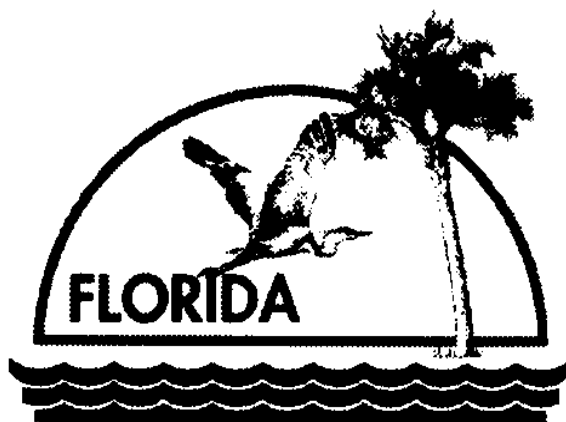


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Reporting Agency: Department of Environmental Protection
Recipient Agency: Governor and Florida Legislature
Subject: Hazardous Waste Management Needs Assessment Report
Report Due Date: Annual - January 1, 1999
Statutory Requirement: Section 403.7226(2), F.S.
Abstract: <p>Section 403.7226(2), Florida Statutes, requires the Department to identify the short and long-term needs for hazardous waste facilities and services to properly manage hazardous waste generated in Florida. It also requires that an annual report be submitted to the Governor and Legislature giving an assessment of the State's hazardous waste management needs. This assessment is an ongoing process and is updated whenever new information on hazardous waste generation and management becomes available.</p> <p>This Hazardous Waste Management Needs Assessment Report reviews the activities of the State Hazardous Waste Management Programs in 1998. It covers the State Hazardous Waste Management Program's statutory framework; progress in the Local Assessment, Notification and Verification Program for small quantity generators of hazardous waste implemented by counties, Regional Planning Councils and the Department; the status of the Local Hazardous Waste Collection Center Grant Program; the Mercury, Cadmium and Lead Reduction and Management Programs; Florida's Pollution Prevention Program; the Used Oil Management and Recycling Programs; and an update to Florida's Need for Hazardous Waste Management Capacity.</p> <p>Copy: Executive Office of the Governor Office of Planning and Budgeting (3 copies)</p>

REPORT TO THE GOVERNOR AND LEGISLATURE
NEEDS ASSESSMENT REPORT
FOR HAZARDOUS WASTE MANAGEMENT



January, 1999

Florida Department of Environmental Protection
Division of Waste Management
Hazardous Waste Management Section

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REPORT TO THE GOVERNOR AND LEGISLATURE
NEEDS ASSESSMENT REPORT
FOR HAZARDOUS WASTE MANAGEMENT

January, 1999

INTRODUCTION

In order to protect Florida's water supply, the Legislature has established local, regional, and state responsibilities for proper hazardous waste management. One of the Department's responsibilities is to estimate the amounts and types of hazardous waste generated by large and small businesses, government facilities, and households and to assess the need for proper collection, storage, treatment, and disposal of these wastes. A report to the Governor and the Legislature on the State's hazardous waste management facility needs is required annually as indicated in Section 403.7226(2), Florida Statutes (F.S.).

This report summarizes the progress of each of the Department's programs that address hazardous waste generation and the need for proper management of these wastes. Included in this year's report is a discussion of the management of mercury and cadmium-containing wastes such as fluorescent lamps and rechargeable batteries that were addressed by the 1993 Legislature. It also reviews the Department's recent collection and analysis of the 1997 Biennial Hazardous Waste Report data submission to the United States Environmental Protection Agency (EPA) as required by the federal Resource Conservation and Recovery Act (RCRA). To begin this report, however, an overview of the history of Florida's statutory requirements is given.

OVERVIEW OF FLORIDA'S STATUTORY REQUIREMENTS

The Water Quality Assurance Act of 1983 required the Department of Environmental Protection to coordinate with the Regional Planning Councils (RPCs) and county governments in conducting county and regional hazardous waste management assessments (403.7225, F.S.). The Legislature appropriated 2.16 million dollars for this program. The assessments were phased in over a three-year period. Work was completed on all the counties' initial assessments on July 31, 1987.

The 1985 Legislature, recognizing the need for the local collection and temporary storage of small quantities of hazardous waste, established the Local Hazardous Waste Collection Center Grant Program (403.7265, F.S.), as a strategy for setting up a local hazardous waste collection center network statewide.

The 1986 Legislature amended Section 403.7234, F.S., and authorized the Department to regulate small quantity generators (SQGs) to ensure proper hazardous waste management in a manner consistent with federal requirements. The counties were given authority to collect fines from any small quantity generator that did not disclose information to the counties as to the types of, quantities of, and management practices of hazardous waste generated. Fines collected are to be used for the annual verification process and for local hazardous and solid waste management programs.

The 1987 Legislature amended Section 403.7265, F.S., to direct the Department to recommend a site for a state multipurpose hazardous waste treatment facility by May 1, 1988. An assessment of the suitability of the storage facility sites selected by the Regional Planning Councils was also required.

The 1988 Legislature initiated new programs for waste elimination and reduction of hazardous waste (403.7223, F.S.); the establishment of used oil recycling centers (403.763, F.S.); and reauthorized the local hazardous waste collection center grant program by providing up to \$100,000 to each grant recipient (403.7265, F.S.).

The 1989 Legislature expanded the use of the 3% tax on the gross receipts of a privately owned hazardous waste facility by the host local government (403.7215, F.S.). It also recognized the designation of the Union County site for constructing and operating a multipurpose hazardous waste facility. In order to establish a centralized and coordinated permitting process for the siting, construction, and operation of a multipurpose hazardous waste facility, the Legislature passed the "Statewide Multipurpose Hazardous Waste Facility Siting Act" (Chapter 89-285, Laws of Florida, codified as Sections 403.78-403.7893, F.S.). In addition, during the 1989 Legislative Session, Senate Concurrent Resolution No. 1146 was passed. The Resolution, in summary, states that there is a need for a comprehensive waste management system including a multipurpose hazardous waste treatment facility; that the Legislature has not and does not intend to enact barriers to the movement of hazardous waste or the siting of hazardous waste facilities for the proper storage, treatment and disposal of hazardous waste; and that the State will work diligently and expeditiously with the private sector toward the siting, construction and operation of such a facility. The 1989 Legislature also amended the strict prohibition on hazardous waste landfills. Untreated hazardous waste is still prohibited from being landfilled in Florida, but if the hazardous waste has undergone treatment, it may be disposed of in a permitted hazardous waste landfill.

The 1990 and 1991 Legislatures again appropriated 1 million dollars to continue the household hazardous waste collection center grant program. The 1991 Legislature also provided for additional uses of the 3% tax levied on the gross receipts of certain hazardous waste facilities (403.7215, F.S.) to strengthen local environmental programs. An amendment was also made to 403.7225, F.S., which authorized counties to impose a small quantity generator notification and verification surcharge (up to \$50.00) on the business or occupational license or license renewal of any firm that is identified as a small quantity generator of hazardous waste.

The 1992 Legislature again appropriated 1 million dollars to continue the Local Hazardous Waste Collection Center Grant Program.

The 1993 Legislature directed the Department to conduct a Hazardous Waste Needs and Capacity Study under 403.7895(5), F.S., to evaluate the current and future need for hazardous waste incineration capacity, including boilers and industrial furnaces burning hazardous waste fuel, in Florida.

In 1993, the Florida Legislature adopted provisions for the environmentally sound management of mercury-containing lamps, such as fluorescent lamps, and mercury-containing devices, such as mercury thermostats and thermometers (403.7186, F.S.). Incineration of such lamps from commercial and institutional sources was prohibited after July 1, 1994, and both incineration and landfill disposal of devices were prohibited after January 1, 1996. Additionally, the Department was directed to develop rules to provide criteria for the permitting of mercury reclamation facilities and to set standards for such facilities and associated collection centers. The Department was further directed to conduct demonstration projects to study the collection and recycling of these mercury-containing materials. The Department was also directed (403.7061, F.S.) to fund a pilot project, to be conducted in a local government jurisdiction served by a waste-to-energy facility, that would include: the design, implementation and evaluation of programs for removing toxic materials from the waste stream prior to incineration; and an evaluation of the effectiveness of the pilot program including analyses of air emissions from the waste-to-energy facility. A letter report on this study was submitted to the Governor and the Legislature on December 1, 1995 and additional information was submitted on July 22, 1998.

In addition, the 1993 Legislature enacted new requirements for consumers, manufacturers, and sellers of batteries (403.7192, F.S.). The principal provisions were aimed at reducing mercury and cadmium in municipal solid waste (MSW). They included mercury content limitations on household alkaline-manganese and zinc-carbon batteries sold in Florida as verified through annual mercury content certifications from manufacturers and importers of those types of batteries, a sales ban for mercuric-oxide button cell batteries, and mandatory unit management programs sponsored by marketers for the collection and proper disposal of larger mercuric-oxide batteries sold or distributed in Florida. Other provisions included design, labeling, and unit management (collection) program requirements for nickel-cadmium and non-vehicular sealed lead acid rechargeable batteries and/or the products containing these batteries which are sold in Florida.

The 1993 Legislature amended 403.7265, F.S., giving the Department authority to use grant funds to assist local governments in carrying out the responsibilities of the SQG Assessment, Notification and Verification Program and to promote the continued development of the local government hazardous waste management programs.

The 1994 and 1995 Legislature appropriated 2.8 million dollars to continue the Local Hazardous Waste Collection Center Grant Program and to initiate the use of grant funds to assist local governments through the SQG Assessment, Notification and Verification Program Grant and the Expanded Local Hazardous Waste Management Programs Grant.

The 1996 and 1997 Legislatures appropriated 600 thousand dollars for each of the following state fiscal years to continue the Local Hazardous Waste Collection Center Grant Program and assist local governments through the SQG Assessment, Notification and Verification Program Grant and the Expanded Local Hazardous Waste Management Grant. The 1994 through 1998 Legislative sessions did not pass specific new or amended statutory requirements directed at the Department's hazardous waste management programs. Work conducted under previous Legislative mandates are summarized in the body of the report.

ASSESSMENT, NOTIFICATION AND VERIFICATION PROGRAM

BACKGROUND

Sections 403.7225 and 403.7234, F.S., established the Small Quantity Generator Assessment, Notification, and Verification Program (SQG Program). A small quantity generator (SQG) is defined in the federal regulations (40 CFR Part 260.10) as a generator that produces less than 1,000 kilograms (or approximately 2,200 pounds or about 275 gallons) of hazardous waste in any calendar month. Since the end of 1986, SQGs are in one of two hazardous waste generation categories: 100 - 1,000 kilograms (220 - 2,200 pounds) per month, or 100 kilograms or less of hazardous waste per month. The latter category is referred to as a conditionally exempt SQG (or CESQG).

The goals of the SQG Program are for local governments to inform SQGs of their legal responsibilities in properly managing their hazardous wastes, to protect public health and the environment (e.g., drinking water resources), and to update the original information submitted to the Department in each county's hazardous waste assessment as required in 403.7225, F.S. A county may have additional uses for this program. Knowledge of hazardous materials and wastes stored at a business location can be useful for county departments with responsibility for comprehensive planning, emergency management, fire and police protection, health care, and water quality management.

