

**SOLID WASTE
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9.0 SOLID WASTE ELEMENT

[Rule 9J-5.011(1)(a)(d)(e) and (f), F.A.C.]

The Solid Waste Element of the Monroe County (County) Comprehensive Plan addresses the data inventory requirements of 9J-5.005(2) and Rule 9J-5.011 of the Florida Administrative Code (F.A.C.). The data inventory requirement will support the development of goals, objectives, policies, and implementation programs for the Solid Waste Element.

The Solid Waste Element is designed to meet the requirements of Florida's Local Government Comprehensive Planning and Land Development Regulation Act (Chapter 163, Florida Statutes). The purpose of the element is to describe the issues, needs and general facilities providing for existing and future solid waste management.

9.1 Introduction

The Solid Waste Element contains an inventory of the existing solid waste systems for the unincorporated areas of the County, and the current as well as projected demands. Chapter 9J-5, F.A.C., requires an inventory of the current solid waste management system, including the identification of waste characteristics and an inventory identifying solid waste deficiencies.

Solid waste management is a critical issue in the Florida Keys. While problems of landfill sitings, facilities, financing, and hazardous waste disposal have increased throughout Monroe County, the unique setting of the Keys makes waste management even more difficult. The geographic isolation, the limited land area, the environmental constraints, and the presence of nationally significant natural resources adds to the challenge of responsibly and efficiently managing the Keys' solid waste stream.

While landfilling has been the predominant means of waste disposal nationwide, our nation is becoming increasingly conscious of what is being thrown away and where it is going. An increasing awareness of the hazards of landfilling some types of wastes, of the potential for reuse of other materials, and the imminent closure of landfills around the country have brought about this change in attitudes towards solid waste management. Now, methods of processing and disposal are evolving that are changing the business of solid waste management.

Florida and the Keys have not been left out of this trend toward more complex, yet more efficient and healthier use of what was once considered simply waste. Landfills filled to capacity, new State laws, and public concern over present volume reduction and disposal methods have altered the direction of solid waste management in the County significantly over the years.

The current solid waste management system for the County, the problems and opportunities specific to the County, and the future solid waste management plans and levels of service are detailed in this element.

9.2 Background Information

9.2.1 *Types of Solid Waste*

The solid waste generated by a community is made up of many different types of wastes, which for public health, safety, and cost effectiveness should be disposed of in different ways. In general, solid wastes means sludge unregulated under the federal Clean Water Act or Clean Air Act, sludge from a waste treatment works, water supply treatment plant, or air pollution control facility, or garbage, rubbish, refuse, special waste, or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from domestic, industrial, commercial, mining, agricultural, or governmental operations. Recovered materials as defined in Subsection (24) are not solid waste. (Section 403.703, F.S.)

Solid waste generated in the County is comprised of:

- **Biological Wastes:** Solid waste that causes or has the capability of causing disease or infection and includes, but is not limited to, biomedical waste, diseased or dead animals, and other wastes capable of transmitting pathogens to humans or animals. The term does not include human remains that are disposed of by persons licensed under Chapter 497, F.S. (Section 403.703 (3), F.S.)
- **Biomedical Wastes:** Solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated, or otherwise managed. The term does not include human remains that are disposed of by persons licensed under Chapter 497, F.S. (Section 403.703 (2), F.S.)
- **Commercial Wastes:** The wastes generated by the commercial and institutional sectors, including stores, offices, restaurants, warehouses, schools, hospitals, motels, churches and other non-manufacturing and non-processing establishments.
- **Construction and demolition debris:** means discarded materials generally considered to be not water-soluble and nonhazardous in nature, including, but not limited to, steel, glass, brick, concrete, asphalt roofing material, pipe, gypsum wallboard, and lumber, from the construction or destruction of a structure as part of a construction or demolition project or from the renovation of a structure, and includes rocks, soils, tree

remains, trees, and other vegetative matter that normally results from land clearing or land development operations for a construction project, including such debris from construction of structures at a site remote from the construction or demolition project site. Mixing of construction and demolition debris with other types of solid waste will cause the resulting mixture to be classified as other than construction and demolition debris. The term also includes:

- Clean cardboard, paper, plastic, wood, and metal scraps from a construction project;
 - Except as provided in Section 403.707(9)(j), F.S., yard trash and unpainted, non treated wood scraps and wood pallets from sources other than construction or demolition projects;
 - Scrap from manufacturing facilities which is the type of material generally used in construction projects and which would meet the definition of construction and demolition debris if it were generated as part of a construction or demolition project. This includes debris from the construction of manufactured homes and scrap shingles, wallboard, siding concrete, and similar materials from industrial or commercial facilities; and
 - Minimal amounts of other nonhazardous wastes that are generated at construction or destruction projects provided such amounts are consistent with best management practices of the industry. (Section 403.703 (6), F.S.)
- Electronic Wastes: Electronic waste (E-Waste) currently does not have a formal definition in the State of Florida Statutes. The term is loosely applied to consumer and business electronic equipment and devices that are near or at the end of their useful life. Since there is no absolute definition, electronic equipment and small appliances such as microwave ovens that could fall under the other waste categories need to be formally assessed and disposed of properly to avoid the hazardous waste contamination.
 - Hazardous Wastes: Solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated, or otherwise managed. The term does not include human remains that are disposed of by persons licensed under Chapter 497, F.S. (Section 403.703 (13), F.S.)
 - Industrial Wastes: Those wastes generated by industrial and manufacturing operations engaged in the processing and production of marketable goods. Although a significant amount of construction and demolition debris is generated in the County, and the County has designated some areas of the Keys in an "industrial" land use category in the past, none of the municipal solid waste generated in the County is classified as industrial waste. Construction and demolition debris is a separate category of "special wastes."

Businesses that fall within the industrial land use category on the *Existing Land Use Map* series are classified for solid waste management purposes as "commercial generators."

- **Recyclable Material**: Those materials that are capable of being recycled and that would otherwise be processed or disposed of as solid waste. (Section 403.703 (26), F.S.) These include: paper, cardboard, yard waste, wood, plastics, scrap iron, aluminum, glass, and electronic waste (E-waste).
- **Residential Solid Waste**: The garbage generated by households. Yard trash, recyclables, and sometimes hazardous wastes are also generated by households, but should ideally be separated from other residential solid waste.
- **Sludge**: Includes the accumulated solids, residues, and precipitates generated as a result of waste treatment or processing, including wastewater treatment, water supply treatment, or operation of an air pollution control facility, and mixed liquids and solids pumped from septic tanks, grease traps, privies, or similar waste disposal appurtenances. (Section 403.703 (30), F.S.)
- **Special Wastes**: Those that require special handling and management, including but not limited to white goods, waste tires, used oil, lead-acid batteries, construction and demolition debris, ash residue, yard trash, and biological wastes (Section 403.703(31), F.S.)
- **White Goods**: Includes discarded air conditioners, heaters, refrigerators, ranges, water heaters, freezers, and other similar domestic and commercial large appliances. (Section 403.703 (42), F.S.)
- **Yard trash**: Means vegetative matter resulting from landscaping maintenance and land clearing operations and includes associated rocks and soils. (Section 403.703 (43), F.S.)

9.3 Regulatory Framework [Rule 9J-5.011(1)(h), F.A.C]

9.3.1 Federal Regulations

The federal government regulates solid waste in order to minimize the potential for environmental impacts, and to encourage resource recovery and sustainability. The U.S. Environmental Protection Agency (EPA) reviews solid waste management facilities for air and water quality impacts. The U. S. Army Corps of Engineers regulates "refuse" under Section 13 of the Rivers and Harbors Act of 1899, Chapter 425, Sec. 9, 30 Stat. 1151. 33 United States Code (U.S.C.) § 407. The 1976 Federal Resource Conservation and Recovery Act 42 U.S.C. §6901 et seq. (1976), removed the regulatory constraints that impeded resource recovery in order to encourage states to conserve materials and energy.

