



Special Waste Management

Waste Tires

The Florida Waste Tire Program began in 1988 with the passage of the Solid Waste Act. The program is funded by a \$1.00 fee, which is paid by the consumer when they purchase a new tire. The tire dealers collect this fee and send it to the Department of Revenue. The Department of Revenue may deduct the costs of administration, but this shall not exceed 3 percent of the total revenues collected. The balance of the money is transferred to the Department of Environmental Protection's Solid Waste Management Trust Fund (SWMTF). The authority for this program is in Florida Statute Chapter 403 Part IV.

The tire fee funds that go into the SWMTF are used in various programs. The Mosquito Control

Districts in Florida get at least 10% of the funds for the specific purpose of abating and providing mosquito control related to waste tire sites, other tire piles, and other sites identified by local mosquito control agencies as mosquito breeding areas. A percentage or allocated amount goes to the tire program specifically for larger State tire abatement projects, and administrative expenses. The largest percentage of the tire funds go back to the 67 counties in Florida as a Waste Tire Grant. The population of each county determines the size of their County Waste Tire Grant. Once awarded, these funds can be used to:

- construct or operate a waste tire processing facility
- contract for a waste tire processing facility service
- collect and remove waste tires from waste tire piles
- perform or contract for the performance of research
- operate recycling and education programs
- provide enforcement and prevention

Table 12: Industrial Usage of Waste Tires

Usage	Industrial Consumption			
	Actual 1997	Actual 1998	Actual 1999	Estimated 2000
Whole tire fuel - In state	850,000	850,000	700,000	650,000
Shredded tire fuel - In state	3,500,000	3,500,000	4,000,000	4,000,000
Whole tire fuel - Out of state	350,000	150,000	150,000	300,000
Shredded tire fuel - Out of state	3,800,000	2,300,000	4,240,000	2,440,000
Tires as fuel - Subtotal	8,500,000	6,800,000	9,090,000	7,390,000
Retreads and used tires	3,000,000	3,000,000	3,000,000	3,000,000
Crumb rubber for asphalt	2,000,000	2,000,000	2,000,000	2,000,000
Crumb rubber for other use	650,000	650,000	650,000	650,000
Septic drain fields	100,000	1,400,000	1,700,000	2,100,000
Die cut parts, etc.	100,000	100,000	100,000	100,000
Reused or Recycled tires - Subtotal	5,850,000	7,150,000	7,450,000	7,850,000
Florida tires - Total	14,350,000	13,950,000	16,540,000	15,240,000

CHAPTER 5: SPECIAL WASTE MANAGEMENT

activities to prevent the illegal transportation and disposal of waste tires and other solid waste materials

- purchase materials and products made from waste tires that are collected and recycled within Florida.

Florida does not subsidize private industry, nor does it pay for the collection or use of waste tires. A part of the tire fees were used to fund some research and development projects early in the program, but none are being funded at the present time.


In addition to the Tire Fee, there is a charge for the registration and permitting of tire businesses. They are as follows:

Waste Tire Collector Registration	1 Year	\$35 per vehicle
Waste Tire General Permit for Mobile Processing Equipment	1 Year	\$100
Waste Tire Collection Center Permit	5 years	\$500
General Permit for Small Processing Facility	5 Years	\$500
Waste Tire Processing Facility	5 Years	\$2500
Alternate Procedure for Processing Facility	1 time only	\$500

These funds are also placed in the SWMTF to be used as needed by the program. The ultimate use of the funds is controlled by the SWMTF appropriations of the Florida Legislature.

Florida Statutes define a “waste tire” as a tire that has been removed from a motor vehicle and has not been retreaded or regrooved. “Waste tire” includes, but is not limited to, used tires and processed tires. Whole waste tires may not be deposited in a landfill as a method of ultimate disposal. A tire dealer is responsible for having their waste tires removed to a permitted facility by a registered waste tire collector. A tire dealer may not keep more than 1500 waste tires on his property at one time. Anyone hauling waste tires in Florida without a current Waste Tire Collector Registration, and having the registration decal on the driver’s door of his vehicle, is subject to being ticketed by law enforcement officers. Anyone illegally dumping more than 500 pounds of waste tires can be charged under the Florida Litter Law with commercial littering which is a felony, and can be arrested and his vehicle confiscated.

Registered waste tire collectors shall deposit waste tires for storage or disposal only at a permitted waste tire processing facility, a permitted or exempt waste tire collection center, a permitted solid waste management facility, or at another site permitted



Resale - about 3 million a year are suitable to be sold as used tires.

Fuel at cement kilns. (whole tires)

Crumb rubber for using to prevent soil compaction, and to make running tracks softer both for horses and humans.

Tire chips for septic system drain fields.

Fuel for electric power plant. (whole tires)

Made into crumb rubber for products such as mats, floor tiles.

Crumb rubber for Rubber Modified Asphalt which is used in the top layer of all Florida roadways

Supplemental energy source at WTE facilities.

Tire shreds for landscape mulch

Waste Tires are Used for Many Purposes in the State of Florida

by the Department to receive waste tires. There is a tip fee that all processing and permitted facilities charge to take the waste tires. This fee is not a State fee and does not go to the State of Florida.

Currently Florida generates approximately 19 million passenger tire equivalents (PTE's) and constructively uses 90+% of this resource. This means that at times our processors are actively looking for waste tires. To our knowledge there are only about 200,000 tires in 13 illegal waste tire piles in the state now, and four of those sites are currently being abated. When the program began there were approximately 9.6 million tires in illegal sites. Florida has developed a very effective tire program that is working, and we will continue to look for new and better ways to improve it.

Solid Waste Combustor Ash

Standards for the handling, processing, disposal and recycling of MSW combustor ash are contained in Chapter 62-702, F.A.C. These regulations were adopted by the Environmental Regulation Commission in June of 1990. Ash is required to be disposed in a lined MSW landfill or a lined ash monofill. Chapter 62-702, F.A.C., requires facilities to submit ash management plans to the Department. These plans describe procedures used by combustors to properly handle, process, store, transport and dispose of their ash.

In March of 1994, the FDEP finalized a Standard Operating Procedures (SOP) Manual for sampling ash residue from solid waste combustors. This SOP Manual provides combustors with an approved method for collecting representative composite samples of their ash for total metals analysis purposes using EPA document SW-846 Test Method 3050. Combustors are now required to incorporate these procedures into their ash sampling methods. Table 8C is a summary of total metals analysis data that was collected from June of 1991 to March of 1997 for combustor ash.

In response to the Supreme Court decision of May 27, 1994, the EPA issued an implementation strategy which directed generators of ash from

WTE facilities to conduct an initial hazardous waste characterization of their ash within 90 days of the effective date of the Supreme Court decision. Next on June 23, 1994 (59 FR 32427), the EPA released a draft guidance document to assist these generators in determining whether their ash exhibited the Toxicity Characteristic (TC).

This draft guidance was entitled, "Sampling and Analysis of Municipal Refuse Incineration Ash." By September 1994, all WTE facilities in Florida had characterized their ash in accordance with EPA's draft protocol and determined that it was not a characteristic hazardous waste. The 90% upper confidence interval for the eight RCRA metals of concern for toxicity characteristic are listed in Table 9C. However, the issue of sampling point location, or point of generation, for this ash had not yet been resolved which left the initial characterizations in doubt. Facility and supplemental ash information are listed in Chapter 3, the Combustion section of this report.