LOCAL GOVERNMENT ACTIVITIES

- In fiscal year 1997-98, 57 counties in Florida submitted data to the Department (Appendix 1). Approximately 99,994 small businesses were reported in the county's assessment rolls as potential or active small quantity generators of hazardous waste. These businesses were notified by mail or through renewal of their occupational or business license of their legal waste management responsibilities. They were also provided options to properly manage their wastes. County and Regional Planning Council (R.P.C.) SQG coordinators, through mostly on-site visits, verified approximately 28,387 businesses on the assessment roll. Additional educational assistance in the form of fact sheets and consultation were provided to small businesses during these site visits.
- Surveys were conducted in September and October 1997 of local SQG Program Coordinators and of DEP RCRA Program Managers in each District. The purpose of the surveys was to identify strengths and weaknesses of the SQG Program and use this information to improve program efforts. Survey results from counties show a need for improved communication and coordination between the Districts and the Counties; more emphasis on solving environmental problems as opposed to number of site visits made; more training opportunities; and the concern that the SQG Program is not financially supported by the State. Survey results from the Districts show a need for improved communication and coordination and a need for more training. One District RCRA inspector summed it up by saying, "We need to be confident that the counties are not giving bad advice".
- County and R.P.C. SQG coordinators within each of the DEP District boundaries meet on a quarterly basis. There are currently five regional county/R.P.C. groups. The main purpose of these groups is to exchange ideas and share information relative to the SQG Program. A representative from the corresponding District office is present at each meeting. County representatives from

these groups have formed committees that are tasked with ways to help improve the quality of the SQG program and its usefulness. Two committees currently functioning are the Annual SQG Workshop Planning Committee and the SQG Program Development Technical Advisory Group. Current projects include:

1. Development of standard operating procedures for inspections and data quality.
2. Assist in the organization of the annual SQG Conference.
3. Working with Santa Rosa County in a pilot project to incorporate SQG data collected into the enhanced 911 system.
4. Development of standard language for a Memorandum of Understanding between the DEP District RCRA Program and County SQG Programs. The goal in this effort is to clarify roles and responsibilities for each group when coordinating the local SQG Program with the State RCRA Program. A secondary benefit is the improved communication between local government and the Department.
5. Making recommendations to be included in draft changes to the SQG Program statutes under Chapter 403, F.S.

TYPES OF FUNDING

After the initial funding for conducting assessments under the Water Quality Assurance Act had run out, local SQG programs had to develop local funding sources to continue the program. In 1991, the Legislature amended 403.7225, F.S., allowing counties to impose up to a \$50 surcharge on the occupational license fee of a business classified as a SQG. Recognizing the need for increased participation by local governments, the Legislature in 1993 amended Section 403.7265, F.S., giving the Department authority to use grant funds to assist local governments in carrying out the responsibilities of this program. Available money is used for grants to assist smaller counties temporarily in developing their local SQG Programs while they establish permanent funding sources at the local level. The total amount for this one-time grant is \$30,000 per county.

Additionally, the Legislature established the “Expanded Local Hazardous Waste Management Grant Program” (403.7238, F.S.). The Department was directed to establish a grant program to promote the continued development of local government hazardous waste management programs. The objective of this grant is to assist local governments in developing enhanced local hazardous waste management programs and to help establish local pollution prevention programs. The total amount for this one-time grant is \$50,000 per county. A summary of current and proposed SQG grant projects can be found in Appendix 2.

ENHANCEMENTS TO THE SQG DATABASE MANAGEMENT SYSTEM

The database software program used by each County SQG program coordinator is currently undergoing a complete overhaul. The software is being upgraded to a 32-bit windows application. New screens will incorporate compliance assistance, pollution prevention and county specific information collected during on-site visits. An orientation-training program will be developed to properly train users. This is part of an ongoing effort to improve the quality of data provided to the Department by each county and to make the database program easier to use and flexible to accommodate county specific needs.

ESTIMATION OF NUMBERS OF SQGS

Based on a recent study by the Center for Hazardous Materials Research, the estimated number of Florida businesses in 1991 ranges from 277,000 to 391,000. Approximately 96,000 (25-33%) businesses produce some form of hazardous waste. This estimate was derived from data collected by local governments as part of the SQG Assessment, Notification, and Verification Program.

Based on the Department's SQG database, 85% of the SQGs would be classified as conditionally exempt small quantity generators (CESQGs) generating less than 220 pounds of hazardous waste per month. These CESQGs account for only 33% of the total waste generated. Sixty-seven percent of the hazardous waste generated are by the remaining 15% of the regulated SQGs (220-2,200 lb./month).

ESTIMATION OF AMOUNTS AND MANAGEMENT OF COMBUSTIBLE AND INCINERABLE (C/I) HAZARDOUS WASTE GENERATED BY SQGS

Using data collected by the local governments, there are approximately 96,000 potential SQGs in Florida. Seventeen percent of these SQGs were reported to produce combustible and incinerable (C/I) hazardous waste. These businesses reported generating 24.8 million pounds of combustible and incinerable hazardous wastes. Approximately 65% of the C/I waste were treated to recover the solvents, 33% is blended as fuel or burned to recover the energy, and 2% is treated by incineration. There are 261 three digit Standard Industrial Classification (SIC) code industries which produce C/I hazardous waste.

Automotive repair and related industries (service stations, car dealers, etc.) in total generate an estimated 43% of the C/I hazardous waste reported to be produced by SQGs in Florida. Special Trade Contractors (construction industry) are reported to generate an estimated 6% of the C/I hazardous waste followed by Trucking and Warehousing (4%) and Personal Services such as dry cleaning and photographic studios (4%).

There are potential opportunities for reducing the quantity of C/I waste produced by SQGs in Florida. Because of regulatory and economic pressures, certain waste streams could be reduced from between 20 and 90%. The greatest pressures will be to reduce the use of halogenated solvents. This type of solvent represents 5% of the C/I waste stream estimated to be generated in Florida. These trends will continue into the next century.

LOCAL HAZARDOUS WASTE COLLECTION CENTER GRANT PROGRAM

BACKGROUND

The Local Hazardous Waste Collection Center Grant Program was established in 1985 to encourage the development of a statewide network of local hazardous waste collection centers. The Legislature initially appropriated \$500,000 to establish local or regional hazardous waste collection centers in Florida. These facilities are intended to provide free collections of non-regulated hazardous waste from households and to provide short-term storage of hazardous waste generated by very small businesses. Also, the public awareness component of a collection not only helps citizens to better understand and manage their household hazardous waste (HHW), but also may help them to explore ways to reduce the volume they generate.

Generally, the level of service and technical expertise at permanent collection centers has tended to increase each year the facility is in operation. Centers are being enlarged and upgraded with equipment such as paint can crushers, aerosol can puncturing/drainage devices, and antifreeze recycling machines. More counties are hiring chemists to staff the facilities which are open 5-6 days per week and are establishing transfer facilities, open 3-5 days per week for collections. As on-site chemists are able to sort, bulk, or pack the wastes into drums and sub-contract out various waste streams such as used motor oil or lead-acid batteries, the cost of operation has decreased.

Recycling is an important component of operation at collection centers. Several programs have "swap shops" where reusable products such as aerosols, polishes, waxes, paints, lawn care and pool products are given away. Antifreeze is recycled and reused in county vehicles. One county sells old car batteries collected at the center to a recycler for annual revenues of \$10,000. County Departments also use automotive, lawn care and paint products when possible.

Paint, the most prolific waste stream collected, is being recycled in a variety of ways. Most of the oil-based products are bulked and shipped off-site to be used for fuel blending. One center blends latex paint and has given as much as 2,000 gallons back to the community within a month. Another mixes the latex it cannot give away with cement to make "paintcrete" in the form of containment slabs, sidewalks, and driveways. Six counties send their paint to three different Florida paint companies where the paint is mixed, re-manufactured and packaged as a post-consumer product containing as much as 95% recycled paint.

Unique Activities and Innovative Projects funded from grants have included establishing the following: mobile collection units in several counties; pilot collections for banned and restricted pesticides; and collection and recycling programs for fluorescent lamps, freon, used motor oil and oil filters. A home fuel oil restoration/pumping program was established to manage the numerous abandoned and potentially leaking home fuel oil tanks that were no longer necessary because of conversion to electric or natural gas home heating. A plan was implemented to reuse old latex paint by substituting it for water when mixing concrete, producing "paintcrete" slabs that were used in building containment areas at solid waste facilities. The grant has funded several public awareness and educational programs promoting both the proper management of HHW and the reduction of hazardous waste generation. Newsletters, brochures and bilingual public awareness pamphlets have been developed and distributed. Local

programs have also coordinated efforts with the Florida Poison Control Center and the local public school system in an effort to educate children.

In an effort to divert heavy metals from the municipal waste stream, fluorescent lights and other mercury-containing devices are being collected for proper management. Several counties have expressed interest in conducting pilot programs to collect and demanufacture televisions, computers and other electronics in order to recycle lead, mercury and their other components.

Six Florida counties (Martin, Lake, Monroe, Marion, Leon and Broward) are complimenting their permanent collection center operation and periodic Amnesty Days-type collection events with mobile unit collections. The vehicles being used are trucks, large vans or ambulances that have been customized for the safe collection and transportation of HHW. In addition to providing HHW collections at convenient locations, the vehicles' eye-catching side murals and lettering provide advertising for county HHW management programs.

TYPES OF FUNDING

- Hazardous Waste Collection Center Grant

Up to \$100,000 per county for constructing one or more safe, secure operational hazardous waste collection centers.

- Cooperative Collection Center Arrangement Grant

Up to \$35,000 per grant to reimburse 75% (with a \$25,000 limit) of a smaller county's collection event. The host county, experienced in hazardous waste collections, is reimbursed up to \$10,000 for assisting the neighboring county in holding its collection.

- Unique or Innovative Project Grant

Up to \$50,000 per grant with the county providing a 100% match. Funding is only available to counties that are operating permanent hazardous waste collection centers and is in addition to Hazardous Waste Collection Center Grants and Cooperative Collection Center Arrangement Grants.

- Grants to reimburse expenses associated with local hazardous waste management

Available to counties that has established operational permanent facilities under the Hazardous Waste Collection Center Grant but have received funding less than their \$100,000 limit.

REQUIREMENTS FOR THE HAZARDOUS WASTE COLLECTION CENTER GRANT

- Contracting with a licensed, insured private hazardous waste management company that will be responsible for collecting hazardous waste and assuring the delivery of that waste to permitted recycling, storage, treatment or disposal facilities.
- Guaranteeing operation of the collection center for two years after the facility is constructed, including at least two days per year when HHW will be accepted from private citizens (non-business) at no charge. These "free collection days" will be well advertised to encourage private citizen participation.

- Offering at least two advertised collections per year when conditionally exempt small quantity generators can bring their hazardous waste to the collection center in order to obtain a reduced fee for proper management of the waste at permitted facilities.
- Working with a hazardous waste management company to establish expanded collection route services such as a “milk run” pickup service for small quantity generators of hazardous waste.