The Resource Conservation and Recovery Act also addresses the regulation of hazardous wastes. Pursuant to this Act, EPA has set forth guidelines and standards for the handling of hazardous wastes, and directs state agencies, including FDEP, to regulate hazardous waste management. To aid in hazardous waste management financing, the EPA "Superfund" Program was established by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §9601 et seq. (1980). This Act provided EPA with the funds to respond to sites requiring clean-up and emergency mitigation, and allows local governments to apply for funding of their hazardous waste management projects. The law has subsequently been amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Title III, Section 305(a), and the Small Business Liability Relief and Brownfields Revitalization Act of 2002 Public Law (P.L.) No. 107-118, 115 Stat. 2356 (2002).

9.3.2 *State Regulations*

Besides Federal EPA regulation, the environmental impacts of solid waste are regulated at the state level by the Florida Department of Environmental Protection (FDEP). FDEP follows the solid waste management guidelines set forth in Chapter 62-701, F.A.C. when permitting solid waste facilities. Specifically, FDEP has established evaluation criteria for the construction, operation, closure and long-term care of landfills. The agency also regulates the handling, classification and disposal of wastes, as well as resource recovery operations.

The 1974 Florida Resource Recovery and Management Act (Section 403.701, F.S.) required each county to prepare a Solid Waste Management Plan. In 1988, this Act was amended by the Solid Waste Management Act to establish State goals, regulations and programs for a host of solid waste activities. Further amendments have been added to Chapter 403, F.S. since 1988 to include recycling mandates, resource recovery, hazardous wastes, biohazardous wastes, and a comprehensive set of solid waste management regulations and guidelines.

In 1988, the Florida Legislature set a 30 percent recycling goal when passing the Solid Waste Management Act, Section 403.7145, F.S. During the 2008 Legislative session, HB 7135 directed FDEP to prepare a recycling study to meet a statewide goal of 75 percent by 2020. In the 2010 Legislative session, HB 7243 set benchmarks to achieve a 7 percent recycling goal. The bill has since been adopted into 403.706 F.S. and requires local governments to create or assure their recycling programs could meet the following targets:

- 40% by December 31, 2012
- 50% by December 31, 2014
- 60% by December 31, 2016
- 70% by December 31, 2018
- 75% by December 31, 2020

However, according to HB 7135, a county with a population of 100,000 or less may provide its residents with the opportunity to recycle in lieu of achieving the goal set forth in this

section (Section 403.706 (4)(c), F.S.) Local governments are also required to have a program that will enable construction and demolition debris to be recycled if economically feasible.

9.3.3 *Local Regulations*

The Monroe County Land Development Code (MCLDC), in compliance with State concurrency requirements, require that, "...sufficient capacity shall be available at a solid waste disposal site to accommodate all existing and approved development for a period of at least three years from the projected date of completion of a proposed development or use" (MCLDC, Section 114-2(a)(2)). This regulation went into effect on February 28, 1988, and serves as a level of service (LOS) standard for solid waste disposal. The exact quantity that constitutes "sufficient capacity," however, is not defined in the MCLDCs.

The determination of sufficient capacity is assessed on an annual basis. As stipulated in Section 114-2(a)(3) of the MCLDC, capacities for solid waste and other public facilities are updated and presented each year on or before June 15th in a public facilities capacity assessment report that is approved by the Board of County Commissioners.

The MCLDC also requires that solid waste management plans be completed before any proposed development of a Major Conditional Use is reviewed by the Growth Management Department. Solid waste generation rates and capacity assessments must be submitted for review and coordination with the Public Works Division, Department of Solid Waste/Recycling (PWD-DSW/R).

In addition to providing solid waste facility capacity, the County has responsibilities for hazardous waste monitoring. Each Florida County must complete a hazardous waste management assessment, and then must maintain an inventory of each small quantity generator, the types and quantities of waste they generate, and their hazardous waste management practices. The County must verify the management practices of at least 20 percent of the small quantity generators each year (Section 403.7234, F.S.) Local governments are also required to participate in the FDEP administered "amnesty days," in which small quantities of hazardous waste may be dropped off for disposal free of charge. Finally, local governments can establish local hazardous waste collection centers with FDEP approval.

9.4 **Solid Waste Generation** *[Rule 9J-5.011(1)(e) and (f), F.A.C.]*

9.4.1 *Land Uses Served By PWD-DSW/R Facilities*

The predominant land uses in unincorporated Monroe County that are served by the PWD-DSW/R are residential, commercial, and governmental and institutional areas. Commercial facilities include numerous hotels, motels and marinas that provide accommodations to the seasonal population and tourists, as well as fish houses, marinas and boat yards that serve the commercial fishing industry. With one exception, the governmental and institutional

uses that exist in the County are also served by PWD-DSW/R. The military facilities at Boca Chica are served by the City of Key West's solid waste facilities on Rockland Key.

The type of land uses served by PWD-DSW/R is a significant factor in the amount of solid waste generated. **Table 9.1** depicts the solid waste generation in the PWD-DSW/R service area by the type of generator for the year October 1, 2008 to September 30, 2009. Seventy-three percent of the total of 116,884 tons of municipal solid waste processed by the County was generated by single family residences and 17 percent by multi-family complexes during this time period. Therefore, approximately 90 percent of the municipal solid waste stream in the PWD-DSW/R service area is generated by residential areas. The remainder is generated by the commercial sector (10 percent). This percentage includes governmental and institutional generators.

Table 9.1 - Municipal Solid Waste Composition by Type of Generator

Generator	Tons Per Year	Percent of Total Tons Per Year	Pounds per Capita per Day	Pounds per Capita per Year
Residential: multi-family	19,870	17	1.53	557
Residential: single-family	85,325	73	6.56	2,393
Commercial	11,688	10	0.90	328
Total	116,884	100	8.98	3,278

Source: Monroe County, – PWD-DSW/R, 2009 Data

Notes:

- 1) This table reflects tonnages delivered to the County's transfer stations and processed through the PWD-DSW/R system.
- 2) The residential single-family category includes mobile homes and live-aboards.
- 3) Per capita figures are based on the 2009 total (permanent + average seasonal) population of 71,311. Tonnages are PWD-DSW/R figures.
- 4) Data is for one year, January 1, 2009, to December 31, 2009.

9.4.2 Historical Solid Waste Generation

In 2010, the County provided solid waste service to accommodate 70,808 residents. FDEP certification of solid waste data for December 31, 2009 is reported to be 71,311 residents in the County. For the purpose of this document, this data will be used as the most recent certified data. This population base reflects a historical increase in population and corresponding solid waste generation rates dating back to 1960. **Table 9.2** summarizes historical solid waste generation for the service area.

Solid waste generation in the County has increased each year from 1998 to 2009 (see **Table 9.2**), showing a general increase over time. Although solid waste generation is expected to increase as the population increases, the solid waste tonnage generated in the County will also fluctuate with natural and economic events. For example, total tonnage values

significantly increased from 2004 to 2005, this increase reflects approximately 35,000 tons of additional waste due to tropical storms events that produce excess debris. Inversely, tonnage values significantly dropped during the years of 2007 and 2008, at which time major economic problems throughout the country were prevalent, causing less tourism, less consumption of goods, and drops in the County's population. Although, these events will not occur on an annual basis, general trends show that the steady increase of solid waste generated within the County will continue as population increases.

The tourism industry in the Florida Keys is another large factor in solid waste generation that needs to be accounted for in projected demands calculations. In 2009 the Monroe County Tourist Development Council estimated 3.3 million tourist visited the County and future tourism will continue to rise as general population increases, thus having a serious impact on the solid waste generation within the County.

Any future declines will also reflect the diligent efforts by the citizens of the County to reduce the amount of solid waste they generate, through the conscious consumption of goods, composting, mulching or other sustainability efforts. Additional factors which are less easily quantifiable could also affect solid waste generation. The amount of construction taking place in the County, and thus the amount of construction debris being disposed of, also significantly affects the total amount of solid waste generated. Periods with less construction could have contributed to the decline in total waste generation. Finally, the weather affects the rate of vegetative growth, and therefore affects the amount of yard waste generated. Drier years could result in less total waste generation.