On February 3, 1995, the EPA published its determination in the Federal Register (60 FR 6666) that the point of generation at which RCRA Subtitle C jurisdiction began for WTE ash was when it exited the combustion building following the combustion and air pollution control processes. This determination allowed the WTE facilities to combine the fly ash and bottom ash inside the combustion building prior to sampling. It also allowed the treatment or conditioning of the ash inside the combustion building prior to sampling. As a result of this determination, the FDEP concluded the initial ash characterizations for the Florida WTE facilities were acceptable. In addition, on October 5, 1995, the FDEP determined it would not require further recharacterizations of the WTE ash prior to disposal since, in accordance with 40 CFR 262.11, these decisions are the responsibility of the generator and all the ash was being disposed of in lined solid waste landfills meeting "Subtitle D" requirements (40 CFR 258). On July 24, 1995, EPA announced the availability of their final guidance for sampling MSW combustor ash. This guidance provides one way for owner/operators of MSW combustor facilities to determine if their ash exhibits the

Toxicity Characteristic and is, thus, a hazardous waste. All Florida MSW combustor facilities have determined, by testing, that their ash is not a hazardous waste. Therefore, FDEP is continuing to allow the disposal of this ash in lined landfills. The FDEP is also using EPA's guidance as the preferred method for determining if MSW combustor ash is a hazardous waste.

The FDEP is continuing to work with interested parties to investigate alternatives for recycling the ash. Limited approvals have been given for using bottom ash in the construction of roadbase materials. Beneficial use options for WTE ash being considered by the DEP include utilization as concrete aggregate, asphalt aggregate, soil cement admixture, structural fill in roadway applications, structural fill under lined landfills with groundwater monitoring, roadway sub-base, land application, and other miscellaneous uses. Investigations are continuing to estimate potential human health impacts by other reuse options.

On February 27, 2001, the FDEP issued a document entitled, "Guidance for Preparing Municipal Waste-To-Energy Ash Beneficial Use Demonstrations." This document is intended to help applicants and the FDEP prepare and evaluate proposals for use of WTE ash. This document can be downloaded off the FDEP Solid Waste web page at:



http://www.dep.state.fl.us/waste/categories/solid_waste/default.htm

In calendar year 2001, the Florida WTE facilities incinerated 5.6 million tons of municipal waste and generated approximately 1.6 million tons of ash. The total tons of ash generated in Florida for the years 1993 through 2001 are listed in Table 7C.

The total annual burn capacity of these facilities was 6.9 million tons of waste resulting in Florida having the largest burn capacity of any state in the nation and serving approximately 7 million people or 51%

of the population of the state. The ash generated from these facilities is currently disposed of in 11 ash monofills strategically located throughout the state. A compilation of WTE ash landfill information is listed in Table 10C.

Biomedical Waste

In the mid-1980s, Florida faced a potential public health threat as a result of the improper disposal of biomedical waste. Florida's beaches, along with other beaches on the nation's East Coast, became resting-places for potentially infectious waste. With the ever-increasing numbers of persons infected with the Human Immunodeficiency Virus (HIV), Hepatitis B, and other blood-borne pathogens, proper management of biomedical waste became a public health issue.

In 1989, Florida's legislature was a forerunner in the nation through the enactment of a law to protect Florida's citizenry and visitors from unnecessary exposure to potentially infectious biomedical wastes. Revisions to Chapter 381, Florida Statutes, required facilities that produce biomedical waste to segregate it from the regular solid waste stream, package, store, transport, and treat it in such a manner as to reduce the risk of infection to healthcare workers, environmental services staff, solid waste personnel, and the general public. Provisions were set forth for permitting generators, storage, and treatment facilities, and for the registration of biomedical waste transporters. Section 381.0098, Florida Statutes, and the subsequent code, Chapter 64E-16, Florida Administrative Code, continue to serve as models for the enactment of biomedical waste regulations in other states.

Initially, the Florida Legislature delegated responsibility to the Department of Health for the oversight of facilities that generate biomedical waste. The Department of Environmental Protection was delegated responsibility for storage, transport, and treatment. In some instances, this dual responsibility resulted in an overlapping of services.

**In 2001, Florida
Waste to Energy
Facilities incinerated
5.6 million tons of
MSW.**

Table 13: Commercial Biomedical Waste Treatment Facilities

Name	Address	Phone	Method	Permitting Agency
Stericycle	254 W. Keene Road Apopka, FL 32703	800-817-1715	Incinerator	DEP
Stericycle	4245 Maine Avenue Eaton Park, FL 33840	800-853-5653	Autoclave	DOH
Stericycle	8795 NW 58th Street Miami, FL	305-698-5510	Autoclave	DEP
Electron Beam Medical Waste Treatment Plant	University of Miami 1501 NW 7th Avenue Miami, FL 33136	305-284-3467	Electron Beam	DOH
Five Star Waste, Inc.	2101 7 th Avenue North Lake Worth, FL 33461	561-685-5321	Autoclave	DOH
Jackson Memorial Hospital	1611 NW 12 th Avenue Miami, FL 33136	305-585-1302	Autoclave	DOH
Jancy Pet Burial Service	4596 Laughlin Zellwood, FL 32798	407-884-7336	Autoclave	DOH
Medico	13200 58 th Street Clearwater, FL 34620	813-532-0099	Incinerator	DEP
Micro-Med	6712 Highway Avenue Jacksonville, FL 32205	904-693-3254	Autoclave	DOH
Ogden Martin	3830 Rogers Industrial Pk. Okahumpka, FL 34762	352-365-1611	Waste to Energy	DEP
Parkway Regional Medical Center	160 NW 170 Street North Miami Beach, FL 33169	305-688-3931	Autoclave	DOH
Safety Disposal Systems, Inc.	1100 25 th Street, Bay 7&8 West Palm Beach, FL 33407	305-819-8877	Autoclave	DOH
Wuesthoff Health Systems	110 Longwood Avenue Rockledge, FL 32955	407-636-2211	Autoclave	DOH

their environmental health sections, monitor biomedical waste management procedures through issuing annual permits, exemptions, and registrations as well as conducting surveys of all biomedical waste facilities to ensure compliance with applicable standards in the statute and code.

The county health departments issue permits to generators who produce 25 pounds or more of biomedical waste in any 30-day period. Permits are valid from October 1 through September 30. In the permit year 1999-2000, permits were issued to approximately 14,000 generators who fall into this category.

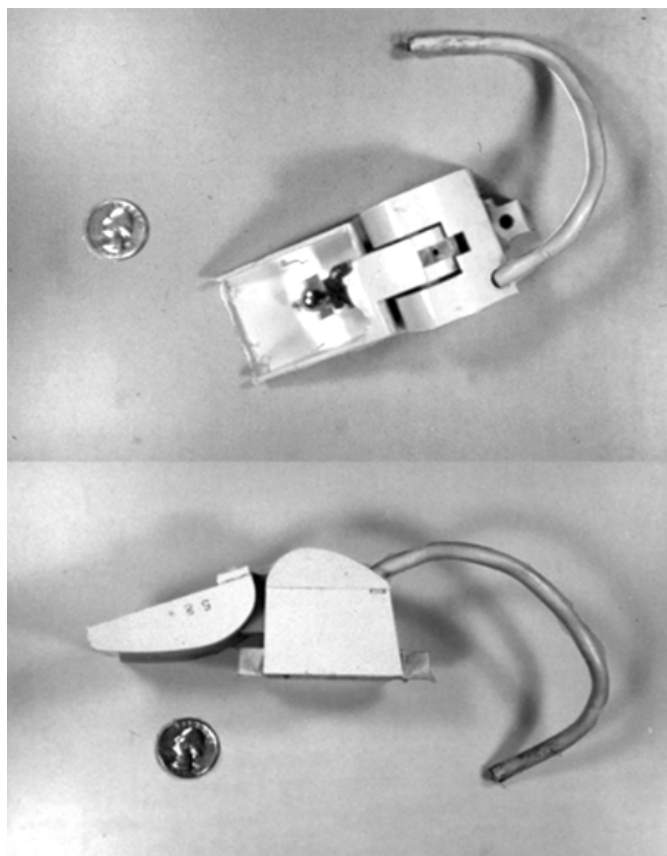
Approximately 16,000 generating facilities that produce less than 25 pounds of biomedical waste in each 30-day period are exempt from

In an effort to eliminate duplication of services, the 1996 legislature transferred the responsibility for transport, storage, and treatment to the Department of Health. Based on the environmental impacts of incineration, responsibility for permitting biomedical incinerators remains within the Department of Environmental Protection.

