts will probably fall into Scenario 2 or 3. If a SWMD determines that it will not be able to meet the 25 percent MSW objective under Goal #2, even after demonstrating compliance with Goal #1 - Program Standards, the SWMD must set a "target" reduction and recycling percentage (Scenario 2). The target established by the SWMD must be greater than the reference year's MSW waste reduction/recycling rate, and must be based upon compliance with the Program Standards. This should ensure that the SWMD will continue to increase the amounts of solid waste reduced and recycled each year, and continue to decrease reliance on landfilling as the law requires.

Other SWMDs may have difficulty meeting the 50 percent industrial objective under Goal #2 due to the nature of their industrial sector, financial resources, or both (Scenario 2). In order to demonstrate that the district

¹ When a district plan is updated every three (or five) years, the SWMD is required to establish a "reference year", which serves as the calendar year for all data collection for plan preparation.

cannot meet the industrial objective, the SWMD should document the composition of the waste stream generated by industries, and explain the difficulty in reducing and/or recycling these materials in greater quantity. Under these circumstances, SWMDs must set a “target” WRR percentage for the industrial sector and design strategies and programs to meet this target. The target must be greater than the current reported WRR rate based upon the latest reference year.

Scenario 3 assumes that a SWMD determines it will not be able to meet Goal #1 after exercising all reasonable efforts to do so, but can meet both the 25 percent MSW objective and the 50 percent industrial objective under Goal #2. Although this situation is probably less likely than Scenario 2, it is possible that a SWMD could meet the WRR requirements under Goal #2 without demonstrating access and participation in programs to manage seven out of the eleven materials listed in Table III- 1.

Scenarios 1, 2, and 3 would all result in district plan approval, assuming that all other requirements for the SWMD plan have been satisfied. *Scenario 4*, however, may result in plan disapproval since the SWMD is in compliance with neither Goal #1 nor #2. In order to avoid plan disapproval under Scenario 4, the district’s plan would need to demonstrate clearly the impediments to meeting Goals #1 and #2, and develop aggressive remedies within the plan to address the deficiencies.

Goal #3

Provide Informational and Technical
Assistance on Source Reduction

SWMDs are required by statute (ORC Section 3734.53 (A) (13)) to have a program for providing informational or technical assistance regarding source reduction to solid waste generators, or particular categories of solid waste generators. SWMDs have the sole discretion to determine the types of assistance to be provided and the categories of generators to be served by it.

Source reduction, which is the most preferred management method in the solid waste management hierarchy, can be an effective practice to reduce waste generation. Source reduction means less waste needs to be managed, lower costs for waste management, and decreased liability concerns for generators of waste.

Source reduction activities can be tailored for all sectors of generators. Examples of source reduction activities targeting the residential sector include providing local communities with assistance on implementing volume-based billing for waste collection, and information on reducing the waste through purchasing practices. Commercial and industrial generators may greatly benefit from pollution prevention efforts, waste audits or waste exchanges coordinated by a SWMD.

Goal # 4

Provide Informational and Technical
Assistance on Recycling, Reuse, and
Composting Opportunities

Regarding other alternative management options such as recycling or yard waste composting, SWMDs must describe in the plan the informational or technical assistance available to residential, commercial and industrial generators within the district that is provided by the SWMD or other entities within the district. Informational assistance can include public awareness efforts such as brochures or fliers on the types of recyclable materials accepted and hours of operation for donation or drop-off locations. Technical assistance activities may include waste audits for local businesses, assistance to local communities in setting up recycling or yard waste composting programs, or marketing collected materials.

The public awareness and technical assistance activities planned by the SWMD should be comprehensive with regard to the types of materials, management opportunities, and generators serviced by the available opportunities in the district.

Volume-Based Fees

Economic incentives are often one of the best methods for changing behavior. The behavior to change is the trend in the United States towards generating more waste each year. U.S. EPA estimates in the *Characterization of Municipal Solid Waste in the United States: 1994 Update* show that the amount of MSW generated will continue to rise through the year 2000.

Volume-based rates (VBR) are widely acknowledged as a potential mechanism to reduce the amount of waste generated by charging generators on a per unit basis. A resident or business is charged a certain amount of money for each bag (or can) set out for collection. Someone setting out six bags of waste will pay twice as much as his/her neighbor who puts only three bags at the curb.

Numerous variations of VBR are in use in the United States. Some systems may charge the same rate for each bag, up to four bags. The resident would then be charged extra for the fifth, sixth, seventh, and all additional bags. While most systems are based on volume, or the number of bags and cans, cities have also implemented weight-based rate structures in which the quantity of waste is weighed at the curb for each resident.

The primary advantages of VBR are the built-in incentive to reduce waste generation and to recycle more materials. Many municipalities using traditional rate structures do not charge the generator directly, but instead, the waste management services are paid through the collection of some type of general tax. Although VBR are sometimes offered as an alternative, solid waste haulers usually charge a flat rate to their customers unrelated to quantity of waste collected. Under these scenarios, there is no incentive to reduce the amount of waste generated because the cost of the service for the resident or business remains the same regardless of how much waste is produced.

Potential negative aspects of VBR include changing a familiar rate structure and open dumping. Municipalities which have always paid for collection services from general revenue funds will experience some administrative costs to implement this new system. Residents may also be reluctant to switch from a system in which the cost of collection appeared to be "free." Open dumping can be a problem, also,

when VBR are implemented. In order to minimize open dumping problems, three components need to be in place prior to initiating VBR. Residents must have an available alternative to reduce the waste set at the curb. Access to recycling must be available for residents. In addition, an aggressive education program and enforcement strategy are essential for successful programs.

Examples in Ohio

VBR have been used on a limited basis in Ohio. In Upper Arlington, a suburban community in Franklin County, curbside recycling was initiated in 1988, followed by VBR on January 1, 1992. The VBR system for Upper Arlington includes separate collection for yard waste at \$2.00 per bag. The results are impressive. In 1991, the City generated a total of 20,222 tons of solid waste compared to 13,738 tons in 1992. While the generation of yard waste showed the largest percentage decrease, other residential waste generation also declined significantly. In addition, the amount recycled increased almost 50 percent. During 1993 and 1994, the amount recycled continued to increase, the amount generated increased slightly, and the disposal tonnage continued to decline.

The Auglaize County SWMD, located in northwestern Ohio, has also implemented a VBR system. In 1992, the district established rules that required all solid waste haulers to charge customers on a per unit basis, or use VBR. As a result, the City of Wapakoneta instituted a system in 1993 charging \$0.70 per bag. In conjunction with this change in the rate structure, the City provided curbside recycling at no extra cost to the residents. Based on new collection account information and increased population in the City, solid waste generation was expected to increase at the rate of 18 percent from 1990 through 1994. However, the actual increase was only six percent. In addition, the amount recycled increased significantly in 1993 (over 100 percent compared to 1992) and again slightly in 1994 (eight percent). The SWMD attributes these effects to the implementation of VBR. The district has not experienced increased problems with open dumping.

Goal #5

Strategies for Scrap Tires and Household Hazardous Wastes

Scrap Tire Management Strategy

Local solid waste management districts are required to include a strategy to address scrap tires. The specific activities to be implemented are at the discretion of the local solid waste management district. (See Chapter VII.)

Household Hazardous Waste (HHW) Program

Local solid waste management districts are required to include a program to address the proper separation and disposal of household hazardous wastes. The specific activities to be implemented are at the discretion of the local solid waste management district. (See Chapter VIII.)

Goal #6

Annual Reporting of Plan Implementation

SWMDs are to annually evaluate the implementation of the programs and activities listed in the implementation schedule of the plan and the progress made toward the reduction objectives. SWMDs must submit to Ohio EPA a report based on the previous calendar year that includes:

- a) a detailed report on the status of the ongoing, new and proposed facilities, programs, and activities listed in the implementation schedule of the approved solid waste management plan;
- b) an inventory of the alternative management methods available in the SWMD and the types and quantities of municipal solid waste, yard waste, and industrial waste managed through alternate methods such as recycling, reuse, or minimization for the year;
- c) an identification of source reduction activities that occurred during the year;

- d) quantities of waste generated in the district that were disposed of at out-of-state landfills;
- e) copies of revisions or additions to SWMD rules adopted under ORC 343.01 (G);
- f) an inventory of municipalities and townships that levy a host community fee under ORC 3734.57 (C); and,
- g) an evaluation of the effectiveness of the HHW program and a report on the results of the district's program for household hazardous wastes, including the types and quantities of household hazardous wastes collected and recycled or disposed of at hazardous waste facilities.

Goal #7

Market Development Strategy (optional)

Local solid waste management districts are encouraged to conduct market development activities to promote the use of recycled products and to develop local markets for recovered materials. A market development strategy is not a mandatory element of a SWMD plan. For more discussion of potential market development activities by the State and SWMDs, please see Chapter IX.

State Strategies

Strategy #1

Continue development of a data and information base on the current levels of waste reduction and recycling to serve as a reference to future planning programs.

Strategy #2

Continue to provide technical assistance to SWMDs and local governments to plan and implement waste reduction/recycling programs. Assistance may be given through trained technical staff, manuals and guidebooks, resource centers, workshops and seminars, bibliographies and directories. Staff

from ODNR's DRLP and Ohio EPA's Division of Solid and Infectious Waste Management (DSIWM) and the Office of Pollution Prevention (OPP) will continue to provide waste reduction/recycling and pollution prevention assistance.

Strategy #3

Finalize and adopt solid waste composting standards for metals, pH, and soluble salts. These standards are being developed based on composting expertise in Ohio and regulatory experience in other states.

Strategy #4

Continue to provide grants to local governments to help pay the start-up costs for recycling programs. Through the Recycle Ohio Grant program, ODNR-DRLP will continue to provide funds to assist municipalities and counties with implementation of a variety of recycling and litter prevention activities.

Strategy #5

Through the Ohio Prevention First initiative, Ohio EPA's OPP provides technical assistance to industrial and commercial generators desiring to design and implement means of reducing their generation of wastes. Participation in Prevention First is voluntary on the part of the manufacturer. The 50 percent reduction of industrial solid wastes is also the goal of the Ohio Prevention First program administered by the OPP at Ohio EPA. (The Prevention First Program is being promoted throughout Ohio, and Ohio EPA staff are available to provide technical assistance to any industrial waste generator. However, in no way do these efforts reduce the responsibility and the role of the SWMD to: 1) determine the types and amounts of industrial waste generated, reduced, and recycled, and 2) ensure the availability of programs in the district to facilitate waste reduction and recycling in the industrial sector.)

Strategy #6

Continue to investigate methods of measuring and promoting source reduction of solid wastes. Efforts of other states and the private sector will be considered in implementing this strategy.

Strategy #7

Ohio EPA will explore alternatives for measuring waste reduction and recycling, and will investigate methods that will reduce the burden of reporting for industries, recyclers and haulers, and lower the costs of data collection for SWMDs. This strategy will include a re-examination of the information needed in order to monitor WRR progress in Ohio and investigating more consistent and accurate survey instruments.

Strategy #8

Ohio EPA will work with other states and U.S. EPA in an effort to promote greater standardization across states of reported recycling and waste reduction efforts.

Other Programs and Strategies

Several programs and activities initiated as a result of the initial State Plan, and from legislation passed subsequent to the initial State Plan, are currently underway and are described in the chapters on market development and the management of household hazardous wastes.

Section 3734.50(C) of the Ohio Revised Code requires the State Solid Waste Management Plan (State Plan) to “establish restrictions on the types of solid waste disposed of by landfilling for which alternative management methods are available, such as yard waste, and a schedule for implementing those restrictions...”

The statute goes on to specify that these restrictions “need not be of uniform application throughout the state or as to categories of solid waste generators. Rather, in establishing those...restrictions, the Director shall take into consideration the feasibility of waste reduction, recycling, reuse, and minimization measures and landfilling restrictions in urban, suburban, and rural areas and shall also take into consideration the extent to which those measures have been implemented by specific categories of solid waste generators and political subdivisions prior to the effective date of this section.”

The remainder of this chapter discusses the restrictions recommended in the 1989 State Plan, the process used to develop those recommendations, and the issues which have arisen as a result of implementing the restrictions. The 1989 State Plan envisioned that these restrictions would be comprehensive and would be enforced on the dates indicated in the plan. However, these expectations were found to be impossible to fulfill as implementation proceeded. While source-separated materials have been banned from disposal, some materials mixed with other solid waste cannot effectively be banned under current statutory authority. As a result, the rules include requirements that facility operators take actions to discourage receipt of these materials in mixed solid waste. (The issues constraining implementation of the restrictions are discussed in detail later in this chapter.) Finally, this chapter establishes guidelines for addressing potential waste restrictions in future State Plan revisions.

The 1989 State Plan Recommendations

To achieve the goal of reduced reliance on landfills, the 1989 State Plan recommended that certain wastes should be restricted from disposal in landfills and managed by alternative methods. When specific wastes are restricted from landfills, incinerators, and resource recovery (waste-to-energy) facilities, the results can include increased landfill life, reduced potential for surface and ground water contamination, decreased ash toxicity, improved air quality, and increased recycling. However, disposal restrictions implemented without careful examination of proper management can create added problems, such as illegal roadside dumping of materials banned from solid waste disposal facilities.

Criteria for Evaluating Restrictions

The 1989 State Plan established the following criteria for consideration in developing disposal restrictions for Ohio:

- the volume of a specific waste versus the total volume of waste disposed at landfills;
- the toxicity of the waste and its potential to cause surface and ground water contamination and air pollution;
- costs and benefits of options;
- effect on recycling activities; and
- alternative management options.

Alternative management options were examined to determine their technical and economic feasibility as costly and highly complex alternatives are difficult to implement. A specific waste exhibiting toxicity, or the potential to cause contamination, received careful consideration for restriction. If

alternatives exist, those wastes with a high potential for contamination were recommended for restriction.

After a preliminary assessment of the components in the overall waste stream, yard waste, used oil, waste tires, lead-acid batteries, household hazardous wastes, and paper and cardboard were evaluated for possible restriction in the 1989 State Plan. Finally, the 1989 State Plan recommended developing restrictions on landfill and incinerator disposal of yard wastes, whole and shredded tires, and lead-acid (automotive) batteries.

Yard Waste Restriction

In accordance with Rule 3745-27-01 of the Ohio Administrative Code (OAC), yard waste is defined as leaves, grass clippings, tree trimmings, garden wastes, brush, tree trunks, holiday trees, and/or prunings. The greatest quantity of leaves is collected in the fall, with smaller collections occurring in the spring. Grass clippings and garden wastes are generated in the summer. Tree trimmings are most prevalent in the waste stream during the spring.

Local solid waste management districts (SWMDs) with large populations generally collect greater quantities of yard waste than rural areas. Grass clippings in an urban county may represent nearly 30 percent of the annual total waste stream. Yet, in some rural counties, less than 10 percent of the solid waste collected is yard waste.

The 1989 State Plan concluded that yard waste should be restricted from landfill and incinerator disposal for the following reasons:

- To preserve landfill capacity in Ohio. Based on a nationwide average, yard waste comprises approximately 16 percent of the total amount of solid waste generated;
- Alternative management options are available for yard waste. Composting, agricultural land application, and mulching are all preferential options compared to landfilling or combustion of yard waste;
- The cost of alternative management options are reasonable compared to landfilling; and

- The moisture content of solid waste is lower and more consistent when yard waste is omitted, resulting in greater combustion efficiency and greater control over temperatures for incinerators and resource recovery facilities. Consistent combustion temperatures improve the likelihood that toxic constituents are destroyed.

Ohio EPA promulgated rules governing yard waste, animal waste, and mixed municipal solid waste composting facilities June 1, 1992. In response to complaints from local officials that the new regulations for leaf and grass composting were unnecessary and burdensome, on November 9, 1992, Ohio EPA Director Donald Schregardus announced a moratorium on the enforcement of rules at composting facilities that exclusively compost yard waste. He noted that the rules were not intended to discourage composting or to close down existing yard waste composting operations.

Responding to complaints from local officials, Ohio EPA rule changes became effective on October 31, 1993, that only require facilities composting exclusively yard waste to register with Ohio EPA and notify Ohio EPA if the facility ownership is transferred or when they close. Yard waste composting facilities are not required to employ certified operators or meet the siting criteria required for facilities that compost other types of waste, such as animal waste.

The 1989 State Plan envisioned that Ohio EPA regulations would be in effect to implement the yard waste restriction by December 1, 1993, and the ban was in effect for incinerators on that date. However, regulations implementing the yard waste ban at landfills were not promulgated until September 13, 1994, and became effective on February 1, 1995.

Management Alternatives

The Ohio Cooperative Extension Service (OCES) has offered more than a dozen municipal and commercial composting seminars. OCES and local SWMDs have begun aggressive campaigns to educate residents about the need to compost, or even

better, about ways not to generate yard waste in the first place. More than half of Ohio counties, and nearly all SWMDs, have initiated educational campaigns to teach residents to leave grass clippings on the lawn when they mow. Many of these educational campaigns use the slogan “Don’t Bag It.”

Many communities already provide opportunities for residents to turn in Christmas trees for mulching. OCES began “Trees for Cities” programs in 10 counties during 1991, encouraging residents to buy a live Christmas tree instead of a cut one, and to turn the live tree over to the city for planting in parks and public spaces afterward.

Ohio had 243 yard waste composting facilities operating in 1994. Cuyahoga and Hamilton counties had the highest number of facilities when compared with other SWMDs in the state.

Yard waste composting operations frequently mix fresh grass clippings with partially decomposed leaves in order to minimize odors. Tree trimmings and other woody materials are usually chipped and used for plant mulch without composting.

Yard waste compost is a valuable product that can be used as a soil amendment, a conditioner, or mulch. The use of compost improves soil structure and soil fertility, and can reduce erosion. Although nutrient levels are not high enough to be a substitute for fertilizer, compost can reduce the quantity of fertilizer required.

Direct land application is used by numerous communities in Ohio. Generally, land application is more common in rural areas with close access to agricultural property. In recent years, the Ohio State University has conducted field tests to determine crop productivity and nitrogen deficiency for crops grown on fields with leaves spread and incorporated into the soil.

Other management alternatives for yard wastes include neighborhood and backyard composting. Small scale composting in back yards is generally more feasible in suburban areas than inner cities due to land availability. Some communities also transport leaves to farmers for use as animal bedding.

Costs

The costs for large-scale composting of yard waste include:

- collection expenses;
- transportation to the composting site;
- processing costs of the composting facility; and
- marketing the final product.

The costs of composting are less than landfilling (not counting collection costs). When comparing the cost of yard waste composting to landfilling, only expenses attributable to composting should be compared, such as the capital and operating costs of the composting facility, and additional collection and transportation expenses. For example, if a community currently provides separate collection for yard waste, the total cost of composting should include only capital and operating costs at the composting facility as a basis for comparison to landfill costs.

The cost of diverting yard wastes to agricultural uses should include collection and transportation expenses. While neighborhood and back yard composting require no public expenditure of funds, residents must provide labor and materials.

In order to meet the yard waste disposal restrictions, a great deal of activity is already underway around the state. Many communities have developed strategies for managing their yard waste, including centralized composting, backyard composting, educational programs, and direct land application projects. To further encourage the development of these types of yard waste management programs, documentable amounts of yard waste that are diverted from landfills may be credited toward the waste reduction and recycling goal for the year 2000.

Lead-Acid Battery Restriction

The 1989 State Plan envisioned restricting lead-acid (automotive) batteries from landfills and incinerators by January 1, 1993. Ohio EPA banned lead-acid batteries from incinerators on May 31, 1991, and from transfer stations on October 31, 1993. Ohio EPA anticipates promulgating regulations in 1996, requiring lead-acid battery detection and education programs to be in place at all landfills.

The increased number of used lead-acid batteries in the solid waste stream in the latter half of the 1980s was due to the low price of primary lead and the increased cost of environmental regulations for secondary lead smelters. These batteries may cause ground water contamination if placed in improperly designed landfills. In addition, lead-acid batteries increase the lead content of municipal incinerator and resource recovery facility ash. (State policy for the disposal of ash from municipal solid waste incinerators and resource recovery facilities is described in Chapter VI.)

One alternative to disposing batteries in the trash is returning them to retail businesses when purchasing a new battery. Many retail battery outlets accept spent batteries and some offer a discount on the purchase of a new battery. In addition, some recycling centers accept batteries. Local solid waste district plans are relying on education efforts and this existing infrastructure for management of this waste stream.

Most Ohio landfills and the major municipal waste incinerators have already initiated separation programs to remove lead-acid batteries from incoming wastes. In some programs, waste haulers are offered a cash premium for every battery delivered to the facility's collection area.

Scrap Tires

The 1989 State Plan envisioned restricting the landfilling of whole scrap tires by January 1, 1993, and restricting shredded tires by January 1, 1995. (This restriction would not apply to shredded tires disposed at monofills and monocells within sanitary landfills).

However, regulations implementing these restrictions have not yet been promulgated.

The Ohio General Assembly passed new legislation in 1993 creating a comprehensive regulatory program governing scrap tire collection, storage, recovery, and monofill facilities and scrap tire transporters. New rules are being drafted during 1995 to implement this law, and, as required in the law, will include restrictions on the disposal for whole and shredded scrap tires at municipal solid waste landfills. These restrictions will be phased in as alternate management and disposal capacity for scrap tires becomes available and licensed statewide. Because transporters of scrap tires are regulated under the law, these bans will be easier to implement than the disposal restriction on yard waste and other materials.

Several questions have arisen with respect to the restriction on disposal of whole tires. As a point of clarification, the whole and shredded tire restriction is aimed at passenger vehicle and truck tires **only**. The ban does not envision every type of tire such as lawnmower and bicycle tires.

Most landfills in Ohio have already notified customers and begun separation programs to remove whole tires and lead-acid batteries from the waste stream, in anticipation of the disposal restriction for these items. Landfills will be strongly encouraged to continue to strengthen these efforts, but they will not be cited with a violation for accepting these wastes before rules to implement the restrictions are in place. Districts should be contacted for information on alternative tire and battery management options available at the local level.

Implementation Issues

In order for bans to be enforceable, the restriction or prohibition must be contained in rules pertaining to each type of licensed solid waste facility (landfills, transfer stations, incinerators, and composting facilities). Disposal restrictions must appear in the rules governing operations of that type of facility. Where the regulations prohibit the receipt of a specific waste (whole or shredded tires, yard

waste, lead-acid batteries), a violation of the applicable rule may be cited by Ohio EPA or health departments, and appropriate enforcement action may be taken against the facility operator according to Ohio Revised Code (ORC) Chapter 3734, and Ohio Administrative Code (OAC) Chapter 3745-27.

All of the disposal restrictions contained in the 1989 State Plan have been incorporated into the state solid waste regulations governing incinerators (OAC 3745-27-52), transfer stations (OAC 3745-27-23), and composting facilities (OAC 3745-27-45). In addition, language implementing the yard waste ban has been incorporated into the landfill rules. There are no existing rules prohibiting receipt of whole or shredded tires, or lead-acid batteries by landfills.

As language was developed for implementing the restrictions, especially yard waste, state regulatory control of each component of the waste management process became an important issue. Ohio EPA has no authority under state law to regulate either the generators or the transporters of solid wastes, including yard wastes. In determining the appropriate regulatory structure for these restrictions, Ohio EPA also evaluated the potential environmental risk associated with landfill and/or incinerator disposal of each material. Both of these issues were primary considerations in developing the yard waste restrictions, and will also be considered when restrictions are established for scrap tires and lead-acid batteries. For these reasons, a number of delays were experienced in implementing the disposal restrictions according to the timelines outlined in the 1989 State Plan.

Environmental Risk, Public Health, or Safety

The types of restrictions (yard waste, tires, and lead-acid batteries) contained in the 1989 State Plan are rather unique for Ohio EPA. Other Ohio EPA restrictions against a facility accepting wastes (i.e., hazardous waste, PCBs, infectious waste, radioactive wastes, and friable asbestos) are based on an increased threat to public health or safety or

environmental impact. There is no increased threat created by disposing of yard wastes in today's highly regulated, highly monitored, engineered landfills. In contrast to the purpose of the lead-acid battery restriction, the primary purpose of the yard waste restriction was to save landfill volume by driving yard waste towards more environmentally sound management alternatives. Since this is a different type of objective (non-environmental based restriction), it requires an approach which considers the potential ramifications before creation of a rule.

No Regulatory Control of Generator or Transporter

Ohio EPA's statutory authority basically extends to regulation of solid waste facilities (composting facilities, landfills, transfer facilities, and incinerators) and enforcement against open dumping or open burning. This authority does not extend to haulers or solid waste generators. A significant difficulty in developing a compliance program for disposal of yard waste is that Ohio EPA cannot cite a violation and enforce against the generator for sending yard waste to the landfill, or the hauler for collecting and taking yard waste to the landfill. Actually, the solid waste law inherently places an obligation on the generators and haulers to take solid wastes to a licensed solid waste disposal facility if they choose not to recycle or otherwise use alternative management.

Strictly prohibiting the landfill from accepting yard waste which generators and haulers can legally bring to the facility will be difficult since the landfill may not have effective management control over the hauler or the hauler's customers. Solid waste containing yard waste coming from states without yard waste restrictions further compounds the landfill owner's ability to control generators and haulers. Therefore, Ohio's only means to implement the yard waste restriction is to regulate the end of the process, the landfill owner/operators. Implementing restrictions for lead-acid batteries will face the same problem. (The disposal restriction for scrap tires is required specifically in the statute,

and therefore, will not face this regulatory limitation.)

Since Ohio law does not provide the state with the authority to regulate generators or transporters, Ohio EPA cannot require source-separation of solid waste, including yard waste, for delivery to a particular type of solid waste facility or recycling facility. In fact, there is no explicit state law mandating source-separation. This is a critical issue since yard waste composting facilities may only accept source-separated yard wastes. Consequently, Ohio EPA's establishment of yard waste restrictions at the landfill, incinerator, or transfer facility cannot directly ensure or mandate that the generator or transporter will keep yard waste from becoming mixed with general trash before arriving at the landfill, incinerator, or transfer facility.

It is important to note that individual cities, villages, and political subdivisions, as well as local SWMDs, may have authority to require generators to source-separate yard waste or to regulate transporters. In keeping with the intent of the State Plan, many cities and villages do require generators to source-separate yard waste. They also require transporters/haulers to keep the **source-separated** yard waste out of the general trash. Ohio EPA's rules are intended to ensure that haulers of **source-separated** yard waste are *identified* by the operator at the landfill, incinerator, or transfer facility, are provided information regarding the location of nearby yard waste composting facilities (61 counties), and are not allowed to landfill, incinerate or transfer that **source-separated** yard waste. Effort must be made to coordinate implementation of disposal restrictions with local regulatory authorities, and to ensure that adequate alternative management capacity exists statewide to recycle or otherwise manage the restricted materials.

Major Components of the Yard Waste Restriction - the Regulation

Except for tree trunks and stumps, the regulations now prohibit landfills, incinerators and transfer facilities from accepting source-separated yard waste. Landfills, transfer

facilities, and incinerators may accept and dispose of source-separated yard waste under the following circumstances:

- For a six-month period after the effective date of the yard waste restriction rules, landfills, incinerators, and transfer facilities may accept source-separated yard waste if the facility is located in a county where no operating or publicly available yard waste composting facility exists. Once a composting facility becomes available in the county, the landfill, incinerator, or transfer facility cannot accept source-separated yard waste. After August 1, 1995, a landfill, incinerator, or transfer facility cannot accept source-separated yard waste regardless of whether an operating or publicly available composting facility exists in the county.
- Upon obtaining the written acknowledgement of the solid waste management district of the need for the temporary disposal of yard waste, a landfill, incinerator, or transfer facility may temporarily accept source-separated yard waste resulting from storm damage or some other natural catastrophe. The solid waste management district is the appropriate entity to make the determination that locally available yard waste management capacity is not sufficient to handle yard waste resulting from storm damage or some other natural catastrophe.
- Upon obtaining the appropriate document, landfills, incinerators, or transfer facilities may accept a vehicle load of source-separated yard waste if that vehicle load has been refused by a yard waste composting facility.

Also, once yard waste is mixed with general trash, it becomes impractical and costly to sort through trash to remove bags or individual pieces of grass or leaves. At this time, there are no Ohio composting facilities which are able to compost general trash (including trash **mixed** with yard waste). Therefore, Ohio EPA promulgated exemptions to the yard waste restriction to allow the

landfill or other facility to accept **mixed** yard waste if no composting facility capable of composting general trash is available in the same county as the landfill.

Judging whether a landfill, incinerator, or transfer facility is complying with the restriction also presents problems. Once waste is placed in the landfill, or on the floor of an incineration or transfer facility, it is difficult to determine whether a particular bag of yard waste originally had been **source-separated** and transported in a vehicle dedicated to transporting yard waste (the situation which the proposed rules seek to restrict) or whether that bag came to the facility **mixed** with general trash in a garbage truck (the **mixed** yard waste situation). Since it may not be practical to have facility operators inspect each garbage truck for yard waste (or have Ohio EPA or health department staff spend a great deal of time trying to decide whether grass or leaves in the landfill or tipping floor is or is not a violation), Ohio EPA addressed this situation by allowing landfills the option of establishing a Yard Waste Restriction Program.

In establishing the Yard Waste Restriction Program option, Ohio EPA sought to place an emphasis on encouraging alternative yard waste management options and deterring landfilling or incineration of **source-separated** yard waste. Ohio EPA believes this approach is appropriate given that the design, operation, and environmental monitoring provides more than adequate environmental protection should incidental loads of yard waste be landfilled. The Yard Waste Restriction Program requires the operator to implement procedures to identify and refuse receipt of **source-separated** yard waste in dedicated vehicles and to promote alternative management of yard waste through distribution of information. By having a Yard Waste Restriction Program, the landfill, incinerator, or transfer facility is not violating the yard waste restriction for **mixed** yard waste or the incidental disposal of **source-separated** yard waste. However, the operator is required to review the program and implement improvements. Failure by the operator to implement the program, review the program, and incorporate any program improvements determined by the owner to be needed, would all be violations.

Another implementation issue pertains to the applicability of the bans to resource recovery facilities (RRFs), which burn mixed municipal solid waste for energy recovery. These facilities are currently exempted from Ohio solid waste regulations, and are subject only to air and water pollution regulations. These facilities cannot be cited for a violation of solid waste rules by Ohio EPA or local health departments. However, the State Solid Waste Management Advisory Council affirmed on October 29, 1992, that the disposal restrictions in the State Plan are intended to apply at these facilities.

As noted above, existing resource recovery facilities have already voluntarily initiated programs to divert some banned materials such as lead-acid batteries from the waste stream.

Other Restrictions

A number of states have imposed restrictions on landfill disposal for specific waste streams. The most frequently restricted items are lead-acid batteries, tires, and yard wastes. Ohio will continue to monitor other states' policies and local recycling markets, in order to consider whether additional disposal restrictions should be considered in Ohio. Any additional restrictions will be evaluated in terms of the criteria outlined at the beginning of this chapter: the volume and toxicity of the specific waste material, the costs and benefits of options, the effect of a disposal restriction on recycling activities, and the availability of alternative management infrastructure, including mechanisms for cost-effective collection of the material where necessary. Disposal restrictions can most easily be implemented in conjunction with regulation of generators and transporters, and in coordination with local regulatory efforts.

Due to the implementation problems associated with disposal restrictions, this state plan revision (and possibly future revisions) will focus more on alternative strategies for waste streams which may be managed more properly by some method other than disposal. Chapter III discusses management strategies for waste streams such as used oil, white

goods, and household batteries which are recommended for implementation by SWMDs. While this approach does not create a regulatory prohibition for disposal of certain wastes, it is more workable in the short run, and requires a strong emphasis on education of residents for long term changes in managing our wastes.