HISTORY AND AWARDS

- 1986 The Legislature appropriated \$500,000 to establish local or regional hazardous waste collection centers in Florida. The grant limit per county for capital outlay expenses was \$50,000. In 1987, the following 7 counties took advantage of this opportunity to establish one facility in each county: Brevard, Citrus, Escambia, Indian River, Lake, Marion, and Volusia.
- 1988 The Legislature reauthorized the Hazardous Waste Collection Center Grant Program and appropriated \$1,000,000 funding. The grant limit per county, again primarily for capital outlay for collection center construction, was raised to \$100,000. Requests for funding exceeded the appropriation and awards were made to the following 11 counties: Alachua, Broward, Charlotte, Collier, Highlands, Hillsborough, Monroe, Orange, Palm Beach, Sarasota, and Seminole. Several of these counties have established multiple collection centers.
- 1989 The Legislature again appropriated \$1,000,000 for the Grant Program with the limit remaining at \$100,000 per county. Awards for funding were made to the following 9 counties: Clay, Dade, DeSoto, Duval, Lee, Leon, Martin, Pasco, and St. Lucie.
- 1990 The \$1,000,000 appropriation was used to award grants of \$100,000 each to Hamilton, Manatee, Osceola, Pinellas, Putnam, St. Johns, and Suwannee Counties.
- 1991 The Legislature again appropriated funding for the Grant Program. Awards of \$100,000 each were made to the following 6 counties: Hardee, Hendry, Hernando, Madison, Okaloosa, and Polk. The Grant Program was amended to include the Cooperative Collection Center Arrangement Grant to provide some financial incentive for a county with a permanent collection center to assist a smaller county in holding a State-subsidized collection event. Eleven counties were awarded these cooperative grants.
- 1992 Funding from this appropriation was used to establish a local hazardous waste collection center in Jefferson County and upgrade permanent facilities in several other counties.
- 1993 Three counties: Bradford, Okeechobee, and Taylor received grants for permanent collection center construction. The legislature also provided an additional funding opportunity from the appropriation for the Unique or Innovative Project Grant. This grant is intended for programs or activities that are designed to decrease the generation of household and conditionally exempt small quantity generator hazardous waste and increase the proper management of such wastes.
- 1994 The appropriation was used to fund grants for permanent collection center construction in Flagler, Levy, and Liberty counties. Ten counties were awarded funding for Unique

or Innovative Projects and funding was provided for collections in 14 counties under the Cooperative Collection Center Arrangement Grant.

1995 Franklin and Gadsden Counties received grants for permanent collection center construction. Eight grants provided funding for Unique or Innovative Projects and 13 counties held collection events under the Cooperative Collection Center Arrangement Grants. Four counties received grants to reimburse expenses associated with local hazardous waste management.

1996-97 The appropriation was used for 14 grants each year to fund both Cooperative Collection Center Arrangements and Unique or Innovative Projects.

1998 It is anticipated that the current appropriation for state fiscal year 1998-1999 will be used to fund 16 to 18 grants.

THE COLLECTION AND MANAGEMENT OF BATTERIES, MERCURY-CONTAINING LAMPS AND DEVICES, OTHER WASTE STREAMS CONTAINING HEAVY METALS, AND PESTICIDES

BATTERIES

Dry Cell Battery Mercury Content and Mercuric-Oxide Battery Prohibitions

From October 1993 through October 1997, the Department annually required mercury analyses and content certifications from all known manufacturers and importers of alkaline-manganese and zinc-carbon batteries as required in Section 403.7192, F.S. Based upon the analyses and certifications received by the Department from 1993 through 1997, it appears that most manufacturers, importers and distributors are complying with the statutory mercury ceilings. As a result, the Department had predicted that this battery waste stream would be essentially mercury-free by 2000. However, some declining quantity of mercury is expected in this alkaline-manganese and zinc-carbon battery waste stream through 2008 based upon annual detailed and ongoing studies of discarded batteries in 3 U.S. counties, including Lee County, Florida. This was due to the discovered disposal of significant quantities of older, higher-mercury content alkaline and zinc-carbon batteries long past their predicted lives (i.e. supposedly two years after their manufacture).

Two other significant parts of Florida's battery legislation were the sales and disposal restrictions placed on mercuric-oxide batteries. Effective October 1, 1993, the sale of mercuric-oxide button cell batteries was prohibited. These batteries were commonly used in hearing aids, cameras and watches. In addition, a sales prohibition was placed on larger mercuric-oxide cells unless the manufacturer or distributor set up a "unit management program" to provide for the collection and proper disposal of these batteries when they were discarded. These two provisions, along with the appearance of acceptable substitute batteries, have led to the virtual disappearance of these batteries from Florida's municipal solid waste (MSW) stream.

Recently, the single remaining U.S. manufacturer of larger mercuric-oxide cells announced plans to step up the marketing of these batteries to Florida medical facilities in response to some performance shortfalls of alternate battery chemistries (e.g., zinc air). However, since this manufacturer has implemented a unit management program consistent with Florida law and since the DEP continues to work with medical facilities to properly manage mercury-bearing wastes, this is not expected to significantly increase mercury from batteries discarded into MSW or regulated biomedical waste.

Rechargeable Dry Cell Batteries

The effective dates of the legislative requirements for nickel-cadmium (Ni-Cd) and small sealed lead acid (SSLA) rechargeable battery manufacturers and marketers to initiate unit management collection programs are being phased in as a result of the Department's adoption of the Universal Waste Rule (UWR). The UWR streamlines regulations governing the collection and management of certain widely generated hazardous wastes (now defined as "universal wastes"). Universal wastes include hazardous waste batteries (including Ni-Cds and SSLAs), thermostats and certain pesticides.

Under Florida's battery legislation, pilot unit management programs had to be in place for covered rechargeable batteries in Florida by September of 1996. In October of 1997, a report was due to the Department on the results of these pilot programs and on plans to implement permanent unit management programs. In April of 1998, these permanent programs began. Annual reporting of the results of these permanent programs was required, starting in October of 1998 and ending in October of 2000.

The Rechargeable Battery Recycling Corporation (RBRC) is the first organization representing battery manufacturers and marketers. It was established, in part, to set up a pilot unit management program in Florida. The Portable Rechargeable Battery Association (PRBA) and RBRC have cooperated with the Department in recent years to help Florida enact legislation and implement unit management programs for rechargeable batteries. On March 16, 1995, RBRC proposed implementing its National Management Program for Ni-Cd Batteries in Florida as a pilot. On May 24, 1995, the Department accepted RBRC's proposal and designated staff to assist in the implementation details. The RBRC program is now permanent in Florida, and internationally, with reported recycling rates in the 20-25% range through 1997 and a 1998 rate expected to exceed 30%. As of November 1998, there were 1,384 collection sites (including many county household hazardous waste and solid waste facilities) in 64 counties in Florida. Most of these facilities are battery and electronics wholesale and retail outlets.

The Department is working with PRBA to implement a similar industry stewardship program in Florida for SSLAs in the near future. Some battery manufacturers and marketers are initiating or have initiated pilot unit management programs as individual companies rather than as part of an RBRC-type trade group organizational structure. The Department encourages an RBRC-type approach to battery unit management since it appears to improve cost effectiveness especially for smaller manufacturers and marketers. The Department has also received conceptual approval from PRBA to link information on various battery chemistry unit management programs (e.g., Ni-Cd and SSLA) so that a purchaser can receive information on various unit management programs for all their battery discards from one phone call or contact point.

Passage of the Federal "Mercury-Containing and Rechargeable Battery Management Act", Public Law 104-142, by the U.S. Congress on May 13, 1996 allowed for the immediate management of rechargeable batteries under the streamlined requirements of the UWR nationwide rather than waiting on individual states to adopt the UWR. Based upon feedback from rechargeable battery industry representatives, this federal law appears to have facilitated the implementation of rechargeable battery unit management programs in Florida and nationwide, since the recycling infrastructure usually involves interstate transportation.

MERCURY-CONTAINING LAMPS AND DEVICES

With the ongoing decline of mercury content in batteries and other products and based on estimates by the DEP, mercury-containing lamps and devices will be the largest source of mercury being discarded into Florida's municipal solid waste by the year 2000. See Appendix 4 for the estimated amounts of mercury being discarded into Florida's municipal solid waste stream by product category.

On May 20, 1998, the Department modified Chapter 62-737, F.A.C., to correlate with EPA's Universal Waste Rule (UWR), Title 40 of the Code of Federal Regulations, Part 273 (40 CFR 273) as adopted by Florida on September 7, 1995 as Rule 62-730.185, F.A.C. Chapter 62-737, F.A.C., contains standards for mercury reclamation facilities and the handling of mercury-containing lamps and devices at collection centers. Six facilities have been granted permits under this Chapter. Based on throughput capacity as listed in their permits, the six permitted facilities have the capability to process every mercury-containing lamp discarded in Florida.

Based upon reports from mercury recovery and reclamation facilities received in 1997, the percentage of lamps processed is estimated to be about 25% for commercial mercury-containing lamps in the State of Florida, up from an estimated 20% in 1995, the first year such facilities were operational in Florida. The percentage estimated for 1996 was about 25% but was not adjusted to exclude lamps from out-of-state sources since reporting requirements did not require this information. On the basis of new reporting requirements, the 1997 percentage was adjusted to exclude these out-of-state lamps. While these out-of-state lamps accounted for up to 50% of the lamps processed by some facilities, it appears that the "true" percentage of Florida lamps being processed still continues to increase.

The streamlined regulatory structure of the UWR and Chapter 62-737, F.A.C., has also spawned a product stewardship program funded by mercury thermostat manufacturers. Following a cooperative effort between the DEP and the thermostat manufacturers, the Thermostat Recycling Corporation (TRC) announced in November 1997 the beginning of a reverse distribution ("take back") program for all brands of mercury thermostats. The TRC is a corporation set up by thermostat manufacturers specifically to collect and recycle mercury thermostats. The program uses the existing new mercury thermostat distribution network of wholesalers and heating, ventilation, and air conditioning (HVAC) contractors to collect thermostats taken out of service. Currently in Florida, there are at least 11 wholesaler companies participating in the TRC program with at least 17 and perhaps as many as 30 collection locations. The cost of this program is built into the cost of the product. The mercury reclaimed from old thermostats is used in the production of new mercury thermostats and other products. Without the streamlined regulatory structure provided by the UWR and Chapter 62-737, F.A.C., the manufacturers would not have been able to set up and fund such a program. The TRC program for mercury thermostats, like the Rechargeable Battery Recycling Corporation (RBRC) program for nickel-cadmium batteries, provides a good working model for other manufacturers who wish to establish product stewardship programs for proper disposal or recycling of their products.

RESEARCH AND DEMONSTRATION PROJECTS

Funds appropriated by the Florida Legislature in Fiscal Year 1997-1998 were used to fund three research and demonstration projects to follow up on research needs relating to mercury-containing devices and other products in Florida's municipal solid waste that were identified during previous research.

Researchers from the Florida Center for Solid and Hazardous Waste Management carried out two projects. The first continued a previous investigation into the uses of mercury-containing devices and other products in medical facilities and the existing waste management practices for those products when

they were no longer useful. Previous research sponsored by the Department had shown medical waste incinerators to be one of the largest sources of mercury air emissions in Florida. Objectives included the field-testing of recommended Best Management Practices (BMPs) to ensure the proper management of mercury-containing wastes (e.g., keeping them out of the medical/red bag waste stream) and to reduce the amount of mercury in products and materials used in hospitals by such methods as identifying and purchasing alternative products with less or no mercury. Field-testing was conducted at seven Florida hospitals. Additionally, in cooperation with the Florida Dental Association, researchers, and the Department of Health, BMPs for management of dental amalgam were agreed upon. These BMPs will be distributed to Florida dentists.

The second project (part of a larger study on recycling construction and demolition debris) provided training on recommended Best Management Practices (developed during previous research) to demolition contractors, local building departments and local solid waste management departments on the removal of mercury-containing devices and other hazardous building components prior to demolition. Based upon the results of a survey of municipal building officials and the demolition contractor professional organization, these BMPs were presented as modifications to the proposed statewide Florida Building Code at a public hearing and will be formally proposed during 1999 for inclusion into that Code.

A third project, again continuing previous research, was performed by a joint research team from the Oak Ridge National Laboratory (Tennessee) and the University of Central Florida. Mercury emissions from landfill gas and through surfaces of municipal solid waste landfill sites in Brevard County, perhaps as a result of disposed mercury-containing devices and other wastes, were quantified. In addition, for the first time, mercury emissions from municipal solid waste collection containers (dumpsters), transfer station operations and transport vehicles were characterized. Waste composition studies on the solid waste from these collection containers and the landfill working face were carried out to identify the particular items producing the mercury emissions. This study is planned to be reproduced at several Orange County solid waste facilities in mid 1999.