Each year, Florida's biomedical waste generators produce approximately 50,000 tons of biomedical waste, which is defined by statute as "any liquid or solid waste, which may present a threat of infection to humans". County health departments, through

permit and fee requirements, but must comply with all other requirements of Chapter 64E-16, Florida Administrative Code. County health department environmental health staff conduct surveys at the exempted facilities every three years.

Storage permits are required if the storage time for biomedical waste at a facility, other than the facility at which it was generated, exceeds 72 hours. The county health department, in the county where the storage facility is located, issues the storage permit. Storage permits were issued to 105 storage facilities for the permit year 1999-2000. Environmental



Bilge pump mercury float switch from a pleasure boat, top and side views. U.S. Quarter shown for size reference. Photo by Jack Price

health staff conduct annual surveys at each permitted facility for compliance with applicable requirements. However, if the storage of biomedical waste occurs within an offsite incineration treatment facility, the Department of Environmental Protection incorporates the storage permit into the treatment permit and conducts the annual survey.

The Department of Health and the Department of Environmental Protection work cooperatively to permit commercial biomedical waste treatment facilities. For the permit year 1999-2000, thirteen commercial biomedical waste treatment facilities were permitted in the state. The Department of Health issued permits for nine facilities that treat biomedical waste through an autoclave process. The Department of Environmental Protection permitted the four facilities that treat biomedical waste through an incineration process. Through an interagency agreement developed between the Department of Health and the Department of Environmental Protection, annual compliance surveys of treatment facilities are conducted by the permitting agency. A

listing of permitted commercial treatment facilities is attached as Appendix A.

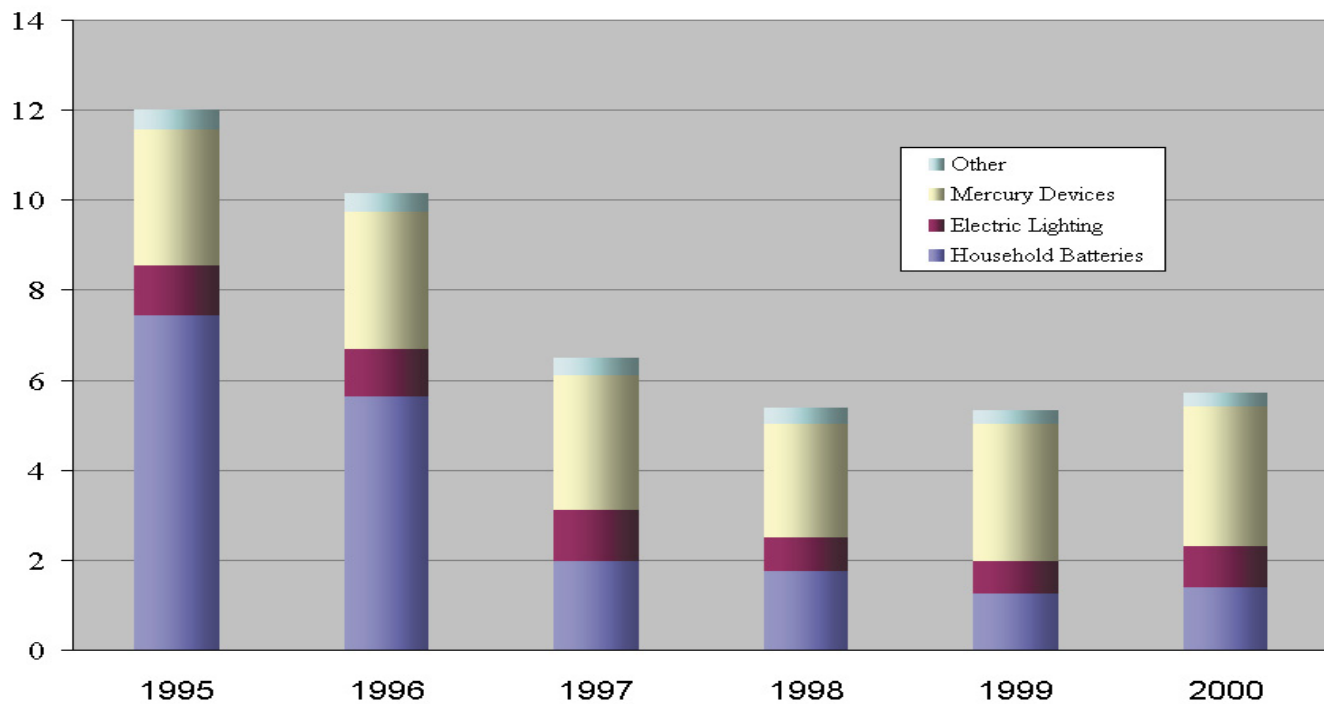
Through the interagency agreement between the Department of Health and the Department of Environmental Protection, procedures are addressed for managing illegal disposals of biomedical waste, approving alternative treatment processes, and streamlining permitting and survey activities in instances when a facility's activities involve areas that are under the purview of both agencies. Examples are treatment facilities that utilize both an autoclave process and an incineration process of biomedical waste, or an offsite incineration facility that has a storage area.

Mercury, Cadmium and Lead

Since 1995 the Department has been tracking the amount of mercury, lead and cadmium entering Florida's municipal solid waste (MSW) stream from discarded products including batteries, mercury-containing devices and lamps, and cathode ray tubes in televisions and computer monitors. The Department has estimated the amounts of these heavy metals potentially entering Florida's MSW in the baseline year of 1995 and then estimated disposal amounts annually for 1996 through 2000. These disposal amounts do take recycling that has been documented into account and therefore represent disposal of heavy metals in products that were not recycled. Reducing the amount of mercury, lead, and cadmium entering Florida's MSW continues to be a key goal of the Department.

Mercury

The amount of mercury discarded into MSW has been dropping rapidly due to the reduction or replacement of mercury in the manufacture of widely used products and the increased use of alternate products as well as recycling programs for mercury-containing lamps and devices. Although the volume of such products discarded in MSW can be high (e.g., household batteries) the amount of mercury reaching Florida MSW via these products is estimated to be less than 5½ tons in 2000, down from an estimated 12 tons in 1995. Figure 21 illustrates

Figure 21: Estimated Discards of Products Containing Mercury into Florida MSW (tons)

the trends since 1995. The estimated percentage contributions of selected product categories to this mercury loading in Florida MSW in 2000 are shown in Figure 22. The source data for Figures 21 and 22 may be found in Appendix C, Table 11C. State legislation, industry source reduction efforts and product stewardship programs, and local recycling programs should continue to further reduce mercury in MSW. Due to the declining mercury content of the alkaline and carbon-zinc battery waste stream, an increasing number of counties have refocused their battery collection and recycling programs on rechargeable batteries which contain significant amounts of cadmium and lead.

Mercury-Containing Lighting and Devices

With the ongoing decline of mercury content in batteries and other products, mercury-containing lamps and devices were estimated by the Department to be the largest combined product category source (more than 70%) of mercury being discarded into Florida's municipal solid waste in 2000 (see Figure 22).