H.B. 592 requires the Director of Ohio EPA “to establish revised general criteria for the location of solid waste facilities.. .”

On March 1, 1990, Ohio EPA’s revised regulations for solid waste landfills became effective. These best available technology (BAT) regulations include new siting criteria specifying acceptable and unacceptable locations for landfills. Ohio’s siting criteria were developed based on recommendations in the 1989 State Solid Waste Management Plan, and also incorporated proposed federal regulations for municipal solid waste landfills. Any new landfill permitted after March 1, 1990, must meet all the siting criteria.

Under State law, older landfills must also upgrade to meet the new BAT standards and siting criteria, or else close in an environmentally sound manner. Facilities sited or permitted before 1968 were called in for upgrades first. Ohio EPA has completed action on these facilities. Facilities permitted between 1968 and 1980 must submit permit applications for review by Ohio EPA between April 1992 and March 1996. Thereafter, facilities permitted after 1980 will be called in on a case-by-case basis. Review by Ohio EPA includes the application of the new siting criteria. Older facilities that cannot meet these standards must close within one year of Ohio EPA’s final denial of a permit application.

U.S. EPA’s proposed regulations for sanitary landfills became effective October 9, 1991. These regulations were promulgated in accordance with Subtitle D of the federal Resource Conservation and Recovery Act, and required minimum siting and operational standards for all landfills receiving municipal solid waste. The federal rules gave municipal solid waste landfills until October 1993 to comply with requirements for new facilities and lateral expansions, and until October 1996 for existing facilities to comply with siting criteria.

Ohio’s siting criteria are more comprehensive than the federal criteria, and were applied to new and existing municipal solid waste landfills well before the federal regulations applied. Ohio has also promulgated siting criteria for transfer stations, composting facilities, and incinerators, which the federal criteria do not address. These state regulations took effect May 31, 1991. State siting criteria for composting facilities became effective June 1, 1992. Composting facilities are also not addressed by federal rules. Siting criteria for scrap tire facilities will be developed and incorporated into new rules during 1995 to implement recent legislation.

Tables V-1 through V-4 show a side-by-side comparison of the siting criteria recommended for Ohio in the 1989 State Plan, the existing state regulations, and the new federal requirements. The citation numbers given for Ohio rules in Table V-1 were updated to reflect the currently effective rules, which took effect in 1994.

New rules under development by Ohio EPA’s Division of Surface Water in Spring 1995 may redefine some terms such as “state resource waters.” Solid waste facility siting criteria may change as a result of these new rules and definitions and would differ from what is described in this State Solid Waste Management Plan.

Background Information

To determine the best possible location for a solid waste facility, a potential site must be evaluated for hydrogeologic conditions, technical and engineering features, and site-specific characteristics. During the review of a Permit-To-Install (PTI) application for a solid waste facility, siting criteria are carefully evaluated to protect the environment, public

health and safety. This evaluation includes the protection of surface water, ground water, and drinking water supplies. Landfills sited in improper locations and lacking current technology have, in some cases, caused environmental harm to ground and surface waters. The cleanup of these sites is costly; some have cost millions of dollars.

Other factors affecting siting decisions are local ordinances such as township zoning, rules adopted by local solid waste management districts, and public concern. Citizens are encouraged by Ohio EPA to become more involved with siting new solid waste facilities. Ohio EPA has increased the number of public hearings and public information sessions it holds on permit applications before a final decision is made. The information gained from these hearings, in nearly all cases, led to improvements in the solid waste permit.

Ground Water Protection

Ground water fills the spaces between particles of soil and rock underground. Most is found in aquifers - layers of porous rock that may be located near the surface or hundreds of feet underground. Aquifer water resources are tapped by wells drilled into the aquifer.

Today, nearly half of the nation's drinking water comes from ground water. Ohio is blessed with an abundance of ground water. Ground water supplies almost 40 percent of the state's population with water for drinking and other household uses. Approximately one billion gallons of ground water are required every day in Ohio for industrial, agricultural, and residential uses. Three major cities - Canton, Dayton, and Springfield - depend almost exclusively on ground water for public water supplies. Other major cities such as Cincinnati and Columbus also draw extensively on ground water. Because of these critical uses of ground water, all siting decisions should assure that it is protected from contamination and depletion.

Surface Water Protection

In addition to tremendous ground water reserves, Ohio has 61,500 miles of streams and rivers, a 45 l-mile border on the Ohio River, 5,130 lakes and reservoirs, and more than 230 miles of Lake Erie shoreline. Ten scenic river systems include a total of 629 river miles. Most Ohioans depend on surface water for drinking, industrial, commercial, agricultural, and household uses. Improper siting and operation of solid waste facilities may result in impacts on surface waters. Existing siting criteria and best available technology (BAT) standards will minimize surface water contamination.

Increasing Public Involvement

Siting decisions affect citizens, communities, local business and industry. Ohio EPA provides two kinds of public forums when a permit-to-install application is received for a proposed solid waste facility. The first is an informational meeting, which is held soon after the Agency receives a permit application for a solid waste facility. The second, a formal public meeting, is held after the PTI has been reviewed by the Agency.

To encourage citizen involvement early in the siting process, Ohio EPA recommends that the local SWMD policy committee establish viable public input through a technical advisory council (TAC). Under H.B. 592, a technical advisory council must include a representative from the solid waste hauling or disposal industry and may include at least one person representing:

- health commissioners having jurisdiction within the SWMD;
- political subdivisions within the SWMD;
- environmental advocacy organizations;
- industrial generators of solid waste; and/or
- other constituencies deemed appropriate by the district policy committee.

The State Solid Waste Advisory Council strongly encourages solid waste management districts to appoint technical advisory councils and strongly encourages that the technical advisory councils have broadly-based and diverse representation. Many SWMDs have established Technical Advisory Councils to help them prepare a 10-year or 15-year solid waste management plan.

Local Siting Strategies for Solid Waste Management Facilities

A SWMD's solid waste management plan is required to include a siting strategy for new solid waste management facilities identified in the plan. Most SWMDs have developed a weighting system to rank different alternatives, and have either a technical advisory council or a special siting committee evaluate potential sites and make recommendations to the district's Board of Directors. Virtually all SWMD siting strategies begin with Ohio's required siting criteria, and add additional concerns such as the type of access road, the availability of public utilities, and so on. A good SWMD siting strategy will also outline each step of the decision-making process, and specify how much time is required or allowed for each stage.

The SWMD should provide a detailed explanation in the plan of the strategy for siting new and expanded facilities. For facilities to be sited by the SWMD, Ohio EPA recommends establishing a siting committee to conduct at least portions of the siting study. The siting strategy should:

- identify individuals or groups responsible for each step of the process;
- provide the estimated time required for each step; and
- be well-defined so the process can be easily followed.

SWMDs should regard the siting strategy as an environmental assessment of potential facility sites with the objective of minimizing negative impacts. Ohio EPA recommends that

local solid waste management districts incorporate the following elements into their siting strategies.

Preliminary Site Survey

1. 'Obtain a current copy of Ohio's solid waste regulations (Ohio Administrative Code 3745-27, 3745-30, and 3745-37) and other available guidance on siting criteria from the appropriate Ohio EPA district office. SWMDs should be aware that the Ohio EPA Director can exempt proposed facilities from selected Ohio solid waste siting criteria if he determines that granting the exemption will not result in negative environmental and/or public health impacts.
2. Obtain county or regional information for the general location where the facility is to be located. Information regarding political jurisdictions, rivers and streams, possible location of wetlands, soil associations, drainage patterns (watershed boundaries), floodplains, public water systems, endangered and threatened species, active and abandoned mines, aquifer boundaries, seismic impact zones, airport locations, glacial drift thickness, and other land use data may be obtained from the Geographic Information System (GIS) coordinator for Ohio EPA, the Ohio Department of Natural Resources, Local Planning Commissions, the U.S. Geological Survey, and Local Soil and Water Conservation Districts.
3. Other considerations in the search for potential sites should include:
 - visual inspection of the designated area;
 - zoning restrictions;
 - location of population centers;
 - hauling distances and economics;
 - transportation routes and emergency services;
 - local land acquisition;

- location of historical or archaeological sites;
 - conservancy districts; and
 - parks, state and national forests, nature preserves, wildlife areas, scenic rivers. .
4. Compile data obtained in items two and three for the general site location. The easiest way to visualize the information is to record it on a general map of the area being studied. Specific sections of the map that will not meet Ohio's siting criteria should be eliminated during initial examination.
 5. Once potential sites have been located, the SWMD may contact the appropriate Ohio EPA district office. Ohio EPA will conduct a preliminary site investigation, if time permits. The preliminary site investigation focuses on superficial features of the site and regional geology. Site specific geologic considerations cannot be addressed until a hydrogeologic site investigation is performed and the results evaluated.
 6. If the SWMD intends to construct a facility, the policy committee should schedule a pre-application meeting with the appropriate Ohio EPA district office geologist and solid waste engineer to discuss best available technology requirements and specific PTI application requirements. The SWMD should decide whether to proceed with engineering detail plans and specifications based upon meetings and discussions with Ohio EPA technical staff.

Ranking Scheme

In order to facilitate evaluation and selection of a facility site, the SWMD should consider developing a ranking scheme. The ranking scheme should allow districts to compare potential sites quickly and as objectively as possible.

Resolving Site Impasses Through Mediation

Siting a solid waste facility usually involves controversy. Increased public involvement and technical advisory council recommendations early in the siting process help to identify potential sites and reduce controversy. Nevertheless, siting conflicts are still likely to occur. The SWMD siting strategy should include a method to deal with impasses associated with facility siting.

Mediation is a technique widely used by government, industry, labor, and management to resolve impasses. This approach is generally formal, and brings together a limited number of representatives of opposing positions to work with a mediator (or a team of mediators) toward resolution of conflicts. The mediator is neutral and serves to:

- act as a "go-between" for the opposing parties, fostering communication and cooperation;
- clarify issues and promote better understanding of opposing positions; and
- offer constructive suggestions and possible solutions.

The Ohio Commission on Dispute Resolution and Conflict Management can provide assistance in locating trained mediators and developing mediation strategies. The Commission is located at 77 South High Street, Columbus, Ohio 43266-02 14, and may be reached by phone at (614) 752-9595.

Table V-1 Landfill Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
Not located in the regulatory floodplain	facility not located in floodway 3745-27-07(A)(3), and limits of solid waste placement not located in 100 year floodplain 3745-27-20(C)(2)	Not in 100 year floodplain unless demonstration made 40 CFR 258.11
Not located within existing/proposed state or national park or recreational area	Limits of solid waste placement not located within: a. national park or recreation area, b.candidate area for potential inclusion in the National Park System, c. state park or state park purchase area, or d. any property within boundaries of national park or recreation area not acquired by U.S. Department of Interior 3745-27-07(H)(1)(a)to(d)	Do not address
Not located in a geologically unstable area	PTI requires identification of unstable areas and demonstration that design will resist earth movement 3745-27-20(C)(5)	Not in unstable area unless demonstration is made 40 CFR 285.15
Not located in areas surrounding wellhead of public supply well if contamination may reach wellhead within 5 years	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(3)(a)	Do not address
Not located above federally declared sole source aquifer	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(2)(c)	Do not address
Not located over unconsolidated aquifer yielding 100 gal/min to well within 1000 of limits of solid waste placement	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(2)(d)	Do not address
Not located within 200' of fault	Same as Solid Waste Management Plan recommendation 3745-27-20(C)(3)	Same as Ohio EPA unless demonstration made for alternative setback
Not located in area of potential subsidence due to underground mine	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(3)(b)	Mines not specifically addressed, but considered under unstable area
Not located within 1000' of ODNR preserves, wildlife areas, or scenic rivers, Ohio Historical Society nature preserves, USDOJ national wildlife refuges or scenic rivers, US Forest Service special interest areas or research natural areas, and Ohio EPA designated resource waters	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(4)(a)(i)to(v)	Do not address
Not located within 1000' of water well or developed spring unless under specified circumstances	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(3)(c)	Do not address
Not located within 300' of property line	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(4)(b)	Do not address
Not located within 1000' of residence 3745-27-07(H)(4)(c)	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(4)(c)	Do not address
Not located within 200' of stream, lake, or natural wetland	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(4)(d)	Do not address

Table V-1 Landfill Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
PTI application must demonstrate that the municipal solid waste landfill will not pose a bird hazard to aircraft (municipal solid waste landfill within 10,000'/5,000') of airports	PTI's identify airports within 10,000'/5,000' then notification letter to airport 3745-27-20(C)(1)	Notification of airport and Federal Aviation Administration of municipal solid waste landfill within 5 miles Bird hazard demonstration if within 10,000' or 5,000'
Required 15' isolation distance from uppermost aquifer for municipal solid waste landfills	Same as Solid Waste Management Plan recommendation 3745-27-07(H)(2)(e)	Do not address
Required 5' isolation distance from uppermost aquifer for some classes of coal combustion solid waste landfills	Same as Solid Waste Management Plan recommendation in the residual waste rules 3745-30-06(B)(15)(a)-(c)	Do not address
Was existing rule	Not in sand or gravel pit 3745-27-07(H)(2)(a)	Do not address
Was existing rule	Not in limestone/sandstone quarry 3745-27-07(H)(2)(b)	Do not address

Table V-2 Transfer Station Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
Not located in regulatory floodplain	Facility not located in a floodway 3745-27-22 (C) and identify floodplain boundary 3745-27-21(B)(2)(d)	Do not address
	Not located within 200' of surface waters of the state 3745-27-22(D)	Do not address
	Not located within park/candidate area, purchase area, etc. 3745-27-22(I)(1)to(4)	Do not address
	Not located within 500' of nature preserves, wildlife area, scenic river, etc. 3745-27-22(J)(1)to(5)	Do not address
	Not located within 250' of domicile, 3745-27-22(K)	Do not address

Table V-3 Incinerator Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
Not located in a regulatory floodplain	Facility not located in floodway 3745-27-51(C) and identify floodplain boundary 3745-27-50(B)(2)(d)	Do not address
	Not located within 200' of waters of the state 3745-27-51(D)	Do not address
	Not located within park/candidate area, purchase area, etc. 3745-27-51(I)	Do not address
	Not located within 250' of nature preserves, wildlife, refuge, scenic river, etc. 3745-27-51(J)	Do not address
	Not located within 250' of domicile, 3745-27-51(K)	Do not address

Table V-4 Composting Facility Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
Not located in a regulatory floodplain	Solid Waste placement areas not located in floodway 3745-27-41(B)(2)(a)(i) and 3745-27-43(C)(1)(a); and identify the limits of the regulatory floodway 3745-27-41(B)(1)(g) and 3745-27-42(A)(2)(o)(iii)	Do not address
	Not located within 100 feet of surface waters of the State 3745-27-41(B)(2)(b) and 3745-27-43(C)(1)(b) and identify streams, wetlands, lakes, springs, and other surface waters 3745-27-41(B)(1)(c) and 3745-27-42(A)(2)(b)(iv)	
	Except for facilities which compost only wastes generated within State or national parks, not located within a park or candidate area, purchase area, etc. 3745-27-41(B)(2)(ii), 3745-27-41(C)(3) and 3745-27-43(C)(2)	
	Not located within 200 feet of a water supply well, or developed spring 3745-27-41(B)(2)(c) and 3745-27-43(C)(1)(c)	
	For a Class 1 composting facility, must be located at least 500 feet from a domicile 3745-27-43(C)(1)(d)	
	For Class 11 composting facilities, must be located at least 250 feet from a domicile 3745-27-41(B)(2)(d)	

Table V-4 Composting Facility Siting Criteria

1989 State Solid Waste Management Plan Recommendation	Ohio Administrative Code	Federal RCRA Subtitle D Regulations
	For a Class III composting facility, must be located at least 250 feet from a domicile, unless the domicile is controlled by the facility registrant, or the facility was in operation on July 1, 1991 3745-27-41(B)(2)(d)	:
	For a Class II and Class III composting facility, waste placement areas must be at least 500 feet from nature preserves, wildlife refuges, scenic rivers, special interest areas, research areas within the Wayne National Forest, State resource waters, coldwater habitats, or warmwater habitats. 3745-27-41(B)(2)(e)(i)-(v)	
	For a Class I composting facility, waste placement areas must be at least 1,000 feet from nature preserves, wildlife refuges, scenic rivers, special interest areas, research areas within the Wayne National Forest, State resource waters, coldwater habitats, or warmwater habitats. 3745-27-43(C)(1)(e)	

Section 3734.50 (E) of the Ohio Revised Code requires that the State Solid Waste Management Plan (State Plan) “examine alternative methods of disposal for fly ash and bottom ash resulting from the burning of mixed municipal solid wastes...”

“Within one year after adoption of the plan, the Director shall adopt rules...establishing standards for the disposal of fly ash and bottom ash resulting from the burning of mixed municipal solid waste.”

Recommendations for Ash Disposal

In the absence of any federal law regarding the status of ash from mixed municipal solid waste (MSW) combustion facilities (incinerators and resource recovery facilities), in 1988 Ohio EPA strengthened its control over the disposal of this ash in Ohio by developing a policy that requires toxicity testing prior to disposal, and places several restrictions on facilities that accept ash for disposal. This policy was included in the 1989 State Plan.

This policy applies only to ash generated from municipal incinerators and municipal resource recovery facilities where the incoming waste stream consists solely of household waste and nonhazardous commercial and industrial waste. Since the development of Ohio's Interim Ash Disposal Policy in 1988, additional guidance has come from U.S. EPA and the Courts. While much of Ohio's Interim Ash Disposal Policy is unaffected, some changes and clarifications are needed to maintain consistency with federal policy.

On September 18, 1992, U.S. EPA Administrator William K. Reilly announced the exemption of municipal waste combustion ash from regulation under Section 3001 (i) of the federal Resource Conservation and Recovery Act (RCRA). This decision was effectively overturned on May 2, 1994, when the U.S.

Supreme Court issued an opinion interpreting Section 3001(i). (*City of Chicago v. EDF*, No. 92-1639) The Court held that Section 3001(i) does not exempt ash generated at resource recovery facilities (i.e., waste-to-energy facilities) burning household wastes and nonhazardous commercial wastes from the hazardous waste requirements of RCRA Subtitle C. As of the effective date of the Court's decision (June 1, 1994), operators of such facilities must determine through sampling whether the ash generated is characterized as a hazardous waste. Ash that sampling characterizes as hazardous must be managed in compliance with all applicable hazardous waste regulations. If the ash is not a hazardous waste according to the test results, it may continue to be disposed at a licensed solid waste landfill that meets U.S. EPA standards under Subtitle D of RCRA.

On May 20, 1994, U.S. EPA issued a draft guidance document titled *Sampling and Analysis of Municipal Refuse Incinerator Ash*. On May 27, 1994, Ohio EPA directed facility operators in Akron, Dayton, and Columbus to follow the sampling and analysis procedures in the federal draft guidance rather than Ohio's Interim Ash Disposal Policy in areas where the two conflict. Ohio and many other states have requested clarification from U.S. EPA and commented to U.S. EPA on the draft sampling guidance. Ohio's Interim Ash Disposal Policy will be revised through formal rulemaking during State Fiscal Year 1996 to incorporate these changes at the federal level.

Another 1994 U.S. Supreme Court decision overturning a local flow control ordinance in New York may adversely affect the ability of MSW incineration and resource recovery facilities to compete economically with landfills and other alternatives. The decision may also affect the ability of these facilities to attract sufficient volumes of waste to ensure repayment of facility financing. (*C & A Carbone, Inc. v. Town of Clarkstown*,

New York, No. 92-1402, May 16, 1994.)

Implementation of the 1990 federal Clean Air Act Amendments has resulted in tighter controls over mercury and dioxin emissions from MSW incinerators and resource recovery facilities, requiring extensive upgrades at many facilities. U.S. EPA has also conducted a multi-year Dioxin Reassessment to evaluate dioxin tolerance levels. Based on the results of this report and in response to citizen concerns, U.S. EPA may place additional requirements on these facilities in an effort to reduce dioxin emissions.

In 1991, Ohio EPA promulgated new rules governing the permitting, operation, closure, and financial assurance of solid waste incinerator facilities, including requirements for management of the ash generated (Rules 3745-27-50 through -53 of the Ohio Administrative Code). Ohio EPA also modified its Best Available Technology landfill regulations during 1993 to incorporate new federal RCRA Subtitle D regulations, which affect landfills at which ash may be disposed.

This chapter outlines these and other facets of state policy, law and recommendations for the management of ash from combustion of mixed municipal solid waste.

Background Information

In Ohio, only two mixed municipal solid waste incinerator facilities are currently operating: Montgomery County North (600 tons per day) and Montgomery County South (800 tons per day). Montgomery County recently announced its intention to close the South incinerator units in 1996 and 1998, and upgrade the North incinerator units to meet new air standards by 1998. Two resource recovery facilities also operated until recently to convert waste to energy: one in the City of Akron (700 tons per day until April, 1995), and another in the City of Columbus (operated by the Solid Waste Authority of Central Ohio, 1000 tons per day until December, 1994).

In 1993 in Ohio, 1,246,528 tons of solid waste were delivered to solid waste incinerators, resource recovery facilities, and infectious waste incinerators that are also

permitted to accept solid waste. These facilities produced 402,746 tons of ash. Once figures are adjusted to eliminate double counting of solid waste and ash, roughly seven percent of the solid waste disposed in the state was managed at these facilities.

Mixed Municipal Combustion Ash Overview

Whenever solid waste material is burned, part of the original material is noncombustible and the result is ash. Under ideal operating conditions, approximately 10 percent of the volume and 32 percent of the weight of municipal waste is left after it is burned. The ash residue from solid waste contains glass, cans, clays that are used in paper, stabilizers from plastics, pigments in inks, and minerals in organic wastes. The exact composition of the ash varies widely depending on what is burned, the type of combustion process involved, and other factors.

Municipal waste incinerators produce two types of ash residue:

- Bottom ash is the residue that collects beneath the combustion chamber. It constitutes approximately 90 percent of all ash.
- Fly ash is the powdery residue that is trapped in the plant's emission control devices. It represents about 10 percent of the total amount of ash that is generated.

The physical appearance of ash ranges from fine-grained to very coarse particles. Although the chemical content of ash varies according to the waste sources, the composition of the ash residue contains many of the same constituents present in the original waste. For example, ash residue can contain relatively harmless materials, such as iron and silicon, and potentially toxic materials, such as lead and cadmium.

The following information is generally accepted about ash:

- Levels of dioxin in ash are linked to combustion practices.
- Fly ash is high in heavy metals, predominantly lead and cadmium.
- Bottom ash is alkaline, while fly ash is acidic.

Typically, fly ash contains the highest concentrations of toxic metals and may produce leachate when disposed in landfills. The bottom ash contains lower concentrations of heavy metal constituents. When fly ash and bottom ash are mixed into what is called “combined ash,” the metal concentrations are usually diluted when compared to the levels in fly ash.

Controlling the Content of the Ash Residue from Mixed Municipal Solid Waste Combustion Facilities

The ash residue from mixed municipal solid waste combustion depends on the materials burned, the air emissions requirements, and the quality of the operator running the combustion process. To control the type of material burned, diverting wastes and source separation are prerequisite to successful combustion management.

Ohio’s Regulatory Status: Mixed Municipal Solid Waste Incinerators vs. Resource Recovery Facilities

Incinerators are regulated under Best Available Technology rules adopted May 31, 1991. All mixed municipal solid waste incinerators are required to prepare and submit ash management plans as part of their permit applications. Additional provisions of Ohio Administrative Code (OAC) Section 3745-27-50(C) require discussion of ash removal, handling and storage practices at these facilities.

Since 1976, resource recovery facilities have been exempted in OAC Rule 3745-27-03(N) from solid waste regulation in Ohio. Facilities such as those that were operated by the cities of Akron and Columbus were exempted from state solid waste regulations, and are subject to air and water pollution control requirements only. Since resource recovery facilities are not regulated as solid waste facilities, there are no requirements for ash management plans at these facilities. However, ash from these resource recovery facilities is subject to the same testing requirements as ash from municipal incinerators.

To restore consistency statewide, Ohio EPA intends to remove the resource recovery facility exemption when new rules governing scrap tire facilities are promulgated during 1995. This change will bring resource recovery facilities burning mixed municipal waste under solid waste rules governing the operation and closure of incinerators. Facilities in existence on the effective date of the new rule will be required to obtain an annual operating license as a solid waste facility for the next and subsequent operating years, and obtain a solid waste permit-to-install if the facility undergoes a significant modification.

Role of Source Separation

Many materials destined for combustion at resource recovery facilities or for incineration can be separated from other wastes at the point of generation. Materials containing heavy metals and other potentially harmful components should not be burned. Instead, the Solid Waste Management Advisory Council recommends aggressive pollution prevention programs to reduce the generation of wastes, and recycling these wastes whenever feasible.

Role of Diverting Wastes from Mixed Municipal Combustion Facilities

Certain wastes, such as lead-acid batteries, contribute hazardous constituents (especially toxic organics and heavy metals) to emissions

and ash. Chapters IV and VIII provide strategies for handling these materials. Owners and operators of solid waste incinerators must implement measures to divert wastes with hazardous constituents from the waste stream. The Solid Waste Management Advisory Council recommends diverting these materials and recycling them whenever feasible.

OAC Section 3745-27-52(T) specifies that solid waste incinerator facilities shall not accept the following:

1. Hazardous wastes;
2. Asbestos or asbestos-containing waste material that is subject to the provisions of NESHAP, 40 CFR Part 61, Subpart M;
3. Infectious wastes...that have not been treated to render them noninfectious, unless the facility is an infectious waste treatment facility operated in accordance with state infectious waste rules, or unless the facility holds a solid waste disposal license with a notation that the facility treats infectious wastes;
4. Explosive materials;
5. Lead-Acid (automotive) batteries;
6. Yard waste after December 1, 1993, except logs and brush;
7. Whole waste tires after January 1, 1993, unless the facility is otherwise authorized to incinerate whole waste tires; and
8. Shredded waste tires after January 1, 1995, unless the facility is otherwise authorized to incinerate shredded waste tires.

In addition, the Solid Waste Management Advisory Council recommends that all districts that utilize or will utilize incineration or waste-to-energy facilities in the future are, to the greatest extent practical, to recycle certain materials. These include glass and other material not usable as fuels, materials which may have greater value if recycled, or materials which may interfere with efficient incinerator operation if not removed. These plans need not consider the recycling of materials with obvious fuel value, such as paper.

Separation and recycling may be met

through community-based programs such as curbside, drop-off or other programs, or by a program initiated at a transfer station, or at the incinerator or waste-to-energy facility itself.

Because Ohio EPA does not have authority to regulate generators or transporters of solid waste, some of these materials such as yard waste and lead acid batteries cannot be effectively banned if mixed with other solid wastes. Therefore, when the incinerator rules are revised during State Fiscal Year 1996, this language will be clarified to apply to source-separated materials. The rules will include the requirement for disposal restrictions such as are described in Chapter IV, to deter to the greatest extent possible, the acceptance of these materials in mixed waste. At the present time, ample recycling opportunities exist for lead acid (automotive) batteries, and market conditions strongly reward recycling rather than disposal of these materials. Should these conditions change, the Solid Waste Management Advisory Council will urge the Ohio General Assembly to address the problem through new legislation that provides clear authority to ban disposal and mandate recycling of these materials.

Ohio EPA does have the ability to regulate hazardous and infectious wastes and asbestos. Therefore, the disposal ban can be retained for these materials. Ohio EPA will also be able to regulate scrap tire transporters under new rules described in Chapter VII. These rules will include provisions governing the burning of tires at scrap tire recovery facilities and solid waste incinerators where specifically authorized, and ash residue management requirements for these facilities.

Role of Ohio's Air Emissions Standards

State and federal regulations are applicable to municipal waste combustion. U.S. EPA regulates air emissions from combustion facilities through its "New Source Performance Standards" (NSPS) and "Prevention of Significant Deterioration" (PSD) permit process. Whenever a new facility is proposed, plant operators must prepare a detailed

calculation of air emissions to determine whether compliance will be achieved with federal and state rules. U.S. EPA also requires such facilities to install best available control technology (BACT) on large facilities.

Ohio regulates particulate incinerator stack emissions through Chapter 3745-17 of the Ohio Administrative Code, Particulate Matter Standards. These regulations address all new and existing facilities by: setting standards that regulate particulate emissions for stationary sources; controlling fugitive dust emissions from various sources; and setting specific restrictions on particulate emissions and odors from incinerators. In addition, all new facilities must install Best Available Technology to reduce all pollutants in accordance with Ohio EPA Permit-to-Install rules.

When materials are burned, gases and other by-products are formed and must be controlled to prevent air pollution. Modern resource recovery plants are designed to solve this problem by achieving extremely high temperatures (1800 to 2200 degrees Fahrenheit) to minimize the formation of complex chemical compounds such as dioxin, and by using pollution control devices. BACT requirements, such as scrubbers, electrostatic precipitators, and fabric filters, can reduce emissions by up to 99 percent.

An efficient pollution control system generally transfers metal oxides from the flue gas to the fly ash or scrubber sludge. This is why fly ash has tested high for metals.

The Clean Air Act of 1990 requires U.S. EPA to promulgate additional requirements for the control of emissions from existing and new municipal waste combustors. These standards were proposed on September 20, 1994, and must be promulgated in final form by September 20, 1995.

Role of Operator Certification

Operator training and certification programs can assist in ensuring safe and effective operation of incinerators and pollution control equipment, as well as help operators determine which wastes should be burned. Ohio EPA is required by law to

develop an operator training program which will focus on the solid waste handling aspects of incinerator technology. It is expected that this program will be implemented during the 1996-97 biennium, which begins July 1, 1995. U.S. EPA's proposed air emissions control rules also include an operator certification component,

Ash Management Requirements

According to Ohio EPA's Interim Policy on the Disposal of Municipal Incinerator Ash, which was incorporated into the 1989 State Solid Waste Management Plan, before accepting municipal incinerator and/or resource recovery facility ash, a disposal facility must verify that the ash is not a Toxicity Characteristic (TC) hazardous waste. Ash was to be periodically sampled and the sample results statistically analyzed. If the results of the statistical analyses of the ash samples exceeded the limits for TC, the material could be rendered nonhazardous on-site where it was generated, as necessary to meet the TC limits, or taken to a hazardous waste treatment or disposal facility. Under the Interim Policy, if the ash safely met the testing criteria as nonhazardous, it could be disposed at a solid waste disposal facility that has a ground water monitoring system in place, but the ash must be kept physically isolated from other solid wastes.

As noted in the introduction to this chapter, on May 27, 1994, Ohio EPA notified operators of Ohio's four municipal waste combustors that, because of the U.S. Supreme Court's ruling, Ohio's Interim Policy had been replaced by U.S. EPA's *Draft Sampling and Analysis of Municipal Refuse Incineration Ash*. This draft sampling protocol is quite similar in principle to the requirements of Ohio's Interim Ash Disposal Policy, with slightly different sampling frequencies. For the initial waste characterization, the combustion facility operator must take two eight-hour composite samples each day for one week's operation, for a total of 14 1000-gram samples. (An eight-hour composite sample means to take one grab sample from the designated sampling area each hour for eight hours, and combine them;

another eight-hour composite sample must be taken during another shift.) The sample analysis method to be used is U.S. EPA SW-846 TCLP (toxicity characteristic leaching procedure) method 13 11, applying the Student's t-test from U.S. EPA SW-846 for statistical data evaluation. The TCLP test covers 40 different species of **organics** and metals. It is recommended that subsequent testing be conducted at least quarterly to determine the ash variability over time. Using the sample data from each sampling period, the operator must determine if the ash exhibits toxic characteristics. If the statistical analysis fails the limits for TC, the ash is to be disposed as hazardous waste, unless rendered nonhazardous prior to the point of disposal.