Funds appropriated by the Florida Legislature in future fiscal years are planned to be used to fund additional research and demonstration projects to follow up on research needs identified in the areas of mercury in medical waste, the collection and proper management of mercury-containing devices, and mercury emissions during solid waste collection, transport and landfilling.

CATHODE RAY TUBES AND ELECTRONIC EQUIPMENT

In 1998, the Department began to focus on the proper management of discarded cathode ray tubes (CRTs) from televisions and computer monitors as well as other electronic equipment normally discarded along with CRTs, e.g., computers and computer peripheral equipment like printers and keyboards. CRTs are estimated by the Department to be the second largest source of lead in Florida's MSW, exceeded only by the combined category of wet cell vehicular and small sealed lead acid batteries. Some studies suggest that much of this obsolete equipment is being stored pending the clarification of its regulatory status and the development of recycling or other cost effective waste management options.

Most Florida counties currently accept these product discards at their landfills but estimates of the quantities, which are landfilled, vary widely. Current Department thinking at the staff level recommends time-limited funding for county collection and recycling programs for these materials from existing Solid Waste Management Trust Fund grant moneys. In addition, the regulatory status of these materials needs clarification and possibly streamlining following the Universal Waste Rule model. It is believed that this

approach will accelerate the development of the reuse and recycling infrastructure and phase in county development and funding of sustainable management programs for these products. The Department expects to issue some guidance and propose some type of funding during the first half of 1999.

OPERATION CLEANSWEEP

Operation Cleansweep began in 1996 as a survey of the types and quantities of canceled, suspended and unusable pesticides (CSUP) stored by pesticide users in Florida. Based upon the need to reduce the potential for public health and environmental damage from these stored materials, 5 pilot collections in 4 counties (Alachua, Dade, Hillsborough and Okaloosa) were conducted in 1996 and 1997. A brochure was developed and distributed to potential CSUP generators. Meetings were held before each collection for potential participants in order to survey the wastes they were storing, advertise the collection events with instructions for the safe transportation of the CSUP to the collection sites, and to provide education on best management practices for the future purchase, storage, use and disposal of pesticides. These pilot collections, available free of charge to farmers, golf courses, nurseries, pest control operators and other such generators, was a huge success. Over 25,000 pounds of CSUP, including Chlordane, Zineb, Alachlor, Lead Arsenate, DDT and 2,4-D were collected for proper management at a cost of \$40,000.

Operation Cleansweep, funded jointly by a partnership between the Department and United Agri Products, and directed by the Florida Department of Agriculture & Consumer Services, has been an outstanding example of public-private cooperation. Additional partners include the Florida Department of Community Affairs, Florida Farm Bureau, Florida Fruit & Vegetable Association, Florida Fertilizer & Agrichemical Association and staff from Alachua, Dade, Hillsborough and Okaloosa County Cooperative Extension Service offices and Hazardous Waste Management Departments. Since there has been no funding and hence no collections since the 5 pilots, the need to reduce stored stocks of CSUP remains and a variety of funding scenarios continue to be pursued.

THE DIVERSION OF MERCURY, LEAD AND CADMIUM FROM FLORIDA'S MUNICIPAL SOLID WASTE STREAM

As part of the Department's 1995 Agency Strategic Plan, a goal of reducing the amount of mercury, lead and cadmium entering Florida's municipal solid waste (MSW) stream by 50 percent was undertaken. Many of the primary waste sources for these heavy metals have been discussed in the previous section and include batteries, mercury-containing devices and lamps, and CRTs. The Department has estimated the amounts of these heavy metals from these discarded materials potentially entering Florida's MSW in 1995 in Appendix 4, and then the estimated disposal amounts that are thought to have occurred in 1996 and 1997.

These reductions or diversion of heavy metals from Florida's MSW are not only the result of collection and recycling programs, but in some cases are primarily the outcome of source reduction activities on the part of the manufacturers as a result of them decreasing the use of these heavy metals in these types of products.

UPDATE TO FLORIDA'S NEED FOR HAZARDOUS WASTE MANAGEMENT CAPACITY

EPA CAPACITY ASSURANCE PLANS

Florida submitted its first Capacity Assurance Plan (CAP) to the EPA on October 17, 1989. All states are required to submit the CAP by the federal Superfund Amendments and Reauthorization Act of 1986 (SARA). The 1989 CAP was followed by a Capacity Assurance Status Report on February 14, 1992.

On May 19, 1994, the Department transmitted to the EPA a completely revised CAP. The source of this CAP was the 1991 Hazardous Waste Biennial Reports received from all large quantity generators (LQGs) and treatment, storage, disposal and recycling (TSDR) facilities handling hazardous waste in Florida. One of the major differences between the 1989 and 1994 CAPs was there was no longer an emphasis on regional agreements to satisfy needed hazardous waste management capacity on a regional basis. Instead, the EPA focused on whether there was enough commercial capacity at the national level to properly treat and dispose of all the hazardous waste requiring off-site management across the country.

The EPA aggregated all of the recurrent waste demand and commercial capacity data from all of the states to come up with national aggregation tables. They show that there is adequate capacity in all categories for recurrent waste demand. On January 15, 1997, the EPA made a final determination that national capacity existed in all hazardous waste management categories and that all states had met the CAP requirements under the federal law of assuring capacity for all hazardous waste being generated.

Of particular interest to the capacity needs study are the estimated national capacities for energy recovery and incineration facilities. Energy recovery facilities provide about 2% of the total capacity projected for 1999. Incineration facilities also provide about 2% of the total projected capacity for 1999. Again, according to the EPA's preliminary determination, there is no shortage of national capacity for hazardous waste demand, from both recurrent and one-time hazardous waste generation, at energy recovery or incineration facilities.

FLORIDA'S INCINERATION NEEDS AND CAPACITY STUDY

The 1993 Legislature directed the Department to do a Hazardous Waste Incineration Needs and Capacity Study under 403.7895(5), F.S., to evaluate the current and future need for hazardous waste incineration capacity, including that at boilers and industrial furnaces burning hazardous waste fuel, in Florida. In addition to using the 1994 CAP projections for LQG commercial hazardous waste demand and in-state TSDR capacity, this study also considered the potential effects of economic growth, waste reduction, public health and environmental risks, and the generation of incinerable hazardous wastes by Florida's small quantity generators. An interim report submitted on November 1, 1994, indicated that there was no justification for additional hazardous waste incineration capacity in Florida.

ANALYSES OF AND COMPARISONS BETWEEN THE 1991, 1993, 1995 AND 1997 HAZARDOUS WASTE BIENNIAL REPORTS

Over the last seven years, much has been learned about hazardous waste (HW) management and generation in Florida based on the implementation of the Hazardous Waste Biennial Reporting System (BRS) as required under federal and state laws for large quantity hazardous waste generators

(LQGs) and for permitted hazardous waste treatment, storage, disposal and recycling facilities (TSDRs). However, due to the unforeseen complexities that first appeared with the initial implementation of the 1991 BRS report, and the gradual evolution of better data quality control measures and electronic reporting, for which Florida has been a national leader, it has taken some time to get a firmer grasp on these complex data sets and to make clearer comparisons over the reporting years.

Even though a better understanding of the data now exists, the reader is cautioned to not too narrowly interpret the numbers presented here. Since the data sets are very complex and there is much variability in components such as one-time and exempt HW generation, including contaminated media derived from the improper disposal of hazardous chemicals, one should be cautious in order to avoid making erroneous interpretations. In addition, the data's cleanup component (i.e. one-time hazardous waste generation) does not include all the hazardous waste that was generated, treated and disposed of on-site (i.e. in place) as a result of the federal Superfund or state cleanup programs.

Finally, even though extensive quality control efforts were made, the data in this report are only as good as the data provided to the Department by the LQGs and TSDRs. Although great efforts were made to provide training to these regulated entities on properly completing the BRS reports and using electronic reporting, there is always the possibility of incorrect reporting.

HW Managed On-site (Tables I. through I.B.)

As displayed in Table I, HW managed on-site (i.e. on-site HW) makes up most of the HW managed in Florida and typically includes large amounts of wastewaters. This on-site HW has been divided into two subcategories: regulated vs. exempt. The regulated on-site HW subcategory includes all HW that is regulated as a generated HW under federal and state laws and that is treated in a permitted HW treatment, disposal or recycling unit, or that is accumulated in a regulated manner before treatment or disposal in an exempt unit. The exempt on-site HW sub-category includes all HW that has not been accumulated in a regulated manner before discharge to an exempt treatment unit, and which treatment effluent is then disposed of in ways regulated under the federal Clean Water Act (e.g., publicly owned waste water treatment works (POTWs)) or Safe Drinking Water Act (i.e. an underground injection control well (UIC)). It also includes much of the contaminated media (e.g., contaminated ground water) that does not count as generated HW and is the result of chemical spills or other mismanagement (See Table III). Because it is exempt, it was only reported by generators that generated other regulated HW and were required to report to the Department on all their HW generation. Therefore, the exempt HW amounts included here don't include exempt HW generated by completely exempt generator sites.

The regulated and exempt on-site HW amounts are further subdivided into recurrent and one-time groups, that are also defined in the footnotes to Table I. Recurrent HW results from manufacturing and service, waste treatment (e.g., fuel blending and solvent recovery activities), and pollution control activities. One-time on-site HW results from cleanup activities at generator facilities and includes any contaminated media. Since the regulated, recurrent on-site HW has typically been a focus of past attention and until 1997 had accounted for the majority of regulated on-site HW, Table I.A. provides some additional information about its management.

Table I.A. shows how the regulated, recurrent on-site HW is managed in the on-site treatment, disposal and/or recycling units at the generator facilities. As shown in this table, most (an average of 68% over the four reporting years) of this HW type is deep well injected. An important fact attached to this number is that this management takes place at just one generator facility in Florida. After deep well injection, the other predominant on-site management types performed on this HW category are waste water treatment (an average of 15% over the four reporting years), recycling/recovery (an average of 12.5% over the four reporting years), and energy recovery (an average of 3.5% over the four reporting years).

Table I.B. shows how the exempt, recurrent HW is disposed of after it has been treated to remove its HW characteristics. This usually includes discharge to a POTW or to surface waters under a NPDES permit that are both regulated under the Clean Water Act and not RCRA, or discharge to an underground injection control (UIC) well permitted under the Safe Drinking Water Act. As displayed, these exempt HW wastewater streams are generated in very large quantities.

Table I. Overview of Hazardous Waste (HW) Managed “On-Site” (RCRA-Regulated vs. Exempt), In Tons

Year	REGULATED HW		EXEMPT HW ¹	
	Recurrent ²	One-Time ³	Recurrent ²	One-time ³
1991	112,529	0	463,987	0.5
1993	97,267	24	1,198,125	289
1995	127,449	0	950,588	73,389
1997	189,497	197,850	897,192	1,387,511

¹ Exempt HW is not regulated as HW generation under the federal or state HW regulations due to the specific exclusion language incorporated into these laws (see narrative for further explanation). Since it is not regulated, only that exempt HW being generated by generators of other regulated HW and that are required to report are reflected in these numbers.

² Recurrent HW includes HW generated as a result of the manufacturing of goods or performance of services, from pollution control activities, and residuals from the treatment of HW.

³ One-time HW generation may vary greatly from year to year due to unplanned cleanup activities and to the planning, permitting and construction of the necessary treatment facilities, and includes contaminated media.