Fluorescent lamps are the most common type of mercury-containing lamps. Mercury-containing

lamps are prohibited from disposal in a municipal waste-to-energy facility or other solid waste incinerator. Since most mercury-containing lamps are hazardous wastes, they cannot be disposed of at Florida MSW landfills and would have to be shipped to out-of-state hazardous waste facilities. As an alternative under Florida law, commercial, governmental, or institutional facilities may recycle them under streamlined universal waste regulations at permitted mercury recovery facilities. Mercury-containing lamps from households may

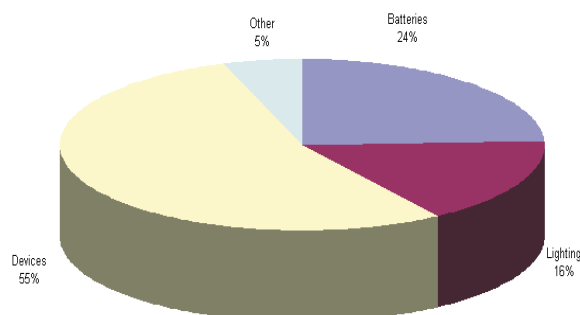
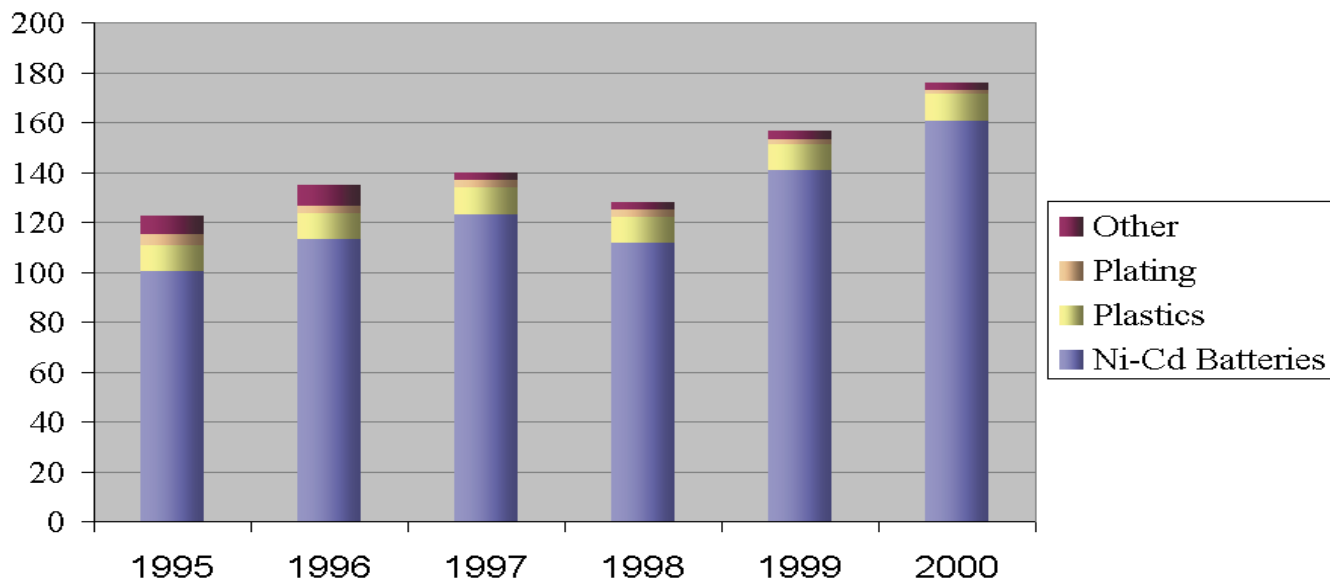
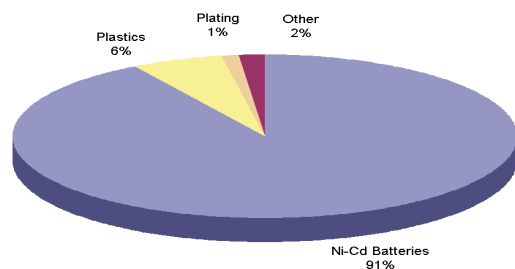
Figure 22: Estimated Discards of Products Containing Mercury into the MSW Stream (CY 2000)

Figure 23: Estimated Discards of Products Containing Cadmium into Florida MSW (tons)

be recycled at most county household hazardous waste collection programs. Mercury-containing devices, including those from households, such as thermostats, thermometers, and pleasure boat bilge pump float switches, are prohibited from disposal both in a municipal waste-to-energy facility or other solid waste incinerator and in a landfill. One boat bilge pump float switch can contain as much mercury as 50 fluorescent lamps. The Department strongly recommends recycling of all mercury-containing lamps and devices.

The reduction or diversion of mercury from Florida's MSW is primarily the result of source reduction activities on the part of the manufacturers to decrease the use mercury in certain widely-used products like

batteries and fluorescent lamps. The growing use of alternative products without mercury, cadmium and lead will also contribute to the reduction of heavy metals in Florida's MSW. Some examples include digital thermometers instead of mercury thermometers; lithium batteries instead of nickel-cadmium batteries; and no-lead flat panel displays instead of lead-containing CRTs in televisions and computer monitors. However, municipal and private collection and recycling programs will continue to be a key part of the ongoing effort to reduce heavy metals entering MSW.

Figure 24: Estimated Discards of Products Containing Cadmium into Florida MSW (CY 2000)

Chapter 62-737, F.A.C., contains standards for mercury recovery and reclamation facilities that process mercury-containing lamps and devices). Four facilities have permits under this Chapter. Based upon the 2000 reports from mercury recovery and reclamation facilities, the percentage of lamps recycled is estimated to be about 30% for commercial mercury-containing lamps in Florida, compared with an estimated 25% in 1995. The average annual lamp recycling rate for the period 1995-2000 is estimated to be about 25%. The increased use of reduced mercury content fluorescent and other mercury-containing lamps in Florida is expected to further reduce the amount of mercury in Florida MSW from discards of this product category.

The streamlined regulatory structure of the USEPA's

Universal Waste Rule (adopted by Florida as Rule 62-730.185, F.A.C.) and Florida's universal waste rule for mercury-containing lamps and devices (Chapter 62-737, F.A.C.) has also spawned a product stewardship program funded by mercury thermostat manufacturers. Managed by the Thermostat Recycling Corporation (TRC), the program uses the existing new mercury thermostat distribution network of wholesalers and heating, ventilation, and air conditioning (HVAC) contractors to collect all brands of mercury thermostats taken out of service. Begun in November 1997, this TRC reverse distribution ("take back") program currently reports at least 43 participating wholesale companies with as many as 95 collection containers in Florida. In 2001, more than 100 pounds of mercury (nearly 11,000 thermostats) were collected and recycled by the TRC program in Florida, more than in any other state. Since 1997, more than 300 pounds of mercury from Florida thermostats have been recycled through the TRC program, representing 30% of the total mercury collected by TRC nationally. 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 Universal Waste Rule and Chapter 62-737, F.A.C., the manufacturers would not have been able to set up and fund such a program.

Mercury Research and Demonstration Projects
Since 1995 Florida's continuing research into the behavior of mercury in MSW handling and disposal has yielded an important body of actual field data that has significantly reduced the uncertainties surrounding this previously unexplored topic. Funds appropriated by the Florida Legislature in Fiscal Year 2001-2002 were used for research and demonstration projects following on previous research related to mercury-containing devices and other mercury-bearing products in Florida's MSW. Continuing their 1998-2000 research, a team from the Oak Ridge National Laboratory (Tennessee) quantified mercury emissions from municipal solid waste landfill sites in Palm Beach, Martin and St. Lucie Counties. In addition, a team from the University of Central Florida characterized mercury

emissions from about 1,400 municipal solid waste collection containers (dumpsters) at commercial facilities in Orange County. Florida's data set on the behavior of mercury in MSW handling and disposal now includes emissions from all pathways at 4 landfills, transfer station emissions at 2 transfer stations, landfill gas emissions at 6 landfills and emissions from commercial collection containers in 2 counties.

<http://www.dep.state.fl.us/waste/categories/mercury>



Cadmium and Lead

As shown in Figures 23, 24, 25, and 26, rechargeable batteries and cathode ray tubes (CRTs) contained in televisions and computer monitors are significant sources of cadmium and lead, respectively, in Florida's MSW. The source data for these figures may be found in Appendix C, Tables 12C, and 13C.