Because of questions about whether fly ash and bottom ash from these facilities could be combined prior to sampling, U.S. EPA published in the *Federal Register* effective February 3, 1995, a *Determination of Point at which RCRA Subtitle C Jurisdiction begins for Municipal Waste Combustion Ash at Waste-to-Energy Facilities*. This point was determined to be the point at which the ash exits the combustion building following the combustion and air pollution control processes. While within the combustion building, ash handling is exempt from regulation under Subtitle C. Fly and bottom ash may be combined prior to sampling for hazardous waste characteristics, as long as the combining of the ash types takes place within the combustion building prior to either ash having been collected or deposited outside the building.

All four facilities operating in Ohio utilized U.S. EPA's sampling protocol since May 1994, and reported no instances in which the TCLP limits were exceeded. Ohio's policy will be expanded through formal rulemaking during 1995-96 to maintain consistency with federal policy. Ohio EPA intends to require that ash from the combustion of mixed municipal waste be kept physically isolated from other wastes if placed in a solid waste landfill meeting RCRA Subtitle D requirements.

Ohio's Ash Monofill Disposal Facility Requirements

While not specific to ash monofills, Ohio EPA's revised municipal solid waste landfill siting, design and operational criteria are applicable for those seeking to construct an ash monofill. These protective requirements and the maintenance of non-acidic conditions in the monofill serve to reduce the potential for metals to leach out of the ash.

Uses for Mixed Municipal Solid Waste Combustion Ash

The State Solid Waste Management Advisory Council encourages methods to reuse nonhazardous ash that are demonstrated by scientifically valid research to be beneficial and environmentally sound. If the incinerator ash is not hazardous based on the TCLP, it can be disposed in a solid waste facility meeting RCRA Subtitle D standards, or possibly reused. Many reuse technologies remain experimental and will require additional testing to determine their environmental suitability.

Ash usually must undergo some form of treatment before it can be reused. Solidification and chemical stabilization are the most widely used forms of treatment. The processes include mixing ash with lime or portland cement to form less soluble metals. A number of companies currently offer stabilization technologies for municipal combustion ash. Once stabilized, the ash can be used for construction materials or road foundation, provided it meets construction specifications.

If adequate funding is made available, existing state testing facilities and state agency testing programs should be used to develop performance data on specifications for reusable ash and products containing recycled ash. State procurement and construction specifications should then include appropriate performance standards.

Overview

Scrap tires pose a substantial management challenge, due both to the large number of tires taken off the road annually and to the inherent properties built into a tire to ensure its safety and durability in use. The same design factors that make tires today wear longer than tires a generation ago also make the tires more difficult to retread or recycle. Currently, the majority of scrap tires are being landfilled (using up valuable municipal solid waste landfill space), stockpiled, or illegally dumped, creating potentially serious health and environmental threats. The objective is to reduce the number of tires in uncontrolled stockpiles or illegal dumps. These sites are often infested with mosquitoes, with the potential for spreading dangerous mosquito-borne diseases. Large tire dumps can also lead to fires with major releases of air pollution and hazardous organic chemicals into surface and ground water. A few tire fire locations have become Superfund sites.

Scrap tires tend to gravitate to the least expensive use or disposal option. As costs or difficulties of legal disposal increase, illegal dumping may result. Tires should be utilized to minimize impact on and maximize conservation of natural resources. This means the first priority should be on reuse, where appropriate, or retreading, followed by recycling of the scrap tires to make rubber products or asphalt, processing the scrap tires for energy recovery, and finally, environmentally sound disposal. At present, the preferred end use markets in Ohio do not absorb all the scrap tires generated. Competition from cheap, illegal dumping prevents the growth of legitimate markets for scrap tires and scrap tire products.

Each year approximately 12 million passenger car, truck, bus, and other vehicle tires enter the waste stream in Ohio. It is estimated by Ohio EPA that some 100 million scrap tires are presently stockpiled or illegally dumped in the state.

Senate Bill 165, which became effective October 29, 1993, created a comprehensive scrap tire regulatory program governing scrap tire collection, storage, transportation, recovery, beneficial use, and the operation of disposal facilities, which include monofills and monocells. When the new regulatory program is fully implemented beginning in 1996, only registered scrap tire transporters will be able to deliver scrap tires to specific types of destinations. A shipping paper system will be required and everyone involved in the shipment of scrap tires must retain a copy of the shipping papers for three years. Annual reports will be required of each transporter and each licensed facility. These reports will give a comprehensive picture of scrap tire movement within Ohio. This system should greatly reduce illegal dumping by allowing for the identification of those responsible for scrap tires that never reach a proper recycling or disposal destination.

Passage of this landmark legislation in 1993 will enable Ohio to finally meet many of the objectives for scrap tire management laid out in the 1989 State Solid Waste Management Plan:

- Reduce volume before disposal
- Restrict disposal to licensed monofills/monocells
- Require permitting standards for scrap tire monofills and scrap tire storage sites
- Increase utilization of scrap tire products through state buying program
- Reduce the number of scrap tire stockpiles and open dumps
- Encourage research and development, such as pilot studies, to improve markets for scrap tire products

The new regulatory program will help to ensure that scrap tire management facilities are located, maintained, operated, and closed in a manner that does not create a nuisance, a threat to public health and safety, or a fire hazard. The law also provides funding for cleanup of abandoned tire dumps, and assistance to encourage scrap tire markets.

As an additional incentive to encourage recycling of scrap tires, local solid waste management plans will be able to credit scrap tires processed at recovery facilities or reused as an approved beneficial use, toward their waste reduction and recycling goal.

Why are Scrap Tires a Special Problem?

Public Health Threats and Environmental Hazards of Tire Dumps and Stockpiles

Mosquitoes

Mosquitoes, as well as other vectors, find scrap tires an ideal breeding habitat. Biting mosquitoes near tire piles can become a serious nuisance. According to the Vector-Borne Disease Unit of the Ohio Department of Health, abandoned or improperly stored tires constitute optimal habitat for a least four types of disease carrying mosquitoes in Ohio: Aedes triseratus (La Crosse encephalitis, dog heart-worm); Culex pipens (St. Louis encephalitis); Aedes albopictus (Dengue, La Crosse encephalitis); and Aedes aegypti (Dengue, Yellow Fever). Between 1960 and 1991, there were 744 incidences of La Crosse encephalitis and 445 incidences of St. Louis encephalitis reported in Ohio.

Commerce in mosquito-infested scrap tires is a vehicle for the intra-state, inter-state and even international spread of mosquitoes. Between 1985 and 1991, Aedes albopictus spread from Houston, Texas to 254 counties in 23 states, primarily by this mechanism. As of May 1992, this mosquito had been detected in three Ohio counties.

In addition, since some viruses (notably La Crosse encephalitis) are transmitted from infected female mosquitoes through the eggs to subsequent generations, scrap tire commerce may result in the further spread of disease unless environmental controls for vectors are implemented.

Fire

Stockpiled tires represent vast collections of highly combustible materials. Once ignited, tire fires can be extremely hard to extinguish. This is due in large part to the geometric design of a tire which encapsulates a rich oxygen supply, thus prolonging the fire.

As the tires burn, large quantities of oil are released, and the heavy smoke and noxious emissions pose a serious hazard to humans and the environment. Once extinguished, unburned oil that is not recovered threatens ground water, surface water, and soil.

Ohio EPA's emergency response office maintains an emergency toll free telephone number which is monitored 24 hours daily. From January 1990 to March 1992, 103 fires specifically attributed to scrap tires were reported on the emergency hotline. One of the most serious tire fires in Ohio occurred in Lancaster in May 1990, and took firefighters more than a week to extinguish.

When a tire fire is reported to Ohio EPA, an emergency response officer records all relevant site data and informs other appropriate authorities including Ohio EPA district offices and local fire and health departments. Where toxic runoff from the fire poses a threat to waters of the state, an Ohio EPA on-scene coordinator may be dispatched to oversee site cleanup activities.

Operational Problems Caused by Scrap Tires in Municipal Solid Waste Landfills

Besides taking up valuable airspace, scrap tires pose an operational problem for sanitary landfills due to their design. The donut shape of the tire enables methane gas to collect inside. This may cause the tire to migrate to

the surface and disturb the cap system of the sanitary landfill facility, allowing more precipitation and surface water runoff to penetrate into the landfill and contribute to the generation of leachate. Whole scrap tires also do not compact well because of their shape.

For these reasons, the 1989 State Solid Waste Management Plan called for a ban on the landfill disposal of whole scrap tires on January 1, 1993, and on the landfill disposal of shredded tires on January 1, 1995. These bans were not enacted into rules because too little alternative management capacity was available in Ohio, and because of similar limitations to those experienced with the yard waste ban. With passage of Senate Bill 165, however, Ohio EPA was given clear authority to regulate transporters of scrap tires. The statute also excludes municipal sanitary landfills from the list of allowable recycling and disposal destinations for scrap tires. A ban on landfill disposal of whole scrap tires will therefore be incorporated into the new rules implementing Senate Bill 165, and will be enforced as soon as the rules are effective. A ban on the disposal of shredded tires in municipal solid waste (MSW) landfills will also be phased in as sufficient tire recycling and disposal infrastructure is available to absorb the annual generation of scrap tires in Ohio.

Senate Bill 165

Besides creating a comprehensive regulatory framework, Senate Bill 165 provides a number of incentives to encourage the recycling of scrap tires rather than disposal.

Scrap Tire Management Fund

The law established a 50-cents-per-tire fee on the first (wholesale) sale of new tires. This fee generates approximately \$3.5 million per year to fund inspections and enforcement of the regulations, cleanup of scrap tire dumpsites, research into alternate uses and tire recycling technology, and loans for establishing scrap tire

recycling and recovery facilities. This fee will sunset in the year 2000. Ohio's State Scrap Tire Management Fund is restricted to these four uses:

- The Institute of Polymer Science at the University of Akron shall receive an annual grant from the scrap tire management fund for the purpose of expediting research concerning and evaluation of alternative methods of recycling scrap tires.
- The establishment of a scrap tire abatement fund, with specific criteria, that Ohio EPA shall use to clean up scrap tire dumps in Ohio.
- The establishment of a source of loans and grants, administered by the Ohio Department of Development, for scrap tire recycling businesses.
- The establishment of funding for compliance monitoring and enforcement of the scrap tire law by Ohio EPA.

The Scrap Tire Regulatory Program in Ohio

Ohio EPA is currently developing rules governing scrap tire collection, storage, beneficial use, monofill, monofill and recovery facilities, and scrap tire transporters.

Scrap Tire Generators

Under Ohio's new law, most scrap tire generators (which include tire dealers, auto repair shops, tire retreading shops, trucking terminals, and individuals) are exempt from registration, permit and license requirements as long as they manage their scrap tires so they remain within the specific exemption limits set forth in the law.

All generators are responsible for ensuring that they are using a registered scrap tire transporter to remove and deliver scrap tires. Generators must retain records for three years

documenting their scrap tire shipments. The generators also must properly store any scrap tires in order to avoid creating a nuisance, a threat to public health and safety, or a fire hazard.

Scrap Tire Transporters

Senate Bill 165 states that anyone who transports more than 10 scrap tires that originate or terminate in the State of Ohio, and who does not qualify for an exemption, must register annually with Ohio EPA. The scrap tire transporter is also required to obtain financial assurance in an amount that is at least \$50,000.

Scrap tire transporters may deliver scrap tires only to a licensed scrap tire facility, an approved beneficial user, another registered transporter, a solid waste incinerator or energy recovery facility, or to an out-of-state facility operating in compliance with the laws of that state.

Scrap Tire Collection, Storage, Recovery and Disposal Facilities

Under the new statute, large facilities will be required to have a permit from Ohio EPA and an annual operating license from the approved local health department. Smaller facilities may register with Ohio EPA, and must also have an annual operating license. Annual reporting and shipping paper requirements will enable the state to track shipments of tires moving legally to recycling activities or disposal facilities.

Scrap Tire Storage

Scrap tires may be managed above ground if the proposed site is registered or permitted and licensed, meets Ohio EPA regulations and is in compliance with local zoning, fire and health codes. The site will serve as a holding facility until the tires can be recycled or properly disposed. Regulations governing tire storage sites will be revised and new tire storage standards will be adopted.

While there may be some modifications to these as rulemaking proceeds, the following are proposed as requirements in the scrap tire rules:

Scrap Tire Storage Facility

- Scrap tire storage piles shall be no greater than 2,500 hundred square feet in area;
- Registered scrap tire storage facilities cannot exceed 10,000 square feet in area;
- Permitted scrap tire storage facilities cannot exceed three acres in area and are only approved if the storage facility is owned by a registered or permitted scrap tire recovery or monofill/monocell facility;
- Adequate fire lanes shall be created and maintained in and around each scrap tire pile stored outdoors. These aisles shall be free of obstructions at all times;
- Open burning on premises where scrap tires are stored is prohibited within 500 feet of a scrap tire storage pile;
- Effective control measures for mosquitoes and other vectors shall be implemented. Such control may include the application of cover material (in no case shall cover materials consist of soil), pesticide or larvicide, shredding the tires to a size that can be demonstrated to not hold water, or other methods approved by the director of Ohio EPA. Where cover materials are utilized as such control measures, scrap tires shall be covered at all times except when tires are being added or removed from the pile.

Scrap Tire Collection Facility

- Receives whole scrap tires from the public.
- All scrap tires shall be stored in portable containers only.
- The maximum storage area shall be five thousand cubic feet.
- Effective control measures for mosquitoes and fire shall be implemented at the facility. Effective controls may include covering the tires, pesticide or larvicide, and security for the facility.

Recycling, Reuse, and Energy Recovery of Scrap Tires

Scrap Tire Recovery

A scrap tire processing facility that uses a controlled combustion, thermal, mechanical, chemical, or other process to extract or produce usable products, materials, or energy from the scrap tires is a scrap tire recovery facility. A scrap tire shredder, either fixed or mobile, is a scrap tire recovery facility. These facilities are allowed to have on-site a temporary tire storage area that does not require an additional registration or license as long as the temporary storage area is in compliance with the storage requirements for the area. The scrap tire recovery facility registration or permit from Ohio EPA shall be based on the facility's Daily Designed Input Capacity.

Solid waste incinerators and energy recovery facilities that primarily accept mixed municipal solid waste are exempt from the scrap tire recovery facility registration or permit requirements. In order to encourage the use of tires for energy recovery, cement kilns, coal-fired electric utility boilers, and coal-fired industrial boilers will be allowed to add scrap tires as a fuel supplement. Rules covering the general storage of scrap tires will apply to these facilities. Tire retreading businesses, tire

manufacturing centers, and tire adjustment centers are exempted in the law from recovery facility registration or permitting requirements if less than 4,000 scrap tires are stored in a single location.

Scrap Tire Monocell/Monofill Facilities

Scrap tires that cannot otherwise be beneficially reused should be segregated from the solid waste stream and disposed in monofill/monocell facilities. A **monocell** is an individual area or cell within a solid waste landfill that accepts only shredded or processed tires; a **monofill** is a sanitary landfill that accepts only shredded or processed scrap tires. A scrap tire **monofill** shall be located in compliance with criteria to be specified in the new rules.

Scrap tires shall be shredded or processed prior to monofill disposal. Because processed tires reduce waste volume by 75 percent, monofill space will be conserved. In addition, scrap tires placed in a monofill may be "mined" at a later date when the technologies for reuse and recycling are more economical and become more prevalent in the region.

Until the new rules take effect, Ohio EPA will provide assistance to persons interested in developing scrap tire monofills/monocells to utilize the existing solid waste permitting process and landfill regulations that took effect June 1, 1994, with appropriate waivers. In the new rules governing a tire monofill, Ohio EPA will tailor the list of parameters for groundwater monitoring specifically to contaminants likely to result from scrap tires. The rules also will emphasize site security due to the potential fire hazard posed by tires. A monofill facility will be required to provide post-closure care for a period of 15 years after closure requirements have been completed.

Drawdown of Existing Stockpiles of Scrap Tires

One of the most significant provisions in the new law requires existing stockpiles to be drawn down over no more than five years, until the scrap tire storage or recovery facility is

fully in compliance with the new rules. For each year of the **drawdown** period, 20 percent of the stockpile must be removed or restacked in compliance with the new rules, and restacked areas may not exceed the maximum size allowed for new facilities. Failure of a facility to remove the tires according to the terms of its approved **drawdown** plan will result in the loss of the annual operating license and the ability to do business receiving scrap tires.

Disposal Within Abandoned Coal Strip Mines

The 1989 State Solid Waste Management Plan also called for an evaluation of the feasibility of landfilling scrap tires in abandoned coal strip mines. Ohio's coal resources are located in 34 counties and extend over nearly 12,000 square miles. Prior to 1948, when the Strip Coal Mining Act became effective, large land areas were stripped of coal and then abandoned. Some of the most serious consequences include problems with acid mine drainage, landslides, floods and contamination from sediment, affecting rivers, drainage pathways, and bottomlands.

Utilizing abandoned strip mine areas for scrap tire monofills may prove beneficial in two ways. First, previously abandoned coal strip mines would be reclaimed. Second, vast stockpiles of discarded tires would be "stored" and possibly mined later when the recycling of scrap tires has become more effective.

A pilot project has been developed in cooperation with the Ohio Department of Natural Resources (ODNR), Division of Reclamation to demonstrate the feasibility of monofilling scrap tires in a former coal strip mine in Stark County. Scrap tire disposal sites in former strip mine areas will be subject to Ohio EPA permit requirements and regulations for scrap tire monofills, in addition to regular inspections by the local health department and an annual operating license. Construction of this pilot project is expected to begin in the spring of 1995 and should take about 60 days to complete. The site will then operate for about three years and then will close and be covered with soil and planted with vegetation.

The mine's surface and ground water will be monitored during the project operation and the results from the monitoring will be made available to Ohio EPA.

Beneficial Use

As defined in Senate Bill 165, beneficial use of a scrap tire results in a commodity for sale or exchange, or use in any other manner authorized by the director of Ohio EPA. The substitution of scrap tires for another material must have a comparable engineering value at least equal to the material the scrap tires are replacing, and must not be solely for purposes of disposal.

The person(s) wanting to beneficially use scrap tires will be required to notify Ohio EPA of their intent and detailed information concerning the use of the scrap tires. If the proposal(s) does not qualify as a beneficial use, then the applicant may be required to obtain a license and a permit or registration as a scrap tire facility. Without some kind of authorizing document, the applicant may be cited for open dumping. Some categories of beneficial uses will also be approved in the rules and will not require specific Ohio EPA authorizing documents, provided they do not violate local fire or zoning requirements. The number of scrap tires stored for the beneficial use shall not be in excess of the total needed for the beneficial use and shall be stored in accordance with the storage requirements.

The use of commercially produced products that are manufactured or assembled from pieces of scrap tires or from crumb rubber derived from scrap tires is a beneficial use of scrap tires. As a commodity for sale or exchange, such products will not be restricted by these rules. Beneficial use does apply to any end use of whole, cut or shredded tires that results in the material being placed into or on the ground or waters of the state. Beneficial use also applies to any end use of crumb rubber as a soil conditioner, compost filler, or other applications that place the crumb rubber directly into or on the ground or waters of the State. Such placement may constitute disposal, therefore, rules are necessary to clearly distinguish the beneficial use of scrap tires from the illegal disposal of scrap tires.

Persons purchasing or accepting whole, cut, or shredded tires or crumb rubber from a scrap tire recovery facility or any other source may have to provide beneficial use notification to Ohio EPA if they plan to place the whole or processed tires in or on the ground or waters of the State. The notification requirements will not apply to such common sense uses by individual homeowners as a single tire swing or flower planter at a single family residence, or to items manufactured or assembled from pieces of scrap tires for temporary use on the ground such as mats, road culvert pipes, etc. Ohio EPA approval must be sought for any use of tires for erosion control, fill, drainage layers, submerged reefs, and so on. Ohio EPA has already issued guidance governing the use of shredded or chipped tires in the construction of solid waste landfill leachate collection systems and freeze-thaw protection layers. The owner/operator of a scrap tire facility or solid waste facility seeking to place whole, cut, or shredded scrap tires on or into the ground or waters of the State in any manner not covered by their facility registration or permit and license must also file a beneficial use notification.

Asphalt Rubber Provisions in Federal Highway Legislation

The 1991 federal highway act, formally titled the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), incorporated a number of provisions to research and promote the use of recycled crumb rubber from shredded scrap tires. Beginning in 1994, a certain percentage of hot mix asphalt pavement laid in each state and financed by federal funds, must be crumb rubber asphalt. The mandated percentages are five percent in 1994, 10 percent in 1995, 15 percent in 1996, and 20 percent in 1997 and thereafter.

Concerns about higher costs, air emissions at plant and paving sites, and the limited data on the long-term performance and recyclability of pavements containing crumb rubber asphalt has forced Congress to delay implementation of the ISTEA requirements to allow for further study of the cost, performance characteristics, and environmental effects of rubberized asphalt. Many states including Ohio expressed

concern that the ISTEA standards constituted an unfunded mandate for state governments because, although states receive federal funding for highway construction, the rubberized asphalt was estimated to cost as much as 2.5 times more than standard asphalt. Congress prohibited the federal highway administration (FHWA) from expending any funds for the implementation, administration and enforcement of the ISTEA rubberized asphalt requirements. With no funds available to it, the FHWA indicated that no state would be penalized for noncompliance with the 1994 and 1995 provisions of ISTEA.

The Ohio Department of Transportation has established nine demonstration projects around the state to study the performance characteristics and life expectancy of crumb rubber asphalt. Two of the projects failed at the beginning of the study, but the other seven have shown a level of performance equal to regular asphalt. The Ohio Department of Transportation is monitoring the progress of the projects. The Ottawa-Sandusky-Seneca Joint Solid Waste Management District is also pursuing three separate projects to demonstrate the feasibility of the use of scrap tires in paving applications.

Scrap Tire Recycling Research

The University of Akron Institute of Polymer Science is presently conducting two studies on alternative methods of recycling tires, as called for by the Ohio scrap tire management law:

“Ground vulcanized rubber as a compounding additive” is an attempt to promote the bonding of vulcanized crumb rubber to other vulcanized crumb rubber or virgin rubber.

“Ultrasonic devulcanization for scrap tire recycling” investigates the use of ultrasonic vibrations, in the presence of pressure and heat to cause devulcanization, to produce crumb rubber.

Both projects could facilitate the use of scrap tires to produce new rubber products.

Financial Assistance For Scrap Tire Recycling

Ohio's new scrap tire law provides approximately \$6.6 million during the years 1995-2000 to be given out in grants, loans, and other financial assistance to scrap tire recyclers by the Ohio Department of Development. The first such loan of \$250,000 was issued on June 6, 1995, to National Feedscrew, Inc. of Massillon for a new process to devulcanize scrap tire crumb. Loans and grants are issued in amounts ranging from \$50,000 to \$250,000. Applications may be submitted at any time during the year. Interested parties should contact Brad Biggs at the Ohio Department of Development, (614) 644-8201, for pre-application information and guidelines.

Scrap Tire Open Dump Abatement and Removal Actions

Cleanup and abatement of the many random tire dump sites in Ohio will require coordination of local governments and law enforcement agencies, local health departments, solid waste management districts, Ohio EPA, and private sector contractors. Senate Bill 165 established approximately \$10 million in funding over a five-year period to cover removal actions. This will enable the State to address the largest piles which constitute the most serious threats to public health and the environment. Local resources will still be needed to clean up many of the smaller abandoned scrap tire piles in the state. Before any State funding can be used for a removal and cleanup operation, vigorous enforcement efforts must be made to make the responsible party pay. The law also specifies that State funding shall not be used for removal actions against any premises where not more than 100 scrap tires are present. One hundred and twenty days after the director of Ohio EPA has ordered the removal of scrap tires from a site, the director may award a contract for removal of the tires while legal action to recover the

cost of abatement continues. If the person(s) responsible for the accumulation fails to pay the full cost of abatement, a lien may be placed against the property.

Senate Bill 165 directs Ohio EPA in contracting for scrap tire pile cleanup and removal operations to send the tires to scrap tire recovery facilities rather than to disposal in monofills or monocells. The law also sets the following priorities for sites to be addressed through the State Scrap Tire Management Fund:

- Accumulations that constitute a fire hazard or threat to public health;
- Accumulations that contain more than one million scrap tires;
- Accumulations located in densely populated areas;
- Accumulations that are determined by the local approved health department to constitute a public nuisance; and
- Accumulations located on a premises operating as a scrap tire facility without a valid license.

Accumulations located in proximity to major highways, state scenic rivers and natural areas, to public water supplies, and other surface waters are also of concern due to the possibility of off-site migration of air and water pollutants in the event of a tire fire at the site.

Other states have paid between \$1 .00 and \$1.60 per tire for scrap tire removal operations. With roughly 100 million tires already abandoned across the state, it is clear that State-financed cleanup programs must continue to be augmented by a number of other funding and enforcement mechanisms. Local officials attempting to address the many smaller accumulations of abandoned scrap tires can expect assistance from Ohio EPA and the State Attorney General's Office in enforcement efforts aimed at pursuing responsible parties. Local solid waste management districts may also be able to provide funding for cleanup of tire dumpsites that are unlikely to be addressed through the State Scrap Tire Management Fund. Environmental penalty monies and credit projects carried out by those fined for

other environmental violations are also a potential source of cleanup activities. Perhaps most importantly, the new shipping paper requirements and regulatory program should serve as a significant deterrent to further dumping. Operators of existing tire storage and recovery facilities will also be under new state requirements to draw down the size of their storage piles as indicated above.

Local Solid Waste Management District Responsibilities

Solid waste management districts must include strategies for scrap tire management in their solid waste management plans. This requirement was inadvertently removed in Senate Bill 165, but was restored by subsequent legislation (H.B. 685) in 1994. The SWMD plan should summarize the annual generation and recycling of scrap tires within the SWMD, and inventory existing scrap tire dumpsites. This inventory is crucial for the statewide prioritization of abandoned sites for abatement actions. Where funds are available for cleanup operations locally, the SWMD plan may also provide a mechanism for these cleanup efforts. Local solid waste management districts may also fund efforts by local law enforcement agencies and local health departments to enforce open dumping laws pertaining to scrap tires. As more information becomes available through the state licensing and registration of scrap tire transporters and facilities, it will be possible for solid waste management districts to better track the actual

generation, recycling, and disposal of scrap tires within their borders. The local solid waste management district may assist Ohio EPA in the identification and prioritization of scrap tire dumpsites for locally and state-funded abatement actions.

Local Health Department Responsibilities

Senate Bill 165 provides additional funding to approved local health departments for compliance monitoring and enforcement activities related to the scrap tire management regulatory program. The annual license fee for all scrap tire facilities will be paid to the local approved health department. The health department will retain the fees in a special fund. The Board of Health is allowed to retain the entire amount of any fee that is less than \$15,000 and the first \$15,000 of any fee over \$15,000. The remainder, if any, of each license fee collected by the board shall be transmitted to Ohio EPA for deposit in the State Scrap Tire Management Fund, to be reallocated for regulatory, research, recycling, or abatement activities. The local health department may assist Ohio EPA in the enforcement and identification and prioritization of scrap tire dumpsites for locally and state-funded abatement actions. Local health departments and SWMDs are encouraged to work together in the oversight of scrap tire facilities and dumpsites.

Table VII - 1
Largest Scrap Tire Accumulations in Ohio
as of September 1, 1995
(by number of tires)

WYANDOT COUNTY	S.R. 231	40 MILLION TIRES
PORTAGE COUNTY	S.R. 225 AT WATER TWP.	4 MILLION TIRES
PORTAGE COUNTY	ALLIANCE RD.	3-4 MILLION TIRES
SUMMIT COUNTY	3565 CLARK MILL RD.	3 MILLION TIRES
CLARK COUNTY	OLD MILL RD.	1-2 MILLION TIRES
FAIRFIELD COUNTY	S. COLUMBUS ST., LANCASTER	1 MILLION TIRES
HAMILTON COUNTY	WHITEWATER TWP.	1 MILLION TIRES
WOOD COUNTY	CYGNET RD.	800,000 TIRES
MAHONING COUNTY	LIBERTY RD.	750,000 TIRES AND 750 TONS OF 3" SHREDS
MORROW COUNTY	COUNTY RD. 2.5	750,000 TIRES
TRUMBULL COUNTY	MAHAN PARKER RD.	500,000 TIRES
UNION COUNTY	WELLWOOD & LINGRELL RD.	500,000 TIRES
LAWRENCE COUNTY	STATE ROUTE 141	450,000 TIRES
AUGLAIZE COUNTY	GEYER RD.	300,000 TIRES
SUMMIT COUNTY	AKRON-CLEVELAND RD.	260,000 TIRES
WAYNE COUNTY	TOWNSHIP RD. 504	250,000 TIRES
MORROW COUNTY	U.S. 42	250,000 TIRES
WAYNE COUNTY	WEST SALEM	200,000 TIRES
WILLIAMS COUNTY	S.R. 20A, WEST UNITY	100,000 TIRES
GUERNSEY COUNTY	CHERRY HILL RD.	100,000 TIRES
TRUMBULL COUNTY	PERKIN JONES CT.	100,000 TIRES
HANCOCK COUNTY	FAIR ST.	50,000 TIRES
STARK COUNTY	CRESTLINE ST.	50,000 TIRES
MORROW COUNTY	C.R. 40	47,000 TIRES
MORROW COUNTY	COUNTY RD. 58	39,000 TIRES
MORROW COUNTY	COUNTY RD. 57	32,000 TIRES
AUGLAIZE COUNTY	ASHBURN RD..	30,000 TIRES

[Comment: This list is not a priority listing for state-financed abatement action. It is solely a listing of the largest accumulations reported to Ohio EPA by local health departments and solid waste management districts. This list includes both abandoned sites and currently operating scrap tire storage or recovery facilities.]

H.B. 592 requires the director of Ohio EPA to “establish a program for the proper separation and disposal of hazardous waste generated by households...” Hazardous wastes are often thought to be chemicals used and discarded solely by large industries. However, many common household products can also be hazardous. Household products can contain the same chemicals found in industrial wastes, and require proper use, storage and disposal to protect human health and the environment. Household hazardous waste (HHW) means any material discarded from the home that may, because of its chemical nature, pose a threat to human health or the environment when handled improperly. Most HHW is hazardous because it contains one or more of the following properties:

flammable:

can be easily set on fire or ignited

toxic/poisonous:

capable of causing injury or death through ingestion, inhalation, or absorption

corrosive/caustic:

can burn and destroy living tissues when brought in contact

explosive/reactive:

can detonate or explode through exposure to heat, sudden shock, or pressure

radioactive:

can damage or destroy cells and chromosomal material.

Categories of common household products that may contain, or be comprised of, hazardous constituents include household cleaners, automotive products, home maintenance and improvement products, lawn and garden products, and other miscellaneous products

such as batteries, photoprocessing chemicals and personal care products. According to Rathje, et al. (1988) in a report prepared for the United States Environmental Protection Agency (U.S. EPA), HHW comprises barely one percent by weight of the solid waste disposal stream. Although HHW can have many of the same properties as industrial hazardous waste, because of the low percentage of the waste stream generated from each source (i.e., household), it is specifically excluded from regulation as a hazardous waste according to the Code of Federal Regulations [40 CFR § 261.4(b)(1)] and the Ohio Administrative Code (OAC 3745-5 1-04). However, the additive effects of HHW can be just as harmful to the environment as the effects of a single discharge from an industrial generator.