Table I.A. Management of Regulated, Recurrent “On-Site” HW by Year, In Tons

Management Type	1991	1993	1995	1997
Recycling and Recovery	16,955	1,198	28,241	23,655
Energy Recovery	8,219	2,947	0	7,512
Incineration	15	4	0	0
Waste Water Treatment	18,889	21,477	1,496	37,483
Stabilization	12	143	889	754
Deepwell/Underground Injection (Disposal)	68,264	71,342	96,494	120,009
Other Treatment/Disposal	172	154	329	83

Table I.B. Disposal Type¹ and Amounts for Exempt, Recurrent HW after “On-Site” Treatment, In Tons

Year	Public Sewer (POTW)	Permitted Surface Water Discharge (NPDES)	Underground Injection Control Well (UIC)
1991	171,077	292,847	64
1993	514,469	399,573	284,083
1995	535,170	103,003	312,416
1997	566,273	155,841	175,078

Off-Site HW Generation (Tables II. Through II.B.)

Tables II. through II.B. focus on the generation and management of HW that is shipped off-site for treatment, disposal and/or recycling. Due to the limited number of commercial treatment facilities in Florida, much of this HW is shipped to storage or transfer facilities at HW transporter sites before final management. Ultimately, most of the HW shipped off-site goes to out-of-state, permitted treatment, disposal and recycling facilities (i.e. is exported). As was done for on-site HW, off-site HW is also divided into recurrent and one-time subcategories.

¹ After this exempt, recurrent HW has been treated for its hazardous constituents, the resulting waste water treatment effluent is disposed of in one of these three manners.

Table II. Overview of Regulated Hazardous Waste (HW) Shipped “Off-Site” (or “Off-Site HW”) for Management, In Tons

Year	Recurrent HW	One-Time HW (e.g., Cleanup)
1991	72,912	5,289
1993	59,587	16,891
1995	57,659	8,031
1997	50,672	26,992

Tables II.A. and II.B. focus on the management of recurrent HW, since this usually makes up most of the HW generation shipped off-site. These tables summarize how regulated, recurrent HW shipped off-site has been managed during the report years and how much of this management has been performed at in-state versus out-of-state facilities (i.e. exports). Although this is not shown, one-time off-site HW also tends to be exported to out-of-state facilities for final management and disposal. As shown in Table II.A., most of this HW goes to off-site recycling/recovery facilities (an average of 33.5% over the four reporting years) or energy recovery/fuel blending facilities (an average of 30% over the four reporting years). An average of fourteen percent over these report years ends up at land disposal facilities (stabilization/landfill). Finally, an average of about two and one-half percent of this HW over the report years go to off-site (and out-of-state) incineration facilities.

Table II.A. Regulated, Recurrent HW Shipped “Off-Site” by Management Type by Year, In Tons

Management Type	1991	1993	1995	1997
Recycling/Recovery	38,828	18,212	17,145	10,009
Energy Recovery/Fuel Blending	18,284	12,674	20,620	18,542
Incineration	1,230	1,755	809	1,867
Waste Water/Sludge Treatment	2,216	9,573	3,393	4,261
Stabilization/Landfill	8,748	9,630	6,937	8,481
Deepwell/Underground Injection	631	1,886	822	456
Other Treatment/Disposal	91	2,624	180	90
Transfer Facility Storage	2,884	3,216	7,752	6,967

Table II.B. shows the location (in-state vs. out-of-state) of the initial HW management facilities receiving the regulated, recurrent HW shipped off-site. As can be seen, most of this HW goes to out-of-state treatment or disposal facilities. In addition, as mentioned in the footnote to this table, most of the HW shown as going to in-state transfer facilities will probably be transferred to out-of-state facilities for final management. HW going to in-state fuel blenders in 1995 and 1997 would also have been shipped to out-of-state energy recovery facilities, since Florida did not have any energy recovery capacity in those years (see Table IV.).

Table II.B. In-State vs. Out-of-State (Exports) Shipments of Regulated, Recurrent HW, In Tons

Year	In-State Management		Out-of-State Management
	(Treatment)	¹(Transfer)	(Exports)
1991	29,654	1,990	41,268
1993	15,914	2,279	41,376
1995	11,435	4,484	41,740
1997	1,782	3,843	44,948

Total Hazardous Waste (HW) Management & Generation (Tables III. and III.A.)

The total amounts of hazardous waste management and generation for each of the report years from 1991 through 1997 are based on the data received from all LQGs and TSDRs that submitted BRS reports (see Table III.A.) to the Department for those years. The Department has broken down this HW management and generation into two components: that which is managed on-site at the generator's facility (i.e. on-site HW) and that which is shipped off-site for management (i.e. off-site HW). As seen for each of these components in the tables that preceded, they subdivided into other categories upon further analyses. However, in this table they are reported as a whole except for the exempt contaminated media. Finally, since not all of the HW generated in a calendar year is treated or disposed of in that calendar year, a storage factor is displayed that shows the end-of-year inventory for HW generated in that reporting year, if the number is positive (+), or the management of HW end-of-year inventory generated in the previous calendar year if the number is negative (-).

In Table III., the HW managed on-site is divided into three subcategories: exempt, contaminated media, other exempt recurrent or one-time HW managed on-site, and regulated recurrent and one-time HW managed on-site. For the "Regulated HW" managed on-site and the "Regulated HW" shipped off-site columns, both recurrent and one-time HWs are included in these amounts. Finally, the "Regulated HW Generation Total" is the sum of the regulated HW managed on-site, the regulated HW shipped off-site, and the storage factor amount.

¹ Based on past analyses, after this initial in-state transfer it is believed that most of this HW would have been delivered to out-of-state facilities for final management. In addition, any HW that was treated by an in-state fuel blender in 1995 and 1997 would have been shipped out of Florida for final energy recovery use. Therefore, these numbers only represent initial management of this HW and not final management.

Table III. Total HW (Recurrent & One-Time) Management and Reported Generation by Reporting Year, In Tons

Year	HW Managed On-Site		HW Shipped Off-Site			Regulated HW
	¹ Contaminated Media - Exempt	Exempt Treatment	Regulated HW	Regulated HW	Storage Factor ²	Generation Total
1991	0	463,988	112,529	78,201	+10,478	201,208
1993	289	1,198,125	97,291	76,478	-442	173,327
1995	73,378	950,599	127,449	65,690	+145	193,284
1997	1,385,683	899,020	387,347	77,664	-122	464,889

Table III.A. Total Number of Generator Reporters by Report Year

Year	Managing HW On-Site	Shipping HW Off-Site	Total # of Reporters By Year ³
1991	85	427	434
1993	102	453	455
1995	100	435	439
1997	91	385	387

Summary of Commercial In-State HW Management Capacity (Tables IV. through IV.A.)

Table IV. shows reported HW management capacities for in-state commercial HW management facilities operating during the report years. Since this information wasn't reported for the 1997 BRS report year, capacity totals have not been included for 1997. From these numbers, it can be seen that fuel blending, solvent recovery and other organics recovery have been the primary HW management methods employed by commercial HW management facilities in Florida. The one commercial facility that burned HW fuel for energy recovery as shown in 1991 and 1993 closed in 1994.

¹ RCRA-contaminated cleanup media is usually not counted as HW generation (depending on the type of HW mishandled), but its management is required to be reported.

² The Storage Factor = RCRA Generation Total - (Regulated On-Site + Shipped Off-Site). If positive, it indicates end-of-year inventory. If negative, it indicates use of the previous calendar year's end-of-year inventory.

³ Many generators manage HW on-site and also ship some HW off-site. In this case they will be counted under each of the on-site and off-site columns, but not in the total # of reporters, and so the number in the total number of reporters column is not equal to the sum of the numbers in the on-site and off-site columns.

Table IV. Types of HW Management Capacities at Permitted Commercial HW Facilities in Florida by Year, In Tons

Management Type	1991	1993	1995	1997¹
Metals Recovery	210	840	1,430	-
Solvents Recovery	9,890	21,580	10,080	-
Organics (e.g., Fuels) Recovery	218,440	210,450	180,350	-
Energy Recovery - liquids	39,350	39,350	0	-
Fuel Blending	49,910	49,910	66,150	-
Totals By Year	317,800	322,130	258,010	-

Table IV.A. shows the amounts of HW imported from other states (and to a limited extent from outside the US) to Florida's commercial HW facilities for management. As above, these numbers reflect the predominate HW management capacities reported for Florida's commercial HW facilities in Table IV.

Table IV.A. Imports of HW to Florida's Commercial HW Management Facilities by Year, In Tons

Management Type	1991	1993	1995	1997
Metals Recovery	0	0	130	330
Solvents Recovery	4,934	3,248	1,181	259
Other (e.g., Fuels) Recovery	12,876	8,601	6,616	0
Energy Recovery	10,276	0	0	0
Fuel Blending	5,425	4,776	4,521	3,288
Transfer Facility Storage	3,601	3,494	4,601	3,402
Totals By Year	37,110	20,120	17,045	7,280

¹ Facility capacities were not required to be reported for the 1997 report year. The 1991 capacity numbers were modified by using Florida's "1993 Hazardous Waste Capacity Assurance Planning Submission" of May, 1994.

FLORIDA'S POLLUTION PREVENTION PROGRAM

DEFINITION OF POLLUTION PREVENTION

Pollution Prevention is a process improvement that eliminates, conserves or reuses materials that are the source of pollution. It achieves positive financial, environmental and worker health results.

Pollution prevention increases efficiency of business operations and results in lower raw material and labor costs. It eliminates long-term cradle-to-grave liabilities, hazardous waste management fees, and expenses associated with pollution control. Pollution prevention can also decrease worker exposure to toxins and clean-up costs resulting from improper disposal of hazardous substances.

LEGISLATIVE BACKGROUND

The 1988 Legislature established an assistance program designed to aid in reducing the amount and toxicity of hazardous waste generated in the State. In 1991, the Florida Pollution Prevention Act expanded the original legislation to encourage source reduction (preventing and reducing pollution at its source), waste reduction, resource conservation, and energy efficiency.

The Florida Pollution Prevention Act of 1991 also expanded the Department's technical assistance activities, directed all state and local agencies to pursue prevention strategies, allowed financial and proprietary data collected during on-site technical assistance visits to be kept confidential, and created the Florida Pollution Prevention Council. The Council met for two years and its final report contained recommendations for a voluntary, statewide 50% reduction goal, small business loan programs, voluntary multimedia inspections, pollution prevention projects in enforcement, and increased technical assistance.

POLLUTION PREVENTION PROGRAM

The Pollution Prevention (P2) Program offers non-regulatory technical guidance and education to Florida citizens, businesses, and industries. Since its inception, the P2 Program has assisted almost 400 Florida businesses in eliminating or reducing the generation of hazardous waste and toxic releases to Florida's environment. Most efforts focus on small businesses because they have fewer resources to research and implement pollution prevention options.

The P2 Program's many outreach efforts include on-site pollution prevention assessments, local government training, pollution prevention tip sheets, and a newsletter. A Statewide Pollution Prevention Conference is held annually. Representatives also participate in government workshops and trade association forums.

STATEWIDE P2 ENGINEERS

Florida's P2 Program currently employs four full-time and five part-time engineers with extensive industrial experience. They provide pollution prevention technical assistance to Florida businesses and citizens around the state.

POLLUTION PREVENTION RESOURCE CENTER

The Resource Center contains tip sheets, industry articles, and case studies which illustrate economic and environmental benefits of pollution prevention. Documents can be obtained by telephone at 850-488-0300 or through the P2 Program's web site at: <http://www.dep.state.fl.us/waste/programs/p2/index.htm>.

POLLUTION PREVENTION AND ECOSYSTEM MANAGEMENT

As instructed by the Department's 1996 Ecosystem Management Implementation Strategy, the Pollution Prevention Program continues to encourage the integration of pollution prevention into all DEP programs. This year, the P2 Program staff will conduct another round of training sessions in all district offices, which will include introductory information, and P2 Projects in Enforcement. Future meetings will focus on incorporating pollution prevention opportunities into rules. A team involving representatives from all interested DEP divisions, programs and district offices continues to make recommendations and identify potential barriers to the implementation of pollution prevention within the Department.