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Table 9.2 - Historical Solid Waste Generation for the PWD-DSW/R Service Area in Tons per Fiscal Year (excluding: Islamorada)

FY	FDEP Total	Recycling	Disposal
1998	N/A	N/A	N/A
1999	N/A	N/A	N/A
2000	158,327	59,798	131,825
2001	125,893	51,435	96,075
2002	134,950	68,738	113,071
2003	134,734	34,619	113,427
2004	112,102	13,757	110,333
2005	212,470	73,085	212,470
2006	200,338	12,206	200,338
2007	134,467	12,497	134,467
2008	130,245	13,743	130,245
2009	116,884	12,099	95,327

Source: Monroe County – PWD-DSW/R

Note:

- 1) Data collection calendar year is January 1 to December 31.
- 2) These are scale tonnages. The amount of solid waste actually generated in the service area is greater (see **Table 9.3**).
- 3) Fluctuations in yearly data may be a result of major storm events, economic conditions, and other generation factors.
- 4) FDEP calendar years do not coincide with PWD-DSW/R calendar years, thus creating a differential in datum between departments.

9.4.3 *Municipal Solid Waste Composition by Type of Material*

The solid waste generated in the County is comprised of a variety of materials. The tonnage and per capita generation figures for each waste material generated in the PWD-DSW/R service area are shown in **Table 9.3**. Yard waste, paper products, construction debris, and miscellaneous material comprise the four largest components of the solid waste stream. Of these, yard waste is by far the largest component, with over 3,700 tons generated between January 1, 2009 and December 31, 2009. This constitutes 31 percent of the total 12,100 tons of waste generated in the PWD-DSW/R service area.

As seen in this breakdown, the potential for recycling is high. The recyclable materials, paper products, yard waste, wood (a portion of construction and demolition debris), plastics,

ferrous materials, aluminum, and glass comprise a total of approximately 70 percent of the County solid waste stream.

Table 9.3 - Municipal Solid Waste Composition by Type of Material

Materials	Tons per Year	Percent of Total Tons per Year	Pounds per Capita per Day	Pounds per Capita per Year
Newspapers	363	3	0.03	10.2
Glass	847	7	0.07	23.8
Aluminum Cans	121	1	0.01	3.4
Plastics	968	8	0.07	27.1
Construction & Demolition debris	1573	13	-	-
Yard Waste	3751	31	0.29	105.2
White Goods	---	---	---	---
Tires	242	2	0.02	6.8
Ferrous metals	847	7	0.07	23.8
Non-ferrous Metals	---	---	---	---
Paper: corrugated	---	---	---	---
Paper: other	484	4	0.04	13.6
Food Wastes	185	15	1.014	50.9
Textiles	242	2	0.02	6.8
Miscellaneous	847	7	0.07	23.8
Total	12,100	100%	0.93	339.36

Source: Monroe County – PWD-DSW/R

Notes:

- 1) Per capita figures are based on the 2009 total (permanent + average seasonal) population of 71,311.
- 2) The tons per year figures are for the PWD-DSW/R service area (Monroe County excluding Islamorada.) They represent scale tonnages, plus materials recycled by private businesses and citizens. Therefore, this table should not be used as a comparison to **Tables 9.2, 9.10, 9.11 and 9.12, and 9.13** for determination of capacity limitations and levels of service.
- 3) Data is for one year, January 1, 2009 to December 31, 2009.

9.5 Description of Existing Facilities and Planned Improvements

[Rule 9J-5.011(1)(d)(e) and (f), F.A.C.]

9.5.1 Haul-Out Disposal Plan

Due to the lack of capacity, maintenance issues, and retrofitting necessary for existing volume reduction units, the County’s three historic landfills were finally closed by 1991. Without the means of disposal, the County entered into a haul out contract with Waste Management Inc. (WMI) in 1990 to have its solid waste hauled out of the County.

Prior to entering into the haul out contract with WMI, the County was responsible for the collection and disposal of solid waste. Prior to the haul out contract, the County’s disposal methods consisted of incineration and landfilling at sites on Key Largo, Long Key and Cudjoe Key. Combustible materials were either incinerated or burned in an air curtain districtor. The resulting ash was used as cover material in the landfill. Non-combustible materials were deposited directly in the landfill.

As a result of the haul out contract with WMI to transport the solid waste to WMI’s landfill in Broward County, the County’s incinerators and landfills are no longer in operation. **Table 9.4** summarizes the status of the County’s landfill and incinerators.

Table 9.4 - Status of County Landfill & Incinerators

Site	Incinerators	Landfills	Reserve Capacity (cubic yards)
Key Largo	Closed 12/31/90	Closed	N/A
Long Key	Closed 1/7/91	Closed	N/A
Cudjoe	Closed 2/25/91	Closed	N/A

Source: Monroe County Public Works Division June, 2010

In December 1990, WMI began to haul wet garbage, yard waste and construction debris out of the County. Since that time, the County has continually renewed five year contracts with WMI. The County has been paying annual disposal fees on a per ton basis of municipal solid waste. The County, in turn, has a guarantee that WMI will haul out and dispose solid waste generated in the PWD-DSW/R service area over the length of the five year contract. The initial haul out rate was \$59.00 per ton. Currently, the County annual solid waste disposal fees are \$80.37/ton. All non-separated solid waste material is hauled to an incineration facility owned and operated by Wheelabrator Technologies, Inc. in unincorporated Broward County.

Solid waste is collected by franchise and taken to the three historic landfill sites, which serve as transfer facilities. At the transfer stations, the waste is compacted and loaded on WMI

trucks for haul out. Recyclable materials, including white goods, tires, glass, aluminum, plastic bottles and newspaper are included as part of the solid waste haul out contract. A recent (2009) amendment to the contract includes WMI and the County's commitment to increase annual recycling rate to 40 percent by 2014.

9.5.2 *Solid Waste Management and Disposal: 2010 to 2030*

The County has recently renewed to 2016 their current solid waste haul out contract with Waste Management Inc. Although the current contract includes an option for extension, the County will be considering other options that may increase services for residents and possibly lower the annual collection and disposal rates. However, the current contract with WMI stipulates that the County will be responsible to pay out a fixed cost component of the contract if the County does not renew in 2021 to the approximate sum of \$317,000.00.

9.5.3 *Sludge, Septage and Leachate*

Historical and present day practice for sludge, septage and leachate treatment and disposal by the County is the removal by private contractors to Black Point or Virginia Key waste water treatment facilities in Miami-Dade County. This practice has been in effect since August of 1990. Presently (2010) the County is under a haul out contract with Sweetwater Environmental Inc. (SEI) for sludge and septage and leachate. The County's last contract with SEI was from 2004 to 2009. This contract was recently renewed in 2009 and will expire in June, 2014.

Local collection of septage and sludge is made throughout the County and then brought to one of the three transfer facilities. The locations of SEI's three transfer facilities are: Cudjoe Key MM 22, Long Key MM 68, and Card Sound. Each facility has two 20,000 gallon containment tanks and are operated and maintained by SEI.

Although the haul out of sludge, septage, and leachate has been the County's means of disposal for the above referenced materials, many changes in the collection process has begun to streamline the disposal process as more sanitary sewer systems come online. Historically, franchise collection would have to collect septage from thousands of private facilities. As more public sanitary systems and package plants are put in place, the franchise will collect more from centralized systems in most areas throughout the County.

The County currently does not have any proposed long-term solution for sludge, septage and leachate treatment and disposal, other than its current means of haul-out to Miami-Dade County wastewater treatment facilities. However, if the County continues to use haul out procedures, future capacity of the Miami-Dade wastewater treatment facilities will not present an issue. Future plans may include composting sludge and other organic materials within the County.

9.5.4 *Disposal of Hazardous Waste*

The management and disposal of hazardous waste has been a major national issue for more than a decade. In 1976, the U.S. Environmental Protection Agency (EPA) was directed to develop a national program to regulate and manage hazardous waste and to provide incentive for states to adopt consistent programs under the Resource Conservation and Recovery Act. EPA is also authorized to respond to incidents requiring State cleanup and emergency mitigation. Funding for this purpose under the Comprehensive Response, Compensation, and Liability Act of 1980 is commonly referred to as the "Superfund" program.