Common methods for disposing of HHW are to include it with the trash, dump it down the drain or toilet, pour it down a storm sewer or dump it in the backyard. These types of disposal practices can pose a health risk to sanitation workers, and hazards to equipment and the environment. Studies document instances where refuse collectors were burned, experienced eye injuries, or became nauseated from handling HHW. Some municipal waste is still being disposed in older, unlined landfills where household hazardous waste can contribute to the toxicity of leachate generated and threaten groundwater supplies. Hazardous chemicals entering a municipal wastewater system can harm the system or personnel. The discharge from the treatment plant into surface waters may contain harmful levels of chemicals. Dumping of HHW onto the ground or into a storm sewer leads to direct contamination of the soil, ground water and surface water.

The following table lists some common household products, hazardous ingredients they may contain, and the potential health hazards.

Table VIII-1
HAZARDOUS HOUSEHOLD PRODUCTS*

Product Type	Possible Ingredient	Potential Hazards
Antifreeze	Ethylene glycol	Very toxic; three ounces can be fatal to adult; damage to cardiovascular system, blood, skin and kidneys
Batteries	Mercuric Oxide (in mercury batteries)	Ingestion may be fatal
	Sulfuric Acid (in car batteries)	Skin burns; single overexposure may lead to laryngeal or pulmonary edema (excess fluid in tissues)
Bleach	Sodium hydrochlorite	Corrosive; contact with other chemicals may cause chlorine fumes
Disinfectant	Ammonia	Vapor irritating to eyes, respiratory tract and skin; possible chronic damage
Dram Cleaner	Sodium or Potassium hydroxide (lye)	Caustic; poisonous if swallowed due to severe tissue damage
	Hydrochloric Acid	Corrosive: damage to kidney, liver and digestive system
Floor Cleaner/Wax	Petroleum Solvents	Highly Flammable; associated with skin and lung cancer
Gasoline	Petroleum hydrocarbons (benzene)	Highly flammable; associated with skin and lung cancer; irritant to skin, eyes, nose, throat, lungs; benzene is a carcinogen
Herbicides	Dipyridyl	Toxic; causes skin, eyes and throat irritations; causes lung, kidney and liver damage, death
	Nitrophenols	Highly toxic; readily absorbed via skin; interferes with oxygen transfer in cells
Motor Oil	Petroleum hydrocarbons (benzene)	Highly flammable; associated with skin and lung cancer; irritant to skin, eyes, nose, throat, lungs; benzene is a carcinogen
	Lead	Damage to digestive, genitourinary, neuromuscular and central nervous system; anemia and brain damage
Nail Polish and Remover	Acetone	Moderately toxic; flammable; may cause respiratory ailments

Table VIII-1 HAZARDOUS HOUSEHOLD PRODUCTS*		
Product Type	Possible Ingredient	Potential Hazards
Oven Cleaner	Sodium or potassium hydroxide (lye)	Caustic; poisonous if swallowed
Paint and Paint Thinners	Alcohols	Volatile and flammable; eye, nose and throat irritation
	Esters	Toxicity varies with product; causes eye, nose and throat irritation and anesthesia
	Chlorinated aromatic hydrocarbons	Flammable; may cause respiratory ailments
	Aromatic hydrocarbon thinners	Flammable; skin irritant; benzene is a carcinogen
	Mineral Spirits	Highly flammable; skin, eye, nose, throat, lung irritant; very high air concentrations may cause unconsciousness, death
Pesticides	Carbamates	Interferes with human nervous system
	Chlorinated hydrocarbons	Very slow biodegradation; accumulation in food chain and fatty tissues; attack nervous system; suspected carcinogens and mutagens
	Organophosphorus	Poison by interfering with the nervous system; can be toxic
Window Cleaners	Diethylene glycol	Toxic; causes central nervous system depression and degenerative lesions in liver and kidneys
Wood Strippers	Toluene	Flammable; skin irritation; narcotic properties; may damage liver, kidney, central nervous system
	Benzene	Flammable; carcinogen; accumulates in fat, bone marrow, liver tissue

*Adapted from: *Characterization of Household Hazardous Wastes and Other Special Wastes Contained in Ramsey and Washington Counties' Combined Municipal Waste Stream*, Pope-Reid Associates, Inc., 1988.

General Strategies for Handling Household Hazardous Waste

The following section lists several strategies available to solid waste management districts (SWMDs) for developing programs to manage HHW.

Education

Education regarding the dangers of improper use and disposal of products containing hazardous materials around the home is an essential aspect of HHW management. For example, the release of toxic fumes from such household products as paint removers, drain openers, and oven cleaners can cause indoor air pollution. Greater public awareness would

enable the consumer to make informed selections of products regarding their relative toxicity, the amount of product needed, and the product's ability to get the task done. Obviously, educational resources are critical to the success of HHW programs. Target audiences are school children (kindergarten through grade 12), adults, community leaders, and local government officials.

A variety of educational materials have been developed for the public that briefly describe the problems, suggest disposal methods, and identify alternate nonhazardous products. In addition, recycling and the complete use of existing stocks of household products is often encouraged. Almost every solid waste management district in the state has included education regarding the proper management of HHW as a part of its general solid waste management education and awareness efforts.

Information “Hotline” for HHW

An information hotline is an effective way to provide the public with timely, accurate information. In addition to SWMD offices, county cooperative extension offices are an alternate choice for handling this task since extension offices are already designed to answer questions on a variety of subjects. Other local agencies such as local health departments, county engineers, nonprofit groups, and litter prevention offices could also be candidates to operate the hotline. The agency or office selected should be highly visible and readily accessible to the public. A SWMD may also consider dedicating a phone line to answer questions regarding an upcoming HHW collection event. For example, the Solid Waste Authority of Central Ohio (SWACO) purchased a voice-mail line before holding its collection programs to handle the volume of calls requesting location and time information about collection events.

Ohio EPA has developed a manual to answer questions about HHW that was distributed to SWMDs in May 1994. This manual, called the *Household Hazardous Waste Telephone Advice Guidance Manual*, presents a detailed, step-by-step procedure designed to assist the caller and the person answering the phone in determining the degree of hazard posed by the product, suggesting proper disposal methods, and identifying nonhazardous substitutes. Each section identifies possible outlets for the specific material. Local communities should compile locations of local outlets such as used oil collection points, paint exchanges, and other exchanges for insertion into the manual. The manual also addresses issues of liability for the person staffing the phone and the sponsoring agency. The Minnesota Pollution Control Agency’s publication of the same name is the basis for the manual. Information in the manual is expected to be updated by Ohio EPA on an annual basis.

Peer Matching for Technical Assistance

To facilitate information exchange on HHW programs, Ohio EPA will be maintaining

updated information regarding collection and exchange programs held by various districts and communities in the state. This information will include data regarding costs, types of materials collected, pitfalls, successes, and contact persons for further information on administering a collection or exchange program. Such information should help SWMDs avoid liability and excessive costs. As a first step in this direction, a summary of HHW programs conducted by solid waste management districts in 1993 has been included in this chapter.

Exchange and Collection Programs

HHW is collected for the purposes of reusing, recycling, or diverting the hazardous material from solid waste landfills, incinerators, or other improper disposal. Collection of HHW can be accomplished by a variety of options ranging from single day multi-material events to permanent sites that collect one or a limited number of products or materials.

A limited number of products used in the home may be recycled or reused by another party. Exchange programs help the reuse of easily recycled materials such as paints. Some products used in the home that cannot be recycled or reused must be sent to disposal facilities. Local collection programs are therefore needed to manage these kinds of materials safely. When properly organized and operated, these programs generally transport a large quantity of materials to a licensed hazardous waste facility.

Sponsoring agencies of collection programs must carefully consider the issues of liability and cost. Potential sources of liability include:

- personal injuries suffered at the collection site;
- spills of HHW when transported from the collection site to a disposal site; and
- future remediation at the disposal site which received the HHW.

Hiring an experienced hazardous waste contractor to handle the waste, package it, and transport it to a licensed disposal site minimizes risks from the first two potential liabilities. In addition, contracts with hazardous waste companies can be written so that the company assumes most of the risk from these programs. According to the U.S. EPA, potential risk from future remediation at the hazardous waste disposal site through the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) is minimal due to the small portion of the total amount of wastes that HHW would comprise at a facility.

The SWMD must balance the possibility of incurring liability as a result of conducting a collection program with the liabilities it could assume while maintaining “status quo” or continuing to dispose of HHW in solid waste landfills. For instance, in 1987, 165 municipal solid waste facilities were included among the 850 sites on the National Priorities List (U.S. EPA, February 1990). Hazardous waste sites identified on the National Priorities List will require clean-up under Superfund. Municipalities that sent waste to these facilities are potentially liable for cleanup costs. HHW collection programs may reduce the risk that a solid waste landfill will face remediation in the future.

In reducing liability by hiring a hazardous waste contractor rather than conducting its own program, however, a sponsoring agency will be increasing the costs associated with the collection programs. Average figures for collection events can be about \$100 per participant. Costs and liability can be minimized by limiting the types of materials accepted at the collection event. In addition, costs can be reduced by writing requests for proposals emphasizing the recycling of materials favored over disposal. For example, latex paint can be recycled at a much reduced cost over bulking and disposing it in a hazardous waste facility.

Solid waste management districts may also consider establishing permanent collection sites. The benefits of permanent sites include the following:

- The collection of materials can be staggered over time to facilitate packing for disposal;

- A wider variety of materials can be collected;
- Materials can be stored until bulk quantities are accumulated for more cost-effective recycling or disposal; and
- The site can serve as a location for exchange programs.

The same concerns regarding liability and costs arise for a permanent site as for a single-day collection event. For example, only trained staff should handle materials brought to the site, and unattended drop-off of materials should be strongly discouraged.

Table VIII-2 summarizes the HHW collection events conducted by SWMDs in 1993. According to the annual district reports and other information submitted by SWMDs, 13 districts held some type of collection event. These ranged from full-scale collection days accepting all materials, to programs managed at existing facilities that accepted used oil and latex paint. In 1991, only five SWMDs held collection events. The SWMDs for Lake, Mahoning, Montgomery and Washington Counties all continued their programs from 1991 through 1993. For example, Mahoning County collected used oil and latex paint on an ongoing basis. In addition, the Solid Waste Authority of Central Ohio (Franklin County) held a collection event with four sites in 1991. The Solid Waste Authority did not conduct a program in 1993, but initiated a mobile unit program in 1994. The portable materials handling unit was at various sites in the county from April 1994 through October 1994 on the weekends. The Authority will continue this program in 1995 with fewer sites and weekends (based upon participation figures from 1994).

Material-Specific Collection and Exchange Programs

A variant of the permanent collection site is a program that only collects certain types of materials. A community may want to target

Table VIII-2 HHW Collection Events in Ohio in 1993

County Name	Number of Events	Percent of Population Served	Number of Cars	Cost	Total Tons Collected	Dollars Per Car	Pounds Per Car	Limits on Materials?
Lima (Allen Co.)	1	4	990	\$47,600	34.2	48	69	NO
Ashland	2	less than 1	45	outside funding				pesticide containers, used oil
Darke	1			outside funding	12.96			used oil
Delaware	1		394	\$45,352		115	216	NO
Pickaway (limited area)	1	7.2	60	\$9,414		157		NO
Washington	1		666					
Lake	2	about 1	1,800	\$151,690	82	84	91	NO
Mahoning	continuous							used oil, latex paint
Montgomery	1	1	1,646	\$20,000 + outside funding	118		143	NO
Portage	1	2	1,250	\$140,000	57	112	91	NO
Summit	1 (2 sites)		4,021	\$283,409	145.5	70	72	NO
Warren	1		500	\$52,636	24.04	105	96	NO

only certain materials in the waste stream for removal. The type of material selected would depend upon several factors, including:

- what materials contain the most hazardous constituents?
- what materials have hazardous effects on haulers, or sanitary sewer systems?
- what materials are brought to collection events in large quantities?
- what materials generate many questions to the hotline regarding disposal methods?
- what materials have no existing infrastructure for safe disposal?

Used Oil

According to the Automotive Information Council, each year do-it-yourselfers (DIYs) dump about 240 million gallons of used oil into the environment, or 20 times the amount of oil spilled by the tanker Exxon Valdez in Alaska.

An estimated 60 percent of the used oil generated by DIYs is poured on the ground or down a storm drain, buried in the backyard, or put in the trash with other garbage headed for the landfill.

Besides contaminating ground water and surface water, dumping used oil wastes energy. Used oil can be re-refined to produce high quality lubricants or processed to produce a fuel oil substitute. Many states have used oil recycling programs. To date, Ohio has not passed legislation establishing any such program on a statewide level. Solid waste management districts are encouraged to develop used oil programs as part of their household hazardous waste management programs. Used oil programs can involve the education of citizens regarding the proper disposal of used oil, and the development of databases and networks providing the public with lists of local service stations and garages accepting used oil.

In many solid waste management districts, oil change outlets, garages, and other full-

service stations collect used oil for recycling. Thus, a SWMD may only need to identify these establishments and advertise their presence to the public. SWMDs with transfer facilities or recycling facilities (such as Crawford County) establish used oil containers on the premises. Most HHW collection programs have been collecting used oil along with all the materials brought to the event. However, to reduce the program costs, the Solid Waste Authority of Central Ohio is encouraging citizens to take used oil to the existing facilities that accept this material, rather than bringing it to their mobile unit program.

Paint Collection and Exchange

Paints can constitute the single largest type of material brought to a collection event. According to the Waste Watch Center, a nonprofit organization based in Andover, MA, paint constitutes about half of the material brought to an HHW collection event. Paint falls into two categories: oil-based and latex paint. In addition to the HHW exemption, modern latex paint does not meet the federal definition of a hazardous waste because it does not contain a "listed hazardous waste," and it does not meet one of the four hazardous characteristics of reactivity, flammability, corrosivity and toxicity (*Post-Consumer Paint Management Manual*, National Paint and Coatings Association, 1993). However, some old formulations of latex paint may contain mercury or lead. Also, the liquid property of paint prevents its disposal in a solid waste facility unless it is solidified. Many haulers will pull a paint can from a customer's garbage and replace it on the curb to avoid disposing liquid waste.

Paint lends itself well to an exchange program as well as a collection program. Many schools, churches and theater groups will accept usable paint. In addition, there are several companies in Ohio that recycle paint. The National Paint and Coatings Association has published a manual outlining options available in waste paint management. The SWMD can also opt to hire a hazardous waste firm to conduct a collection day.

Pesticides

Pesticides can be either synthetic or natural materials that are designed to kill insects, fungi, weeds and rodents. Most pesticides are designed to last about two years within the container. However, many people keep old containers of pesticides in their garages or basements. Many pesticides can be managed through exchange or collection programs as long as proper management options are available for the cancelled or restricted pesticides, and other liability concerns are carefully addressed.

For example, some older pesticides may contain chemicals that are now on the U.S. EPA's Suspended, Cancelled and Restricted Pesticides list, such as DDT and Chlordane. Therefore, it may not be feasible under all circumstances to recommend that the pesticide be used up or given to someone who can use it. Additionally, the SWMD may require that citizens sign a waiver stating that the SWMD is not held liable if pesticides received at an exchange program are not properly used.

Currently, an infrastructure is not in place to handle cancelled and restricted pesticides. If a collection or exchange program does not handle pesticides, proper disposal in the trash must be emphasized, as opposed to pouring the pesticide down the drain or into an open body of water, dumping it on the ground, or burning it. Proper pesticide disposal in a solid waste landfill is preferable to open dumping of the material.

Household Batteries

Household batteries contain varying amounts of cadmium, lithium, manganese, mercury, nickel, silver, zinc and other metals. Mercuric oxide batteries contain the greatest amount of mercury as a percent of weight, and nickel-cadmium (ni-cad) batteries have the largest percent of cadmium. Mercuric oxide batteries are button batteries primarily found in hearing aids, watches and calculators. Ni-cad batteries are rechargeable batteries. They last about one-third as long as alkaline batteries, but can be recharged hundreds of times. Ni-

cads are found in appliances such as portable vacuums, hand tools, computers, video cameras and cordless phones. The mercury content of alkaline batteries (the most common type in use) is becoming less of a concern. Manufacturers are making commitments to eliminate the use of mercury in the manufacture of alkaline batteries.

To reduce the amount of mercury and cadmium being disposed in landfills or burned in incinerators or resource recovery facilities, SWMD efforts should focus on recycling programs for button and rechargeable batteries. Ohio EPA has a list of battery recyclers and disposal facilities on file. One possible type of collection program would involve a cooperative venture with local businesses. Companies would accept batteries from residents, and the solid waste management district would have oversight the final collection. In setting up such a program, the solid waste management district must be careful to ensure that commercial and industrial batteries are not included, to maintain the HHW exemption.

Governmental Responsibilities

Proper disposal of HHW is widely recognized as an important management objective for state and local governments. Management of HHW is most effective if it takes place at the local level, under the direction of solid waste management districts. At the state level, Ohio EPA may be most effective by developing resource materials and guidance documents, and maintaining contacts with the appropriate state agencies, businesses, and other parties interested in providing these resources.

State Responsibilities

Ohio EPA will provide guidance for managing HHW in the following areas:

- a bibliography of school curricula materials for kindergarten through grade 12;
- general information brochures and flyers for public awareness campaigns;

- a household hazardous waste hotline manual; and
- a guidance document for and technical assistance in setting up exchange and collection programs.

Ohio EPA is currently compiling bibliographies of educational materials and curricula. For example, The California Department of Toxic Substances Control publishes an anthology called "The No-Waste Anthology: A Teacher's Guide to Environmental Activities K- 12," and an annotated bibliography of education materials entitled "Tools for the Environmental Teacher." These and other reference materials are available for use by solid waste management districts in establishing HHW curricula and educational programs. Ohio EPA is also in the process of preparing or has completed fact sheets for the following HHW issues:

- lead-acid batteries;
- automotive servicing waste;
- pesticides;
- used oil;
- photographic wastes; and
- paint.

The HHW telephone advice guidance manual will be updated on an annual basis. The target date for each update will be May-June of each year. A guidance document for permanent collection events is targeted to be completed in June of 1996, and will also be updated as any statutory or regulatory changes occur.

Local Responsibilities

The 1995 state solid waste management plan allows and encourages SWMDs to credit HHW that is reduced or recycled toward the solid waste reduction and recycling goal. Previously, the recycling of materials such as paints, used oil and other liquid HHW were not

counted toward the reduction goals because these materials are not solid waste as defined by Ohio law. However, diversion of these materials from the solid waste stream is one method of achieving the goals established by H.B. 592 of protecting the environment and reducing our reliance on landfilling.

SWMDs are required to include a set of strategies for the proper management of HHW in their solid waste management plan. Local conditions can vary substantially regarding the types, quantities, risks, and management opportunities for such wastes. Therefore, in order to select the proper strategies, the SWMD should assess the HHW waste stream and existing management infrastructure. Additionally, the effectiveness of the strategies selected needs to be evaluated for the plan updates. An assessment and evaluation could include the following steps:

- identification of the types of HHW in the local waste stream;
- assessment of the risks posed by disposal of HHW;
- identification of the household hazardous wastes that the SWMD will target for management activities;
- identification of the existing management opportunities and the planned new activities to manage specific HHW;
- an inventory of the existing management opportunities in the SWMD for used oil, fuels, appliances and batteries; and
- measurement of the effectiveness of the programs selected.

The first element of such a program is the evaluation of the materials in the residential waste stream that have the potential for causing harm to human health and the environment. The district plan should include an assessment of the hazardous constituents of the residential waste stream. There are several sources of information that may be used for such an assessment:

- National data;
- Tracking log of phone calls received from citizens regarding various types of HHW materials;
- Survey of haulers and solid waste facilities regarding any accidents occurring as a result of collecting HHW with the household garbage;
- Information from wastewater treatment plants and city maintenance departments;
- Complaints to local health departments or Ohio EPA district offices regarding the improper disposal of HHW;
- Reports from hospitals and poison control centers regarding accidents resulting from the improper use or disposal of HHW;
- Information from local retail merchants' associations regarding what is selling in the community; and
- Sort of residential waste collected.

The second element of such a program would be to analyze the data collected in step one and evaluate which materials need to be targeted for separation and disposal. The following sources of information could be used to make this determination:

- Characterization of the SWMD HHW waste stream (from above sources of information);
- Inventory of the facilities that can potentially be adversely affected by the handling of HHW (e.g., incinerator, resource recovery facility, transfer station, Materials Recovery Facility, sanitary sewer system, wastewater treatment plant); and,
- Inventory of natural resources that can potentially be adversely affected by the improper disposal of HHW (e.g., lakes, streams, ground water resources, parks, tourist attractions).

The information regarding the facilities and natural resources would then be used in combination with the waste stream characterization to select specific materials the SWMD will target when selecting the strategies for HHW management. For example, if a SWMD has a resource recovery facility, and has found that button batteries are being disposed in the garbage, then this material could be targeted for a collection program to reduce mercury emissions at the facility.

The third element of the program should include an assessment of existing and needed infrastructure for the proper management of HHW. This includes an inventory of existing facilities and businesses that handle various types of materials. In addition, the district plan needs to incorporate strategies for the materials targeted in the second step of the program. The SWMD can select from the following set of strategies for the proper management of HHW:

- Educational programs • Programs for both children in kindergarten through grade 12 and adults should be given a high priority at the local level. Various existing civic groups might be target audiences for presentations, and the SWMD could identify locations for placement of HHW brochures, used oil brochures, and other materials. For planning purposes, the SWMD should consider estimating the number of people to be reached and the delivery method used.
- Telephone hotline • The SWMD should consider selecting an agency or office to handle HHW telephone calls. Methods of publicizing the hotline need to be explored. The information gained from the telephone hotline can be used to evaluate the success of the HHW program. For example, the SWMD may find that in a given month, 40 calls are received regarding the proper method for disposing of used oil. This may be an indication that further education and outreach is necessary to inform the public regarding disposal locations.
- Exchange and collection programs • While collection programs and exchange projects are important options for SWMDs, their

priority should be based on the magnitude of the problem and funding availability. To assist in documenting the implementation of HHW programs, the SWMD should compile data on all collection and exchange programs, and make a written report available to the public and Ohio EPA.

The report should include:

- costs of the program;
 - participation rates and eligibility;
 - type and quantity of materials brought to the collection site;
 - how liability issues were handled; and
 - a brief description of the planning process used for the event.
- Single-material programs • These programs are similar to exchange or collection programs, except that a specific material is targeted. Based on the results of the waste stream analysis and infrastructure inventory described above, the SWMD must evaluate whether single-material programs are required for any type of hazardous material generated by households. For example, the SWMD may negotiate an arrangement with local businesses and a button battery recycler to collect and recycle batteries. Or, based on telephone calls received at the hotline, the SWMD may decide to initiate a paint collection and exchange program for spring and autumn.

The SWMD can select any combination of the above strategies, (or alternate strategies) that include the elements of the program outlined above. That is, the SWMD can tailor its HHW program in any fashion that includes a demonstration of the types and quantities of HHW in the residential waste stream, the materials targeted for separation and proper disposal, and the availability of a system to ensure proper disposal.

The final element of the program is a measurement of the effectiveness of the program. Thus, the SWMD must outline in the plan which parameters will be measured and evaluated for the SWMD's plan update to

evaluate the effectiveness of the strategies selected. These parameters may include the sources of information used in making the initial assessment of the waste stream. Finally, the SWMD needs to maintain records of all aspects of HHW management for inclusion in the plan updates and the district annual reports to Ohio EPA. Education projects should record numbers of attendees at meetings and the issues discussed. Staff members handling telephone hotlines should track the number of calls received and types of questions asked. Data should be recorded on the amount of used oil collected, and some effort should be made to determine the factors contributing to a successful collection site. The number of batteries collected and the prices received should be recorded. Information gathered from collection days (listed above) needs to be compiled. This type of information is vital for the SWMD to document efforts made to reduce household hazardous waste generation and disposal.

Chapter IX

"Recycled Paper Shortages..... may deter deinking investments"

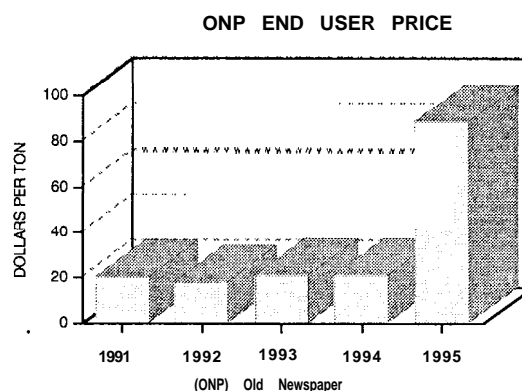
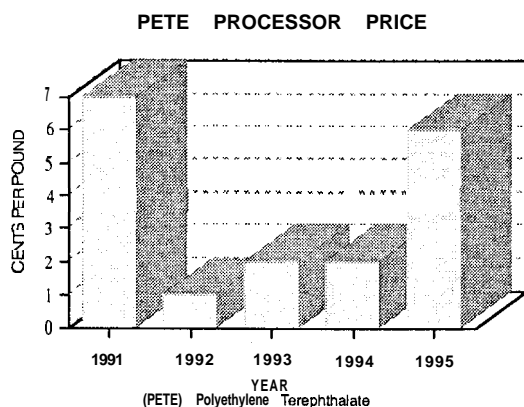
Resource Recovery Report, January 1995

"Clearly the problem is on the collection side. Every ounce of plastic being collected now has a ready market - and at very competitive prices. - Bedell",

Recycling Times, February 21, 1995

Recycling market development means "...the activities that stimulate the demand **for** recycled products, provide a consistent supply **of** recyclables to meet the needs of recycling industries, or both..."

(Section 1502.01 of the Ohio Revised Code)



As can be seen from the above quotes and charts, many markets for recycled goods have changed significantly since the first State Solid Waste Management Plan (State Plan) was drafted in 1989. Today, demand for many of the recyclables commonly collected by Ohio's community recycling programs are strong. End users of many recyclables such as newspapers, office papers, cardboard, plastic soda and detergent containers, etc., are having some difficulty getting adequate supplies of recycled feedstock for their operations. As such, significant movement is being made to increase collection of many of the recyclable materials and less effort is being focused on improving the demand for these materials. The following pages in this chapter detail the tremendous recycling market development activity that has been initiated to help improve Ohio recycling markets. The chapter concludes with recommendations and objectives for state government as well as local solid waste management districts (SWMDs) to implement in order to improve recycling markets.

Market Development Activities Since 1989

The initial State Plan listed four major recommendations for recyclables market development at the State level. This section discusses each of those objectives and presents information regarding all the various programs which have been undertaken by Ohio's State government, and/or participated in by State government. The actual language for each objective from the initial State Plan is shown in italics.

1989 State Plan - Objective A

The State should legislatively establish a program within the Department of Development to develop markets for recycled goods. The program should focus on industries using recycled goods. This program should include a legislatively developed low-interest loan program for market development, and for research and development of recycled goods and markets.

Activities Implemented that have Contributed to the Accomplishment of Objective A:

• **H.B. 345 • Recycling Market**

Development Plan: Sub. House Bill 345, effective July 1994, creates the framework needed to develop and expand markets for recycling in Ohio. A key component of this legislation was the development of the **Ohio Recycling Market Development Plan**. This initial plan, along with biennial plans to follow, will serve as Ohio's blueprint for building future recycling market opportunities. Some of the highlights of Sub H.B. 345 are as follows:

The creation of a five member Interagency Recycling Market Development Workgroup (IAWG) consisting of representatives from the Ohio Departments of Natural Resources, Development, Environmental Protection, Administrative Services and Transportation.

The development of the biennial Recycling Market Development Plan which will address: types of recyclables receiving assistance, assessments of financial and technical assistance available from the State and recommendations for statutory changes if appropriate.

The creation of technology or product specific task forces to provide industry input and recommendations to the IAWG.

- **Recycled Plastic Drain Pipe Project:** In 1992, the Ohio Departments of Natural Resources (ODNR) and Transportation (ODOT), the University of Toledo and the U.S. EPA cooperated in a research project on "Utilizing Recycled Plastics in Pipe Applications".

- **Pollution Prevention Loan Program:** In 1994, Governor Voinovich announced the creation of the \$10 million pollution prevention loan program. The program, a joint effort of the Ohio Department of Development and Ohio EPA, will provide

low interest capital improvement loans for the construction and/or purchase of equipment to complete pollution prevention activities at small and medium sized facilities throughout Ohio. Pollution prevention activities include the use of environmentally sound recycling in order to reduce risk to public health, safety, welfare, and the environment.

- **Recycling Economic Advocate Project:** In 1994, the Ohio Department of Development in cooperation with the Ohio Department of Natural Resources, applied for and received a grant from the United States Environmental Protection Agency for hiring a Recycling Economic Development Advocate (REDA). The REDA is working to assist manufacturers and businesses in increasing their use of recycled feedstock and increasing recycling related job opportunities within Ohio.
- **Plastic Pallet/Plastic Lumber Research:** The Division of Recycling and Litter Prevention at ODNR contracted in 1994 with Battelle Research Laboratories Inc., in Columbus, for two research initiatives aimed at improving the markets for recycled plastics. The first project involved the research and testing of recycled plastic pallets. The second involved the research and testing necessary for developing American Society for Testing and Materials (ASTM) standards for mass production of "recycled plastic lumber."

1989 State Plan • Objective B

The buying of recycled-content products will be promoted in the State of Ohio.

Activities Implemented that have Contributed to the Accomplishment of Objective B:

- **ODNR Pilot "Recycled Product" Projects:** ODNR's Division of Recycling and Litter Prevention sponsors projects using recycled-content products. These

projects accomplish two objectives: first, pilot projects help the division assess the cost, performance, maintenance requirements and various construction characteristics of a recycled product; and second, through demonstration projects, Ohioans become more aware of the success and benefits of using recycled-content products. A list of the pilot projects through 1994 can be found at the end of this chapter.

- **Recycled Newsprint Agreement:** In 1992 The State of Ohio and Ohio's newspaper industry signed a Voluntary Newsprint Recycling Agreement. The purpose of this agreement was to increase the use of recycled newsprint by Ohio newspaper publishers. The goal for recycled fiber use by Ohio newspapers is 11 percent in 1993, 23 percent in 1996, 31 percent in 1998 and 40 percent in 2000.
- **Recycled Products Guide Distribution:** During July 1992 through June 1993, ODNR mailed all Ohio counties, solid waste management districts and cities with populations exceeding 25,000 the national *Recycled Products Guide* to assist them in purchasing recycled content products.
- **H.B. 2.5 • Recycled Product Purchasing Preference:** In 1993 H.B. 25 was passed by the Ohio General Assembly. This bill required the director of the Department of Administrative Services (DAS) to adopt guidelines for purchasing equipment, materials and supplies containing recycled materials and authorized entities within State government to purchase products containing recycled materials. The bill also required an annual report on the value and type of recycled products purchased by the State. In 1995, the Department of Natural Resources produced the first "*Recycled Products Purchased by the State of Ohio*" annual report. Said report identified that approximately 53 agencies purchased an estimated \$8.8 million worth of recycled-content products.
- **Ohio Recycled Product Vendors Guide:** In 1993, ODNR produced and distributed its first *Directory of Ohio Vendors of Recycled Products*. A second edition was prepared and distributed in 1995.
- **Local Government Grants for Recycled Product Procurement:** In 1993, ODNR granted monies to local communities for the first time for the purchase and evaluation of recycled content products. In 1993 and 1994, 67 Ohio communities received approximately \$935,000 to purchase various recycled content products for use in their communities.
- **ODNR/DAS Buy Recycled Partnership:** During July 1993 through June 1994, the Division of Recycling and Litter Prevention at ODNR lent its technical expertise and its marketing and procurement unit manager to the Ohio Department of Administrative Services' Division of Office Services to assist in researching and increasing recycled content products available under State contracts. A few of the beneficial results of this partnership were as follows: over 80 separate product listings on eight different state contracts were identified and promoted to state purchasing officials (list found at end of this chapter), business cards on recycled paper were made available to state employees and the Ohio Department of Transportation printed its 1994 road map on recycled paper.
- **Great Lakes States Recycled Copy Paper Bid:** In late 1991, the DAS's Division of Office Services became active in the Great Lakes Recycle Project sponsored by the Council of Great Lakes Governors. A seven-state cooperative bid was awarded for 30 million pounds of copy paper. Ohio contracted for Hammermill Saving DP paper. Other provisions of the recycle agreement committed the seven states to cooperatively explore the purchase of re-refined oil and retread tires.
- **Appalachian Tri-State Cooperative Purchasing Council:** On December 11, 1992, purchasing representatives from the states of Ohio, Kentucky, and West Virginia met in Maysville, Kentucky to discuss the possibility of a joint procurement of re-refined motor oil. As a result of that meeting, the Appalachian Tri-State

Cooperative Purchasing Council was created with the express purpose to...“establish a multi-state cooperative bid for re-refined motor oil...” In 1993, a joint bid for 189,850 gallons of re-refined oil and 66,000 pounds of other re-refined lubricants was conducted. Currently, each state has products on contract as a result of this multi-state effort.