Nickel-Cadmium and Small Sealed Lead-Acid Rechargeable Batteries

EPA has identified nickel-cadmium (Ni-Cd) batteries as the largest source of cadmium in MSW. Small sealed lead-acid (SSLA) batteries are a source of lead when disposed of in MSW. Products sold in Florida which contain Ni-Cd and SSLA rechargeable batteries must have a removable battery or battery pack and labeling information with identification and disposal/recycling information. The disposal of

Figure 25: Estimated Discards of Products Containing Lead into Florida MSW (CY 2000)

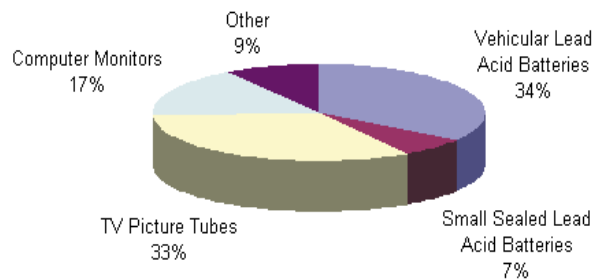
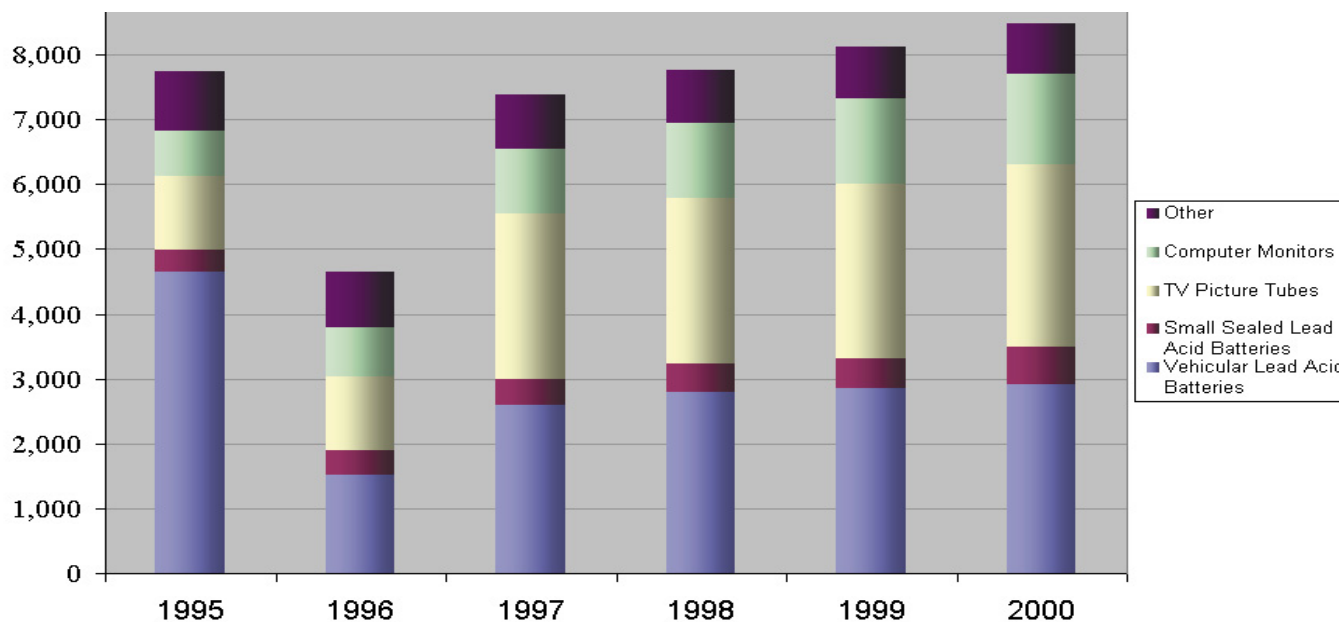


Figure 26: Estimated Discards of Products Containing Lead into Florida MSW (tons)

Ni-Cd and SSLA rechargeable batteries or products that contain them from any source, including households, into MSW is prohibited.

Florida became the first state to adopt the U.S. EPA's Universal Waste Rule (40 CFR Part 273) on September 7, 1995, thus activating other battery management requirements in Florida's 1993 Solid Waste Act, Section 403.7192, F.S. The Universal Waste Rule streamlines regulations governing the collection and management of certain widely generated hazardous wastes (now defined as "universal wastes"), including Ni-Cd and SSLA batteries, in order to facilitate their proper collection and recycling. Manufacturers and marketers that sell rechargeable batteries or products containing those batteries in Florida are required to have permanent unit management programs for collection and recycling. Annual reporting of the results of these permanent programs was required through October of 2000 and continues on a voluntary basis.

<http://www.dep.state.fl.us/waste/categories/batteries>



The Rechargeable Battery Recycling Corporation (RBRC) manages a rechargeable

battery recycling program in Florida and throughout the U.S. and Canada. The program includes county/municipal collection sites, retail collection sites, and a commercial/institutional generator program fully or partially funded by the industry. A licensee fee/rebate program, run by the RBRC and available to battery or product manufacturers and distributors, provides the funding. As of October 2002, there were 2,017 collection sites (including many county household hazardous waste and solid waste facilities) in 64 Florida counties. Many of these sites are battery and electronics wholesale and retail outlets. Florida's Ni-Cd battery recycling rate is estimated to be about 13% for 2000, with the annual average rate for the period 1995-2000 at about 20%.

The Department has successfully worked in cooperation with the Portable Rechargeable Battery Association (PRBA) and RBRC to expand their Ni-Cd battery recycling program to include SSLAs. On January 1, 2001 the RBRC program began accepting SSLAs, nickel-metal hydride (NiMH) and lithium ion (LI-ion) rechargeable batteries. Now a battery purchaser can receive information on various recycling programs for all their battery discards from one phone call (1-800-8BATTERY) or website (www.rbrc.org). The Department encourages an

industry-wide approach to battery management since it appears to improve cost effectiveness, especially for smaller battery manufacturers and marketers.

Lead in Vehicular Lead-Acid Batteries

These batteries, typically larger than the SSLAs, contain a liquid acid electrolyte, and are prohibited from disposal in landfills or municipal waste combustors under Section 403.708, F.S. Retailers who sell these batteries are required under Section 403.7185, F.S., to collect a fee of \$1.50 for each battery sold which contributes to the State's Water Quality Assurance Trust Fund. Battery retailers are also required to take back spent batteries as trade-ins. In addition, some scrap dealers buy back spent lead-acid batteries. Also, county programs accept these batteries at solid waste/household hazardous waste facilities and collections.

A mature, close-looped recycling infrastructure that is driven by economic incentives within the lead-acid battery industry and convenient collection locations ensures that nearly all lead and plastic casings that are reclaimed from recycled batteries are used to make new batteries. According to the Battery Council International website (<http://www.batterycouncil.org/recycling.html>), "the typical new lead-acid battery contains 60 to 80 percent recycled lead and plastic."

The recycling rate for vehicular lead-acid (VLA) batteries has been estimated by the battery industry to be nearly 93% nationally since 1995. No estimates of the recycling rate in Florida are known for VLA batteries, but the rates are believed to be consistent with

the national average. Due to the large amounts of lead contained in these batteries, they and SSLAs are believed to be the second largest (behind TV and computer monitor cathode ray tubes) combined source of lead in Florida's MSW stream even with this very high estimated recycling rate.