9.5.5 *State Legislation*

In 1983, the Florida Legislature recognized the need to establish a coordinated and broad-based approach towards maintenance and improvement of the State's valuable and vulnerable water resources. The response was passage of a critical piece of environmental legislation entitled the Water Quality Assurance Act (WQAA) of 1983. One major component of the effort was that section specifically addressing hazardous waste. In preceding years, many sites in Florida where improper storage, treatment or disposal of hazardous waste had caused contamination of the ground water were uncovered. Consequently, Part IV of the WQAA addresses the critical role of hazardous waste as a potential groundwater contaminant.

This section of the law, contained in Chapter 403 of the Florida Statutes, established the framework for dealing with hazardous waste on the local level. It strictly prohibits the landfilling or disposal of hazardous waste to the ground anywhere in the State of Florida (Section 403.7222 F.S.). Furthermore, it requires two important actions of local government that continue to serve as a focus for local government activities concerning hazardous waste. First, Section 25 (403.7225 F.S.) mandates the implementation of local hazardous waste management assessment. The first component of this assessment consists of a survey of business establishment hazardous waste generators, an inventory of the type and quantity of the hazardous waste generated, and a listing of the current practices used by these generators to treat, store or dispose of this waste. Second, the statute requires that each county designate areas where a hazardous waste storage facility could be constructed to meet a demonstrated need.

9.5.6 *Large Quantity Generators*

Large quantity generators are those generators which produce more than 1,000 kilograms (kg) of hazardous waste in a calendar month. The only large quantity generators in the County are public facilities or the military: the Florida Keys Electric Cooperative, City Electric, the Florida Keys Aqueduct Authority, and the U.S. Navy and the Coast Guard. All of these generators are required to follow requirements that are monitored directly by the Florida

Department of Environmental Regulation and over seen by the Florida Department of Health (DOH).

9.5.7 Small Quantity Generators

Small quantity generators are those which produce between 100 and 1,000 kg per calendar month. The amount of material produced determines the regulations which must be followed. As a part of responsible management, the generator is required to maintain a record of the accumulation, amount, type and number of containers of waste. The generator must also have a Preparedness and Prevention Plan which sets procedures for managing the waste within the generator's business including safety precautions and emergency plans should an accident occur. The generator is required to obtain an EPA/FDEP identification number and must contract with a licensed transporter.

The County is responsible for monitoring small quantity generators. This program is managed by the Department of Health (DOH). There are approximately 800 potential small quantity generators that are registered in the County. On this list, all small quantity generators are termed "potential" because the definition of a generator is given in terms of how much waste is produced each month. Small businesses may produce hazardous waste one month but not the next. The businesses are not considered actual small quantity generators unless they have produced hazardous waste in a given month.

Businesses that produce a very small amount of waste in a given month are "conditionally exempt." This means that they do not have to follow manifestation procedures, but must still comply with storage requirements. Small quantity generators must have a "cradle to grave" manifestation, as required by FDEP and the EPA, documenting every stage of their waste disposal process. The PWD-DSW/R is required to inspect 20 percent of the 800 sites each year. FDEP also performs spot checks of generators.

9.5.8 Storage

The FDEP regulations specify on-site storage facilities and labeling requirements for small quantity generators. The DOH monitors this through inspections. There are no building code requirements for small quantity generators; only the containers and tanks are regulated.

9.5.9 Transportation and Disposal

Each small quantity generator is responsible for the transportation and disposal of its own hazardous waste. However, as part of the agreement with the County, small quantity generators can contract with the County's private contractor, at reduced rates. A generator can choose its own transportation company as well, as long as the company is licensed by the State. The generator of the waste and the transporter are both responsible for any mishaps; the "cradle to grave" manifestation must document every step. Transportation of hazardous

materials within public right-of-ways also falls under the jurisdiction of the Department of Transportation.

There are no hazardous waste disposal sites in Florida. Disposal sites are scattered throughout the South, each accepting only certain types of wastes. Cost for transportation and disposal for the small quantity generators and the County depends on not only the quantity of waste, but also on the type and how far it must be transported. Currently, the County uses Clean Harbors, Inc. for the removal, transport, and disposal of hazardous wastes within the County on a per-needed basis.

9.5.10 Household Hazardous Wastes

PWD-DSW/R has temporary storage facilities: at Cudjoe, Long Key, and Key Largo for small quantities of hazardous material and electronic waste. PWD-DSW/R receives bids for transportation and disposal contracts for these waste types. At present, the County uses the services of Clean Harbors Inc. for hazardous waste disposal. The County accepts household hazardous material and electronic waste during specified times and days at all three transfer station sites and sponsors special collection events at no charge to residents. Small quantities of these materials are accepted from businesses for a fee during regular collection hours. In addition, the County has encouraged auto repair stations to voluntarily collect batteries and waste oil from their customers as a public service.

9.5.11 Contaminated Sites

Property owners are required to clean up any contaminated sites on their property. There are five private properties in the County listed on EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) inventory of potential hazardous waste sites. Many, if not all of these are Superfund sites. PWD-DSW/R also suspects there are some contaminated sites on civilian property but these would fall under the jurisdiction of FDEP.

Monroe County's Hazardous Waste Assessments, Identification of Abandoned Dump Sites (n.d.), lists additional sites which have the potential to be contaminated. The report lists the potential hazardous waste problem for these sites as minimal for all sites. Abandoned dump sites are under FDEP jurisdiction. The list of abandoned dump sites is presented in **Table 9.5**.

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Table 9.5 - Unincorporated Monroe County Abandoned Dump Sites

Site	Sec/Tws/Rng	MM	Owner	Type	Potential Hazardous Waste Adde
Boca Chica	5/68/26	8	U.S. Government	Landfill	Minimal (Inactive)
Saddle Bunch Key	8/67/27	15	U.S. Government	Landfill	Minimal (Inactive)
Middle Torch Key	17/66/27	27	Baltuff	Landfill	Minimal (Inactive)
Boot Key	16/66/32	48	Tropic South Inc.	Landfill	Minimal (Inactive)
Key Largo	9/60/40	NA	Carter	Landfill	Minimal (Inactive)
Cudjoe Key	20/66/28	21	PWD-DSW/R	Landfill/ Incinerator	Minimal (Inactive)
Key Largo	11/60/40	NA	PWD-DSW/R	Landfill/ Incinerator	Minimal (Inactive)
Long Key	27/65/35	68	PWD-DSW/R	Landfill/ Incinerator	Minimal (Inactive)

Source: PWD-DSW/R, 2010

Another cause of soil and groundwater contamination is storage tanks. The DOH is in charge of inspections for tanks containing vehicular fuel and pollutants. FDEP handles tanks containing hazardous substances. DOH estimates that 99 percent of the active tanks in the County are reported to DOH. Potential abandoned tanks may present a great health and safety hazard. DOH relies upon citizen reports of tanks, and upon the DOH Tank Inspector finding abandoned tanks while on field inspections.

9.5.12 Emergency Management

A federal “Community Right-To-Know” law, managed by the EPA with some authority delegated to the States, requires that companies using hazardous substances register with state and local authorities. Any projects producing hazardous waste are required to inform the local Fire Department, the Police, and the hospitals.

Through the Florida Department of Labor and Employment Security, Division of Safety and OSHA, Florida’s “Right-To-Know” law is enforced. Employers must inform their employees about any toxic substances in the workplace. Workers can refuse to work with substances if they are not provided a Material Safety Data Sheet on the substance by their employer.

9.5.13 Public Education and Training

PWD-DSW/R offers training sessions and classes on hazardous waste management to various business and community groups. Training, along with evaluation and assessment, is

one of the topics on which the Cooperative Extension Service has written materials, slides, and a video that are available upon request. The County sponsors special household hazardous material and E-waste collection events at no charge to residents.