- **DAS Town Meetings:** In 1994, DAS conducted six town meetings in various regions of Ohio. The purpose of these meetings was to bring government closer to the people of those areas. An average of 35 citizens attended each meeting. The Division of Recycling and Litter Prevention presented a program on recycled products to help stimulate interest in “closing the loop.” This has become a part of DAS’s public education program on recycled product procurement.
- **1994 Buy Ohio Conference:** In 1993, DAS sponsored a successful Buy Ohio Conference in Columbus. The 1994 trade show featured approximately 35 Ohio vendors and manufacturers of recycled products. Approximately 1,000 individuals attended the conference representing business, industry, government and the public.
- **The National Association of State Purchasing Officials (NASPO):** Many of the NASPO member states have become interested in multi-state cooperative purchases to help achieve greater economies. This interest has been combined, on many occasions, with a growing awareness of recycled product purchasing. In addition to multi-state cooperative purchasing of recycled products, NASPO has also developed a Database of Recycled Commodities (DRC) and Bulletin Board System (BBS) at its Lexington, Kentucky headquarters. The Ohio Office of State Purchasing was instrumental in establishing the DRC and BBS. In the time that the DRC has been operational, reported procurement of recycled content commodities has risen from 5,000 contract entries to 6,872.
- **Ohio Buy Recycled Business Alliance:** The Ohio Buy Recycled Business Alliance, a state affiliate of the National Buy Recycled Business Alliance was formed in 1995. The goal of the Ohio Buy Recycled Business Alliance is to document and increase businesses’ purchase and use of recycled- content products.

1989 State Plan - Objective C

Efforts will be directed to promote expansion of existing industries and attract industries to Ohio that will use recycled materials.

Activities implemented that contribute to the accomplishment of Objective C:

- **Newsprint Deinking Mill Feasibility Study:** In 1993 the Ohio Department of Development, the Ohio Department of Natural Resources and Manistique Paper Inc., funded and conducted a comprehensive study on the feasibility of locating a newsprint de-inking and manufacturing mill in Ohio.
- **Senate Bill (S.B.) 165 - Scrap Tire Recycling Bill:** In 1993, S.B. 165, a scrap tire recycling bill was passed by the Ohio General assembly. This legislation regulates scrap tire collection, storage and recovery, and levies a fee on the first sale of tires. Fees will be utilized for tire pile cleanup and a low-interest loan program for tire recycling research and development.
- **Recycling Market Development Grant Program:** In 1994, the Ohio Department of Natural Resources’ Division of Recycling and Litter Prevention initiated its Recycling Market Development Grant Program. The grant program’s initial focus was on assisting Ohio manufacturers in increasing their use of recyclable materials generated in Ohio. In the first two grant cycles, 11 businesses have been awarded almost \$ 1 million to help improve the markets for old newsprint, container glass, HDPE and PETE plastics.

The following is a brief summary of those projects:

Cuyahoga Solid Waste Management District

Participating Business:
Packaging Corporation of America
 Award:
\$137,457

Grant funding used to purchase a baler that enables an additional 30,000 tons per year of newsprint to be processed. The processed newsprint will be used by a local mill to produce new paperboard packaging material.

Erie Solid Waste Management District

Participating Business:
Form Pac, Inc.
 Award:
\$34,776

Funds will be used to conduct applied research, in cooperation with a local manufacturer, in the manufacturing of spark plug holders. These holders, which are used during the plugs' manufacturing process, are currently made of PVC. Research to determine the use of recycled #1 (PET) plastic in place of virgin material will be conducted with the grant funds.

Ottawa/Sandusky/Seneca Joint Solid Waste Management District

Participating Business:
Green Earth Containers
 Award:
\$100,000

Grant money will purchase molds and welding equipment for a manufacturer producing refuse dumpsters made with recycled colored #2 (HDPE) plastic.

Southeastern Joint Solid Waste Management District

(Guernsey, Monroe, Morgan, Muskingum, Noble and Washington counties)
 Participating Business:
Ensley Corporation
 Award 1:
\$14,950
 Award 2:
\$91,250

Round 1 grant funding will improve the shipping capabilities of a glass processing facility by supporting construction of a railhead to ship Ohio's green and amber glass to expanded, distant markets. Round 2

funding will assist in the purchase and installation of optical ceramic sortation equipment.

Summit/Akron Solid Waste Management District

Participating Business:
The Plastic Lumber Company
 Award:
\$150,000

Funding will increase manufacturing capacity and expand the consumption of Ohio sources of recycled #2 (HDPE) plastics to manufacture and fabricate plastic lumber products.

Ashtabula County Solid Waste Management District

Participating Business:
Covered Bridge Organics
 Award:
\$20,000

Funding will increase manufacturing capacity and expand the production of a composting bin made from post-consumer recycled HDPE feedstocks.

Auglaize County Solid Waste Management District

Participating Business:
Plastics Recycling Company
 Award:
\$120,000

Funding for equipment to increase use of post-consumer HDPE in their HDPE pellet manufacturing operation.

Defiance/Fulton/Paulding/Williams County Solid Waste District

Participating Business:
Van Wert Plastics
 Award:
\$125,000

Funding for a new blow molding machine to assist in the manufacture of recycled plastic drain pipe fittings.

Lorain County Solid Waste District

Participating Business:
Trio Products Inc.
 Award:
\$125,000

Funding for a new extruder to be used in the manufacture of PETE sheet from 100% post-consumer flake.

Wood County Solid Waste District

Participating Business:
PETE Processors Inc.
 Award:
\$62,100

Funding to purchase PVC and metal detection equipment, to allow the company to accept post-consumer, custom, PETE containers as feedstock.

1989 State Plan • Objective D

The State of Ohio will actively pursue the development of “regional” markets for products containing recycled materials.

Activities implemented that contribute to the accomplishment of Objective D:

- **Great Lakes Recycle Agreement:** In 1992 Governor George Voinovich signed Executive Order 92-174V which officially implemented the Great Lakes Recycle Agreement in Ohio and ordered state departments and agencies to take steps to begin using recycled copy paper and re-refined motor oil.
- **Great Lakes States Recycled Copy Paper Bid:** Also, as a result of the Great Lakes Recycling Agreement, Ohio participated in a multi-state purchase of recycled copy paper. This joint purchase of approximately 30 million pounds of recycled copy paper saved the tax payers of the Great Lakes states approximately \$500,000.
- **MACRO Prospectus on Recycled Materials:** In 1993 ODNr participated with the Mid American Council of Recycling Officials (MACRO) in developing and distributing a Regional Recyclable Material Prospectus for 14 Mid-American states. The prospectus identified the current and projected supply and demand for various recyclables. It was developed to assist MACRO states with their market development strategies and initiatives.

Local Projects Implemented To Promote Markets for Recyclables

In addition to the market development initiatives undertaken by the State, several SWMDs have initiated local projects to promote the use of recyclables and the use of recycled-content products. The following is a list of some of those projects:

Solid Waste Authority of Central Ohio (SWACO)

SWACO, in conjunction with the Governor's Office, is involved in an effort to get a paper mill, which will process newspaper and other types of paper for recycling, to locate in central Ohio.

Lucas County SWMD and the Ottawa/Sandusky/Seneca Joint SWMD

The Lucas County SWMD had consultants prepare a background report entitled, “Comprehensive Source Reduction, Recycling and Market Development Action Plan for Economic Development.” This report, completed in 1993, provides information on Lucas County and 11 other Ohio counties in northwest Ohio in addition to two counties in Michigan having contiguous borders with Lucas County.

Mahoning County SWMD

Several projects have been initiated by the district that are designed to promote greater recycling and greater use of recycled-content materials. For example, the district has funded the construction of a building at the county fairgrounds demonstrating the use of recycled materials in both the structural and nonstructural portions of the building.

Coshocton/Fairfield/Licking/Perry SWMD

A grants program was established by the district to encourage businesses to implement recycling market development initiatives.

Cuyahoga County SWMD

In cooperation with communities in Cuyahoga County, a market of newsprint and magazines will be sent to a paper mill in northeast Ohio. In 1991, 27 communities in the county signed a letter of intent to contract with the SWMD to market all their newspapers and magazines to Packaging Corporation of America for five years.

Ashtabula County SWMD

As a project using old newspapers as animal bedding, the district will: subsidize the location of mobile and/or stationary drop-off programs and transportation of newspapers throughout the county, and will purchase

or lease on-site shredders to agricultural operators that want to use newspaper for bedding.

Recommendations for Future Recycling Market Development In Ohio

As with all commodities, recyclable material markets will continue to fluctuate based on supply and demand. With continued input from Ohio business and industry, local governments, solid waste management professionals and their organizations, and the biennial Recycling Market Development Plan, the State will attempt to mold its recycling and solid waste management assistance (financial and technical) in a manner that will provide a balanced recycling collection and recycling market infrastructure. It is anticipated that Ohio will continue its course of working voluntarily with Ohio businesses and local governments to increase and improve the collection, processing, marketing and procurement of recyclable goods.

Recommendations for the State

The following recommendations should be undertaken by the State of Ohio to promote market development for recyclables:

- All state government departments and offices should be encouraged to participate in an advisory capacity to the Interagency Workgroup (IAWG) for Market Development created under H.B. 345. Within this context, all State agencies and offices should be required to develop and implement a recycling market development plan which will promote the demand and supply of recycled materials directly, and indirectly through work with agency customers.
- The IAWG and the associated task forces should continue to explore strategies for expanding the demand and supply of recyclable materials for the materials identified in Ohio's Recycling Market Development Plan.
- The IAWG and the associated task forces should explore the feasibility of adopting a voluntary plastic recycled-content agreement similar in nature to the Voluntary Newspaper Recycling Agreement.
- The new program to electronically trade recycled glass, PETE, and HDPE plastics on the Chicago Board of Trade (CBOT) should be monitored and promoted if demonstrated to increase/improve recycling markets in Ohio.
- The Department of Administrative Services (DAS) should continue to integrate the "Buy Recycled" option within the local government cooperative purchasing events being conducted around Ohio.
- DAS should review and evaluate the new "recycled product procurement" guidelines issued from the U.S. Environmental Protection Agency (U.S. EPA). If appropriate, DAS should adopt similar regulations that encourage the purchase of these products by State agencies.
- The Ohio Department of Natural Resources and the Interagency Workgroup for Recycling Market Development should strive to implement all feasible recommendations made by the material-specific task forces set up by the Workgroup.
- DAS and the State Architect should research the feasibility and use of recycled-content products in the construction and/or renovation of State-owned and leased buildings.
- ODNR and DAS should work with organizations such as the Building Industry Association, U.S. Department of Agriculture, the National Homebuilders Association, and associations representing engineers and architects to plan and conduct a statewide seminar/conference on the use of recycled-content materials in the building trades industry.
- Private sector construction projects receiving State funds should consider the use of recycled content building materials.

- The Ohio Department of Development (ODOD) should continue to incorporate a “Buy recycled” component into its annual “Buy Ohio” conference.
- ODNR should evaluate the feasibility of expanding the Ohio Recycling Information Communication System (ORICS) to include more information on what recycled-content products are being purchased, by whom, and who is selling them.
- ODNR should increase recycled-content product procurement/use information to organizations such as the County Commissioners Association of Ohio, the Ohio Township Association, and the Ohio Municipal League by offering to submit articles for their monthly newsletters and to participate in seminars and conferences.
- ODNR should establish a toll free recycled-content product “hotline” to improve awareness and access to information regarding procurement of recycled-content products.
- ODNR should continue its efforts in establishing and expanding the Ohio Buy Recycled Business Alliance in an effort to increase private business purchase of recycled-content products.
- examining the composition of the local waste composition. By examining waste composition, the SWMD may discover the presence of a large, potentially recyclable waste stream. The SWMD may use this information to help find a market for the material, or determine whether to focus on improving the demand for recycled-content products, or the supply of recyclables for end-users.
- conducting a market development feasibility study. Lucas County has taken this approach in conjunction with surrounding counties in Ohio and Michigan. Their study included an assessment of materials generated in the waste stream, potential markets for those materials, and an analysis of economic development initiatives which might improve markets for recyclables and recycled-content products.
- establishing a local database of information on where recycled products can be purchased.
- encouraging the participation of local businesses in the Ohio Buy Recycled Business Alliance.
- Utilizing information from efforts such as these described above to design a strategy appropriate to local conditions. A strategy could include one or more of the following programs:

Recommendations for SWMDs

SWMDs should develop a strategy for promoting recyclables market development locally. This strategy should identify the status of markets for materials in the district, and identify strategies for improving “weak” markets, if feasible. The strategy may focus on increasing/maintaining the demand or the supply for recyclables, or both. Suggestions for developing a SWMD strategy may include:

- ascertaining the level of knowledge in the SWMD regarding how to obtain recycled-content products. Districts could achieve this objective by surveying a random number of businesses and local government entities.
- a. implementing pilot projects that demonstrate the use of a recycled-content product (examples are provided earlier in the chapter);
- b. providing limited financial incentives for local governments to use recycled-content products (See box to the right);
- c. coordinating waste exchanges;
- d. coordinating cooperative buying and marketing programs for local entities (also, encouraging local governments to become a part of the State’s recycled products purchasing program);

- e. seeking out businesses in the district that could improve markets for hard to market materials and assist them in applying for ODNR market development grants;
- f. providing technical assistance to local governments and local businesses wishing to use recycled-content materials, or find markets for their recyclables; and
- g. providing education to the public, local governments, and businesses through seminars, presentations to local organizations and associations, news releases, and a SWMD newsletter on options available for market development.

The Darke County Solid Waste Management District "...plans to initiate a grant program during 1995 to provide grants to local governments and public agencies and institutions to subsidize the purchase of recycled-content products. The program is designed to encourage the recipients to actively search for, purchase, and evaluate recycled-content products that they might not ordinarily buy. The subsidy may be particularly helpful in assisting recipients to purchase products that may be more durable and have a longer useful life than the virgin equivalent, but which are initially more expensive, for example, recycled-content plastic wood products which replace natural wood products.

The grant program is designed to change purchasing behaviors. The decision regarding how long to continue the program and the level of funding will depend on interest in the program and the degree to which the program stimulates permanent non-subsidized change as evaluated from participant reports..."

Draft Darke County Solid Waste
Management Plan Update, April 1995

Table IX- 1
Sample of ODNR Pilot Projects Utilizing Recycled Content Products

Recycled-Content Product	Community	Division Partner	Date
Amphitheater Seating (board)	Loudonville	ODNR - Mohican State Park	9/93
Bench (park style)	Bexley	Office of the Governor	10/93
	County Seats	County Commissioners/governments	92-94
Boardwalk (plastic lumber)	Columbus	ODNR - Fountain Square Offices	5/93
	Kent	ODNR - Division of Natural Areas and Preserves	9/93
Boundary Marker	Beaver Creek	ODNR - Beaver Creek Wetland State Wildlife Area	94/95
Carpet	Loudonville	ODNR - Mohican State Park	9/93
	Waynesville	ODNR - Caesar Creek State Park	5/94
Dock Decking (marine)	Dellroy	Muskingum Watershed District	?
Dock Bumper Pads	Lake Milton	ODNR Engineering	1992
Erosion Control	London	ODNR - Division of Soil and Water	9/93
Floor Tile	Waynesville	ODNR - Caesar Creek State Park	5/94
Laminate Signage (plastic)	Lima	Johnny Appleseed Metro Park District	5/94
	Cincinnati	Hamilton County Park District	
Laminate Signage (plastic)	Toledo	Metropolitan Park District of Toledo	5/94
	Dayton	Dayton-Montgomery County Park District	
	Akron	MetroParks, Serving Summit County	
Picnic Table	college communities	24 Ohio Technical Colleges	1994
	200 recipients	Include School and Non-profit Organizations	1992
Playground Equipment	Loudonville	ODNR - Mohican State Park	9/93
Playground Surface	Coldwater	Coldwater School District	6/94
Recycling Receptacles/Bins	Loudonville	ODNR - Mohican State Park	9/93
Rest Room Partition	Loudonville	ODNR - Mohican State Park	2/94
Retaining Wall	Hillsboro	ODNR - Rocky Fork State Park	8/94
"Road" Sign	Recycling Rest Areas	Ohio Department of Transportation	94/95
Roof Shingle	Logan	ODNR - Hocking Hills State Park	9/94
Sign Material (outdoor)	Perrysville	ODNR - Mohican Memorial State Forest	5/93
Tree (seedling) Shelter	Jewett	ODNR - Harrison State Forest	7/93
Work Space Tile (pool area)	Loudonville	ODNR - Mohican State Park	2/94

Table IX -2
Recycled Commodities Available on DAS Contracts

As of 10/20/94

Plastic Trash Can Liners

Air Filters (Heating, Ventilation and Air Conditioning)

Office Supplies

- Index cards
 - ruled
 - unruled
- Binders, Data Proc.
- Binders, Report
- Note pad refills
- File pockets
- Expanding Wallet
- Folders
 - Manila, letter & legal size
 - Folders classification, letter size
 - Folders classification, 2 part, letter
- Indexes, for binders
- Adding machine tape
- Pads ruled
- Pencils #2, #2-1/2
- Waste baskets, metal, round
- Memo pads
- Memo pads, fax
- Note books, steno
- Moistener, pencil type
 - file guides 5" x 8", 25 part
 - 3 ring
 - burst

Paper Cut Size - Business Papers and Related Items

- Dual purpose bond, No. 4 - 20#
- White
- Colors

Envelopes, Plain Including Recycled

- No. 6 -3/4 - 24# white wove regular
- No. 10- 24# white wove regular
- No. 11-24# white wove regular

Paper Products and Disposable Food Service Products

- Shipping bags, regular padded
- Napkins
- Wipers, windshield
- Tissue, bleached

Oils, Lubricants

Recycled paper

- Xerographic copy paper, white, Hammermill Savings DP



The State Solid Waste Management Advisory Council was created by law in 1988 to advise and assist the director of Ohio EPA with preparation of the State Solid Waste Management Plan. Members are appointed for two-year terms, to represent specific interests on the Council.

Deane Allen is a Township Trustee for Sylvania Township in Lucas County. Mrs. Allen represents townships and is appointed for a term that ends June 23, 1996.

Madonna Allread, of Centerville, is a community volunteer. She has been a member of the Aullwood Audubon Center and Farm for six years and is currently president of the board. She has served as president of the board of Miami Valley Earth Central, as president of the Quail Run Garden Club, and as community vice President of the Junior League of Dayton. She has been involved in developing a hands-on solid waste exhibit for the Children's Museum of Dayton and other projects involving solid waste education. She holds a bachelor's degree in elementary education and a master's degree in reading supervision. Ms. Allread represents the public and was appointed for a term that ended June 23, 1995.

William Ervin Ball, R.S., of Cuyahoga Falls, is deputy director of environmental health at the Cuyahoga County District Board of Health. He brings 18 years of experience in implementation of state solid waste and environmental health programs to the Council. A registered sanitarian, Erv serves as chairman of the Solid Waste Technical Committee of the Ohio Environmental Health Association. He is appointed for a term ending June 23, 1996. Mr. Ball represents the interests of health districts.

Sally Beals is a member of the Centerville City Council. Mrs. Beals represents municipalities and was appointed for a term that ended June 23, 1995.

Tom Davis represents Donald Anderson, director of the Ohio Department of Natural Resources. Mr. Davis is the administrator for technical assistance at the Division of Recycling and Litter Prevention at the Ohio Department of Natural Resources.

Phillip D. DeVore represents Donald Jakeway, director of the Ohio Department of Development. Mr. DeVore is an environmental affairs coordinator for the Ohio Department of Development.

Joseph E. Haines, of Xenia, is state representative of the 74th House District, consisting of Madison and part of Clark and Greene Counties. He is chairman of the House Agriculture and Natural Resources Committee and serves on various other House and special committees. A former Greene County Commissioner, he graduated from The Ohio State University with a degree in rural economics and farm management. He represents the Ohio House of Representatives.

Wayne P. Handley (Secretary) has served as chief financial officer of Rumpke Consolidated Companies, Inc. since 1984 and was promoted to vice president • finance, chief financial officer, treasurer in 1995. Wayne has a master's of business administration in accounting and is a public accountant in Ohio. He is an active member of several public and fraternal organizations, including being treasurer of The Cincinnati Temple of Shriners. Mr. Handley represents the interests of the private solid waste management industry. He is appointed for a term ending June 23, 1996.

David L. Kidder is a business development manager for Browning Ferris Industries, Inc. (BFI) in northern Ohio. Mr. Kidder represents the interests of the private recycling industry. He was appointed for a term that ended June 23, 1995.

Christopher D. Knopf is a member of the Sierra Club. Mr. Knopf represents statewide environmental advocacy organizations. He was appointed to a term that ends June 23, 1996.

W. Reed Madden is a commissioner for Greene County. Mr. Madden represents counties and is appointed to a term that ends June 23, 1996.

Gary Murcer is an administrator in the environmental department at Honda of America Manufacturing, Inc. He is a member of the Ohio Manufacturer's Association Environment Committee and is chairman of the Solid Waste Subcommittee. He represents industrial generators of solid waste and was appointed for a term that expired on June 23, 1995.

Phillip F. Palumbo is the executive director of the Stark, Tuscarawas and Wayne Counties Solid Waste Management District. Mr. Palumbo represents joint-county solid waste management districts and is appointed to a term that ends June 23, 1996.

Donald A. Reese, a lifelong Allen County resident and Allen County Commissioner since 1985, has a history of service both as a U.S. Army veteran and as a three-term member of the Allen East Local Schools. An accounting graduate of Bowling Green State University, Don is president of the Ohio Automatic Merchandising Association (OAMA). He and Carolyn are the proud parents of four children and ten grandchildren. Mr. Reese represents the interests of counties and was appointed for a term that ended on June 23, 1995.

James Stratton is the director of the Mahoning County Solid Waste Management District. Mr. Stratton represents single county solid waste management districts and was appointed to a term that ended June 23, 1995.

Gary C. Suhadolnik, of Parma Heights, has been the State Senator of the 24th Senate District since 1980. He is chairman of the Senate Energy, Natural Resources and Environment Committee and vice-chairman of the Joint Committee on Agency Rule Review. He also serves as a member of the Senate Health Committee, the Senate Finance Committee, and the Senate Financial Institutions, Insurance and Commerce Committee. He received his bachelor of industrial engineering degree in 1973 and his master's of business administration degree in 1995 from Cleveland State University. He represents the Ohio Senate.

Carolyn Watkins (Chairman) represents Ohio EPA Director Donald Schregardus on the Council. Since 1991, she has overseen the implementation of Ohio's State Solid Waste Management Plan and review of local district solid waste management plans. She also coordinates legislative analysis on issues affecting Ohio's solid waste regulatory program. In 1993 she assumed responsibility for a new regulatory program governing scrap tires facilities and transporters, and cleanup of tire dumpsites. Prior to joining Ohio EPA, Ms.

Watkins served on the Environmental Studies and Government faculties at Oberlin College and the University of New Hampshire, and as research director for the Ohio Environmental Council.

Richard (Dick) Williams is completing his 13th year as a trustee of New Russia Township, Lorain County. He is also a director of the Ohio Township Association (OTA). He is the township representative on the Lorain County Solid Waste Management Policy Committee and serves on a number of boards and commissions. A graduate of Fenn College Technical Institute, he was appointed a township representative to the Advisory Council in 1990 and has served five consecutive years. Mr. Williams represents townships and was appointed for a term that ended June 23, 1995.

Appendix B

Amenability of Products and Materials in MSW to Alternative Management

Materials	Percent of Generation (1993)	Alternative Management Method		
		Materials Recovery, Recycling	Composting	Refuse Derived Fuel Incineration
Highly Amenable #				
Less Amenable *				
Least Amenable -				
Durable Goods				
Major Appliances	1.7	#	-	-
Furniture and Furnishings	3.4	*	-	*
Carpets and Rugs	1	*	-	*
Rubber Tires	1.6	*	-	#
Batteries, lead acid	0.8	#	-	-
Miscellaneous Durables	6.6	-	-	-
Nondurable Goods:				
Newspapers	6.3	#	#	#
Books	0.5	*	*	#
Magazines	1.2	*	*	#
Office Papers	3.4	#	*	#
Telephone Books	0.4	*	*	#
Third Class Mail	1.9	*	*	#
Other Commercial Printing	2.6	*	*	#
Tissue Paper and Towels	1.5	-	*	*
Paper Plates and Cups	0.4	-	*	*
Plastic Plates and Cups	0.2	-	-	-
Trash Bags	0.4	-	-	*
Disposable Diapers	1.3	-	*	*
Other Nonpackaging Paper	2.3	*	*	#
Clothing and Footwear	2.1	*	-	#
Towels, Sheets and Pillowcases	0.3	*	-	#
Other Miscellaneous Nondurables	1.7	-	-	-
Glass Packaging:				
Beer and Soft Drink Bottles	2.6	#	-	-
Wine and Liquor Bottles	0.9	#	-	-
Food and Other Bottles and Jars	2.4	#	-	-
Steel Packaging:				
Food and Drink Cans	1.3	#	-	-
Other Steel Packaging	0.1	*		

Appendix B (continued)
Amenability of Products and Materials in MSW to
Alternative Management

Materials	Percent of Generation (1993)	Alternative Management Method		
		Materials Recovery, Recycling	Composting	Refuse DerivedFuel/ Incineration
Aluminum Packaging: Beer and Soft Drink and Other Cans	0.8	#	-	-
Foil and Closures	0.2	*	-	-
Paper and Paperboard Packaging: Corrugated Boxes	12.7	#	#	#
Milk Cartons	0.2	-	*	*
Folding Cartons	2.4	*	*	#
Other Paperboard packaging	0.1	*	*	#
Bags and Sacks	1.1	*	*	#
Other Paper Packaging	0.5	*	*	#
Plastic Packaging: Soft Drink Bottles	0.3	#	-	#
Milk Bottles	0.3	#	-	#
Other Containers	0.9	*	-	#
Bags and Sacks	0.5	*	-	#
Wraps	0.9	*		#
Other Plastic Packaging	1.1	-	-	#
Wood Packaging:	4.6	#	#	#
Other Miscellaneous Packaging	0.1	-	-	-
Food Wastes	6.7	-	*	-
Yard Trimmings	15.9	-	#	*

Appendix B (continued)

Amenability of Products and Materials in MSW to Alternative Management

		Alternative Management Method		
Materials	Percent of Generation (1993)	Materials Recovery, Recycling	Composting	Refuse Derived Fuel/ Incineration
Miscellaneous Inorganic Wastes:	I *1.5			
Total MSW	99.70			
Percent Highly Amenable (#) to:		38%	39%	48%
Percent Less Amenable (*) to:		24%	26%	31%
Percent Least Amenable to:		38%	35%	21%
<p>The sum of the percentages for individual components do not equal 100 due to rounding.</p> <p>Definitions:</p> <p>1 Materials Recovery: Highly Amenable (#): A product or material in the waste stream is considered to be highly amenable to materials recovery if markets and recovery mechanisms are in existence and common. Less Amenable (*): A product or material for which markets and recovery methods exist but are less common than for materials considered highly amenable. Least Amenable (-): A product or material for which markets and recovery methods are rare or nonexistent.</p> <p>2 Composting: Highly Amenable: Products or materials considered to be highly amenable to composting include only source separated yard wastes and other source-separated materials that may be used as bulking agents at a Class II, III or IV composting facility in Ohio. Less Amenable: A product or material is considered to be less amenable to composting if it may be composted to produce a usable compost product or for volume reduction, at a Class I composting facility. Least Amenable: Products and materials that are not readily reducible by composting.</p> <p>3 Refuse Derived Fuel/ Incineration Highly Amenable: Products and materials that offer the highest fuel value and are most easily separated from the waste stream. Less Amenable: A product or material is considered to be less amenable to use as a refuse derived fuel if it has a lower fuel value or may require a greater level of processing or effort to separate from other wastes. Least Amenable: Products and materials that have the lowest values as fuels.</p> <p>Sources: The above categorization of municipal solid waste for the purposes of alternative management was made by Ohio EPA staff using the definitions described above and the following sources: <u>Characterization of Municipal Solid Waste in the United States, 1994 Update</u>, Franklin Associates, for US EPA, 1994. <u>The Role of Recycling in Integrated Solid Waste Management to the Year 2000</u>, Franklin Associates for Keep America Beautiful, September 1994. <u>Curbing Waste in a Throwaway World, Report of the Task Force on Solid Waste Management</u>, National Governor's Association, 1990.</p>				

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State of Ohio Environmental Protection Agency

Review of the 1995 State Solid Waste Management Plan

June 10, 1998

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Introduction

In accordance with the requirements of House Bill 592, which became law in 1988, Ohio adopted its first state solid waste management plan in 1989. This plan established a state-wide recycling goal, which solid waste management districts (SWMDs) were required to achieve through programs described in their solid waste management plans. Beginning with the first local solid waste plan approved in 1991, SWMDs implemented programs and activities which moved the districts closer to achieving the goals in the *1989 State Solid Waste Management Plan (1989 State Plan)*.

As required by the Ohio Revised Code (ORC), the Ohio Environmental Protection Agency (Ohio EPA) and the Solid Waste Management Advisory Council (SWAC) reviewed Ohio's progress towards meeting the goals in the *1989 State Plan* during 1992 and 1993.¹ The review of progress towards state plan implementation is designed to examine all the goals and strategies established in the state plan in the context of current solid waste management practices in Ohio. If it is determined that the state plan goals and strategies have not been effective or responsive to the solid waste management needs of the state, or need some adjustment, then Ohio EPA and SWAC are directed to revise the state plan. This initial review, which is contained in the *1993 Progress Report to the 1989 State Solid Waste Management Plan*, concluded that some problems existed in meeting the *1989 State Plan* goals, but a revision of the state plan was not warranted.

After a preliminary review of the progress of state plan implementation in late 1994, SWAC determined that the *1989 State Solid Waste Management Plan* should be revised. Using the findings of the *1993 Progress Report* and new data gathered from SWMDs during 1994, new goals and strategies were developed for the *1995 State Solid Waste Management Plan (1995 State Plan)*. The *1995 State Plan* was adopted in August 1995.

This document is the first three-year review of progress towards implementing the *1995 State Plan*. As in 1993, Ohio EPA and SWAC have determined that a revision of the state plan is not necessary at this time, since sufficient time has not passed to adequately evaluate the progress made in implementing the *1995 State Plan*. This document is a result of the review, and should be considered a companion document to the *1995 State Plan*. (In fact, the remainder of the chapters in this document mirror chapters in the *1995 State Plan*.) This document is intended to provide an update on the progress made towards implementing the state plan, and to report on the status of commitments that were made by Ohio EPA in the *1995 State Plan*, but is not intended to provide the in-depth background information or level of detail contained in that document. Readers interested in a more comprehensive description

¹The Ohio Revised Code Section 3734.50 states that "...triennially the director, with the advice of the advisory council, shall conduct a thorough review of the progress made toward achieving the goals set forth in divisions (A) to (H) of this section. Based upon the findings of this review, the director, in accordance with the procedures of this section, may prepare and adopt a revised state solid waste management plan..."

of solid waste management in Ohio and more detailed analysis of the issues, history, and regulatory programs should refer to the *1995 State Solid Waste Management Plan*.