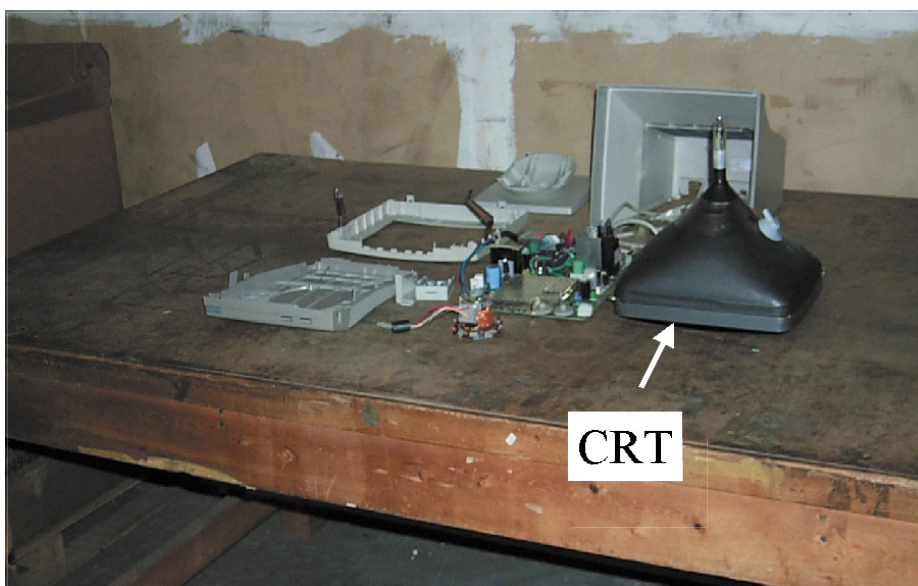
Lead in Cathode Ray Tubes

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, the combined category of computer monitors and TV picture tubes, are estimated by the Department to be the second largest source of lead in Florida's MSW (see Figure 25 and Table 13C). Some studies suggest and surveys confirm 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.



<http://www.dep.state.fl.us/dwm/programs/electronics>

"The typical new lead-acid battery contains 60-80% recycled lead and plastic"



Disassembled computer monitor showing CRT and other internal parts.

Pesticides: Operation Cleansweep

Operation Cleansweep, run jointly by the Department of Agriculture and Consumer Services and the Department of Environmental Protection, provides farmers, nursery operators, golf course operators, and pest control services a safe and economical way to dispose of their cancelled, suspended, and unusable pesticides. Proper disposal can be costly and a regulatory burden for small farmers and other pesticide users. Operation Cleansweep offers an opportunity to avoid these formidable barriers and to promote safe and environmentally sound pesticide use, handling, and disposal.

The main goal of Operation Cleansweep is to protect agricultural workers, emergency responders, the public, and the environment from potential health and environmental threats from these stored pesticides. Some of these materials are very old and may be in deteriorating containers. Some, such as chlordane and DDT, are no longer allowed to be used. Others are no longer usable due to changes in the product during long term storage or changes in farming practices. Another goal is to reduce the need for future Operation Cleansweep collections by preventing the creation of unusable pesticides

in the first place. Participants receive printed educational materials that include tips on purchasing only as much pesticide product as is needed; proper labeling, storage, and handling techniques; and information for responding to leaks, spills, and exposure incidents.

More than 40 private and public partners have worked together through Operation Cleansweep since 1995 to rid the state of 569,000 pounds (nearly 285 tons) of stored cancelled, suspended, and unusable pesticides from almost 1,000 participants in 62 counties. More than \$607,000 (\$532,000 in state funds; \$75,000 in private funds) has been spent for collection and disposal with public and private partners donating their time for planning, event support and staffing. With an average load of about 500 pounds, each participant saved at least \$2,000 since otherwise they would have had to pay 4 or 5 times more than the state contracted disposal price. Pesticides were collected at specific locations selected by the public and private partners serving on a Steering Committee on the basis of need, availability of a site and other logistical constraints.

For details on Operation Cleansweep participants, quantities and costs from the 1995 statewide lead arsenate collection program and the 1996-1998 pilot collections through the 2000-2001 and 2001-2002 strategic campaigns see Table 14C. Operation Cleansweep has again been funded by the 2002 Legislature for \$200,000. To efficiently serve the whole state, the 2002-2003 Operation Cleansweep program will provide pickup service to participants statewide on an as-need basis (participants sign up in advance) rather than holding collections on particular days in particular locations.



Leaking drum of herbicide 2,4-D removed from a Jackson County farm on November 8, 2001.

Used Oil

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 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, a permitting program for used oil processors 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 rerefined used oil by state and local governments, as well as some limited liability exemptions for businesses which 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. The 2001 Legislature appropriated \$200,000 to update Florida's used oil recycling program. 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.

Florida law contains several bans on the disposal of used oil. Since October 1, 1988, it has been unlawful for used oil to 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 DEP (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 required retailers who sell over 500 gallons of oil annually to post signs which display the State's toll free 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).

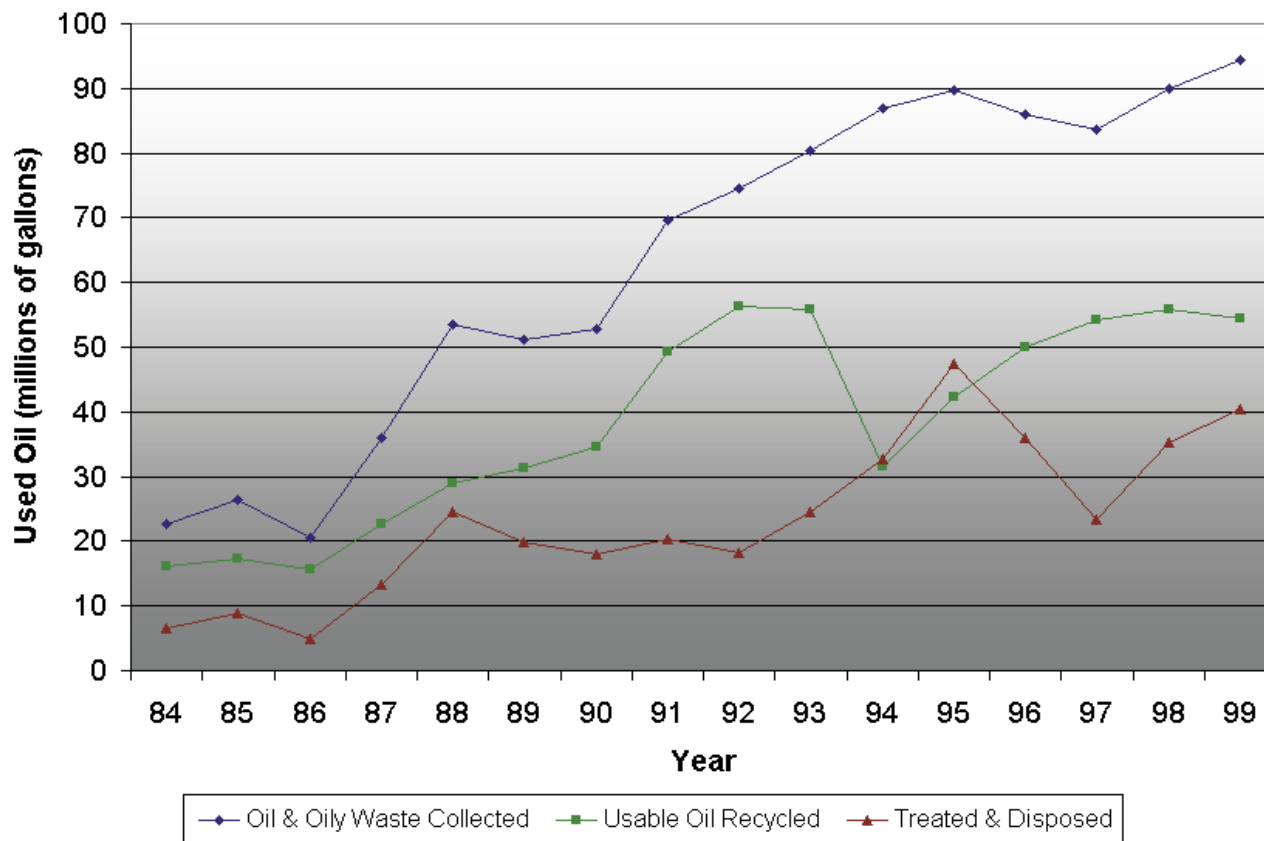


For more information, go online at:

http://www.dep.state.fl.us/waste/categories/used_oil/

Recent Developments

Chapter 62-710, F.A.C. was amended, effective December 23, 1996. The most significant change required Used Oil Processors to obtain a Used Oil Processing Permit. There are currently 19 used oil processors permitted by the Department. 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,

Figure 27: Used Oil Management in Florida 1984-1999

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 Chapter 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.