ADDITIONAL FUNDING AND GRANTS

The measurements of pollution prevention success gathered for the USEPA 1996 Pollution Prevention Incentives for States (PPIS) grant will be entered into a database, which is under development. These findings will assist the P2 Program to quantitatively evaluate the success of services offered to Florida businesses. An initiative to identify pollution prevention incentives for industry through the environmental regulatory structure is also planned under this grant.

The 1997 PPIS grant encourages and expands pollution prevention partnerships with the Florida Manufacturing Technology Centers, the John F. Kennedy Space Center, and NAS Whiting Field, among others.

The 1998 PPIS grant expands partnership networks with environmental and business assistance providers, including the Florida Small Business Development Centers and the FDEP Small Business Assistance Program. A supplemental project allows the P2 Program to assist the Florida Pollution Prevention Roundtable, a group composed of local government representatives, with travel, funding, and staff time. The Roundtable has adopted by-laws and produced their first yearly workplan. The workplan provides more specific information on how the group will meet its goals, which are: to coordinate pollution prevention efforts in the state, improve the transfer of information, and maximize local efforts.

USED OIL PROGRAM

BACKGROUND

Florida's comprehensive, statewide Used Oil Recycling Program is recognized as one of the most successful in the United States and serves as a national and international model. The Florida Department of Environmental Protection (DEP) has implemented a used oil management program under Sections 403.75 through 403.769, Florida Statutes (F.S.), since 1984. The program consists of a registration and record keeping program for used oil handlers and technical assistance to the public and regulated community. The 1988 Solid Waste Management Act substantially changed public policy toward solid waste management and used oil collection, management, transportation and recycling. New initiatives included a 5% price preference for the purchase of recycled and re-refined used oil by state and local governments as well as some limited liability exemptions for businesses that accept used oil from the public. The 1988 Legislature approved a one-time appropriation of funds amounting to \$1 million for local government grants for establishing public used oil collection centers and \$1.5 million for statewide incentive/awareness and educational programs aimed at Do-It-Yourself (DIY) oil changers and school students. These funds have been expended and follow-up measures are being taken. The Department continues its regulatory program and, though the number of regulated parties remains relatively stable, the amount of used oil recycled per capita continues to grow while, at the same time, the amount of oily wastes managed by way of landfill disposal and incineration continues to decline.

Florida law contains several bans on the disposal of used oil. As of October 1, 1988, used oil may not be discarded into sewers, drainage systems, septic tanks, surface or ground waters, watercourses, or marine waters. It cannot be mixed or commingled with solid waste to be disposed of in landfills, except for those instances wherein the disposal occurs unknowingly, or is approved by the Department (such as in the case of emergency clean-up of accidental oil spills). Used oil cannot be mixed with hazardous substances or hazardous wastes that make it unsuitable for recycling or beneficial use. It cannot be used for road oiling, dust control, weed abatement, or other similar uses that may release used oil into the environment.

The used oil statutes were amended by the 1993 Legislature. The majority of these amendments were made to make Florida law consistent with the federal used oil regulations, especially in the use of terms and definitions. A major change requires retailers who sell over 500 gallons of oil annually to post signs which display the State's toll free 1-800 number (1-800-741-4DEP[4337]). This number uses a voice mail system to provide the locations of all public used oil collection centers in Florida, indexed by post office zip code.

Chapter 62-710 of the Florida Administrative Code (F.A.C.), addresses used oil management and implements the provisions of state law. It establishes a program for registration, record keeping and reporting by handlers of used oil; certification of used oil transporters; and permitting of used oil processing facilities. The federal used oil management standards which are found in Chapter 40, Part 279 of the Code of Federal Regulations (CFR) are adopted by reference in Rule 62-710.210, F.A.C., effective June 8, 1995. The definitions and forms used in this program are found in Chapter 62-701, F.A.C. (Solid Waste Management).

The Used Oil Management Standards (Rule 62-710, F.A.C.) were amended, effective December 23, 1996. The most significant change requires Used Oil Processors to obtain a Used Oil Processing Permit. Since this rule became effective, 20 Used Oil Processors have filed permit applications with DEP. Of these applicants, 16 facilities have been granted permits, 3 facilities are still under review and 1 facility is in the process of preparing a new application as it is changing location. DEP charges a \$2,000 application fee to cover the cost to DEP for the permit review. Permitted facilities must provide descriptions of the corporate structure, processing operations, preparedness and prevention, analysis and contingency plans, tank management, closure and employee training. Some items (storage tank integrity, adequacy of secondary containment, and certain portions of the closure plan) require certification by an engineer registered in the State of Florida.

The rule was again amended, effective March 25, 1997. These latest amendments deleted certain obsolete or redundant sections of Rule 62-710, F.A.C., and centralized some common Solid Waste Management items (e.g. intent, definitions and forms) in Rule 62-701, F.A.C., Solid Waste Management, in order to meet the requirements of the Governor's Chiles' Rule Reduction Initiative.

EDUCATION AND LOCAL GOVERNMENT

In 1988, the Legislature appropriated \$2.5 million for public education materials and local government used oil program grants. These funds were expended during the production of award winning education and awareness materials, and the creation of a statewide network of public used oil collection centers. Of the almost 20,000 curricula materials developed by teachers and placed in every public elementary, secondary and post-secondary school in the state, about 40 remain in stock. The Department is pursuing incorporating some of these tested materials into other education programs, currently under development, aimed at vocational and technical studies students.

COMPLIANCE ASSISTANCE INITIATIVES

Department staff from various programs, including used oil recycling, are coordinating the production of materials aimed at bringing conditionally exempt and small quantity generators into compliance with various environmental programs. Tallahassee and District staff are participating in workshops aimed at these generators and conducted by various trade and local government associations. Materials developed include fact sheets and multi-media compliance checklists, which can be used to conduct self-audit reports.

The United Association of Used Oil Services, a trade association representing about 45% of the used oil and used oil filter handlers registered with the Department, has also agreed to work in partnership with the Department as it pursues grant funding for educating generators of used oil. A critical step in keeping the Used Oil Recycling Program up to date and at the cutting edge of technology occurred in March 1998 when the program established a presence on the internet at the DEP web site. Annual Reports and all fact sheets and forms used in this program are available for downloading at this site. Various education materials will soon be added to the site. The internet address for Florida's Used Oil Recycling Program is http://www2.dep.state.fl.us/waste/programs/used_oil/.

PUBLIC USED OIL COLLECTION CENTERS

Florida has a statewide network of 1,092 Public Used Oil Collection Centers (PUOCCs) as of December 1998. All but four (rural) counties have at least two locations where used oil can be taken for recycling. Major oil companies and hundreds of independent service stations and auto repair shops, quick-lube shops and auto parts retailers have volunteered to become PUOCCs. Those businesses participating in the program are awarded certain protections from potential liabilities resulting from spills or mismanagement (provided certain provisions are met). However, the number of PUOCCs participating in this program continues a three year decline. There are at least two reasons for this decrease. First, many major retailers are discontinuing auto service functions (most notably K-Mart and Sears). Second, many local governments have established fixed location collection sites (Household Hazardous Waste Collection Centers, recycling sites or landfill stations) and have shut down the isolated, unstaffed collection tanks. By centralizing their collection operation, local governments can better manage the site. A number of counties reported housekeeping and monitoring problems at remote, unattended sites.

Despite the decline in numbers of collection sites, the gallons of used oil collected from household Do-It-Yourselfers (DIYers) continues to increase annually. In 1998, PUOCCs accepted 2,489,256 gallons of used oil, an increase of 86,267 gallons, which is higher than last year's increase of 82,289 gallons. The Department estimates that approximately 5 million gallons of used oil is generated by DIYers who change their own motor oil. This means that Florida is now collecting 50% of the used oil generated by DIYers, which is, an increase of about 3% over last year.

The Department maintains a toll-free number (1-800-741-4DEP) which uses voice mail to index PUOCCs by post office zip code. Anyone calling this number is prompted to enter his or her zip code. The system then either reports a listing of PUOCCs in that zip code, or directs the caller to leave a taped message for a prompt reply from a Department representative.

ANNUAL REPORTS FOR CALENDAR YEAR 1997

As of December 1998, 143 individual private and public businesses were included in the registration database, 14 of which are based outside of Florida. This is less than the 188 handlers registered in 1997 and is attributed to falling prices in the virgin petroleum market which has a direct, negative impact on those businesses involved in used oil recycling. The high cost of transporting and processing used oil for recycling makes it difficult to compete with virgin crude which is priced at its lowest level since the mid-1980s. Most of the handlers are registered for more than one activity and, though the number of individual businesses has declined, the number of activities for which these businesses register has increased. Specifically, these 143 businesses now occupy 182 sites (very near the 188 businesses registered last year).

Effective June 8, 1995, Used Oil Filter (UOF) Handlers were required to register with the Department's Used Oil Recycling Program. The number of 1998 UOF registrants is not significantly changed except for an increase of 17 UOF transfer facilities, which is indicative of existing businesses expanding to fill gaps left by those going out of business. Many used oil handlers now also manage UOFs to meet customer demand. As of December 1998, the DEP database includes 107 UOF Transporters, 72 UOF Transfer Facilities, 28 UOF Processors and 4 UOF End-Users (metal foundries and Waste-To-Energy facilities [WTEs] that accept segregated loads of UOFs from non-registered persons). As a WTE facility will burn the oil contained within a filter for energy recovery and recycle the metal casing, the Rule allows generators of used oil filters who live in one of the 14 counties serviced by a WTE facility to commingle their used oil filters with the rest of their solid waste. The WTE facility, in turn, need not register with the Department

to manage commingled filters. Because such a large portion of UOF generators in the state are in areas served by WTE facilities, the reporting requirement for UOF Handlers was made optional within the Rule. As reporting is optional, data regarding UOF management is destined to remain an approximation.

Types and Quantities of Used Oil Generated by Source

In calendar year 1997, 119,563,069 gallons of used oil and oily wastes were reported to have been collected. Automotive used oil and oily waste made up 35.5% of the total amount collected, including the 2,489,256 gallons collected from PUOCCs (based on PUOCC reports). Approximately 21.6% of the total was industrial oil collected from bulk petroleum and industry sources. Approximately 42.9% of the total was of the mixed type, generated by commercial sources (i.e. a combination of automotive and industrial oils).

Disposition of Used Oil

Of the 119,563,069 gallons of used oil reported to have been collected in Florida during 1997, about 42,542,494 gallons of this figure represent a duplication of data which occurs when used oil transporters report their collections to the Department when the oil is not end-used but rather is transferred to a another facility. The receiving facility then also reports this same quantity as having been collected at that site. When the on-hand inventory is included and the transferred quantity is removed from the data, a total of 80,887,456 gallons of used oil and oily wastes are reported as collected for management. However, only 74,808,926 gallons of used oil are reported as being managed (recycled or disposed). This leaves a difference of 6,078,530 gallons of used oil unaccounted for. According to information provided by industry, there is always a degree of error in tracking used oil because of differences in measuring loads of used oil which are intrinsic to the used oil industry. Most transporters use dip sticks to estimate volume during pick-up and transit. Processors use a more sophisticated measure, using actual weight from certified scales in determining a price per load. It is not uncommon for transporter estimates to differ by 6-12% from the final measured volume, with the mean falling to around 7%. The error in this year's annual report calculates to just over 5% of the total quantity reported to have been collected, which is well within the normal range of any expected margin of error.