The remainder of this chapter includes a brief discussion of the following subjects:

- changes in waste generation, reduction/recycling, disposal capacity, and imports and exports of solid waste;
- the current status of district solid waste management plan revisions, or updates;
- a summary of the overall progress in meeting the *1995 State Plan* goals;
- a new initiative that SWAC is undertaking to explore barriers to implementing the *1995 State Plan*.

Changes in Solid Waste Management Since the Adoption of the 1995 State Plan²

Waste Generation

When the *1995 State Plan* was prepared, the most recent year for which waste generation was available was 1993. In 1993, total waste generation was estimated at more than 22.6 million tons, or 11.3 pounds per person day. Municipal solid waste (MSW) generation for 1993 was approximately 11.4 million tons (slightly more than 50 percent of the total), which translates to 5.7 pounds per person per day. By 1996, total waste generation had increased substantially to more than 33 million tons, or 16.41 pounds per person per day. The industrial waste generation increased from 11.2 million tons in 1993 to 20.7 million tons in 1996, which resulted in the very large increase in the total amount generated. A large portion of the industrial waste increase, 2.4 million tons, can be attributed to waste received at the AEP Gavin residual solid waste facility, which became operational in 1995 and accepts air-pollution control wastes from a coal-fired power plant. The MSW generation also increased from 1993 to 1996, but by a much smaller amount (approximately one million tons).

Changes in Management Practices

Two notable changes in solid waste management practices have occurred since adoption of the *1995 State Plan*. First, the two remaining large, publicly-owned incinerators ceased operation in 1997. Although incineration of municipal solid waste has never been a major method of management statewide (representing about seven percent of the waste stream in 1993), the closing of these facilities directly affects the management of waste from the communities which relied on them. A second change, mentioned above, is increased industrial solid waste production at coal combustion power plants as a result of stricter emission control regulations.

²For more detailed information on solid waste generation, disposal, reduction and recycling in Ohio, readers are encouraged to refer to the *Ohio Solid Waste Facility Data Report*, and the *Summary of Solid Waste Management in Ohio: Recycling, Reduction, Incineration & Disposal*. Both documents are produced annually by Ohio EPA, Division of Solid and Infectious Waste Management.

Reduction/Recycling

In 1993, the statewide reduction/recycling rate was estimated at 33 percent, while the rates for the MSW and industrial sectors were approximately 20 percent and 46 percent, respectively. These rates were calculated based upon the methodology in *1989 State Plan*.³ For 1996, the reduction/recycling rates were calculated based upon the *1995 State Plan*, and the overall reduction/recycling rate had increased to 42 percent. The MSW reduction/recycling rate increased slightly from 1993 to 1996 (21 percent in 1996), while the industrial rate jumped to 55 percent. The inclusion of yard waste recycling in the 1996 MSW reduction/recycling rate has resulted in only a small increase from the 1993 rate. It is likely that the amount of yard waste recycling included for 1996 is largely offset by the decrease in incineration from 1993 to 1996.

Disposal Capacity

When the *1995 State Plan* was prepared, the most recent data available for disposal capacity was 1994. By the end of 1994, Ohio had 57 publicly-available landfills operating with total gross airspace at these facilities estimated at 240 million cubic yards. The remaining life for Ohio landfills was estimated to be 11 years. As of the end of 1996, the number of publicly-available landfills had decreased to 53, but the total landfill capacity had increased to almost 398 million cubic yards of gross airspace. In terms of remaining life, Ohio had over 18 years of landfill capacity in 1996 at current disposal rates. Ohio's shift from small, local landfills to large, regional facilities is continuing based upon the comparison of 1994 and 1996 data.

Imports and Exports of Solid Waste

The imports of solid waste from other states into Ohio landfills has steadily declined over the past seven years. Since 1994 when imports were approximately 1.5 million tons, imports decreased to 1.1 million tons in 1996. However, the amount of waste imported from counties contiguous to Ohio's border also decreased, from 24 percent of the total in 1994 to 19 percent in 1996. This percentage decrease suggests that a greater proportion of imports are being transported longer distances to be disposed in Ohio landfills. It is interesting to note that while the percentage coming from *counties* adjacent to Ohio declined, the amount coming from the *states* adjacent to Ohio, as a percentage of total imports, has increased since 1994, from 51% in 1994 to 58% in 1996.

While imports to Ohio landfills are decreasing, Ohio exports of solid waste to landfills in adjacent states has been steadily increasing. However, it is likely that at least a portion of the increase in reported numbers is due to more accurate data collection and better access to data in neighboring states. Ohio exports were estimated at 509,000 tons in 1994 and 902,000 tons in 1996, or four percent of the total landfilled amount of Ohio-generated waste in 1996. The

³The *1989 State Plan* did not allow recycled yard waste or industrial waste recycled through programs that were initiated prior to 1985 to be included in the calculation of the reduction/recycling rate. The *1995 State Plan* changed these requirements and allowed both of these materials to be included when calculating the reduction/recycling rate.

majority of Ohio exports were sent to Michigan and Kentucky landfills, while the majority of imports originate from New York and Pennsylvania.

The vast majority of Ohio-generated waste continues to be disposed in-state (96% in 1996). Of this in-state disposal, 66% is disposed within the SWMD where it was generated.

Status of Solid Waste Plan Updates

The ORC requires SWMDs to update their approved solid waste management plan every three years.⁴ By October 1995, all 52 SWMDs were operating under an initial, approved (or ordered) solid waste management plan. The following references to solid waste management plan status in this section are current up to March 15, 1998. Thirty-nine SWMDs have submitted a draft plan update to their initial solid waste management plan. Eleven of these plans were prepared under the requirements of the *1995 State Plan*. (See Chapter III for further discussion of the plans prepared in accordance with the *1995 State Plan*.) Of those 39 SWMDs, twenty-one have also submitted a ratified plan update which has subsequently been approved by Ohio EPA. During the remainder of 1998, twelve more SWMDs are expected to submit draft plan updates to their initial solid waste management plans.

Summary of State Plan Progress

The chapters which follow in this report provide details regarding the progress which has been made to implement the goals and strategies established in each chapter of the *1995 State Plan*. The current status of each of these strategies or commitments, and goals, and the efforts which have been made towards implementation are discussed. In general, this review concludes that considerable progress has been made in some areas (e.g. regulation and cleanup of scrap tires), while very limited achievements have been realized in other areas such as developing a methodology to measure the effects of source reduction efforts. The assessment of progress to implement goals and/or the appropriateness of goals cannot be conclusively determined in some instances due to a lack of data. In such cases, a longer period of implementation is needed for these goals in order to make a determination related to their progress or appropriateness.

Exploring Barriers to Implementation

In addition to providing input during the review of the *1995 State Plan*, during 1997 SWAC began to investigate barriers to successful implementation of the *1995 State Plan*. Thus far, SWAC has organized subcommittees to explore two possible barriers to successful plan implementation:

⁴SWMDs with approved plans having a planning period of 15 years or more must update their approved plan at least every five years.

< Costs and Economic Incentives — This subcommittee's mission is to identify the current barriers to state plan implementation which are related to program costs, realized or perceived, and develop a list of economic incentives which will further promote the reduction, recycling and reuse of solid waste in Ohio.

< Achievability of State Recycling Goals — This subcommittee's mission is to examine whether the current state percentage recycling goals are realistically achievable for some SWMDs, or the state as a whole, despite "good faith" efforts on the part of the districts to reach the goals.

These subcommittees will evaluate the degree to which these issues constitute barriers for successful implementation of the *1995 State Plan* and explore possible solutions for minimizing or eliminating the barriers. In addition to the above two issues, SWAC has developed a working list of 20 other possible barriers, some of which they will explore in detail in the future. It is anticipated that the findings of current and future subcommittees will be valuable components of future revisions to the state plan.

Goals for Solid Waste Reduction, Recycling, Reuse and Minimization for the Year 2000

Paragraphs (A) and (B) of Section 3734.50 of the Ohio Revised Code requires the State Solid Waste Management Plan to "Reduce reliance on the use of landfills for management of solid wastes" and "Establish objectives for solid waste reduction, recycling, reuse, and minimization and a schedule for implementing those objectives".

The *1995 State Plan* contains several goals and strategies which were established to address the portion of the ORC quoted above. Seven goals were established in the *1995 State Plan* that SWMDs are required to address in their solid waste management plans. In addition, several commitments for Ohio EPA were included within the discussion of the SWMD goals, designed to facilitate implementation of these goals. Eight additional strategies directed towards state agencies in Ohio including Ohio EPA and the Ohio Department of Natural Resources (ODNR) were also included.

A discussion of SWMDs' progress in meeting each of their seven goals is presented below. Within the discussion of Goal #1 and Goal #2 is also an update regarding the commitments for Ohio EPA associated with facilitating implementation of the SWMD goals. The last section of this chapter discusses the eight state-level strategies directed towards Ohio EPA and ODNR. The goals and strategies established in the *1995 State Plan* are shown below in italics.

Goals for SWMDs

Goal #1: Program Standards for SWMDs to ensure the availability of reduction, recycling, and minimization alternatives for municipal solid waste.

One of the intents of the *1995 State Plan* was to offer SWMDs an option of meeting a goal focused on the provision of management strategies for residential/commercial solid waste that are alternatives to landfilling (e.g. recycling drop-offs, curbside recycling, etc.) instead of achieving a numerical recycling goal. In addition, it was anticipated that Goal #1 would result in an emphasis on: (1) program implementation and providing access to recycling opportunities; and (2) indirectly reducing the resources devoted to data collection, as SWMDs choosing to meet Goal #1 may be less likely to conduct an industrial survey when preparing a plan update.

As of March 15, 1998, eleven SWMDs have submitted amended plans to Ohio EPA under the *1995 State Plan*. Of these, ten have chosen to meet Goal #1 of the *1995 State Plan* and one has chosen to meet the numerical recycling goals in Goal #2. Nine of the plans that have been submitted were draft and two were ratified plans that have been approved by Ohio EPA. By the end of 1998, Ohio EPA anticipates six of the nine SWMDs that have submitted draft

plans under the *1995 State Plan* goals will have an approved ratified plan in place. We also anticipate an additional twelve draft plans will be submitted to Ohio EPA for review and comment in 1998.

In reviewing the ten plans that have been submitted under Goal #1, we have identified 90 new recycling drop-offs and 7 new non-subscription curbside recycling programs that will come on line by the year 2000. These drop-offs and curbside recycling programs appear to be a result of the new access standards that require the SWMDs to ensure that 90% of the residents of a SWMD have access to recycling opportunities. These new recycling opportunities will provide 414,696 people with access to recycling that would most likely not have had access under the *1989 State Plan's* 25 percent recycling goal. From this information, the preliminary data suggests that the *1995 State Plan* has been successful in moving SWMDs away from an emphasis on a numerical recycling goal and toward ensuring that recycling opportunities are available to their residents.

Limited information is available to determine if the *1995 State Plan* has been successful in reducing the time and costs devoted to data collection. However, all ten plans that have been submitted under Goal #1 have also conducted an industrial survey for their plan updates.

A few SWMDs preparing amended plans under Goal #1 have identified a potential problem in meeting the requirements by the year 2000. For example, a SWMD preparing a draft plan update in 1998 may not receive approval of its ratified plan update until 1999. Assuming that the district does not yet meet Goal #1 when the plan is approved, it may have less than one year to implement new programs in order to meet the goal by the year 2000. Having less than one year to achieve compliance with the goal may not be realistic for some SWMDs. This potential problem also exists with regard to Goal #2.

Ohio EPA Commitment Related to Goal #1:

Ohio EPA will develop access and participation standards for SWMDs. These standards will be submitted to SWAC for approval.

Ohio EPA, with the advice and participation of ODNR's Division of Recycling and Litter Prevention (DRLP), SWMDs, and other interested parties, developed access and participation standards for SWMDs. These standards were approved by SWAC at a meeting on January 10, 1996. SWMDs must demonstrate compliance with these standards in order to meet Goal #1.

Goal #2: Reduce and/or recycle at least 50 percent of the total generation of solid waste statewide by the year 2000.

This goal is determined by adding the amounts of residential/commercial and industrial waste reduced and recycled by all SWMDs in Ohio. Based upon the most recent information available, Ohio achieved an overall reduction/recycling rate of 42 percent in 1996. This was the first year that the reduction/recycling rate has been calculated based upon the requirements in the *1995 State Plan*. As a result, the reduction/recycling amounts for 1996 include yard waste recycled and industrial waste which was recycled prior to 1985.

Goal #2, Objective #1: 25 percent MSW Objective for SWMDs - Reduce, recycle, or minimize 25 percent of the generation of municipal solid wastes by the year 2000.

Ohio achieved a statewide reduction/recycling rate of 20.4 percent in 1996 for MSW, or the residential/commercial sector. Eleven SWMDs reported reduction/recycling rates over 25 percent for the residential/commercial sector in 1996, while eight SWMDs had reduction/recycling rates between 20 and 25 percent. Twenty-one SWMDs reported reduction/recycling rates between 10 and 20 percent, and the remainder had rates below 10 percent. (See the *1997 Summary of Solid Waste Management in Ohio* for a more detailed discussion of individual reduction/recycling rates for SWMDs.)

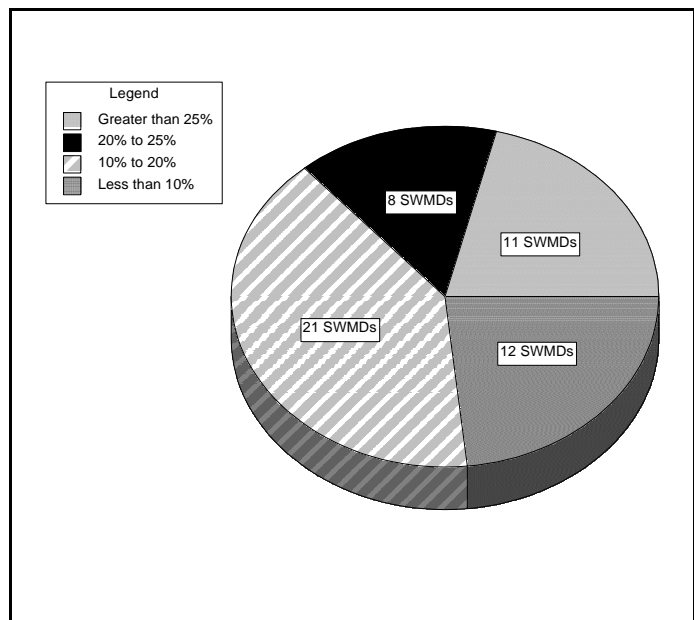


Figure 3-1. Residential/Commercial Reduction/Recycling Rates for 1996

Goal #2, Objective #2: 50 percent industrial goal for SWMDs - Reduce or recycle 50 percent of the generation of industrial solid wastes by the year 2000.

SWMDs in Ohio reported a total of 11.3 million tons of industrial reduction/recycling for 1996, or 54.6 percent of industrial generation. Individually, 44 of the 52 SWMDs reported reduction/recycling rates greater than 50 percent in 1996. In addition, four districts had reduction/recycling rates between 35 and 50 percent, while the remainder reported rates less than 35 percent.

Ohio EPA Commitment Related to Goal #2:

Ohio EPA will revise the District Solid Waste Management Plan Format (Format). Since the calculation of recycling percentages will no longer use the "pre-1985 industrial recycling policy," the revised Format will include a list of materials which cannot be credited towards the industrial waste reduction and recycling goal.

Ohio EPA, with the advice and participation of ODNR, SWMDs, and other interested parties, developed and distributed to SWMDs an updated version (3.0) of the *Format* that incorporated the new goals of the *1995 State Plan* in the Spring of 1996. To replace the pre-1985 industrial recycling policy, the *Format* prohibits the following waste streams from being classified as solid wastes:

- ☐ train boxcars;
- ☐ metals from demolition activities; and

⌄ ferrous metals resulting from salvage operations conducted by licensed motor vehicle salvage dealers.

Goal #3: Provide informational and technical assistance on source reduction.

SWMDs are required to incorporate strategies into their plan to address source reduction. However, limited data is available from SWMDs regarding the success of technical assistance efforts to promote source reduction. Difficulty measuring source reduction continues to be a major impediment towards evaluating success. Many SWMDs provide some type of assistance specifically to business and/or industry for purposes of waste reduction or pollution prevention. During 1996, at least eighteen SWMDs offered direct technical assistance to business and industry, including waste stream assessments directed at waste reduction or recycling and educational seminars for district businesses. For the residential sector, some SWMDs have promoted a version of a program called "Don't Bag It", which encourages residents to leave grass clippings on the lawn instead of collecting them.

Goal #4: Provide informational and technical assistance on recycling, reuse, and composting opportunities.

All SWMDs have some type of general education and awareness program to encourage waste reduction/recycling, provide information regarding preparation of materials for recycling, and provide up-to-date lists of recycling opportunities and composting sites within the SWMD. General education programs normally focus on the residential sector primarily. Most SWMDs have prepared printed material for distribution to district residents as part of their educational effort. Two examples of informational and technical assistance provided by SWMDs are shown below:

⌄ The Clark County SWMD conducted an educational campaign in 1996 to encourage residents to use pay-as-you-throw (PAYT) garbage collection programs⁵, and provided technical assistance to haulers for implementing PAYT programs. The educational campaign included six billboard advertisements, radio ads, distribution of informational brochures, and articles in one of the SWMD's newsletters.

⌄ In 1996, a total of 11,205 tons of yard waste were collected and recycled at the Hamilton County SWMD's four yard waste recycling drop-off sites. In addition to providing the yard waste recycling drop-off sites, the SWMD enhanced its existing backyard composting and "Just Mow It" programs through the development of a handbook on managing yard waste.

⁵Residents or businesses receiving Pay-As-You-Throw (PAYT) garbage collection are charged based upon the amount of garbage set out for collection, usually measured by the number of bags or cans. PAYT collection systems are designed to decrease the generation of waste, and increase the amount of recycling.

Goal #5: Strategies for scrap tires and household hazardous wastes.

SWMD plans must contain strategies for managing scrap tires and household hazardous waste (HHW). In most cases, these strategies consist of educational efforts designed to inform residents how to properly handle these materials. In addition to education, at least nineteen SWMDs held scrap tire collection events in 1996 or cleaned up abandoned or illegal scrap tire piles. Forty-seven of the 52 SWMDs reported conducting some type of program for the management of HHW in 1996. In general, SWMDs provided telephone assistance, conducted presentations, prepared fact sheets and directories of drop-off sites, prepared videos, and hosted HHW collection events.

Goal #6: Annual reporting of plan implementation.

Each SWMD is required to submit an annual report to Ohio EPA which documents the progress made towards the *1995 State Plan* goals and provides estimates of the amount of reduction and recycling taking place within the district. Annual reports must also include information concerning the on-going activities and programs of the SWMD which have been undertaken to fulfill the requirements of the SWMD's implementation schedule contained within their approved solid waste management plan. All but two of the 52 SWMDs submitted an annual report for calendar year 1996.

Goal #7: Market development strategy.

Even though this is an optional goal, many SWMDs include market development strategies in their solid waste management plans. In 1996, approximately nine SWMDs reported conducting market development activities ranging from encouraging the use of recycled-content materials within their district to assisting local recyclables processors in finding markets for their materials. (See Chapter VIII for more discussion regarding market development activities of SWMDs.)

Ohio EPA Commitment Related to Goals #1 through #7:

Ohio EPA will incorporate access and participation standards, along with the other goals of the 1995 State Plan into rules.

Access and participation standards were incorporated into rule 3745-27-90 of the Ohio Administrative Code (OAC). This rule, which became effective on August 1, 1996, requires all SWMDs that were scheduled to begin preparation of their amended plan in August 1996 or later to use Version 3.0 of the *District Solid Waste Management Plan Format*.

State Strategies:

Strategy #1: Ohio EPA will continue to develop a data and information base on the current levels of waste reduction and recycling to serve as a reference to future planning programs.

To address this strategy, in 1996 Ohio EPA began compiling waste reduction and recycling data and publishing it annually in the *Summary of Solid Waste Management in Ohio: Recycling, Reduction, Incineration, & Disposal*.

Strategy #2: ODNR and Ohio EPA will continue to provide technical assistance to SWMDs and local governments to plan and implement waste reduction and recycling programs and pollution prevention. Assistance may be given through trained technical staff, manuals and guidebooks, resource centers, workshops and seminars, bibliographies and directories.

ODNR's DRLP has conducted 4 program assistance workshops, two in 1996 and two in 1997. The workshops were designed to help local program managers with everything from writing and designing promotional materials to implementing pay-as-you-throw programs.

The DRLP participated in two national "buy recycled" awareness campaigns. Television and radio spots as well as video and print materials were provided by the National Recycling Coalition and the Environmental Defense Fund and distributed through DRLP's program managers.

In state fiscal year (SFY) 1996, the DRLP coordinated the workshop, *Recycling in Local Communities: Current Options and Initiatives*, and held it at three Ohio locations. The workshop audience was comprised of local county commissioners, city council members, township trustees, service directors, SWMD coordinators and local program managers.

In SFY 1997, the DRLP, Ohio EPA and the Buckeye Chapter of the Solid Waste Association of North America (SWANA) planned and conducted three *Rural Community Solid Waste Management Workshops* to address issues of concern to SWMDs, legislators, county commissioners and township officials.

In SFY 1997, the DRLP partnered with Ohio EPA, SWANA, U.S. EPA and several Ohio SWMDs to conduct a workshop titled *Getting More for Less: Cost-Cutting Strategies for Collecting Solid Waste and Recyclables*. This workshop featured real-life experiences of solid waste and recycling managers who successfully changed their municipal solid waste management and recyclables collection systems, improved service and cut costs.

In March 1998, SWANA, ODNR, and Ohio EPA coordinated efforts once again to develop and submit a grant proposal to U.S. EPA for holding at least four educational seminars and two focus groups in the fall of 1998 and spring of 1999 to promote the implementation of pay-as-you-throw garbage collection systems in Ohio. U.S. EPA has selected Ohio's proposal to receive funding.

Until it was replaced with their web page on the Internet, the DRLP maintained an electronic bulletin board (ORICS) which provided a variety of recycling and market development information in full text search and downloading capabilities.

The DRLP established a website which provides recycling, waste reduction, recycling market development and litter prevention information. This information can be downloaded and includes fact sheets, recycling program lists and the latest in recycling and litter prevention news.

Ohio EPA also established a website in 1995 which has information on each program area at the Agency. In addition, the Solid Waste Division's area of the website includes listings of facilities, reports, fact sheets and guidance documents which are available, solid waste regulations, and information on upcoming conferences and training. The website is located at:

<http://www.epa.ohio.gov/dsiwm/dsimain.html>

The DRLP operates a FaxBack system in which anyone can access fact sheets, brochures, and publications offered by the division. A toll free number was established for the convenience of the customers.

The DRLP published a variety of technical reference documents on recycling including: *The Secondary Markets List*; *Ohio's Recycling Opportunities Open to the Public*; *Let Recycling Work for your Business*; *InfoCycle: A Guide for Recycling Companies*; and *Web Directory*.

A buy-recycled campaign, *Get in the Loop*, was conducted as a pilot program with several of the local recycling programs. The campaign targeted shoppers at retail stores such as Krogers, Walmart and Heinen's in an awareness campaign. Promotional materials were provided such as posters, and button badges. Many of the local programs enhanced the campaign with local business contributions of door prizes and promotions.

A partnership between Ohio EPA, ODNR, the Department of Development, and the Association of Ohio Recyclers has resulted in a statewide materials exchange program, OMEx, which was implemented in early 1998. (See Chapter VIII for further discussion of this effort.)

Ohio EPA's Office of Pollution Prevention (OPP) has also been involved in a number of technical assistance activities to assist local government and SWMDs complete waste reduction/recycling and pollution prevention activities. These activities include:

- C *Southwest Ohio Local Government Pollution Prevention Collaborative*: This project helps local governments save money and improve the environment through pollution prevention. A series of meetings and training opportunities are being offered to representatives of local government in southwestern Ohio in areas such as purchasing, vehicle maintenance, utility engineering, air pollution inspection and community landscaping. Information sharing on initiatives and successes among local governments

will also be a key component of the project. Ohio EPA hopes to make this project permanent in southwest Ohio and then expand to the rest of the state.

C General Technical Assistance: OPP is one of the leading technical assistance programs in the country for a state without mandatory pollution prevention legislation. OPP provided technical assistance to over 6,000 companies, organizations and/or individuals. This includes over 130 site visits to help Ohio companies implement pollution prevention programs and providing over 70,000 pollution prevention documents free-of-charge to help Ohio businesses help themselves to prevent waste. In addition, OPP completed 150 presentations and training events to educate Ohio businesses and organizations about pollution prevention. OPP's Internet site has also been acknowledged by U.S. EPA and others as one of the best sites in the nation to obtain practical pollution prevention information.

Strategy #3: Ohio EPA will finalize and adopt solid waste composting standards for metals, pH, and soluble salts.

Ohio EPA anticipates proposing composting rules in the Spring of 1998 and adopting final rules that will become effective by the end of the year. These rules will establish standards that must be met for metals, organic constituents, foreign matter, and pathogens. These parameters are being proposed in place of standards for pH and soluble salts because those commenting on earlier drafts of the rules have argued that standards for pH and soluble salts are not appropriate. Low pH, for instance, may be beneficial for one use while a high pH may be beneficial for another. However, operators will be required to determine pH and soluble salts concentration, in addition to maturity, nitrogen, carbon, phosphorous, and potassium content. The rules will require that test results for these parameters be made available for informational purposes only.

Strategy #4: Through the recycle Ohio Grant program, ODNR will continue to provide funds to assist municipalities and counties with implementation of a variety of recycling and litter prevention activities.

ODNR, through the DRLP, has provided the following grants to local governments for the implementation of recycling and litter prevention activities:

<u>Grant Year</u>	<u>Number Awarded to Counties</u>	<u>Number Awarded to SWMDs</u>	<u>Number Awarded to Cities</u>	<u>Total Dollars Awarded</u>
1996	54	21	12	\$6,498,872
1997	54	26	16	\$6,458,130
1998	54	27	16	\$6,719,904

Strategy #5: Ohio EPA's Office of Pollution Prevention, through the Ohio Prevention First initiative, will provide technical assistance to industrial and commercial generators desiring to design and implement means of reducing their generation of wastes.

In 1993, Governor George V. Voinovich targeted the top 100 companies that report the most releases to the environment, and asked Ohio EPA to work with each to develop a

comprehensive pollution prevention plan. Ohio Prevention First is now the leading voluntary pollution prevention initiative in the U.S. Eighty-six of the top 100 emitters are in this program, along with 81 additional facilities. Participants have already reduced hazardous waste by 651,000 tons; solid waste by 230,000 tons; and materials reported for the Toxic Release Inventory by 135 million pounds. They have pledged to reduce approximately 422 million additional pounds of pollution, and estimate they will save more than \$37 million through pollution prevention efforts. OPP has also modified the existing annual Governor's Awards for Pollution Prevention to recognize Ohio Prevention First participants and established a new Director's Award program to provide additional recognition. In 1997 Ohio Prevention First was one of five programs nationwide to receive an award from the Council of State Governments for environmental innovation. At this time, the 167 facilities participating in Ohio Prevention First have pledged to reduce 391,000 tons of solid waste by 2000.

In 1997, OPP completed two workshops to provide assistance to Ohio Prevention First participants, and is planning another for 1998. OPP plans to coordinate with ODNR's DRLP and Ohio EPA's Division of Solid and Infectious Waste Management to provide assistance in the future.

Strategy #6: Ohio EPA will continue to investigate the methods of measuring and promoting source reduction of solid wastes.

Although documentation and publications addressing this issue continue to be gathered, Ohio EPA has made very limited progress towards implementing this strategy due to other more pressing work responsibilities.

Strategy #7: Ohio EPA will explore alternatives for measuring waste reduction and recycling, and will investigate methods that will reduce the burden of reporting for industries, recyclers and haulers, and lower the costs of data collection for SWMDs. This strategy will include a re-examination of the information needed in order to monitor waste reduction and recycling rate progress in Ohio and investigating more consistent and accurate survey instruments.

The Annual District Report (ADR) is the vehicle by which Ohio EPA requires SWMDs to report recycling data that allows the Agency to monitor waste reduction and recycling rates. As a result of Ohio EPA's re-examination of the information needed to monitor recycling rates and in an attempt to reduce the burden of reporting recycling data, the ADR has been reduced in size. This has been accomplished by eliminating many questions and categories for reporting data. For each question and category of data Ohio EPA asked the following questions: Is this information required by regulation or statute? Does Ohio EPA need this information? Does Ohio EPA use this information or publish it, and if so, for what purpose? If the information was not required by regulation or statute or was not necessary to monitor recycling rates, then the question or category of data collection was eliminated. To further reduce SWMD's reporting burden, Ohio EPA and ODNR are in the process of consolidating their survey efforts to eliminate redundant reporting requirements.

Ohio EPA is currently in the process of implementing a new information management system. This system, called SIIMAN, will help reduce the SWMDs' burden of reporting to Ohio EPA by providing a system that will automatically retrieve data from one part of a report to use in another, make calculations, and allow for electronic submittal of annual reports. SIIMAN will also allow Ohio EPA to revise the *Format* (the instructions for preparing a solid waste management plan), thus reducing the redundancy of data entry in several locations in the plan. In addition, SIIMAN should also reduce the number of calculations that need to be made for plan preparation, the size of a solid waste management plan, and the time and effort that will go into its preparation.

During 1997, seven SWMDs assisted Ohio EPA in using and evaluating the U.S. EPA's standardized recycling measuring methodology to investigate more consistent and accurate survey instruments. This methodology does not appear to produce survey results that are more consistent or accurate than the method that is currently recommended in the *Format*. (See the discussion under the next strategy for further information regarding this project.)

Strategy #8: Ohio EPA will work with U.S. EPA and other states to promote greater standardization in the way that recycling and waste reduction efforts are measured and reported.

In 1997, Ohio EPA participated in U.S. EPA's Recycling Measurement Model pilot project along with four other states. The purpose of this project was to test the method that U.S. EPA had developed for measuring recycling and published in a draft document titled *Measuring Recycling—A Guide for State and Local Governments*. If the pilot project demonstrates that the measuring method is effective, U.S. EPA will attempt to persuade all states to voluntarily adopt this measurement method by publishing and widely distributing the recycling measurement guide and promoting the method as a means of standardizing measurement methodology nationwide.

In Ohio, the following SWMDs contributed to this project by collecting recycling data using the reporting forms developed by U.S. EPA.:

- ☐ Darke County SWMD
- ☐ Solid Waste Authority of Central Ohio
- ☐ Gallia-Jackson-Meigs-Vinton SWMD
- ☐ Lucas County SWMD
- ☐ Mahoning County SWMD
- ☐ Medina County
- ☐ Summit-Akron Solid Waste Management Authority

Final reports from the five participating states are due to U.S. EPA in March, 1998. U.S. EPA has planned a nationwide teleconference to promote the recycling standardization methodology in June 1998. Ohio EPA has been asked to participate in this teleconference.

Restrictions on the Types of Waste Disposed in Landfills and Burned in Incinerators

Section 3734.50(C) of the Ohio Revised Code requires the State Solid Waste Management Plan to "establish restrictions on the types of solid waste disposed of at landfills for which alternative management methods are available, such as yard waste, and a schedule for implementing those restrictions..."