Used Oil Registration and Reporting

As of December 2000, 128 individual private and public businesses were included in the registration database, 4 of which are based outside of Florida. This has not significantly changed from the 129 handlers registered in 1999. However, the number of handling activities and number of sites decreased in 2000, reflecting market pressure in the used oil

recycling industry, the result of stiff competition and the continuing climb of liability insurance premiums. Small operations with limited resources are quitting this industry, leaving, or selling, their customer base to larger companies.

Effective June 8, 1995, commercially generated used oil filters (UOFs) were banned from landfill disposal and UOF handlers were required to register with the Department's Used Oil Recycling Program. Many used oil handlers now also manage UOFs to meet customer demand.

As of December 2000, the DEP database includes 91 UOF transporters, 68 UOF transfer facilities, 21 UOF processors and 2 UOF end-users (metal foundries and waste-to-energy facilities [WTEs] which 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.

When the UOF landfill ban was put in place in 1995, a number of businesses opened up for this market. The number of registered UOF handlers continues a steady decline as this market settles. As the Department has the authority to regulate only the oil within a UOF, 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.

Annual Reports for Calendar Year 1999

Transporters and processing facilities must report on the type, quantities, and sources of used oil collected, processed, and end-used. This data is graphically illustrated in Figures 27 and 28, and are explained in the following sections.

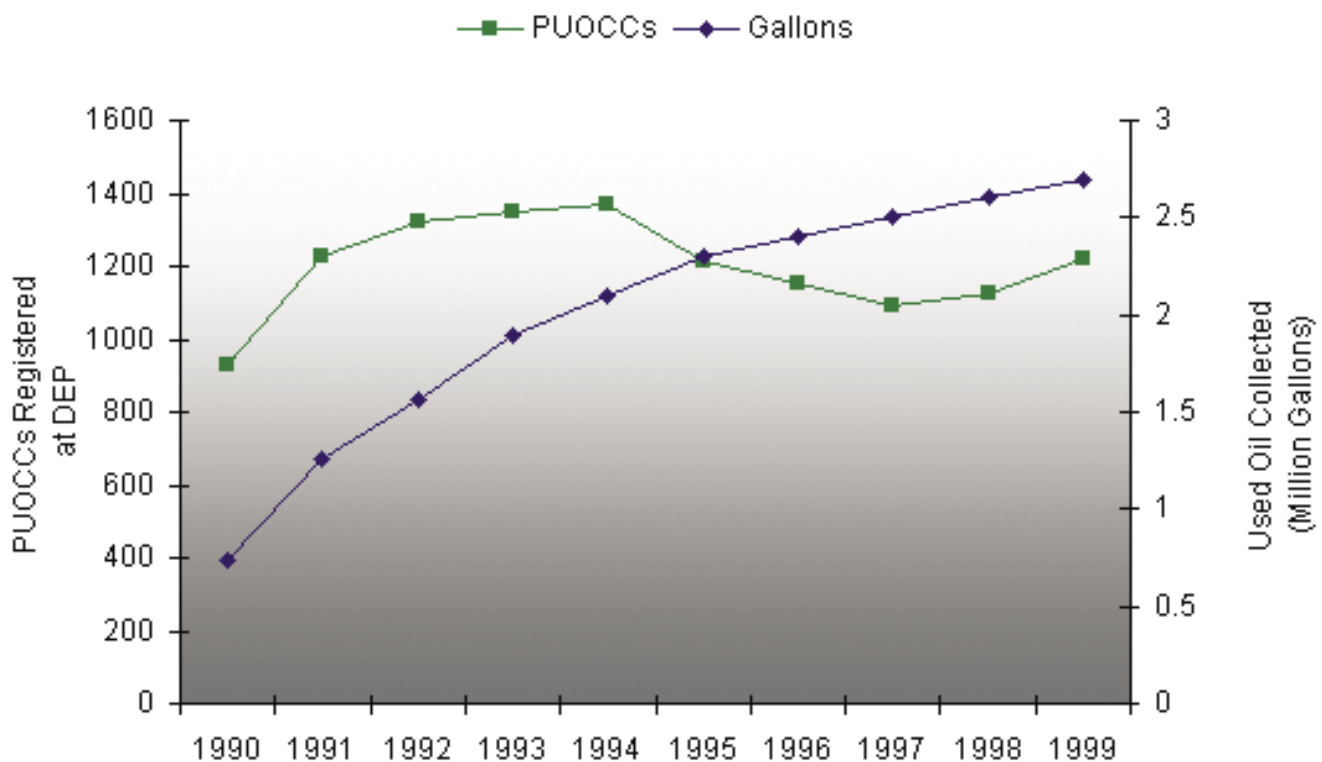
Trends in Used Oil Management in Florida

Figure 27 shows the trend of used oil management in Florida from 1984 to 1999. Overall, the trends (collection, recycling and disposal) show a steady increase in volume over time. This is to be expected, given Florida's steady population growth.

It is difficult to correlate increased rates of used oil recycling to population growth due to many variables. Variables resulting in reduced oil changes include extended vehicle service schedules for newer cars (significant in Florida's large rental fleets) and for those consumers using the new, synthetic oils which have a longer life, the use of on-board, in-line oil filtration systems by truck fleets, and the growth of on-site used oil reconditioning and recycling technologies increasingly employed by industry. Nonetheless, the rate of growth in the volume of used oil collected seems to at least keep pace with the population growth rate.

A significant adjustment is evident in the period between 1993 and 1995. It was during this time that DEP promulgated amendments to both the Used

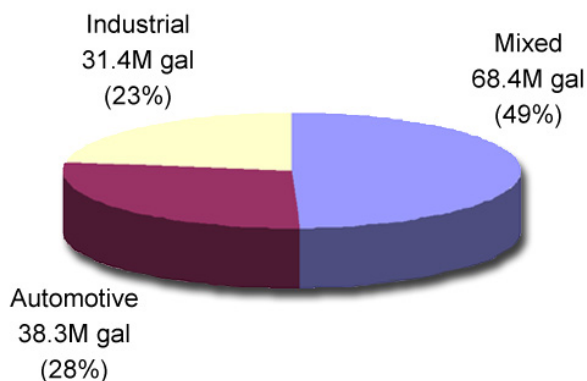
Figure 28: Growth of Florida's Public Used Oil Collection Center Program



Oil Management Standards and, at the same time, adopted standards for the management of petroleum contact water (PCW). The changes in definitions of used oil, oily wastes, and PCW, along with the fine tuning of the data collected by DEP regarding these activities, resulted in a major data shift. 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 and the volumes reported collected, recycled and disposed reconcile to within a 1.5% margin of error.

Figure 29: Amount of Used Oil and Oily Wastes Collected in Florida, 1999

Total: 138.1M Gallons



Amount of Used Oil and Oily Wastes Collected

In calendar year 1999, 138,136,143 gallons of used oil and oily wastes were reported to have been collected (Figure 29). Automotive used oil and oily waste made up 28% of the total amount collected, including 2,648,285 gallons collected from over 1200 Public Used Oil Collection Centers. Approximately 23% of the total was industrial oil collected from bulk petroleum and various industrial facilities, and other sources. The remaining 49% of the total was of the mixed type generated by commercial sources (i.e. a combination of automotive and industrial oils). Again this year, more oil is reported as Mixed, compared to previous years. This seems to indicate a consolidation of loads by handlers.