Of the 74,808,926 gallons reported as managed, 54,229,115 gallons (72.5%) were recycled as follows:

- 33,524,746 gallons (61.8%) were marketed as an on-specification used oil fuel
- 2,643,060 gallons (4.9%) were marketed as an off-specification used oil fuel
- 12,652,963 gallons (23.3%) were marketed for other industrial uses (e.g. phosphate beneficiation)
- 5,408,346 (9.9%) were counted as end of year, on-site inventory

The remaining 20,579,811 gallons (27.5%) of the total amount of used oil reported as managed ended up as oily wastes. These wastes are primarily condensation water and sediment which are ubiquitous in used oil. These oily wastes were managed as follows:

- 795,349 gallons (3.9%) were landfilled (non-liquid sediment)

- 19,374,059 (94.1 %) were treated as industrial wastewaters
- 410,403 gallons (2%) were incinerated

Used Oil Filters

This is the third year that data on used UOF management have been collected. The Department feels that this year's report is more accurate than those of the first two years of data, due to refinements in the database and thorough quality control checks of all reports submitted to DEP. There are a number of difficulties in deriving conclusions with a high degree of confidence from this data. First, as the Department's authority to regulate UOFs extends only to the oil trapped within the filter, the reporting of such data was made optional under the rule. Second, UOFs are collected in a number of different ways (e.g. barrels, drums, roll-offs or bins of crushed, uncrushed or shredded filters) and the data are gathered using barrel equivalents (1 barrel equals a certain number of filters) and tonnage conversions (converting weight to numbers of filters). Hence, the numbers generated can only be approximations. Finally, data on filters generated in areas of the state serviced by Waste-to-Energy facilities are not reported at all. This is assumed to be a significant number of filters as approximately 30% of all solid waste generated in Florida is burned for energy recovery.

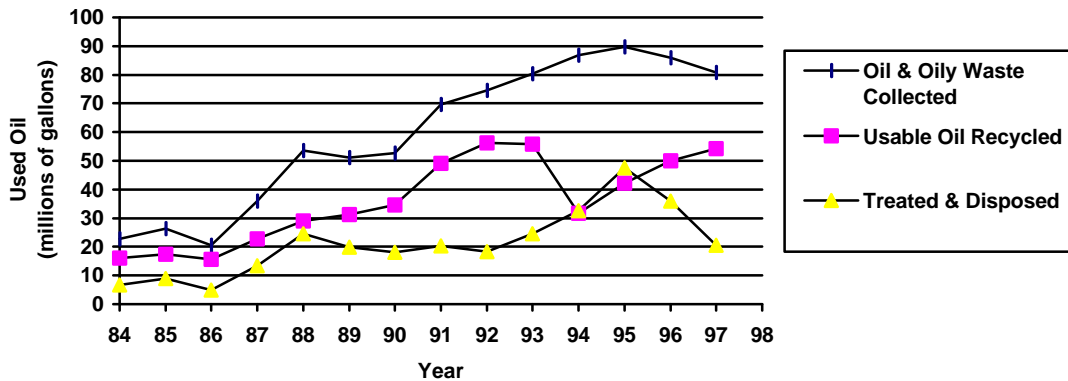
In the past, the Department used very conservative estimates of UOF generation in Florida. This year, the parameters of the criteria used were expanded (for instance, assuming four, rather than two, filter changes per year for passenger cars). The result is a very liberal estimate of UOF generation, which results in a higher performance standard against which the effectiveness of the program is measured. DEP now assumes that approximately 42.5 million UOFs are generated in Florida compared to the 30 million assumed to have been generated last year.

From the data reported, approximately 17,808,898 UOFs were collected (diverted from landfill disposal). Based on the sticker assumptions used this year, this accounts for approximately 42% of the 42.5 million UOFs generated in Florida. It can be assumed that persons served by a WTE facility generate a majority of the unreported filters. Most of the filters reported to have been collected were managed at a foundry in Dade County, which recycles the filters into manhole covers. About 316,267 gallons of used oil, trapped within the filter, were collected during the management of these filters and handled under the used oil management standards. Approximately 652,058 UOFs were reported as end of year, on-site inventory. It is very common for filter handlers to store large quantities of filters on-site until a large bulk load can be shipped to a final end use. This practice minimizes transportation costs, allows for thorough draining of used oil from the filters and ensures a maximum value for the clean metal. A slight degree of error can be assumed, based on the variety of used oil filter management practices, mentioned at the start of this section. The degree of error in this year's report is around 1.3%.

Trends

The trends pictured in Figure 1 show a steady increase in the volume of used oil and oily waste collected over time. This is to be expected, given Florida's steady population growth. An even more significant adjustment is evident between 1993-1995. It was during this time that new used oil regulations, more stringent than those past, took effect.

Figure 1
Used Oil Management in Florida
1984-1997



The trend since the shift during rulemaking is interpreted by DEP to be very positive in that the amount of oil actually recycled continues to increase while the amount of waste disposal related to used oil steadily declines. Used oil, once a catch-all waste stream for a variety of materials, is becoming a cleaner commodity. The trend in Figure 1 indicates that better management is occurring at the point of generation so that good quality used oil, rather than waste material, is collected. The apparent reduction in total collection is not significant, as this number includes both oil and waste. As the level of waste material in the oil declines, then so too will this total volume. The important trend is that the amounts of “usable oil recycled” continue to increase.

SUMMARY OF FLORIDA'S HAZARDOUS WASTE MANAGEMENT PROGRAMS

After more than twelve years of working with local governments, Regional Planning Councils and private industry, the Department has identified a number of constraints and opportunities that affect the status of hazardous waste management needs in Florida.

LOCAL HAZARDOUS WASTE ASSESSMENT, NOTIFICATION AND VERIFICATION PROGRAM

The Local Hazardous Waste Assessment data and reports submitted to the Department from 1986 through 1998 indicate substantial room for improvement in the management and disposal methods used for hazardous waste. Much of the hazardous waste from small quantity generators was reportedly sent to public landfills or discharged into sewer systems or septic tanks. This waste could have been managed in a more environmentally sensitive manner. These studies show a need for more compliance assistance and pollution prevention activities, and consolidation of these hazardous waste stream through local and regional collection and transfer facilities. In addition, this emphasizes the importance of partnering with local government and industry through the Assessment, Notification and Verification Program in its educational outreach to, and the collection of data from, small quantity generators of hazardous waste. Current partnerships are being strengthened to help provide common sense solutions to environmental management problems.

LOCAL HAZARDOUS WASTE COLLECTION CENTER GRANT PROGRAM

In 1985, the Legislature initiated a grant program designed to establish a statewide network to collect and properly manage household hazardous wastes at the local level.

Hazardous Waste Collection Center Grants, awarded to 49 counties, have helped fund the construction of 79 permanent, operational collection centers and establish a network of such facilities in 73% of Florida's counties. Grantees have indicated that their permanent hazardous waste collection centers would probably not have been built, nor would they have hazardous waste collections, had it not been for the incentive of the grant. Contracts for funding collection center construction only require the centers to operate for a limited time. However, the centers have generally not only continued to operate, but local hazardous waste management programs have evolved, becoming more comprehensive, efficient and sophisticated as counties have supported them with funding and technical staff.

Cooperative Collection Center Arrangement Grants (Co-op Grants) have helped fund 1-day collection events in 22 counties. This grant provides a hazardous waste management opportunity for a smaller county that is not ready to construct and operate a permanent facility. So far, 9 counties (Flagler, Franklin, Gadsden, Hardee, Hendry, Jefferson, Levy, Liberty and Okeechobee) that opted to initially participate in the Co-op Grant went on to secure state funding for permanent collection center construction. They used their co-op experience as a bridge between their state Amnesty Days collections and establishing their own permanent programs.

Although no grants for funding permanent collection center construction have been awarded since 1996, there still are counties without centers that have expressed interest in the grant. These counties have been encouraged to continue participation in the Co-op Grant for two reasons. First, some smaller

counties are at risk as far as continuing operation of their facilities after funding from their grant is depleted. Second, the annual legislative appropriation has diminished to the point where it is not adequate to fund grants for collection center construction in addition to the other grants. If there were adequate grant funding to construct permanent collection centers in the 14 counties currently participating in co-op programs and the 2 additional counties recently expressing interest, then 97% of the counties in Florida would be managing their hazardous waste with local programs.

Unique and Innovative Project Grants have provided counties the incentive and funding to expand local hazardous waste management operations with new programs, some of which have received national recognition.

MERCURY-CONTAINING LAMPS AND DEVICES MANAGEMENT PROGRAM

As a result of the 1993 solid waste legislation and the subsequent development of streamlined waste management regulations, a solid infrastructure for recycling mercury-containing lamps and devices has developed resulting in a significant and growing recycling rate for these discarded products. These streamlined regulations have spawned an industry funded product stewardship (“take back”) program for mercury-containing thermostats in Florida and about 10 other states. Ongoing research and demonstration projects are improving the management of these discarded products from medical facilities and from building demolitions and are seeking to quantify mercury emissions and the emission sources during the collection, handling and landfilling of municipal solid waste.

BATTERY MANAGEMENT PROGRAM

The Department’s proposed battery bill passed in the 1993 Legislature along with the provisions for mercury-containing lamps and devices. This law set standards for reducing heavy metals in these products to reduce their concentration in the municipal solid waste stream. It prohibited the use of mercuric-oxide button cell batteries that were commonly used in hearing aides and set up mandatory collection and recycling programs for nickel-cadmium and small sealed lead acid rechargeable batteries and commercial/industrial mercuric-oxide batteries. As a result, the state has been a leader in the initiation of a successful private corporation, the Rechargeable Battery Recycling Corporation, which collects and recycles nickel-cadmium batteries throughout Florida and the nation. This model is being used to develop a similar program for small sealed lead-acid rechargeable batteries.

PESTICIDE COLLECTION PROGRAMS

In 1996 and 1997, the Department worked with the Department of Agriculture and Consumer Affairs, a private pesticide supplier and a variety of other governmental agencies and trade organizations to develop Operation Cleansweep. This program was set up to collect stored stocks of canceled, suspended and unused pesticides from agricultural and other commercial users for proper disposal. Since there has been no funding and hence no collections since the 5 pilot collections carried out in 1996 and 1997, the need to reduce the stored stocks of these pesticides remains and a variety of funding scenarios, including appropriations from the Legislature, continue to be pursued.

CATHODE RAY TUBES

Since cathode ray tubes, an integral part of computer monitors and televisions, are estimated to be the second largest source of lead in the municipal solid waste stream, the Department is developing strategies to foster the recycling or other proper management of these products. Possible strategies include regulations along the Universal Waste Rule model and time-limited funding for county programs in order to develop a sustainable collection system and recycling infrastructure.

POLLUTION PREVENTION PROGRAM

The implementation of the Pollution Prevention (P2) Program is an essential element in Florida's hierarchy of hazardous waste management programs. An effective P2 program must be based on accurate and current information which can be provided by the hazardous waste biennial reports and the ongoing Small Quantity Generator (SQG) Assessment, Notification and Verification Program. Cost effective P2 technologies are being identified and implemented as an established part of a company's management and operation practices. By avoiding the creation of wastes, costs are substantially reduced. Chemical product substitutions, modification of production processes, volume reduction, better housekeeping and inventory management methods, recycling, reuse, and energy recovery are all methods which can be used to reduce the costs of waste management while achieving economic efficiency and environmental protection.

The P2 Program with funding from EPA grants is laying the groundwork for establishing P2 Programs on a local government level. Through the SQG Assessment, Notification and Verification Program, interested local governments are developing P2 plans that will be instituted at county operated facilities. Local government P2 programs will serve as demonstration projects that can be copied by area businesses. Additionally, the P2 Program is developing measurement tools to track the effectiveness of pollution prevention activities.