PWD-DSW/R’s involvement with actual hazardous waste disposal is limited. PWD-DSW/R completes surveys required by the state and federal governments, and inspects the sites of suspected hazardous waste generators when reports of improper disposal are received. PWD-DSW/R also disseminates information on proper disposal methods to hazardous waste generators. Each year PWD-DSW/R also verifies the hazardous waste management practices of at least 20 percent of its inventory of small quantity hazardous waste generators, as required by law.

9.6 Public and Private Solid Waste Facilities
[Rule 9J-5.011(1)(d)(e) and (f), F.A.C.]

9.6.1 Solid Waste Collection

The collection of solid waste is undertaken by private contractors under franchise agreements with the County. The following private solid waste collection contractors presently operating under franchise agreements with the County are shown in **Table 9.6**.

Table 9.6 - Solid Waste Collection Contractors

Collection Company	Franchise Area
Waste Management, Inc	South of the Seven Mile Bridge
Marathon Garbage Service, Inc.	Middle Keys, MM45-MM72
Key Sanitary Service	Upper Keys, MM91-County line
Ocean Reef Club, Inc.	Ocean Reef Club
National Park Service (Agent)	Everglades National Park

Source: PWD-DSW/R, 2010

9.6.2 Transfer Facilities

Through the terms of the five year contract between the Monroe County Board of County Commissioners and WMI, a lease agreement which runs concurrent with the solid waste haul out contract allows for the utilization of the County owned transfer stations by WMI. The location of the transfer facilities are depicted on **Map Series 9-1**. The size and capacity of these facilities are shown in **Table 9.7**.

Table 9.7 - Solid Waste Transfer Facility Sizes and Capacities

Transfer Facility	Acreage	Capacity
Cudjoe Key Transfer Station	20.2 acres	200 tons/day
Long Key Transfer Station	29.5 acres	400 tons/day
Key Largo Transfer Station	15.0 acres	200 tons/day

Source: Waste Management Inc., 1991

The maintenance and operation of the solid waste transfer facilities is entirely the responsibility of WMI. These responsibilities include enforcement of safety procedures, ongoing repair and maintenance of facility components, assurance of compliance with all applicable federal, state and local laws, regulations and permits including those pertaining to the environment and OSHA, and prevention of any environmental degradation to the transfer sites. The contract only allows for the receipt of "acceptable waste" which is defined as not being Hazardous, Biohazardous or Atomic Waste. The disposal of unacceptable waste is the responsibility of the generator and must be accomplished through the use of licensed private waste removal firms. The County can, upon 12 hours notice, perform inspections to determine compliance with the operational terms of transfer station lease agreement.

9.6.3 Landfill and Resource Recovery Facilities

9.6.3.1 Landfill Facility

Although the original solid waste disposal site stipulated in the haul out contract was the WMI owned and operated Central Disposal Sanitary Landfill (CDSL) located at 3000 Northwest 48th Street, Pompano Beach (Unincorporated Broward County), Florida, all trash, unseparated recyclables and hazardous waste is currently hauled to the Wheelabrator facility in Broward County, Florida, for incineration and disposal.

9.6.3.2 Resource Recovery

Resource recovery is the process of recovering materials or energy from solid waste. Mandatory or voluntary recycling of common waste products like paper products, plastic containers, tires, glass, and metals has become a common means of recovering materials while reducing the volume of waste that is landfilled. Solid waste incineration has also become a common practice of resource recovery through the production of electricity.

Resource recovery in Broward County (North Broward at the North Regional Resource Recovery Facility (NRRRF) and South Broward at the South Regional Resource Recovery Facility (SRRRF)) is accomplished through two 2,250 ton/day, 70 megawatt trash to energy facilities designed, built, owned and operated by Wheelabrator Technologies (see **Table 9.8**). WMI utilizes the South Regional Resource Recovery Facility for Monroe County solid waste

disposal. Each facility is designed so its daily capacity can be expanded to 3,000 tons to meet future needs. Florida Power and Light Company purchases the electricity generated by the facilities. To provide for the disposal of ash from the resource recovery facilities, Wheelabrator has designed and constructed a state-of-the-art monofill with a liner system that includes structural fill, a six inch layer of bedding sand, a manufactured clay liner, two high-density polyethylene liners, a 24 inch layer of drainage sand and leachate collection systems. With the operation of these two facilities the expected life of the CDSL is extended approximately 20 years.

Table 9.8 - Disposal Facility Demand and Capacity Comparison

Disposal Facility	Current Demand	Design Capacity
CDSL	950 TPD	7,490,815 (tons)
NRRRF	250 TPD (ash)	3,200,000 (tons)
NRRRF	700 TPD	2,250 TPD
SRRRF	2,000 TPD	2,250 TPD

Source: Broward County, 2010

9.7 Recycling Program *[Rule 9J-5.011(1)(e)(f), F.A.C.]*

The “Monroe County Recycling Program” was initiated in September 1989. Initial activities included the purchase of four multi-material recycling containers and the establishment of neighborhood recycling centers as recycling drop off sites. Within two years of the initiation of the County’s recycling program, the City of Key West and the Middle Keys area, including the City of Marathon, had established curbside collection for 18,000 residential units including both single and multi-family residential units. Since 1989, the County has expanded its recycling program to include all residential communities within the County on a voluntary basis.

Currently the County’s recycling program consists of a voluntary curbside collection system, recycling centers at each of the solid waste transfer stations, and voluntary commercial collection. Recycling programs related to commercial establishments have been developed and put in place. The Monroe County School District has developed and implemented programs at all County schools. County, State and federal agencies have also initiated recycling programs. New commercial developments are required to submit a study to show how waste will be reduced and recycled from clearing through on-going business.

As previously noted, the County is contracted with WMI for solid waste haul out. Under the terms and conditions of the contract with WMI, solid waste is collected by franchisees and taken to the three trash transfer facilities. At these facilities, the solid waste is transferred to trucks for hauling out of the County. The solid waste hauled out of the County includes non-

recyclable and recyclable materials. Recyclable materials are being and will continue to be separated from the solid waste stream to the maximum extent possible at the source.

9.7.1 Voluntary Recycling

9.7.1.1 Curbside Collection

The County's residential curbside collection is facilitated by four franchise contractors. Each vendor is contracted to collect recycling from a defined service area and are as follows: (1) Stock Island to Seven Mile Bridge [Waste Management Inc.], (2) North End of Seven Mile Bridge to Mile Maker 72 [Marathon Garbage Services], (3) Mile Marker 91 to the County line [Keys Sanitary Service], and (4) Ocean Reef Club [Ocean Reef Disposal].

The education program for the residents includes television advertisements, newspaper, radio and printed material.

9.7.1.2 Recycling Centers

In addition to the curbside collection, recycling centers have been made available to the residents as part of County's recycling program. The current drop off centers are located at (1) Cudjoe Key Transfer Station (MM 21.5, Blimp Road), (2) Long Key Transfer Station (MM 68), and (3) Waste Management Recycling Center (MM 100.2, 300 Magnolia St. Key Largo). These locations accept recyclable material that coincides with curbside collection of recyclable material. In addition to typical recyclable materials (paper, plastic, glass, and metals), the Key Largo Recycle Center also accepts electronic waste (E-waste) and household hazardous wastes.

9.7.1.3 Commercial

The hospitality industry, including hotels, motels, guest houses, bars and restaurants, are also encouraged to establish recycling programs. Cardboard, glass, aluminum and office paper make up the largest components of the recyclable fraction of the hospitality industry. Lending institutions, hospitals, and other contributors of major amounts of white paper and computer paper have been encouraged to participate in recycling those materials. Recycling audits done on the premises have helped businesses to determine the amounts of materials with the potential to recycle. Commercial generators of all sizes have established programs to collect the various materials.

Collections of recyclable materials from commercial entities are voluntary and conducted on individual sites, and by individual businesses. Some businesses collect and transport materials to county recycling centers. There are four franchise waste companies offering commercial recycling services for recycling in the Florida Keys.

9.7.2 *Government Recycling*

9.7.2.1 Monroe County

Monroe County has implemented recycling programs at most County facilities. Materials collected include all materials that are collected curbside. Recycling is encouraged, but not mandatory at present.