The 1989 *State Plan* identified yard waste, whole and shredded scrap tires, and lead-acid batteries as candidates for the establishment of regulatory restrictions. Regulations implementing the yard waste restriction were in place for both landfills and incinerators by December 13, 1994. As illustrated by Ohio's experiences concerning the yard waste ban (see Chapter IV of the 1995 *State Plan* for an account of the yard waste ban), implementing the full intent of ORC Section 3734.50(C) with comprehensive restrictions on the disposal of specific waste streams is an arduous task at best. As a result, rather than focus on developing restrictions for these waste streams, the 1995 *State Plan* focused Ohio's attention on developing alternative management strategies for waste streams for which disposal is not the most logical management option. One strategy focuses on requiring owners and operators of landfills to implement yard waste restriction programs as a means of limiting the amount of yard waste disposal. To this end, owners and operators of landfills and incinerators are required to implement procedures to identify and refuse receipt of source-separated yard wastes in dedicated vehicles and to promote alternative management of restricted wastes through the distribution of educational information. At the time the 1995 *State Plan* was written, requirements for landfill owners and operators to develop restriction programs for yard waste were already in place.

Given the focus of solid waste regulation on landfill facilities as opposed to generators and haulers of solid wastes (see page 37 of the 1995 *State Plan* for an explanation), Ohio EPA does not anticipate implementing any new disposal restrictions. In the future, if Ohio EPA's regulatory jurisdiction is expanded to encompass generators and haulers of restricted wastes or greater enforcement capability is afforded to Ohio EPA for pursuing violations of the yard waste ban, then new disposal restrictions could be developed.

Information Updates from the 1995 State Plan

The 1995 *State Plan* obligated the State of Ohio to several commitments which would further the implementation of the disposal restrictions. The following bullet points provide updates regarding the status of these obligations:

- < The 1995 *State Plan* mentions that "effort must be made to coordinate implementation of disposal restrictions with local regulatory authorities, and to ensure that adequate

alternative management capacity exists statewide to recycle or otherwise manage the restricted materials".

Regarding capacity for yard waste disposal, on January 1, 1995 there were 180 Class IV composting facilities and 53 Class III composting facilities registered with Ohio EPA. As of December 22, 1997, there were 381 Class IV and 49 Class III composting facilities registered with Ohio EPA. This amounts to a net increase of approximately 201 Class IV and a net decrease of four (4) Class III composting facilities registered since 1995. (It is difficult to determine a definite number of new facilities as some facilities closed during this three year period and some re-registered for a different class [mostly from Class III to Class IV]. Overall, however, there was a substantial net increase in the number of composting facilities registered with Ohio EPA since the implementation of the *1995 State Plan*). While there appears to be a substantial increase in the level of interest regarding composting, annual reporting is not required for all classes of compost facilities. Therefore, it is difficult to determine how many compost facilities are actually in operation.

On July 1, 1997, a new program titled the Interim Alternative Waste Management Program was implemented at Ohio EPA between the Divisions of Solid and Infectious Waste Management and Surface Water. This program provides Ohio EPA with a means of considering alternative methods of managing waste materials. Materials banned from disposal in landfills and combustion at incinerators may be eligible for alternative uses through the Interim Alternative Waste Management Program. In addition, the scrap tire rules contain provisions for beneficial uses of both whole and shredded scrap tires.

- < The *1995 State Plan* states that Ohio EPA anticipated promulgating regulations in 1996 requiring lead-acid battery detection and education programs to be in place at all landfills. In 1995, when Ohio EPA and SWAC began addressing this obligation, studies indicated that the majority of used lead-acid batteries in the state were already being recycled. As a result, SWAC advised Ohio EPA to delay the development of these regulations and to monitor the recycling and disposal markets for lead-acid batteries. In the event that Ohio EPA observes a shift from recycling to disposal, then development of a regulatory restriction program would be warranted at that time. Since no such shift has been observed, a regulatory program has not been implemented to date. If circumstances change in the future, then SWAC and Ohio EPA will need to revisit the issue.
- < The *1995 State Plan* states that new regulations were being drafted in 1995 to implement the scrap tire regulatory program. Because Ohio law requires the registration of scrap tire transporters, it was possible to implement a full ban on the disposal of scrap tires in solid waste landfills and incinerators. The scrap tire rules went into effect on March 1, 1996 thereby implementing the ban on the disposal of whole scrap tires. The ban on the disposal of shredded scrap tires at landfills and incinerators went into effect a year later, on March 1, 1997. (For more information regarding the scrap tire management program in Ohio, see Chapter VI of this report.)
- < The *1995 State Plan* committed Ohio to continued monitoring of other States' policies and local recycling markets to determine whether additional disposal restrictions should be

evaluated (see Chapter VIII for information on recycling markets in Ohio). Ohio's last full scale effort to survey other States' disposal restrictions and recycling activities occurred prior to the completion of the *1995 State Plan*. Ohio EPA does anticipate conducting another survey of disposal restrictions across the nation as the *1995 State Plan* continues to be implemented and before the next state solid waste management plan update is prepared.

Revised General Criteria for the Location of Solid Waste Facilities

Section 3734.50(D) of the Ohio Revised Code requires the State Solid Waste Management Plan to "establish revised general criteria for the location of solid waste facilities..."

Although Ohio has historically had restrictions on where solid waste facilities may be located, the State's adoption of the 1990 solid waste rules implemented an expanded, proactive, and comprehensive set of criteria against which to evaluate the suitability of a particular location to house a solid waste facility. In general, these criteria govern the siting of solid waste facilities to ensure that such facilities are not located in sensitive or otherwise inappropriate areas. In fact, Ohio's siting criteria predated the U. S. EPA's criteria established in the federal RCRA Subtitle D program. (For a complete discussion of the rule adoption sequence and the specific siting criteria adopted, please see pages 41-48 of the *1995 State Plan*.)

Because Ohio's siting criteria are already fairly restrictive and, therefore, are protective of human health and the environment, no changes to the current siting criteria have been made since the publication of the *1995 State Plan*. However, in order to comply with the requirements of ORC Section 119.032, which requires all state agencies to review all of their rules every five years, the Division of Solid and Infectious Waste Management has appointed a team of interagency personnel to review the siting criteria for municipal, industrial, and residual solid waste landfill facilities and for scrap tire monofills. A function of this team is to evaluate the current siting criteria to determine whether changes (either deletions or additions) need to be made. The siting criteria for other types of solid waste facilities (such as composting facilities and infectious waste treatment facilities) will be reviewed along with the other rules governing those types of activities. Thus, the composition of the siting criteria could change in the next couple of years depending upon the outcome of this review process. One of the functions of this process is to allow interested parties the opportunity to provide input into the review of the rules. To accomplish this, there are several steps in the review process which involve soliciting input from interested parties. A complete schedule of the review for the siting criteria has been included in Appendix B. This schedule is based on milestones and is intended to provide approximate goal dates rather than exact dates. As a result, the dates provided in Appendix B are subject to change. Specific milestones that interested parties should be aware of include:

< March 2, 1998	Scoping Report to Interested Parties for Comment
< September 2, 1998	Concept Papers to Interested Parties for Comment
< December 31, 1998	Draft Rules to Interested Parties for Comment
< August 18, 1999	Revised Draft Rules to Mass Mailing
< June 6, 2000	Final Rule Package to Mass Mailing
< September 4, 2000	Complete Necessary Training

To obtain more information on the status of the siting criteria review team and how to become involved, please contact either Lindsay Taliaferro in the Division of Drinking and Ground Waters at (614) 644-2752 or Vladimir Cica in the Division of Solid and Infectious Waste Management at (614) 728-5361.

Some members of SWAC have raised concerns regarding the ability of the current siting criteria to address how landfills affect local communities and conditions. These concerns relate to issues such as traffic flows, road damage, noise, etc. The existing siting criteria do not address these issues directly. Currently, the authority to address these local issues resides with local governments through zoning provisions. In some instances, these issues are also addressed through negotiated agreements between facility owners and local governments. SWAC will continue to explore this issue and make appropriate recommendations. This topic may also be raised for discussion during the next revision of the state solid waste management plan.

Information Updates from the 1995 State Plan

The *1995 State Plan* obligated the State of Ohio to several commitments related to siting criteria. The following bullet points provide updates regarding the status of these obligations:

- < The *1995 State Plan* indicated that "siting criteria for scrap tire facilities would be developed and incorporated into new rules during 1995..." The scrap tire rules went into effect on March 1, 1996. Contained in the rules are siting restrictions for scrap tire monofill facilities, Class I and Class II scrap tire storage or recovery facilities, scrap tire collection facilities. These criteria are listed in Table 1, located on page 24.
- < The *1995 State Plan* states that "New rules under development by Ohio EPA's Division of Surface Water in Spring 1995 may redefine some terms such as 'state resource waters'." Solid Waste Siting Criteria may change as a result of these rules and definitions and would differ from what is described in this State Solid Waste Management Plan." The rules referred to by the *1995 State Plan* are the antidegradation provisions contained in rule 3745-1-05 of the Ohio Administrative Code (the "Antidegradation Rule"). At the time the *1995 State Plan* was being written, Ohio EPA's Division of Surface Water was in the process of drafting the language for the Antidegradation Rule. The rule was adopted on July 3, 1996 and became effective October 1, 1996.

The Antidegradation Rule defines state resource waters as "surface waters so designated in rules 3745-1-08 to 3745-1-30 of the Administrative Code, all publicly owned lakes and reservoirs and all wetlands". Thus, all surface waters which had been designated as state resource waters prior to the adoption of the new Antidegradation Rule retained that designation following the adoption of the rule. In addition to naming specific bodies of water as state resource waters, the Antidegradation Rule also established the process by which surface waters will be evaluated to determine their designation under the new rule. The designation given to a water body dictates the level of protection afforded the water body by the Antidegradation Rule. The rule stipulates that all water bodies designated as

state resource waters in the state rules are to retain that status until the bodies were evaluated under the designation process prescribed in the rule. Depending upon the result of that evaluation, the water body could retain its current designation as a state resource water or be redesignated as one of the other designation types afforded in the rule. To date, the current state resource waters have not been reevaluated, and no additional water bodies have been designated as state resource waters.

The siting criteria for municipal, industrial, and residual solid waste landfill facilities and for scrap tire monofills have not been changed since the adoption of the Antidegradation Rule. The solid waste regulations for Ohio currently prohibit owners and operators of sanitary landfill facilities from placing solid waste within one thousand feet of stream segments designated by Ohio EPA as state resource waters. Thus, although this provision prohibits the placement of solid waste within one thousand feet of those stream segments designated as state resource waters, the same restriction does not seem to apply to lakes and reservoirs. Both lakes and reservoirs are, however, defined as state resource waters in the Antidegradation Rule. Another provision in the solid waste rules prohibits solid waste from being placed within two hundred feet of surface waters which include lakes. Thus, although both lakes and designated stream segments are currently mentioned in the solid waste siting criteria, the specific distance requirements are different. Furthermore, reservoirs, a state resource water according to the Antidegradation Rule, are not addressed in any of the siting criteria for solid waste facilities. The siting criteria rule review team, mentioned earlier in this chapter, is examining this issue as part of the rule review process.

Table 1: Siting Criteria for Scrap Tire Facilities

Criteria	Scrap Tire Monofill Facility	Class I Scrap Tire Storage Facility or Class I Recovery Facility	Scrap Tire Collection, Class II Storage, or Class II Recovery Facility
At least 100' from any buildings or structures not owned or leased by the owner or operator of the facility. This includes all portable containers in which tires are stored, at a collection facility	No*	Yes	Yes
Not located within areas specified below, unless facility exclusively stores scrap tires generated within the areas specified below: a) national park or national recreation area b) state park or established state park purchase area c) candidate for potential inclusion in the national park system d) any property within boundaries of national park or national recreation area not acquired by the U. S. Department of Interior	 Yes Yes Yes Yes	 Yes Yes Yes Yes	 Yes Yes Yes Yes
Not located in a regulatory floodplain	Yes	Yes	Yes
At least 1000' from the boundaries of the following natural areas: a) areas designated by ODNR as state nature preserve, state wildlife area, or state scenic river. b) areas designated, owned, and managed by the Ohio Historical Society as a nature preserve c) areas designated by the United States Department of the Interior as either a national wildlife refuge or a national scenic river d) areas designated by the United States Forest Service as either a special interest areas or a research natural area in the Wayne National Forest e) stream segments designated by Ohio EPA as either a state resource water, a coldwater habitat, or an exceptional warmwater habitat	 Yes Yes Yes Yes Yes	 Yes Yes Yes Yes Yes	 Yes Yes Yes Yes Yes
Two hundred feet from the property line	Yes	No	No
One hundred feet from the property line	No	Yes	Yes
Five hundred feet from domicile	Yes	Yes	Yes
Two hundred feet from domicile owner or leased by the owner or operator	No	Yes	Yes
Two hundred feet from surface waters	Yes	Yes	Yes

*The two hundred feet property line setback and five hundred feet domicile setback make this unnecessary.

Ash Management

Section 3734.50(E) of the Ohio Revised Code requires the State Solid Waste Management Plan to "examine alternative methods of disposal for fly ash and bottom ash resulting from the burning of mixed municipal solid wastes. . ." That section of the Revised Code also states: "Within one year after adoption of the plan, the Director shall adopt rules. . . establishing . . . standards for the disposal of fly ash and bottom ash resulting from the burning of mixed municipal solid waste."

Management of municipal solid waste (MSW) combustion ash is not a pressing issue for Ohio at this point in time. There is currently only one active licensed MSW incinerator in the state, and it primarily burns infectious waste. Given the controversy surrounding flow control and the expense of upgrading existing incineration facilities to meet current emission standards, Ohio EPA does not anticipate that incineration will become a significant solid waste management option in Ohio in the foreseeable future. Consequently, an updated analysis of alternative methods of disposal of MSW incineration ash, beyond what is in the *1995 State Plan*, is not warranted at this time.

One recent Ohio EPA activity is relevant to the ash management issue. The Agency has developed the "Interim Alternative Waste Management Program", a program designed to expedite the approval of alternate uses of waste materials. Should MSW ash management become an important issue in the future, it is possible that alternative uses of ash could be approved through this program.

Information Updates from the 1995 State Plan:

The *1995 State Plan* references a number of activities that were to take place during the 1995-96 time frame. The following bullet points provide updates regarding the status of these activities:

- < During 1994, a U.S. Supreme Court decision and issuance of a U.S. EPA guidance document on MSW incinerator ash made Ohio EPA's "Interim Ash Disposal Policy" somewhat obsolete. The *1995 State Plan* mentions that the Interim Ash Disposal Policy would be revised and the revisions incorporated into rule during the 1995-96 time frame. These rule revisions were made as part of the scrap tire rules which became effective March 1, 1996.
- < Since 1976, resource recovery facilities had been exempted from solid waste regulations in Ohio. The *1995 State Plan* states that this exemption would be eliminated as part of the scrap tire rule package. As mentioned above, those rules became effective March 1, 1996, and this exemption was removed.

- < The *1995 State Plan* mentions that the restrictions against acceptance of lead-acid batteries and yard waste at incinerators were difficult to enforce since Ohio EPA does not have authority to regulate generators and transporters of solid waste. The *1995 Plan* states that these restrictions would be clarified during state fiscal year 1996 so that they would apply only to source-separated materials. Modifications were made to the yard-waste portion of these restrictions, clarifying that it applies only to source-separated yard waste. These modifications became effective January 1, 1995. The lead-acid battery restriction remains in place, unmodified from its original version. This restriction is not limited to source-separated batteries, but applies to mixed loads as well.
- < The *1995 State Plan* states that Ohio EPA would develop and implement an incinerator operator training and certification program, as required by statute, during the 1996-97 biennium (see ORC Section 3734.02(L) for details.) This training program would be one component of a training and certification program covering all operators of solid waste facilities, all infectious waste treatment facilities, and all health department personnel who are responsible for enforcing the solid and infectious waste laws and rules. In 1992, Ohio EPA proposed rules necessary to create this program. Opposition to these rules was significant, primarily from health departments who felt that they lacked adequate funding to complete the proposed training and certification requirements. Due to this opposition, the rules were never finalized.

At this point, Ohio EPA believes it is unlikely that rules can be passed until the health department funding issue is resolved. An Ohio EPA/Ohio Environmental Health Association workgroup is currently working towards a recommendation on this issue, and legislation has recently been introduced that addresses health department funding. Pending the outcome of this issue, work on the certification program is scheduled to continue during the 1998-99 biennium.

A Statewide Strategy for Managing Scrap Tires

Section 3734.50(F) of the Ohio Revised Code requires the Solid Waste Management Plan to "establish a statewide strategy for managing scrap tires, which shall include identification of locations within the state that qualify as scrap tire facilities and accumulations. In developing the strategy, the director [of Ohio EPA] shall examine the feasibility of recycling or recovering materials or energy from scrap tires and landfilling scrap tires in abandoned coal strip mines as well as other methods for managing scrap tires".

Since the *1995 State Plan* was adopted, the full scrap tire rule package was finalized and became effective on March 1, 1996. These rules establish the regulatory program for the licensing and registration of scrap tire facilities and transporters, respectively, as well as how the proper beneficial (re)use of whole and processed scrap tire materials is now promoted in Ohio.

Since so many activities have transpired in the scrap tire program since the writing of the *1995 State Plan*, the information in this chapter is organized into four sections:

- < **Information updates from the 1995 State Plan S** Information regarding how proposed regulations for scrap tire management were actually promulgated in 1996.
- < **The scrap tire management fund S** Information about the four ways the scrap tire management fund, and the associated 50-cent per tire fee on the sale of tires by wholesale distributors, is providing the main vehicle for managing scrap tires in Ohio through recycling and processed scrap tire material recovery.
- < **Scrap tire abatement progress S** Information about how funds from the 50-cent fee are enabling Ohio EPA to clean up the state's largest scrap tire accumulations, with vital help from the SWMD's and Health Departments to clean-up relatively smaller scrap tire dump sites.
- < **Scrap tire regulatory program S** Information regarding the licensing of scrap tire facilities and transporters.

Note: The Division of Solid and Infectious Waste Management anticipates issuing a report in late 1998 that will fully describe the status of the scrap tire regulatory program in Ohio, and provide information that has been recently compiled regarding the quantity and flow of scrap tires throughout the state.

Information Updates from the 1995 State Plan

The *1995 State Plan* provided a detailed description of the scrap tire regulatory program, although at that time the scrap tire rules had not been finalized. The following is a list of the differences between the final scrap tire rules and the regulatory program described in the *1995 State Plan*. All other information found in the *1995 State Plan* regarding the scrap tire regulatory program remains accurate.

< Scrap Tire Transporters

The amount of financial assurance required from each registered scrap tire transporter, based in law under S.B. 165, is \$50,000. That amount covered all trucks hauling scrap tires under each company's registration. Since the *1995 State Plan* was adopted, Sub. H.B. 545 was enacted in February 1996 to include, among other issues, a reduction in the amount of financial assurance required to \$20,000 per registered transporter. That reduction was intended to allow more transporters to qualify for registration while maintaining an acceptable level of financial assurance on all tire transporters.

< Scrap Tire Collection, Storage, Recovery and Disposal Facilities

Limited exemptions were mentioned in the *1995 State Plan* for qualifying scrap tire transporters. The revised scrap tire rules now also include licensing exemptions for qualifying tire businesses, local governments, and beneficial end-users of scrap tires. Initially, the comprehensive tire law (SB 165) included references to most of the allowable exemptions, although HB 545 which later passed just prior to the promulgation of the tire rules, allowed for a limited five year exemption (to the licensing requirements) for facilities which recycle 75% (or more) bias-ply scrap tires.

< Beneficial Use

The *1995 State Plan* describes how the proposed rules were expected to regulate beneficial end-users of whole, cut, or shredded scrap tires. The *1995 State Plan* described how beneficial use regulations apply "to any end use of crumb rubber as a soil conditioner, compost filler, or other applications that place crumb rubber directly on the ground". The final regulations do not regulate the storage of crumb rubber, in general, nor the use of crumb rubber as a soil conditioner, specifically. Ohio EPA maintains that, because of the relatively high cost necessary to process scrap tires into a powder-like material, crumb rubber has enough "value added" to prevent a company from wasting or open dumping the material. Also, based on studies considered during the drafting of the scrap tire rules, leachate from crumb rubber products is not considered to be detrimental to public health or the environment. Therefore, the definition of a "scrap tire" in the rules was drafted to exclude crumb rubber products which have been processed down to a size which is no longer visually identifiable as scrap tires and which no longer contains wire or fiber. The definition of "scrap tire" was limited in this way to provide regulatory relief, thereby encouraging the use of crumb rubber produced from scrap tires.

The *1995 Plan* also mentions the beneficial use of processed scrap tires for "compost filler". The rules were drafted to allow for the restricted use of "bias-ply tire shreds or shreds with the metal removed" as a compost bulking agent without Ohio EPA regulation

of that material. This type of use only requires notification to Ohio EPA's Scrap Tire Unit that this use is going to take place. However, any such use still requires Ohio EPA's approval of the composting facility.

< Ohio EPA encourages recycling and re-use of whole and processed scrap tires where possible. The *1995 State Plan* mentions scrap tires may be used as a fuel supplement (tire-derived fuel). Currently, only one industrial boiler — Champion Paper in Hamilton, Ohio — occasionally uses tire-derived fuel to supplement their fuel mix. No electric utilities or cement kilns in Ohio are currently using scrap tires as a fuel supplement. Most facilities would incur considerable cost to retrofit and upgrade in order to burn tire-derived fuel. Also, because of some current concerns about exactly how coal and oil (combustion) emissions will be regulated in the future, expansions in the use of tire-derived fuel are also in question.

Two other general uses for processed scrap tires, which Ohio EPA hopes to see better utilized in the future, include: 1) the use of processed scrap tires to supplement asphalt mixtures with crumb rubber in road paving; and 2) the use of processed scrap tire chips for drainage layers under roadways.

In June 1998, Ohio EPA and the Scrap Tire Management Council will be holding a regional scrap tire conference to focus on market development for scrap tire re-use, with a specific emphasis on civil engineering uses of scrap tires.

The Scrap Tire Management Fund

In addition to the creation of the regulatory program established by 1993's Senate Bill 165, the law also establishes a number of incentives to encourage the recycling of scrap tires rather than disposal. The law established a 50-cents-per-tire "scrap tire fee" on the first (wholesale) sale of new tires. The scrap tire fee generates approximately \$3.5 million per year to: 1) fund inspections and enforcement of the regulations; 2) clean up scrap tire dump sites; 3) provide financial assistance to qualifying scrap tire recyclers for alternate uses; and 4) provide funds for researching tire recycling technologies at the University of Akron. The 50-cents-per-tire scrap tire fee will sunset in the year 2000. Based on the review of the *1995 State Plan*, the successful implementation of the scrap tire regulatory program over the last two years, and the progress that the program has made in addressing illegal tire accumulations throughout the state, SWAC recommends continuation of the funding past the year 2000.

The accumulation of all scrap tire fees generated are placed into an account known as the Scrap Tire Management Fund. The Scrap Tire Management Fund is restricted to four uses:

- 1) Ohio EPA's Division of Solid and Infectious Waste Management receives up to \$750,000 from the Scrap Tire Management Fund for compliance monitoring and enforcement of the scrap tire law, and oversight of state contracts for cleanup of scrap tire sites. This funding level currently supports eight and one-half (8-1/2) full-time-equivalents located in each of Ohio EPA's five district offices and in the central office.

- 2) Over the three-year period before funding sunsets in the year 2000 (state fiscal years 1998, 1999, and 2000), Ohio EPA will use approximately \$10 million from the Scrap Tire Management Fund to pay qualified contractors for the cleanup of some of Ohio's worst scrap tire piles. Ohio EPA's scrap tire abatement program prioritizes sites of a million tires or more, and those that pose the most serious threats to public health and the environment, based on criteria set out in the law. It provides a much-needed supplement to ongoing efforts by Ohio EPA, local health departments, and local law enforcement officials to have scrap tire facility operators and those responsible for illegal stockpiling and disposal of tires to clean up the problem sites that they created. These funds are intended to be reimbursed to Ohio EPA from costs recovered from the responsible parties. Recovered funds can then be channeled into additional cleanup projects.

The first two contracts were bid in 1997 for state-funded cleanup of an estimated five million tires at sites in Summit and Clark Counties. (Progress of these two projects is described below.) Additional contracts will be bid and cleanup projects initiated as additional funding accumulates from the scrap tire fee.

- 3) The Scrap Tire Management Fund will also provide approximately \$6.6 million during the years 1994-2000 to be given out in grants, low-interest loans, and other financial assistance to scrap tire recyclers through the Ohio Department of Development (ODOD). These funds are placed into ODOD's Facility Establishment Fund where loans and grants are issued in amounts ranging from \$50,000 to \$250,000. Loans are provided on a first-come, first-served basis to companies that can demonstrate they will create new scrap tire-derived products. ODOD can also provide funds for qualifying beneficial use projects where whole or processed scrap tires are proposed to be substituted for other more expensive materials (on projects which have been pre-approved by Ohio EPA). Funding is designated as "take-out" financing wherein a business must complete its project utilizing financing from a conventional lender as its equity. Upon completion of the project, funds from the Facility Establishment Fund are then disbursed. Preferential interest rates and terms are available for qualifying companies locating or expanding in "distressed" areas.

During state fiscal years 1994 through 1997, ODOD received a total of \$4,581,135 from the scrap tire fee. In each of the fiscal years for 1998, 1999 and 2000, an additional \$1,000,000 (plus half of any revenues in excess of \$3,500,000) will be sent to ODOD. ODOD's dispensation of loans and grants began in late 1995 and totaled \$2,447,850 by the end of state fiscal year 1997.

A listing of organizations which have received funding from ODOD can be found in Appendix C of this document.

- 4) The Institute of Polymer Science at the University of Akron receives an annual grant of \$150,000 from the Scrap Tire Management Fund for research and evaluation of alternative methods of recycling scrap tires. Two multi-year research projects are currently underway. One is the "Ultrasonic Devulcanization Technology for Scrap Tire Recycling," which investigates the use of ultrasonic vibrations in the presence of pressure

and heat, to cause devulcanization to produce crumb rubber. The other study, "Ground Scrap Tire Rubber as a Compounding Additive", is an attempt to promote the bonding of vulcanized crumb rubber to other vulcanized crumb rubber or virgin rubber.

Through the period 1994-1997, The University of Akron has received a total of \$450,000 from their portion of the scrap tire fee. Expenditures for the two studies during the same period total \$440,029.52.

Scrap Tire Abatement and Enforcement Progress

Ohio EPA Scrap Tire Abatement

Ohio EPA is now using funds provided through a portion of the scrap tire fee to pay qualifying contractors to remove and either beneficially (re)use the processed scrap tires, or properly dispose the tires, as the *1995 State Plan* proposed. Based on the priorities set by law, Ohio EPA must first cleanup the most significant risks to human health and the environment. There are many other scrap tire dumps where there are significant risks to human health and the environment, but the total amount of state funding available is not expected to be adequate to abate all of these sites. In some cases, local SWMDs and Health Departments have been able to provide funding for abatement projects. Abatement work continues by Ohio EPA, SWMDs, and Health Departments. Abatement progress is outlined below.

- < There are currently three sites scheduled for abatement using funds from the Scrap Tire Management Fund. These sites include: 1) the ReGenesis Site in Summit County where more than 3,700,000 tire equivalents are being removed at a total cost of \$2,805,689 committed to complete this cleanup; 2) the Seelig Site in Clark County, where removal of the approximately 1,200,000 million tire equivalents began in February 1998 at a total dollar commitment of \$1,194,780; and 3) the Warsing Site in Coshocton County involving more than 1,700,000 million tire equivalents has been bid out and a contractor has been chosen for the abatement project at a dollar commitment of \$1,311,894.
- < Dollar commitments for the three sites listed above are expected to total \$5,312,363. The balance of funds remaining in the account after these three sites are cleaned-up is expected to be \$1,963,703.
- < Ohio EPA's Scrap Tire Unit expects to accumulate \$4,000,000 (in addition to the \$687,637 already in the Scrap Tire Management Fund) before the end of state fiscal year 2000 (when the scrap tire fee and the program sunsets) and to pay qualified contractors for the clean-up of as many of the remaining 4 sites in Coshocton County, Lawrence County, Mahoning County, Portage County as funding will allow.
- < The abatement projects described above will clean up all seven sites in Ohio where more than 1 million tires have been accumulated.

Local Tire Abatements by SWMD's and Local Health Departments

< Since 1990 more than 4,000,000 tires have been cleaned-up through enforcement actions and from funding provided by SWMDs.

< The following lists local scrap tire clean-ups which Ohio EPA is aware of:

1996

Auglaize County (performed with private funding)	30,000 tires
Hamilton County (performed with SWMD funding)	1,000,000 tires
Mahoning County (performed with SWMD funding)	50,000 tires
Montgomery County (performed with private funding)	47,000 tires
Tuscarawas County (performed with SWMD funding)	225,000 tires

1997

Guernsey County (performed with HD/SEP* funding)	100,000 tires
Mahoning County (performed with SWMD funding)	76,200 tires
Medina County (performed with SWMD/HD funding)	40,000 tires
Muskingum County (currently being performed by County Commissioners)	+28,998 tires
Wayne County (performed with SWMD funding)	250,000 tires

*A Supplemental Environmental Project (SEP) is completed with funding resulting from an Ohio EPA enforcement action (monetary fine/penalty) against an entity.

1998 (as of 3/31)

Mahoning County (performed with SWMD funding)	2,000 tires
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In 1996, the Allen-Champaign-Hardin-Madison-Shelby-Union SWMD (North Central SWMD) collected scrap tires from residents during six scheduled household hazardous waste collection days in each county in the District. In 1997, the SWMD provided permanent boxes in seven locations throughout the District for the convenience of local governments to collect scrap tires dumped illegally in their jurisdiction.

In 1997, Carroll-Columbiana-Harrison SWMD sponsored four recycling events throughout the three counties where approximately 12,000 scrap tires were collected.

In 1996, Stark-Tuscarawas-Wayne SWMD contracted with the private sector to transport scrap tires collected within three counties at eight sites established by the District. The contractor is required to deliver sufficient numbers of collection containers to each site, maintain each site, and deliver scrap tires to the contractor's processing facility that beneficially uses scrap tires. During 1996 and 1997, the SWMD funded four scrap tire clean-ups involving more than 200,000 tires at three of those sites.

The Delaware-Knox-Marion-Morrow SWMD provided typical scrap tire collection services for residents of the four counties in conjunction with household hazardous waste collection events. Over 5,200 scrap tires were collected from the public on four Saturdays during 1996. All of the tires were used in beneficial uses projects.

Several SWMDs have also provided drop-off locations and collection events for recyclable materials. Information regarding whether scrap tires were included in materials accepted is not complete.

Local HD and Ohio EPA Enforcement Actions

Locally, the Gallia-Jackson-Meigs-Vinton SWMD has contracted four Sheriff departments in each of the four counties to provide a Deputy Sheriff to work twenty hours per week investigating cases of open dumping. These deputies meet with the District enforcement coordinator on a regular basis and provide regular updates of enforcement progress. The District also held an "Environmental Enforcement Seminar" in September 1996 for all health department and law enforcement personnel in the District to highlight the problems of open dumping and review pertinent laws.

In the Franklin County SWMD (Solid Waste Authority of Central Ohio), the District continues to work with the Franklin County Board of Health in conducting a strong illegal dumping enforcement program, and has maintained their very successful "Nail a Dumper" telephone hotline for open dumping complaints.