The Hazardous Waste Management Section in the Department's Division of Waste Management is currently seeking to work more closely with the Department's P2 Program and its other compliance assistance programs. The SQG Assessment, Notification and Verification Program, through its' relationship with local government programs, can provide a unique opportunity to provide further P2 assistance to SQGs and other small businesses. In addition, grant monies are being applied for to develop and implement pilot projects that promote voluntary self-evaluations by SQG facilities and that recognize those SQGs that participate in such evaluations and reduce waste generation. Finally, grant monies are being sought to provide increased training to local government programs to raise their levels of awareness about P2 strategies and on the federal and state environmental regulatory framework that affects the small businesses in their counties.

USED OIL MANAGEMENT PROGRAM

Florida's used oil management program has been recognized as one of the most effective in the nation. Sound, practical management standards, at both state and federal levels, and ongoing education efforts contribute to its continued success. The Department is working closely with the regulated community, particularly through the United Association of Used Oil Services, to increase the awareness of the general public and small waste generators through cooperative education and compliance assistance initiatives. The management standards in place in Florida's regulatory program were adopted with the input, cooperation, and approval of the regulated community. They are based on a common sense approach to regulation that is felt to be protective of the environment and human health while assuring used oil will be recycled to the most practical extent possible.

HAZARDOUS WASTE MANAGEMENT CAPACITY ASSURANCE PLAN

In 1983, the Legislature believed there was a need for a facility to store and treat hazardous waste in Florida. In 1988 and 1989, state-owned land near the Union Correctional Institution in Union County was recommended and designated as a site for a multipurpose hazardous waste treatment facility. Also, in 1989 and 1991, two private companies applied for permits to construct commercial hazardous waste incineration facilities. However, the 1994 Capacity Assurance Plan and the Department's Hazardous

Waste Incineration Needs and Capacity Study demonstrated that there is more than enough commercial capacity at the national level to handle Florida's off-site demand, and that the need for new commercial incineration facilities in Florida could not be justified.

ANNUAL WORKSHOP AND TRAINING ON HAZARDOUS WASTE MANAGEMENT

Each spring the Hazardous Waste Management Section sponsors a 5-day workshop for local government staff managing hazardous waste programs. Ideas and information are exchanged on pollution prevention, personal and site safety, cost-saving and efficient waste management strategies, and on new legislative mandates.

APPENDICES

Appendix 1, Summary of SQG Program Verifications (FY97/98)

County	Assessment Roll	Verification	% Verified
ALACHUA	1129	523	46.3%
BAKER	0	0	0.0%
BAY	0	0	0.0%
BRADFORD	190	38	20.0%
BREVARD	4784	85	1.8%
BROWARD	4900	1818	37.1%
CALHOUN	93	19	20.4%
CHARLOTTE	1200	50	0.04%
CITRUS	1230	299	24.3%
CLAY	481	0	0.0%
COLLIER	6739	1560	23.1%
COLUMBIA	415	85	20.5%
DADE	7061	2803	39.7%
DESOTO	283	62	21.9%
DIXIE	138	28	20.3%
DUVAL	2823	527	18.7%
ESCAMBIA	887	747	84.2%
FLAGLER	0	0	0.0%
FRANKLIN	54	11	20.4%
GADSDEN	258	38	14.7%
GILCHRIST	116	24	20.7%
GLADES	0	0	0.0%
GULF	68	15	22.1%
HAMILTON	108	26	24.1%
HARDEE	291	84	28.9%
HENDRY	176	0	0.0%
HERNANDO	1500	0	0.0%
HIGHLANDS	863	242	28.0%
HILLSBOROUGH	13144	2811	21.4%
HOLMES	239	76	31.8%
INDIAN RIVER	424	211	49.8%
JACKSON	157	32	20.4%
JEFFERSON	92	19	20.7%
LAFAYETTE	80	16	20.0%
LAKE	712	116	16.3%
LEE	13861	4116	29.7%
LEON	1277	260	20.4%
LEVY	272	68	25.0%
LIBERTY	22	5	22.7%
MADISON	176	38	21.6%
MANATEE	2259	450	19.9%
MARION	1351	280	20.7%
MARTIN	1559	319	20.5%
MONROE	791	158	20.0%
NASSAU	93	19	20.4%
OKALOOSA	1855	281	15.1%
OKEECHOBEE	360	108	30.0%

Appendix 1, Summary of SQG Program Verifications (FY97/98)

County	Assessment Roll	Verification	% Verified
ORANGE	4315	883	20.5%
OSCEOLA	634	143	22.6%
PALM BEACH	0	0	0.0%
PASCO	2800	303	10.8%
PINELLAS	0	0	0.0%
POLK	1765	248	14.1%
PUTNAM	0	0	0.0%
ST JOHNS	0	0	0.0%
ST LUCIE	603	120	19.9%
SANTA ROSA	1205	241	20.0%
SARASOTA	9057	7216	79.7%
SEMINOLE	2898	486	16.8%
SUMTER	286	72	25.2%
SUWANNEE	322	65	20.2%
TAYLOR	0	0	0.0%
UNION	68	15	22.1%
VOLUSIA	1390	101	7.3%
WAKULLA	57	12	21.1%
WALTON	0	0	0.0%
WASHINGTON	83	15	18.1%
Total	99,994	28,387	28.39%

Appendix 2, SQG Grant Program Funding Summary

FY95/96

Citrus County (HW299)	Base SQG Grant for \$30,000
Gadsden County (HW325)	Base SQG Grant for \$30,000
Gulf County (HW324)	Base SQG Grant for \$30,000
Hillsborough County (HW326)	Expanded SQG Grant for \$50,000
Total	\$140,000.00

FY96/97

North Central Florida RPC (HW327) (for Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Madison, Suwannee, and Union Counties)	Base SQG Grant for \$54,000
West Florida RPC (HW352)(for Santa Rosa, Okaloosa and Holmes Counties)	Base SQG Grant for \$18,000
Leon County (HW354)	Base SQG Grant for \$30,000
Dade County (HW351)	Expanded SQG Grant for \$18,000
Total	\$120,000.00

FY97/98

Nassau County (HW381)	Base SQG Grant for \$6,000
Desoto County	Base SQG Grant for \$6,000
Washington County (HW380)	Base SQG Grant for \$6,000
Charlotte County (HW382)	Base SQG Grant for \$6,000
North Central Florida RPC (HW327)(for Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Madison, Suwannee, and Union Counties)	Base SQG Grant for \$54,000
West Florida RPC (HW352)(for Santa Rosa, Okaloosa and Holmes Counties)	Base SQG Grant for \$18,000
Dade County (HW351)	Expanded SQG Grant for \$18,000
Escambia County	Expanded SQG Grant for \$25,000
Total	\$139,000.00

FY98/99

Nassau County (HW381)	Base SQG Grant for \$6,000
Desoto County	Base SQG Grant for \$6,000
Washington County (HW380)	Base SQG Grant for \$6,000
Hernando County (HW394)	Base SQG Grant for \$6,000
Flagler County (HW410)	Base SQG Grant for \$6,000
West Florida RPC (HW352)(for Santa Rosa, Okaloosa and Holmes Counties)	Base SQG Grant for \$18,000
Charlotte County (HW382)	Base SQG Grant for \$6,000
North Central Florida RPC (HW327)(for Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Madison, Suwannee, and Union Counties)	Base SQG Grant for \$49,700
Pasco County (HW393)	Expanded SQG Grant for \$50,000
Dade County (HW351)	Expanded SQG Grant for \$23,400
Escambia County	Expanded SQG Grant for \$25,000
Total	\$202,100.00

Appendix 3, Hazardous Waste Collection Center Grant Program Funding Summary

FY98/99

Funding for Cooperative Collection Center Arrangements	
Gadsden/Wakulla (HW414)	\$12,000
Alachua/Dixie (HW407)	\$20,000
Alachua/Gilchrist (HW408)	\$20,000
Alachua/Lafayette (HW409)	\$15,000
Highlands/Glades (HW413)	\$20,000
Okaloosa/Bay (HW400)	\$35,000
Okaloosa/Calhoun (HW399)	\$20,000
Okaloosa/Gulf (HW406)	\$20,000
Okaloosa/Holmes (HW404)	\$20,000
Okaloosa/Santa Rosa (HW405)	\$25,000
Marion/Sumter (HW412)	\$18,000
Okaloosa/Jackson (HW403)	\$20,000
Okaloosa/Walton (HW401)	\$20,000
Okaloosa/Washington (HW402)	\$20,000
Total	\$285,000.00
Funding for Unique or Innovative Projects	
Pasco (HWxxx)	\$50,000 (electronics demanufacturing)
Pinellas (Hwxxx)	\$15,000 (electronics demanufacturing)
Okaloosa (HWxxx)	\$25,000 (mobile unit)
Total	\$90,000.00

Appendix 4, Estimated Discards of Mercury, Cadmium and Lead in Products in the Florida Solid Waste Stream, 1989 and 2000

Estimated Mercury in Florida Municipal Solid Waste, 1995-2000 Projection, in Tons								
Product Category	1995	1996	1997	2000	1995	1996	1997	2000
Household Batteries	7.42	5.63	3.65	1.24	62.2%	55.3%	44.5%	22.5%
Electric Lighting	1.11	1.17	1.25	0.98	9.3%	11.5%	15.2%	17.8%
Mercury Devices ¹	2.96	2.97	2.93	3.00	24.8%	29.2%	35.7%	54.3%
Other ²	0.44	0.41	0.38	0.30	3.7%	4.0%	4.6%	5.4%
Total	11.93	10.18	8.21	5.52	100.0%	100.0%	100.0%	100.0%

Estimated Cadmium in Florida Municipal Solid Waste, 1995-2000 Projection, in Tons								
Product Category	1995	1996	1997	2000	1995	1996	1997	2000
Ni-Cd Batteries	100.24	112.99	123.26	185.43	82.0%	83.9%	88.1%	92.4%
Plastics	10.47	10.49	10.52	10.58	8.6%	7.8%	7.5%	5.3%
Pigments	0.52	0.52	0.52	0.52	0.4%	0.4%	0.4%	0.3%
Plating ³	4.11	3.00	3.07	1.51	3.4%	2.2%	2.2%	0.8%
Other ⁴	6.92	7.62	2.56	2.65	5.7%	5.7%	1.8%	1.3%
Total	122.26	134.62	139.93	200.69	100.0%	100.0%	100.0%	100.0%

Estimated Lead in Florida Municipal Solid Waste, 1995-2000 Projection, in Tons								
Product Category	1995	1996	1997	2000	1995	1996	1997	2000
Vehicular Batteries ⁵	4,645	1,542	2,567	2,586	60.0%	32.8%	45.2%	38.4%
Small Sealed Batteries	339	377	402	572	4.4%	8.1%	7.1%	8.5%
TV Picture Tubes	1,144	1,144	1,144	1,768	14.8%	24.6%	20.2%	26.2%
Computer Monitors	691	742	736	1,033	8.9%	16.0%	13.0%	15.3%
Glass and Ceramics	450	453	456	463	5.8%	9.8%	8.0%	6.9%
Circuit Boards	141	123	105	51	1.8%	2.6%	1.8%	0.8%
Plastics	166	137	124	127	2.1%	3.0%	2.2%	1.9%
Other ⁶	169	144	142	138	2.2%	3.1%	2.5%	2.0%
Total	7,745	5,341	5,533	6,595	100.0%	100.0%	100.0%	100.0%

¹ Switches, thermostats, thermometers

² Dental amalgam, pigments

³ Inks, dyes, paints

⁴ Rubber products, used oil, miscellaneous products

⁵ The national recycling rate for 1995 and 1996, as reported in the Battery Council International (BCI) National Recycling Rate Study, was 89.5% and 96.5%, respectively. Since BCI did not complete its study in 1997, the recycling rate for 1997, 94.9%, was based on an average of the annual recycling rates estimated by BCI in its annual studies completed for the years 1991-1996.

⁶ Includes solder in light bulbs and cans