9.7.2.2 Monroe County School Board

The Monroe County School Board has implemented recycling programs at all County school facilities and collects all recyclables that are collected curbside.

In-service training for faculty and staff is offered by Monroe County PWD-DSW/R staff. Recycling curriculum and recycling projects for teachers are offered through cooperative arrangements with the Monroe County School District. The Monroe County School District has a *Solid Waste Reduction Plan* in place.

The Florida Keys Community College has also implemented a recycling program.

9.7.2.3 U.S. Military

The United States military facilities located in the County participate in recycling programs at all facilities by collecting office and computer paper, cardboard, and aluminum which are currently being recycled at non-residential facilities. Curbside collection has been established for all military residential areas and includes collection of yard waste which is turned into mulch for use on military facilities.

9.7.3 *Yard Waste Program*

Yard waste comprises the largest percentage by weight and volume of the County's waste stream. However, yard waste is currently collected as part the solid waste stream and hauled out of the County. Residential yard waste mulching programs were implemented in the past, but discontinued due to limited demand, the spread of contagious tree diseases, and contamination concerns. Yard waste is collected from residential dwellings under various arrangements by the franchise service providers.

9.7.3.1 Monroe County

Currently, mulching takes place at the three locations within the County, but is limited to County funded maintenance of public lands and right-of-ways. Future consideration of a yard/organics waste program should be revisited in the near future, in order to institute new

means and methods to reduce current quantities of organic waste being hauled out of the County.

9.7.4 Abandoned Vehicles

A program to remove, crush and haul abandoned vehicles for processing has been developed by the County. This service is provided to the County through contractual agreements.

9.7.5 Education of Recycling

A revised comprehensive program for public education and awareness of recycling is currently in development and is being implemented for the entire County. Updated brochures, an on-line newsletter, press releases, and media interviews are prepared on a regular basis by PWD-DSW/R.

9.7.5.1 School System

Currently, the County conducts educational programs that instill awareness of waste management issues; encourage the participation of children in recycling efforts, promote classroom activities, extra curricular events and special competitions. A “Recycling Education and Awareness Program” for grades K-12 is in place and being taught throughout the school system. County staff currently assists, promotes and coordinates educational activities for the public school system. Materials have been developed for use in the classroom which includes puppet programs and video presentations. School presentations are linked to Sunshine State Standards (Florida Department of Education Standards).

9.7.5.2 Other Groups Targeted for Recycling Education Programs

Civic groups, homeowner associations, condominium associations, professional associations, the hospitality industry, business entities, and government agencies, including the State parks and military facilities have been targeted for recycling presentations and activities. On-line newsletters, event announcements and brochures have been developed by PWD-DSW/R for the use of these groups.

9.7.5.3 Government Agencies

Recycling presentations, activities and materials have been developed for use by all participating government agencies. They are available upon request and on the County Solid Waste Department’s section of the Monroe County website.

9.7.5.4 Public Relations

A list of all local newspapers, radio stations and television stations has been compiled. News releases and public service announcements are sent regularly to all local newspapers and

radio stations. Paid advertisements have been utilized for publicizing special recycling events. Brochures have been prepared and distributed and flyers to promote recycling events have been circulated throughout the County by PWD-DSW/R.

9.7.6 State Mandated Waste Separation Deadlines

In addition to recycling of materials, as previously described, another way to reduce the demand for landfill space is to incorporate resource recovery and volume reduction practices into the solid waste disposal process. For this reason, and to reduce the hazard certain wastes may cause to humans and the environment, the State has imposed a number of deadlines for the separation of special wastes from landfills. However, due to a total population less than one hundred thousand people, state mandates for separation are not mandatory.

9.7.6.1 Waste Oil

Since September 1990, uncontaminated waste oil has been accepted at the all three PWD-DSW/R solid waste facilities and at no charge to residents.

9.7.6.2 Lead Acid Batteries

Lead acid and niCad batteries are collected and segregated by PWD-DSW/R at all three transfer facilities and the Key Largo Recycling Center on an ongoing basis. Pursuant to Section 403.717 F.S. it is illegal to landfill lead acid batteries.

9.7.6.3 Tires

Tires are also segregated from landfill waste. Tires without rims are collected at residences by residential service providers upon special request on regular collection days at no charge. Tires can be dropped off at any of the three transfer facilities for a fee. Tires are then stockpiled and hauled out for recycling.

9.7.6.4 Construction and Demolition Debris

Construction and demolition debris is separated from other solid waste. Recyclable components are stock piled at all three transfer stations by WMI until haul out of the materials to their recycling facility. Construction and demolition debris is transported to a special landfill facility in Homestead, Florida.

9.7.6.5 White Goods

White goods are collected by the franchised solid waste collectors, brought to the three transfer stations, and stockpiled. The County has contracted with Waste Management Inc. to

process, bale and ship white goods. Prior to transfer WMI removes Freon from all refrigeration and air conditioning units.

9.7.6.6 Electronic Waste

Electronic waste (E-Waste) can be dropped off at Cudjoe Key and Long Key transfer Facilities and at the Key Largo Recycling Center during designated dates and times. The E-Waste is then stockpiled by the County and collected by the franchise contractor for haul out to the contractor's recycling facility.

9.8 Geographic Service Area [Rule 9J-5.011(1)(f), F.A.C.]

PWD-DSW/R has divided solid waste collection operations within the County into three subdistricts. The geographic boundaries of these subdistricts are shown on the solid waste **Map Series 9.1** of the map Atlas, and are described below:

- Subdistrict I is served by the Key Largo Transfer Facility and comprises an area extending from the Miami-Dade County line to Snake Creek at southern Plantation Key. The collection franchises serving Subdistrict I are Keys Sanitary Service and Ocean Reef Solid Waste Inc.
- Subdistrict II is served by the Long Key Transfer Facility and comprises an area extending from Snake Creek to the Seven Mile Bridge. The collection franchise servicing Subdistrict II is Marathon Garbage Service.
- Subdistrict III is served by the Cudjoe Key Transfer Facility and comprises an area from the Seven Mile Bridge to Stock Island (Incorporated Key West is not part of the WMI operation). The collection franchise serving Subdistrict III is Waste Management, Inc.

9.9 Litter

9.9.1 Litter Types and Sources

Marine litter and terrestrial litter are the two primary types of solid waste litter within the County; both types create adverse affects, on the natural environment, animal species, the general aesthetics of local communities, and the beauty of the Florida Keys.

9.9.1.1 Marine Litter

Marine litter originates from a variety of sources including intentional and unintentional releases from recreational boaters, shoreline users, commercial fishing operations, sport fishing and diving charters, and oceanic sources such as merchant ships, cruise ships, and oil drilling vessels. In addition, litter on the land blows into the waterways of the Keys. See Chapter 3.0, (Conservation and Coastal Management of the Monroe County Comprehensive

Plan Update). Fishing line disposal containers are stationed on most fishing bridges within the County.

9.9.1.2 Terrestrial Litter

Terrestrial litter also originates from a variety of sources including both intentional and unintentional releases from trash receptacles, commercial haulers, motorists, pedestrians, and beach goers. Furthermore, animal infiltration of trash receptacles can produce litter within residential communities, commercial area, and park facilities.

9.9.2 Affects of Litter on Animal Species

Whether the litter is marine or terrestrial, it will have adverse effects on animal life within the County. Entanglement and ingestion of litter can cause bodily injury, illness and death to the wildlife within the Florida Keys. Endangered species such as Key Deer face further danger of survival with the interaction of humans and their litter. Exposure to litter may cause mortality by entanglement and disease. (U.S. Fish and Wildlife Service, National Key Deer Refuge, 2000).

9.9.3 Affects of Litter on the Environment

Litter can cause habitat destruction, which will eventually lead to the loss of a sustainable environment for which the animal life needs to survive. Litter not only causes physical damage to the environment, but also damages the aesthetics and allure of the Florida Keys which naturally draws thousands of tourists to each year.