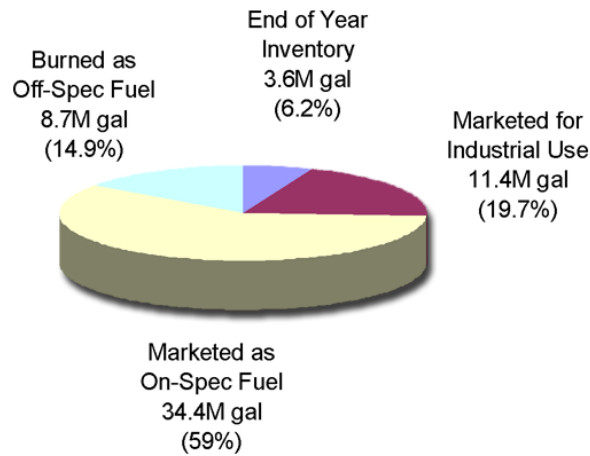
Disposition of Used Oil and Oily Wastes

As mentioned in the preceding section, approximately 138,136,143 gallons of used oil were reported to have been collected in Florida during 1999. About 43,794,916 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 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 97,052,413 gallons of used oil and oily wastes were reported as collected for management. On the other end, 98,539,249 gallons of used oil are reported as being managed (recycled or disposed). This leaves a difference of 1,486,836 gallons. 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 around 7%. The error in this year's annual report calculates to approximately 1.6% of the adjusted total quantity reported to have been collected. This error continues to reflect well on the Department's efforts to increase the accuracy of its data collection and management.

Of the 98,624,851 gallons of used oil and oily waste reported as managed, 58,170,183 gallons (58%) were recycled as follows (Figure 30):

- 34,463,565 gallons (59.2%) were marketed as an on-specification used oil fuel
- 8,654,818 gallons (14.9%) were recycled as an off-specification used oil fuel
- 11,434,760 gallons (19.7%) were marketed for other industrial uses (e.g. phosphate beneficiation)
- 3,617,040 (6.2%) gallons was counted as end of year, on-site inventory

Figure 30:
Disposition of Used Oil Recycled in Florida -
58,170,183 Gallons, 1999



Calendar year 1999 data is not significantly changed from the previous year. The recycled used oil market will always be tightly linked to the virgin crude market. Market prices for virgin crude during 1999 remained relatively stable over time and probably worked towards keeping used oil management trends in line with those of the previous year.

Of all the oil and oily wastes collected, 40,369,066 (42% of the total amount of used oil reported managed) ended up as oily wastes. These wastes are primarily condensation water and sediment which are ubiquitous in used oil. When a container of used oil is picked up for transportation, whether in drums or pumped into a vac-truck, these wastes will almost always constitute some significant portion of the used oil load. A significant portion, according to industry reports, ranges anywhere from 4-20%, with the mean around 7%. These oily wastes were managed as follows:

- 238,102 gallons (0.6%) were landfilled (non-liquid sediment)
- 39,933,985 gallons (99.0 %) were treated as industrial wastewaters
- 196,979 gallons (0.4%) were incinerated

Overall, the volume of oily waste disposal did not change much since the year prior to this data. This is thought to be due to the practice of conducting solid waste management at used oil processing

facilities. After the Used Oil Processing Permit was put in place in 1997, the Department noticed that a number of permitted processors were managing what were essentially solid wastes under the used oil management standards. The Department has continued to take aggressive steps towards discouraging the blurring of the distinction between solid vs. oily wastes. Facilities which might have managed solid wastes under the more relaxed used oil standards (and reporting it as used oil recycling), now manage such wastes under the more stringent solid waste standards (where such oily wastes are properly reported as disposal). So, the amount of used oil recycled vs. the amount of oily wastes disposed of, continues a trend towards reconciliation with the total volume reported collected and managed.

The trends within the realm of oily waste disposal continue to show improvement. The percentage of oily wastes managed by both landfill disposal and incineration have both dropped. Landfill disposal of oily wastes dropped from 1.5% to 0.6% of the total disposal methods. Even more encouraging, the incineration of oily wastes dropped from 10.3% to 0.4%. At the same time, the volume of oily wastes treated through wastewater treatment increased by almost 11% over last year. This is considered an improvement in the management of oily wastes as, in most cases, wastewater treatment seems to offer more refined and controllable methods of waste cleaning and emissions discharges.

Used Oil Filters (UOFs)

There are a number of difficulties in deriving conclusions with a high degree of confidence from UOF data. First, as DEP'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 reported 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. Furthermore, staff has been unable

CHAPTER 5: SPECIAL WASTE MANAGEMENT

to obtain sales figures of new oil filters in Florida as this is considered proprietary information by the companies involved in this business. As a result, staff can only estimate the number of filters which are generated in the state. Finally, data on filters generated in areas of the state serviced by Waste-to-Energy facilities are, for the most part, 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.

Even though the actual reporting mechanisms are weak, the Department continues to use a very liberal estimate of UOF generation in Florida (assuming four filter changes per year for the 12.3 million vehicle registrations estimated for 1998 by the Florida Department of Highway Safety and Motor Vehicles). Based on this assumption, DEP now estimates that approximately 52 million UOFs are generated in Florida per year.

From the data reported, approximately 22,043,381 UOFs were collected (diverted from landfill disposal). This accounts for approximately 42% of the UOFs estimated generated in Florida, an increase of 6% over last year. It can be assumed that a majority of the unreported filters are managed by persons served by a WTE facility. Most of the filters reported to have been collected were sent to U.S. Foundry in Dade County which recycles the filters into gray steel, used to produce manhole covers and similar products.

The prohibition against the landfill disposal of used oil filters has resulted in the recycling, rather than disposal, of approximately 12,186 tons of steel in 1999. About 198,911 gallons of used oil, trapped within the filter, were collected during the management of these filters and handled under the used oil management standards. This less than last



A bright clean conveyor system awaiting use Photo: Bill Hinkley

year's amount of used oil, while the number of filters is up. This can be explained by the trend by U. S. Foundry in Miami, the major UOF end user in the state, towards handling only those UOFs which are relatively free of residual oil.

Approximately 916,027 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 user. This practice minimizes transportation costs, allows for thorough draining of used oil from the filters and ensures a maximum value for the clean metal.

Public Used Oil Collection Centers (PUOCC's)

As of December, 2000, Florida had a statewide network of 1,219 PUOCCs. DEP has worked closely with all county Used Oil Coordinators, the Florida Petroleum Council, the Florida Petroleum Marketers Association, and others in the quick-lube oil-change business in establishing this network. As a result of this effort, all but four (rural) counties have more than one location where used oil can be taken for recycling. Major oil companies and hundreds of independent service stations, auto repair shops, quick-lube shops and auto parts retailers have volunteered to become public used oil collection centers. Discount Auto Parts® stores maintain almost 30% of the PUOCCs in Florida. With so many sites state-wide, this major participant helps to ensure the convenience of this program for all Floridians.

The number of PUOCCs participating in this program seems to be on the upswing. This past year, some municipalities have consolidated collection sites or initiated curbside recycling programs. At the same time, new businesses continue to register as PUOCCs, taking the place of withdrawn sites. Operators of used oil collection sites who maintain compliance with all applicable management standards are granted certain liability exemptions under Section 114 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund), are granted

protection against enforcement penalties related to a release of used oil under Florida Statutes, Section 403.760, but must still assume the significant costs associated with a clean-up. Despite slight fluctuations in the number of PUOCCs over the years, the quantity of used oil collected from household Do-It-Yourselfers (DIYers) continues to increase annually.

PUOCCs accepted 2,648,285 gallons of used oil in calendar year 1999, which continues the trend of an average annual increase of about 3%. It is difficult to estimate the number of DIYers in Florida. In 1999, DEP applied a strict estimate value of 4 oil changes per year per DIYer. The Department feels that in Florida, because of the size of its retirement age population, the vibrant quick lube service business, and large lease fleets, the number of DIYers is probably close to 15%. DEP estimates that Florida DIYers generate approximately 7.3 million gallons of used oil. This means that Florida is now collecting about 36% of the used oil generated by DIYers.

DEP 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 their zip code. The system then either reports a listing of PUOCCs in that zip code, or directs the caller to retry adjacent zip codes or leave a taped message for a prompt reply from a DEP representative.



A new truck waiting to be used in Leon County's new transfer station. Photo: Bill Hinkley