Since 1996, twenty-one new scrap tire cases involving outstanding violations have resulted in Ohio EPA escalated enforcement action. As of April 28, 1998, over 50 percent of those cases have been resolved. Of those cases that have been resolved, seven involved unilateral clean-up orders issued by Ohio EPA. Two of those seven orders issued have resulted in Ohio EPA hiring contractors to remove the tires. Ohio EPA intends to pursue recovery of the clean-up costs.

Scrap Tire Regulatory Program

The following information is accurate as of April 28, 1998:

Registered Scrap Tire Facilities

- < 3 facilities permitted (includes 2 scrap tire dedicated monofills and 1 storage facility located at a municipal landfill where tires will be stored until beneficially used in the landfill's cell construction)
- < 24 facilities registered (includes 10 collection facilities, 1 storage facility, 8 "fixed" recovery facilities, and 4 mobile recovery facilities)
- < 13 existing facilities have applications in process
- < 3 new facilities have applications in process
- < 7 facilities have received proposed denials from Ohio EPA's Scrap Tire Unit

Registered Scrap Tire Transporters

- < 67 transporters have been registered
- < 27 transporter applications are in process
- < 20 transporters withdrew applications
- < 2 transporters have received proposed denials from Ohio EPA's Scrap Tire Unit
- < 13 transporters have received final denied of their registration application

Approved Scrap Tire Beneficial Use Projects

- < 6 projects have received approvals
- < 5 of the 6 projects beneficial use projects approved are for landfills which have used chips in drainage layers or protective layers
- < 4 additional landfills have requested use of tire chips in drainage layers or protective layers

If all 9 landfills use chips as expected, then 20-30 million tires could be beneficially (re)used before the end of 2000.

Midwest Regional Scrap Tire Conference

The Ohio EPA's Division of Solid and Infectious Management partnered with The Scrap Tire Management Council to sponsor the Midwest Region Scrap Tire Management Conference on June 8, 9 and 10, in Columbus. Participating states included Kentucky, Illinois, Indiana, Michigan, Ohio, Pennsylvania, West Virginia, and Wisconsin. One hundred seventy attendees, including representatives from private businesses, inspectors, engineers, and local and state officials, participated in a forum for discussion that included regional generation and flow of scrap tires, regional market outlook, state scrap tire management programs, business planning and funding sources, civil engineering applications for scrap tires, markets for tire products, tire-derived fuel issues, and markets for steel.

A Program for Managing Household Hazardous Waste

Section 3734.50(H) of the Ohio Revised Code requires the State Solid Waste Management Plan to "establish a program for the proper separation and disposal of hazardous waste generated by households."

The *1995 State Plan* identified several strategies available to the SWMDs for developing local programs to manage household hazardous waste (HHW). In addition to outlining some general strategies for managing various types of HHW, the *1995 State Plan* presented an assessment process the SWMDs could use in order to determine the most effective combination of strategies to implement at the local level. A summary of the types of programs implemented by the SWMDs, and the types and amounts of materials collected, as well as costs, is included in the *Summary of Solid Waste Management in Ohio: Recycling, Reduction, Incineration, and Disposal*, published annually by Ohio EPA.

Information Updates from the 1995 State Plan

The *1995 State Plan* also identified four areas where Ohio EPA needed to develop guidance to assist local governments in establishing programs for HHW. The following bullet points provide updates regarding the status of those four items:

C A bibliography of school curricula materials for kindergarten through grade 12.

Ohio EPA maintains a file of curricula materials developed by other states. In addition, staff at Ohio EPA provide technical assistance to ODN's Division of Recycling and Litter Prevention regarding their supplemental curriculum project titled *Investigating Solid Waste Issues*, which is currently being revised. This document includes HHW issues and activities.

C General information brochures and flyers for public awareness campaigns.

Ohio EPA has developed or updated the following fact sheets:

- < *A Guide to Safe Management of Household Hazardous Waste*
- < *Household Photographic Chemical Wastes*
- < *Pesticides*
- < *Storage and Disposal of Paint*
- < *Automotive Maintenance Products*
- < *Gasoline and Fuel Oils*
- < *Used Oil*
- < *Lead-Acid Battery*
- < *Household Batteries*

In addition, the following fact sheets and publications are made available and have been mailed to the SWMDs:

- < US EPA's *Household Hazardous Waste Management: A Manual for One-Day Community Collection Programs*
- < US EPA's *Reducing Lead Hazards When Remodeling Your Home*
- < US EPA's *Protect Your Family From Lead in Your Home*
- < Water Environment Federation's *Household Hazardous Waste: What You Should and Shouldn't Do*

C A household hazardous waste hotline manual.

The *Household Hazardous Waste Telephone Advice Guidance Manual* was updated February, 1997. The organization remained the same, but the text was updated, and errors found in the previous version were corrected. The manual also includes lists of recyclers and/or disposal companies in the appropriate sections. Most of these lists are maintained by the Division of Hazardous Waste Management (DHWM) or the Office of Pollution Prevention (OPP), with input from the Division of Solid and Infectious Waste Management (DSIWM). These lists have all been updated (or created) since the last edition of the manual, and were included in the 1997 version:

- < DHWM and OPP's *Vendor Information: Paint Recyclers and Firms Accepting Paint-Related Wastes*
- < DHWM's *Fluorescent Lamp Recyclers and Ballast Recycling Services*
- < OPP's *Mercury Recyclers*
- < DHWM's *Gas Cylinder Recycling Services*
- < DHWM's *Battery Recyclers/Brokers and Disposal Facilities*
- < DSIWM's *HHW Program Contractors*

C A guidance document for and technical assistance in setting up exchange and collection programs.

Ohio EPA is in the process of finalizing a guidance document on permanent collection programs. The guidance document is being kept in draft form pending evaluation of the transfer facility rules to determine whether HHW collection facilities fall under this regulatory authority. In the interim, SWMDs are provided technical assistance in the following manner:

- < Ohio EPA's current regulatory requirements for permanent HHW facilities.
- < Contacts and phone numbers of other state agencies with potential regulatory requirements.
- < List of local departments with potential regulatory requirements.
- < Names of coordinators of other SWMDs with existing or proposed programs.
- < Publications developed by other states and/or organizations, such as US EPA's *Household Hazardous Waste Management: A Manual for One-Day Community Collection Programs*, Minnesota's *24-hour Safety and Health Training for Household Hazardous*

Waste Management Program Staff, and the Waste Watch Center's *Household Hazardous Waste Management Training Manual*. The Waste Watch Center is a national, non-profit organization "devoted to pollution prevention, education, consensus building and policy developments in the areas of solid and hazardous waste management, including household hazardous waste".

Recycling Market Development

Section 3734.50(G) of the Ohio Revised Code requires the State Solid Waste Management Plan to: "establish a strategy that contains specific recommendations for legislative and administrative action to promote markets for products containing recycled materials generally and for promoting the use by state government of products containing recycled materials."

Markets for recyclable materials are dependent upon several factors, including the availability of virgin materials, processing capacity for recyclable materials, the amount and consistency of the supply of recovered recyclables, and the demand for recycled materials. Although the supply of recovered recyclables has generally increased steadily over the past several years, the demand for these materials has been very volatile over the same period.

At the writing of the *1995 State Plan*, prices for many recovered materials were at all-time highs. However, by early 1996, prices for many of these same materials had dropped drastically. The following chart shows an example of the dramatic price changes that occurred in early 1996 and how the prices for these materials have rebounded somewhat in late 1997 and early 1998.

The *1995 State Plan* indicated that due to the market conditions that existed in June of 1995, a reasonable strategy would be to implement programs that increased the supply (collection) of various recyclable materials. As such, various programs were planned and implemented that did help increase the supply of recycled materials. However, by the end of 1995, it became evident that marketing the materials from community and business recycling programs was going to be quite a challenge for the future. A 1998 report by

Franklin and Associates, Ltd., entitled *Solid Waste Management at the Crossroads*, states "...although the current capacity to use recovered materials appears to meet the needs in most regions of the country, there are some major problems with market price stability because of small changes in demand for recovered materials.... Markets will continue to be available for

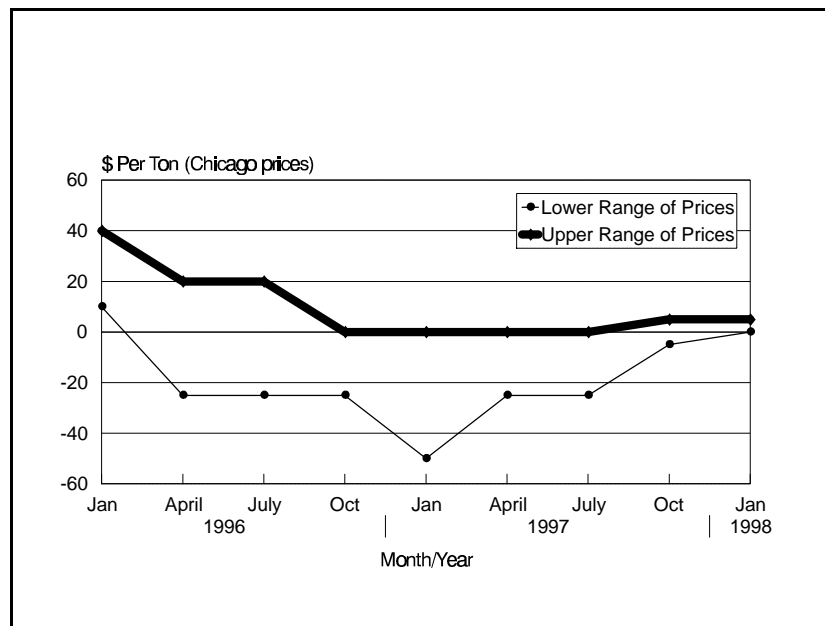


Figure 9-1. Chicago Prices for Old Newsprint in \$/Ton (Source: *Waste News*)

recovered materials, but there will always be discontinuities between supply and demand. Some of the available markets will not pay the high prices that collectors and processors would like to have..."

In an attempt to address the "discontinuities between supply and demand", the *1989 State Plan* listed four major recommendations for recyclables market development at the State level. This section discusses each of those objectives and presents information regarding the various programs that have been undertaken by Ohio's State government, and/or participated in by State government since the adoption of the *1995 State Plan*. The actual language for each objective is shown in italics.

1989 State Plan - Objective A

The state should legislatively establish a program within the Department of Development to develop markets for recycled goods. The program should focus on industries using recycled goods. This program should include a legislatively developed low-interest loan program for market development, and for research and development of recycled goods and markets.

Activities that have been implemented since the adoption of the *1995 State Plan* that have contributed to the accomplishment of Objective A are as follows:

- < House Bill 345 — Recycling Market Development Plan: This legislation, effective in July 1994 requires the state to prepare a recycling market development plan every two years. The second *State Recycling Market Development Plan* was published in December 1996, and includes commitments from five state agencies (Natural Resources, Environmental Protection, Transportation, Administrative Services, and Development) to implement projects designed to improve markets for recyclable material. The third biennial plan is scheduled to be completed by December 1998.
- < ODNR Plastic Pallet/Lumber Research: The Ohio Department of Natural Resources, in conjunction with and the U.S. Department of Energy, completed a plastic pallet research and demonstration project. This project demonstrated that using a recycled plastic pallet for storing/handling 55 gallon drums of hazardous materials was feasible and cost effective. Also, in 1997, Battelle Research Laboratories, Inc., with support from ODNR, was able to obtain approval for five American Society for Testing and Materials (ASTM) standards for recycled plastic lumber.
- < Pollution Prevention Loan Program: This program was established in 1994 as a joint effort between Ohio EPA and the Ohio Department of Development. From 1994 through February 1998, small and medium-sized companies throughout Ohio have been awarded low interest loans totaling approximately \$3,634,000 for construction and/or purchase of equipment to complete pollution prevention activities. While Ohio EPA has reviewed the technical aspects of 62 projects since 1995, twenty of these projects have received funding from the Department of Development. From 1995 through February 1998, four projects

have been funded which include solid waste recycling as well as four projects with solid waste source reduction components.

1989 State Plan - Objective B

The buying of recycled content products will be promoted in the State of Ohio.

The following activities, which have contributed to the Accomplishment of Objective B, have been implemented since the adoption of the *1995 State Plan*:

- < ODNR Pilot ‘Recycled Product’ Projects : There have been no new pilot projects since 1995.
 - < Ohio Newspaper Association Voluntary Recycled Newsprint Procurement agreement: In 1996, the Ohio Newspaper Association reported that its members used 312,168 metric tons of newsprint containing recycled fiber. The aggregate recycled fiber content was 26 percent, down slightly from the 30.3 percent in 1995. This total still exceeds the 23 percent goal established for 1996 in the Ohio Voluntary Newsprint Agreement.
 - < House Bill 25 state agency report: ODNR’s Division of Recycling and Litter Prevention (DRLP) continues to actively promote the concept of “buying recycled” to state employees through publications, displays, training and other awareness materials. Reports required under House Bill 25 indicate that Ohio state agencies purchased \$7,674,729 in state fiscal year 1996 and \$3,162,412 in state fiscal year 1997 of recycled content products. The decrease from 1996 to 1997 is in large part due to two factors: 1) incomplete reporting, and 2) a decrease by the Ohio Lottery Commission in its purchase of lottery tickets.
- In 1997, Ohio Governor Voinovich challenged state agencies to increase their purchase of recycled-content products by 15 percent in fiscal year 1998. As a result, the Ohio Departments of Natural Resources, Transportation, Administrative Services, Development and Ohio EPA signed Memoranda of Understanding committing to increase their Departments' recycled content purchases by 15 percent. The Governor directed all other departments to meet the 15% increase as well.
- < Ohio’s Recycled Product Vendor’s Guide: This guide was updated and distributed for the third time in 1996. The guide was also made available through the ODNR-DRLP web page at:
<http://www.dnr.ohio.gov/odnr/recycling>
 - < Buy-Recycled Grants: ODNR-DRLP continued to provide funds to Ohio local governments for the purchase and testing of recycled-content products. From 1996-1998, over \$ 800,000 was awarded through the *Recycle, Ohio!* grant to increase local purchase of recycled-content products.

- < Ohio Buy-Recycled Business Alliance: Since its inception in 1995, the Alliance's membership has grown from the 12 original founding members, to almost 150. The overall goal of this organization is to document and increase businesses' purchase and use of recycled-content products. Recently, the Alliance has been concentrating on expanding its membership and determining a funding mechanism to sustain the organization and its services.
- < University of Toledo Research project: The Ohio Department of Transportation sponsored research with the University of Toledo, College of Engineering, on the cost effectiveness of using recycled-content materials. The research was to develop a procedure for performing life cycle cost analysis for recycled materials such as rubber, glass, paper and plastics.

1989 State Plan - Objective C

Efforts will be directed to promote the expansion of existing industries and attract industries to Ohio that will use recycled materials.

Activities that have been implemented since adoption of the *1995 State Plan* that have contributed to the accomplishment of Objective C are as follows:

- < Senate Bill 165 - Scrap Tire recycling market development: See Chapter VI for a discussion of the on-going programs implemented as a result of Senate Bill 165.
- < ODNR Recycling Market Development Grant Program: ODNR-DRLP awarded over \$1.2 million, from 1996-1998, to 16 Ohio local businesses for the implementation of projects to improve the markets of post-consumer recyclables in Ohio. For a summary of those grants, see Appendix D.
- < ODNR Demonstration projects: In an effort to target mixed color glass and residential mixed paper, two recycled materials with limited markets, ODNR-DRLP funded two demonstration programs - one with Strategic Materials, Inc, in Cleveland, and one with Central Fiber Corporation in Dayton.

Also, ODNR-DRLP, in conjunction with the Butler and Hamilton County SWMDs, City of Forest Park, Cincinnati Recycled Fibers, Browning Ferris Industries, Rumpke Recycling, and the American Forest and Paper Association, planned and implemented a pilot "residential mixed paper" collection program in Butler County. The pilot ran for 10 months and many valuable things were learned from this pilot.

1989 State Plan - Objective D

The State of Ohio will actively pursue the development of regional markets for products containing recycled materials.

Since the adoption of the *1995 State Plan*, the following activities have been implemented, contributing to the accomplishment of Objective C:

- < Ohio Materials Exchange : A partnership between Ohio EPA, Department of Natural Resources, Department of Development and the Association of Ohio Recyclers has resulted in a statewide materials exchange program, OMEx. OMEx provides Ohio businesses with a mechanism for finding an alternative to disposal for their company's waste. Materials exchanges facilitate turning one company's waste into another company's raw materials, thus avoiding landfilling of such materials. OMEx began operations in early 1998.
- < Cooperative Marketing Initiative: In 1997, ODNR-DRLP facilitated several meetings with many of Ohio's public recycling facility managers in an effort to increase the cooperative marketing of various recyclable materials. As a result of these meetings, seven regional groups were identified that ODNR-DRLP will be able to work with to improve markets for recycled materials. Two of the regions have already initiated activities that should improve markets for residentially generated recyclables in their region.

Local Projects Implemented to Promote Markets for Recyclables and Recommendations for SWMDs

SWMDs continue to implement programs to help develop markets for recyclable materials. The *1995 State Plan* recommended that SWMDs include market development activities for local communities, and suggested one or more of the strategies below shown in italics. Under each of these strategies are examples of programs implemented by SWMDs.

< Pilot projects demonstrating the use of a recycled-content products:

The Mahoning County SWMD continues to purchase recycled-content products such as plastic lumber, drainage pipe, and pavement crack sealant, and uses these materials in construction projects (e.g. a building at the county fairgrounds) to demonstrate their effectiveness.

< Providing limited financial incentives for local governments to use recycled-content products:

The Ottawa-Sandusky-Seneca SWMD offers grants to local communities which can be used to purchase recycled-content products.

< Coordinating waste exchanges:

Several SWMDs have initiated waste exchanges over the past three years, including Hamilton, Mahoning, Ottawa-Sandusky-Seneca, and Lucas SWMDs.

< Coordinating cooperative buying and marketing programs for local entities:

At least two SWMDs (Cuyahoga and Guernsey-Monroe-Morgan-Muskingum-Noble-Washington) have implemented cooperative marketing programs to assist local communities in selling their recyclables.

< Seeking out businesses in the district that could improve markets for hard to market materials and assist them in applying for ODNR market development grants:

The Cuyahoga County SWMD applied for and received a \$100,000 market development grant from the Ohio Department of Natural Resources for a local glass recycler, Strategic Materials, Inc. Grant funds will be used to begin processing mixed container glass for sale to the fiberglass industry. The project will increase glass recovery significantly, and greatly improve the markets for mixed glass. (See Appendix D for further discussion of this project.)

< Providing technical assistance to local governments and local businesses wishing to use recycled-content materials:

The Solid Waste Authority of Central Ohio (Franklin County) continues to provide technical assistance to businesses and worked closely with the Columbus Chamber of Commerce to promote waste reduction by conducting seminars for business and conducting general publicity campaigns to promote waste reduction and encourage buying recycled-content products.

< Providing education to the public, local governments, and businesses through seminars, presentations to local organizations and associations, news releases, and a SWMD newsletter on options available for market development:

The Darke County SWMD continues to implement the "Model Community Program" which educates local businesses and organizations on ways to reduce waste, recycle more materials, and increase purchase of recycled-content products.

Recommendations for the State

The *1995 State Plan* included fifteen recommendations for various state agencies. The recommendations are shown below in *italics*, followed by a discussion of the status of each one.

< *All state government departments/offices should be encouraged to participate in an Advisory capacity to the Interagency Workgroup for Market Development (IAWG)...*

All state agencies are encouraged, through the State Recycling Coordinators infrastructure and a newsletter to promote recycling and to buy recycled-content products. However, no additional agencies are providing direct input to the IAWG.

< *The IAWG and the associated task forces should continue to explore strategies for expanding the demand and supply of recyclable materials...*

In the process of creating the biennial *Recycling Market Development Plan*, the IAWG continues to explore activities to increase recycling market development and include them in the next plan. The Material Specific Task Forces were only active during the Spring and Summer of 1995 to develop recommendations and strategies for improving the markets for their specific material.

< *The IAWG and the associated task forces should explore the feasibility of adopting a voluntary plastic recycled-content agreement similar in nature to the Voluntary Newspaper Agreement.*

There has been no progress on this recommendation. Industry has not expressed strong interest in a plastic recycled-content voluntary agreement, and as a result, the IAWG and ODNR have focused resources on other more pressing topics.

< *The program to electronically trade recycled glass, PETE, and HDPE plastics on the Chicago Board of Trade (CBOT) should be monitored and promoted....*

CBOT program information/brochures were provided to Ohio's community recycling representatives, and recycling processors. Also, in conjunction with the National Recycling Coalition and the CBOT initiative, a special session on the CBOT program was integrated into the state's 1995 recycling conference held in Sharonville, Ohio.

< *The Department of Administrative Services (DAS) should continue to integrate the Buy-Recycled option within the local government cooperative purchasing events...*

DAS Local Government Cooperative Purchasing "town meetings" were discontinued and have been replaced with "How to Do Business with the State" meetings. Although the purchase of recycled-content products is no longer a component of these events, ODNR continues to work with DAS to add new recycled-content products to state contracts.

< DAS should review and evaluate the new “recycled product procurement” guidelines issued from the U.S. Environmental Protection Agency...

DAS continues to receive the new U.S. EPA procurement guidelines, and adds new recycled-content products to state contracts when feasible.

< The Ohio Department of Natural Resources and the IAWG should strive to implement all feasible recommendations made by the material-specific task forces set up by the workgroup.

Progress has been made on satisfying 18 of the 25 recommendations made by the IAWG in the Recommendations and Strategies document that was published as a follow-up to the initial *Recycling Market Development Plan*.

< DAS and the State Architect should research the feasibility and use of recycled-content products in the construction and/or renovation of state-owned and leased buildings.

In 1997, as a result of the Design Decisions seminar (described below) for sustainable building design, the State Architect and ODNR-DRLP linked their homepages in an effort to increase access to recycled-content product information.

< ODNR and DAS should work with organizations such as the Building Industry Association, U.S. Department of Agriculture, the National Homebuilders Association...to plan and conduct a statewide seminar on the use of recycled-content materials in the building trades industry.

In 1997, ODNR-DRLP, the State Architect’s office and the Solid Waste Authority of Central Ohio planned and conducted “Design Decisions”. This was a seminar primarily for architects and engineers to help them understand the environmental impacts of their design decisions and to provide increased awareness about recycled-content products being utilized in the construction industry.

< Private sector construction projects receiving state funds should consider the use of recycled-content building materials.

There has been no progress to date on this recommendation.

< The Ohio Department of Development should continue to incorporate a Buy recycled component into its annual "Buy Ohio" conference.

The "Buy Ohio" conference was replaced with the "Ohio Business Expo." However, both of these events have now been discontinued.

< ODNR should evaluate the feasibility of expanding the Ohio Recycling Information Communication System (ORICS) to include more information on what recycled-content products are being purchased, by whom, and who is selling them.

ORICS was replaced with ODNR-DRLP's new web page, located at:

www.dnr.state.oh.gov/odnr/recycling

As a result, DRLP's "Directory of Ohio Vendors of Recycled Products" is now available via the Internet. Also, for individuals without Internet access, recycled-content product information is available via DRLP's FaxBack System, by dialing (800) 317-4797.

< ODNR should increase recycled-product procurement use/information to organizations...by offering to submit articles for their monthly newsletters and to participate in seminars and conferences.

DRLP's "Directory of Ohio Vendor's of Recycled Products" was updated in 1996 and distributed to all of DRLP's local recycling programs and all the local SWMDs. As mentioned above, it was also placed on the DRLP website and FaxBack system. From 1996-1998, over \$800,000 was awarded by DRLP to local governments for increasing their purchase of products containing at least 5 percent post-consumer material.

< ODNR should establish a toll free recycled-content product "hotline" to improve awareness and access to information regarding procurement of recycled-content products.

In place of a toll free recycled-content product hotline, ODNR-DRLP established a web page and toll free FaxBack system that contain recycled-content product information.

< ODNR should continue its efforts in establishing and expanding the Ohio Buy Recycled Business Alliance in an effort to increase private business purchase of recycled-content products.

The Ohio Buy Recycled Business Alliance is discussed under 1989 *State Plan - Objective B* earlier in this chapter.

Appendix A

Acronyms Used in this Document

<i>1989 State Plan</i>	<i>1989 State Solid Waste Management Plan</i>
<i>1995 State Plan</i>	<i>1995 State Solid Waste Management Plan</i>
ADR	annual district report
CBOT	Chicago Board of Trade
DAS	Department of Administrative Services
DRLP	Division of Recycling and Litter Prevention (ODNR)
DSIWM	Division of Solid and Infectious Waste Management (Ohio EPA)
<i>Format</i>	<i>District Solid Waste Management Plan Format</i>
HHW	household hazardous waste
IAWG	Interagency Workgroup for Market Development
MSW	municipal solid waste
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
ODOD	Ohio Department of Development
Ohio EPA	Ohio Environmental Protection Agency
OMEx	Ohio Materials Exchange
OPP	Office of Pollution Prevention (Ohio EPA)
ORC	Ohio Revised Code
PAYT	pay-as-you-throw
SFY	state fiscal year
SWAC	Solid Waste Management Advisory Council
SWANA	Solid Waste Association of North America
SWMD	solid waste management district

Appendix B

Tentative Review Schedule for the Siting Criteria Rules

Note: Steps that include outreach to interested parties are listed in **bold**.

STEP	MILESTONE	DATE
1	Scoping Report to Rules Committee	January 30, 1998
2	Scoping Report to Interested Parties for Comment	March 2, 1998
3	Concept Paper to Rules Committee	July 31, 1998
4	Concept Papers to Interested Parties for Comment	September 2, 1998
5	DRAFT Rules to Rules Committee	December 1, 1998
6	DRAFT Rules to Interested Parties for Comment	December 31, 1998
7	Responsiveness Summary to Rules Committee	March 31, 1999
8	Revised DRAFT Rules to Rules Coordinator	June 3, 1999
9	Revised DRAFT Package to Director	June 17, 1999
10	Revised DRAFT Package to State Printing	July 19, 1999
11	Revised DRAFT Package to Mass Mailing	August 18, 1999
12	Revised DRAFT Package to JCARR & Interested Parties	September 2, 1999
13	JCARR Hearings Complete	January 1, 2000
14	Complete Responsiveness Summary	March 6, 2000
15	FINAL Rule Package to Director	April 5, 2000
16	FINAL Rule Package to Mass Mailing	June 6, 2000
17	FINAL Rule Package Files with JCARR	June 6, 2000
18	Complete Necessary Training	September 4, 2000

Appendix C

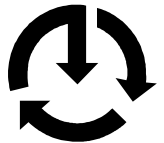
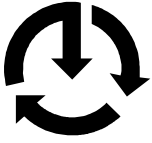
Organizations that have Received Funding through the Ohio Department of Development's (Scrap Tire) Facility Establishment Fund

(This information is accurate through state fiscal year 1997)

- < National Feed Screw, Massillon \$250,000/Loan
National Feed Screw has created a machine that can "de-vulcanize" crumb rubber without using chemicals. Their technology uses an ultra-sonic process and a mechanical feed screw.
- < Ottawa, Seneca, Sandusky Joint Solid Waste District \$125,000/Grant
The Solid Waste District used a "cold paving" process to demonstrate crumb rubber and scrap tire chips in road paving and parking lot application. Four township roads and Ottawa County Fair Grounds were paved in this project.
- < FIFO Manufacturing, McArthur \$97,850/Grant
Extended a grant to facilitate the building of a machine that would make culvert pipes from whole scrap tires. The grant will also be used to build a building to house the machine.
- < C&E Coal Company, Minerva \$250,000/Grant
C&E bought a primary shredder with grant assistance for their monofill operation. An estimated 10-13 million tires will be shredded and monofilled in this project.
- < Ashland County Solid Waste District \$175,000/Grant
This project was two-fold working with Black River Schools to create a new play area for elementary and pre-school children, and the Ashland County Fair Board on creating a handicap/veterans parking lot at the Ashland County Fairgrounds.
- < Renewable Recyclers, Canton \$250,000/Grant
This grant was to build the equipment necessary to start their business of cryonics and ambient separation of scrap tires. This process has led the company to new business ventures utilizing crumb rubber as a raw material.
- < Lucas County Solid Waste District, Toledo \$500,000/Grant
This project was a two-fold project utilizing crumb rubber as a hot mix additive along with other recyclable raw materials. The crumb rubber was also used in a top dressing and finish. The project will also be instrumental in removing 875,000 scrap tires in two locations in Lucas County.
- < National Feed Screw, Massillon \$800,000/Grant
National Feed Screw is continuing their ultra-sonic devulcanization and will expand the use and application of that raw material in a further value-added process.

Appendix D

Ohio Department of Natural Resources Recycling Market Development Grant Successful Grant Projects, Rounds 3 - 5



Round 3 - July 1995 - \$ 225,000

Delaware/Knox/Marion/Morrow Solid Waste District with American Disposal, Incorporated:

\$100,000 to purchase a truck and roll-off recycling containers to collect newspaper, mixed office waste, and magazines from 12 school districts in the district. The paper was to make recycled egg cartons and the school was expected to earn revenues from the sale of the paper.

Mercer County Solid Waste District with Versa-Pak, Incorporated:

\$125,000 to upgrade one of plastic bag maker Versa-Pak's existing production lines to utilize 20 percent recycled plastic resin in the manufacturing process. Versa-Pak was not using post-consumer resin prior to the grant award.

Round 4 - July 1996 - \$ 444,350

Brown County Solid Waste Authority with Adams/Brown Counties Economic Opportunities, Incorporated:

\$60,000 to purchase equipment to establish a glass molding system on-site and to construct a building to house this equipment. This project will allow the company to begin using recycled glass bottles in the production of glass tile.

Cuyahoga County Solid Waste District with Strategic Materials, Incorporated:

\$100,000 to purchase equipment to process and market post-consumer mixed container glass. The glass will eventually be used in the manufacture of fiberglass.

Cuyahoga County Solid Waste District with Cleveland Reclaim Industries, Incorporated:

\$50,000 to purchase and install molding equipment to produce fire and rescue products made from colored high-density polyethylene.

Erie County Solid Waste District with Universal Clay:

\$63,350 to purchase grinding equipment for use in mixing post-consumer glass to manufacture low-voltage electrical porcelain and refractory ceramics. Universal Clay had previously used new glass elements in the production process.

Southeastern Ohio Joint Solid Waste Management District with Mondo Polymer Technologies:

\$99,000 to increase the use of recyclable plastic feedstock to manufacture recycled plastic products, including a highway guardrail block that has passed Federal Highway Safety Standards testing.

Wood County Solid Waste District with PETE Processors, Incorporated:

\$72,500 to help to remove PVC flake from post-consumer PET bottles for recycling and to more effectively process and dry HDPE flake for recycling.

Round 5 - July 1997

Lucas County Solid Waste District with Plastic Technologies, Inc.

\$95,000 to demonstrate the commercial, technical, and economic feasibility of a process to turn curbside generated post-consumer PET into a resin that would meet FDA guidelines for direct food contact plastic packaging.

Southeastern Ohio Joint Solid Waste Management District with Mondo Polymer Technologies:

\$139,835 to upgrade equipment to enable Mondo Polymers to use increased quantities of post-consumer plastics as feedstock for its 100% recycled content and Federal Highway Administration approved highway guardrail blockouts and other 100% recycled content plastic products.

Stark/Tuscarawas/Wayne Solid Waste Management District with Rittman Paper Board, Inc.

\$158,125 to purchase contamination separation equipment to enable Rittman Paperboard to accept and process post-consumer paper stock - including plastic-lined bags, phone books, and loose corrugated containers - to use in the manufacture of 100% recycled paperboard.

To date, the Recycling Market Development Grant has assisted in over **\$1.8 million** worth of successful recycling market development projects throughout Ohio. The next round of grant awards will be announced in June 1998.

Appendix E

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