9.9.4 Litter Control

Controlling litter within the County will need to be addressed through improved solid waste collection practices, animal/tamper proof waste receptacles, community cooperation, clean-up efforts, education, and local laws. Section 21-21(a) of the County's LDCs states, "No person shall place, cast, sweep, or deposit anywhere within the county any refuse in such a manner that the same may be carried, spread, or deposited by the elements upon any street, alley, parkway, or other public place or into any occupied or unoccupied property or waterway." Therefore, code enforcement should focus on persons dumping or littering. Furthermore, the County's education efforts should illustrate the impacts of litter upon animal species and habitat.

9.10 Level of Service Standards [Rule 9J-5.011(1)(e), F.A.C.]

The historical solid waste generation values for the PWD-DSW/R service area (**Table 9.2**) show a steady growth of total solid waste generation between the years 1998-2001. During the period 2002 - 2006, the County's solid waste generation was significantly higher. These higher values do not correspond to normal solid waste generation trends within the County

and in actuality result from a cluster of outliers. The outliers are functions of favorable economic conditions (greater consumption of goods and services) and storm events that cause a significant amount of over generation due to debris. Furthermore, during the period of 2007-2008, an economic recession affected solid waste generation, significantly reducing standard trends for generation growth.

The LOS Standard utilized for projecting solid waste demands during the planning periods will be 11.41 pounds/capita/day (lbs/cap/day). This LOS is calculated by averaging LOS from years 2000 through 2009. Although this value is higher than the current Comprehensive Plan (5.44 pounds per capita per day – Objective 801.1), it is considered a reasonable and conservative standard because: (1) these years represent a general trend of solid waste generation with respect to functional population growth; (2) the average LOS creates a conservative rate of solid waste generation in comparison to the increasing trend of solid waste generation between the years 1998-2000, thus predicting a comparative or slightly higher annual solid waste production in relation to population; (3) the limitations on future development should reduce the amount of construction and demolition debris generation; and (4) recycling and consumer awareness will be part of the County’s efforts to reduce generation. **Table 9.9** depicts the historical solid waste generation for the County exclusively.

Table 9.9 - Solid Waste Generation Trends

Year	Solid Waste Generation (Tons/Yr)	Population			LOS (LBS/CAP/DAY)
		Permanent	Seasonal	Functional	
2000	158,327	36,036	33,241	69,277	12.52
2001	125,893	36,250	33,263	69,513	9.92
2002	134,950	36,452	33,285	69,737	10.60
2003	134,734	36,543	33,307	69,850	10.57
2004	112,102	36,606	33,329	69,935	8.78
2005	212,470	37,164	33,351	70,515	16.51
2006	200,338	36,466	34,019	70,485	15.57
2007	134,467	35,749	34,568	70,317	10.48
2008	130,245	34,788	35,550	70,338	10.15
2009	116,884	36,268	35,043	71,311	8.98

Source: Monroe County Recommended Functional Population Series, Fishkind & Associates 2010

9.11 Projected Future Ability to Meet Level of Service Standards
[Rule 9J-5.011(1)(e)(f), F.A.C.]

Table 9.10 presents solid waste generation for Monroe County (excluding Islamorada) from 2010 to 2030 based upon a LOS standard of 11.41 lbs/cap/day. The LOS includes recycling and disposal (excluding hazardous wastes). Planning periods are in five year increments.

Table 9.10 - Projected Demands

Year	Population			LOS (LBS/CAP/DAY)	Projected Solid Waste Generation (Tons/Year)
	Permanent	Seasonal	Functional		
2010	35,368	35,440	70,808	11.41	147,436
2015	35,696	36,067	71,763	11.41	149,424
2020	35,374	37,120	72,494	11.41	150,947
2025	35,052	38,173	73,225	11.41	152,469
2030	34,730	39,226	73,956	11.41	153,991

Source: Monroe County Population Projections, Fishkind & Associates 2010

Notes: FEDP data uses only permanent population for their evaluations.

9.12 Key Carrying Capacity Limitations, Facility Inadequacies and Policy Constraints
[Rule 9J-5.011(1)(e)(f), F.A.C.]

The latest data available from FDEP (2008 calendar year) indicated that 143,988 tons of solid waste was collected in the County and processed by franchise contractors between January 2008 and December 2008. The County’s contract with WMI does not stipulate limitations to collection and disposal demands; therefore, WMI will continue to follow the terms of the contract without limitation on demand until 2016 or beyond if and the option to renew the haul out contract for an additional five years is exceeded. Based on the current contract between the County and WMI, the agreement will adequately address solid waste disposal and recycling needs through the five year contract period ending in 2016. With the provisions provided for in the contract, the County could hypothetically continue to renew contracts for future disposal needs. Although WMI projects that the Broward County Central Landfill’s capacity will be approximately met by the year 2027, WMI does have other facilities in the State that will be able to facilitate the County’s solid waste disposal needs well past the planning period of this document (2030). Therefore, it will be necessary for the County to research other means and methods to reduce solid waste generation, improve recycling volume, and increase sustainability to preserve resources in the County and its impacts on other Florida Counties.

The transfer facilities within the county are currently well below permitted capacity, and should not exceed capacity within the planning period of this document. **Table 9.12** represents the growth limitations within the County based on the transfer facilities capacities and the terms of existing haul out contract.

Table 9.11 - Remaining Broward County Central Landfill Capacity

	Remaining Capacity	Allocation to Monroe County	Projected Demand
Year	(Tons)	(Tons)	(Tons)
2010	25,000,000	N/A	190,737
2015	18,000,000	N/A	192,604
2020	11,000,000	N/A	194,436
2025	3,000,000	N/A	196,268
2027	Closed	N/A	198,100

Source: WMI, 2010

- Note:
1. Projected remaining capacities for the Broward County Central Landfill shown above are estimated by WMI.
 2. Ash for Wheelabrator facility is disposed of at Broward County Central Landfill.
 3. WMI does not allocate landfill space for any entity that is contracted to dispose at their facilities.

Table 9.12 - Growth Limitations Based on Solid Waste Transfer Facility Capacity

Transfer Facility	Current Demand	Permitted Capacity	Design Capacity
Location	TPD	TPD	TPD
Key Largo	133.33	250	750
Long Key	133.33	250	750
Cudjoe Key	133.33	250	750
Total	400	250	2250

Source: WMI, 2010

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CHAPTER 9.0 – SOLID WASTE – COMMENT RESPONSES

Commenter: Rosa Washington Date Received: 8/17/10		
Location	Comment	K&S Response
9.2.1 Types of Solid Waste (Definitions)	Alphabetize definitions.	Revisions to definitions have been made and now it is in alphabetical order.
9.2.1 Types of Solid Waste (Definitions)	Add definition for Electronic Waste (E-Waste)	Formal Definition does not exist in Florida State Statues; however, explanation an informal definition has been added to definition list.
9.4.1 Land uses served by PWD-DSW/R Facilities	Revise NAS solid waste facilities location.	Verified actual location of Rockland Key with Rosa Washington (R.W.) and made revision from Stock Island to Rockland Key.
Table 9.1 Municipal Solid Waste Composition by Type of Generator	Discrepancies between table data and FDEP certified quantities from 2008.	Requested FDEP (2008) for comparison from R.W., found discrepancies and made revisions to table, table data source, and table notes.
9.4.2 Historical Solid Waste Generation	Discrepancies between 2008 populations.	Verified with R.W. that FDEP population is 76,081 and does not use the separate population as permanent and seasonal. Revised to reflect FDEP certified data.
9.4.2 Historical Solid Waste Generation	Additional mention of the increase of tourism should me noted in document.	Noted that tourism in the Florida keys should be accounted for and does impact the solid waste production.
Table 9.2	Excluded municipalities for table need to be confirmed.	Verified with R.W. that only Islamorada is excluded from FDEP data. Made revisions.
Table 9.2	Source needs confirmation and calendar year of source needs to be confirmed.	Verified with R.W. that data is from FDEP. FEDP's calendar year confirmed. Made revisions.
Table 9.3	Numbers do not completely match up with FDEP data.	Requested FDEP report for verification from R.W. Checked data made minor revisions to table data..
Table 9.3	Table notes need verification regarding total population in 2008.	Checked FEDP data, made minor revisions to table notes: total population change from 2008 FDEP report in note #1. Verified with R.W. that only Islamorada is excluded from FDEP data. Made revisions.

Location	Comment	K&S Response
9.5.1 Haul-Out Disposal Plan	Confirm Haul-Out Contract details.	Verified with R.W. Made revisions based on R.W. comments.
9.5.3 Sludge Septage, and Leachate	Confirm wording and add content regarding future plans.	Verified with R.W. Made revisions based on R.W. comments.
9.5.10 Household Hazardous Waste	Confirm wording and add content regarding future plans.	Verified with R.W. Made revisions based on R.W. comments.
9.5.11 Contaminated Sites	Note that there are not any contaminated public sites.	Revisions made.
9.5.13 Public Education and Training	Change Verbiage regarding "Amnesty Days".	Revisions Made per R.W. Direction
Table 9.6	Mid-Key Waste Inc. no longer exists and Island Disposal Service DNE.	Checked County website for verification and the table was correct, however, after speaking with R.W. the website needs to be updated and Marathon Garbage Service is the correct franchise for MM45-72.Made Revisions to table.
9.6.3.1 Landfill Facility	Change verbiage	Revisions made per comments.
9.6.3.2 Resource Recovery	Change verbiage	Revisions made per comments.
9.7 Recycling Program	Change verbiage/grammar	Revisions made per comments.
9.7.1.1.1 Curbside Collection	Include Ocean Reef Disposal Franchise as a recycling collection contractor.	Made revisions to include Ocean Reef.
9.7.1.1.2 Recycling Centers	Change Verbiage and add Key Largo Recycling Center.	Revisions made per comments.
9.7.1.1.3 Commercial Recycling	Change verbiage to properly describe commercial recycling collection and drop off procedures.	Revisions made per comments.
9.7.2Government Recycling	Remove "Mandatory" from title	Revisions made per comments.
9.7.2.1 Monroe County	Revise Verbiage per notes.	Revisions made per comments.
9.7.2.1 Monroe County School Board	Revise Verbiage per notes.	Revisions made per comments.
9.7.3 Yard Waste Program	Revise Verbiage per notes.	Revisions made per comments.
9.7.3.2 Residential	Revise Verbiage per notes.	Revisions made per comments.
9.7.5 Education	Note that an updated brochure is available online, and newsletter, press releases, and media interviews are prepared on regular basis.	Revisions made per comments.
9.7.5.1 School System	Revise Verbiage per notes.	Revisions made per comments.

Location	Comment	K&S Response
9.7.5.2 Other Groups Targeted for Recycling Education Programs	Is there currently a mailing list? Change verbiage.	Verified with R.W. that the mailing list is no longer part of program. However Rosa noted that upon request persons can be added to the newsletter email distribution list or go on-line for the newsletter. Made revisions per comments.
9.7.5.3 Government Agencies	Change Verbiage and Outdated Information.	Verified with R.W. Made revisions per comments and omissions.
9.7.5.4 Public Relations	Change Verbiage and omit notation about distribution of flyers and TV commercials.	Made revisions and revised public relations program information.
9.7.6.1 Waste Oil	Omit Service Station information and finer details for collection process. Also Change Verbiage.	Omitted reference to waste oil collection by service station and details regarding collection process at County collection facilities. Revised Verbiage.
9.7.6.2 Lead Acid Batteries	Omit Service Station/retailer battery collection. Remove Florida Statues (F.S.) reference.	Revised verbiage to only include County collection process. Omitted service station/retailer collection clause. Comment noted regarding F.S., however this clause is relevant and should remain. Updated Verbiage.
9.7.6.3 Tires	Revise Tire collection details.	Verified with R.W. and made revisions per comments
9.7.6.4 Construction and Demolition Debris	Revise Verbiage and note that Construction and demolition Debris is collected and transported to a special landfill in Homestead, FL.	Made revisions per comments and added details regarding C&D material disposal.
9.7.6.5 White Goods	Revise Verbiage, Omit Tampa Market reference, Not WMI removes Freon before transport.	
9.7.6.6 Electronic Waste E-waste cont.	Add reference that commercial collection of E-waste is accepted for a per lbs fee and revise verbiage.	Added reference regarding commercial collection of E-waste and revised verbiage. See above.
9.8 Geographic Service Area	Move section to front of document.	Comment Noted, however this section will serve this document's needs better for the existing and future conditions reference if it remains as is.
9.9.1.1 Marine Litter	Add reference that states fishing line disposal containers are stationed at most fishing piers.	Reference added.

Location	Comment	K&S Response
No Comments Received from County on 10-25-10		
Commenter: Kathy Grasser, Dent Pierce, and Rosa Washington Date Received: 2/9/11		
Location	Comment	K&S Response
9.3.2 State Regulations	HB 7135, Page 16 exempts small counties from recycling goals of 75%, according to Dent, we are exempted from the benchmarks listed	HB 7135 has since been adopted into Florida statues and does note that: A county with a population of 100,000 or less may provide its residents with the opportunity to recycle in lieu of achieving the goal set forth in this section. For the purposes of this section, the “opportunity to recycle” means that the county. Revisions made to SW Element to include updated information.
9.5.2	The WMI contract ends in 2016, however, there is a contract renewal for 2021, (if we don’t renew with WMI, we own them over \$325,000). See page 4 and Exhibit B of the contract.	Additional information regarding WM contract added to section 9.5.2.
9.12 Carrying Capacity	The landfill will be closed in 2027. Our contract technically expires in 2021. Our Comp plan term ends in 2030. Rosa is getting a letter from WMI on what they plan on doing next. Our SW has to go somewhere. This letter will discuss that. Since there is a time discrepancy of 6 years between the contract expiring and the landfill closing, Rosa is going to have WMI put something in writing on their next steps.	Letter closely reflects our research. Therefore, only a slight change in verbiage was revised regarding WMI landfill capacities to section 9.12 to reflect comment.

Location	Comment	K&S Response
9.4.2	Maybe there should be a paragraph pertaining to pre and post hurricane debris removal. During these times, the SW generation increases due to tree trimming and clean up.	See 9.4.2 for storm generated debris. Furthermore, if you are to include the years where pre/post storm debris is generated within the LOS calculations, then a separate section within the element will not be necessary unless the County has a storm debris plan to note within the element. LOS updated to include those years.
Table 9.2	FDEP data is annual and a year behind, so 2009 data is available.	The data in the document is the data we receive from Rosa Washington during the existing conditions phase of our services. We did not receive 2009 data at that time. Unfortunately, we can't continue to update data as the Comp plan progresses. However, if you find that the 2009 data needs to be present please request this from Debbie Love from our offices.
Table 9.10 Level of Service Standards	Here is a conflict with the Level of Service Standards: on the 2 nd to last line on the page, 'represent a general trend of solid waste increase with respect to population growth.' FDEP data is based on permanent population. MC's permanent population is decreasing. Therefore, this sentence is no longer true.	Yes, the County's permanent population is decreasing. However, the seasonal population is on the rise, which will increase the functional population and therefore increase waste output. This is why I think that the LOS should be based off the functional population since the waste generation growth is in the seasonal residents.
Tables 9.9, 9.10, & 9.11	Table 9.9 and 9.10, section 9.11 excludes Islamorada, but should also exclude Key West since they have their own waste management contract.	Table 9.9: FDEP includes the solid waste generation from the entire county, but does exclude Islamorada Therefore our LOS calculation excluded Islamorada population as well. Table 9.10:

Location	Comment	K&S Response
Table 9.10 Level of Service Standards	The LOS in the tech doc is 6.97 lbs/cap/day. FDEP data and their LOS calculation is based only on permanent population, not on seasonal population. Furthermore, when Rosa gathers her data from LOS FDEP, it reflects only permanent population. However, Table 9.9 includes both seasonal and permanent population (functional).	The use of the functional population should depict the actual LOS more accurately since permanent population is shrinking and seasonal population is on the increase.
Table 9.10 Level of Service Standards	LOS in the tech doc is based on years 2000, 2001 and 2007. The LOS is 6.22, 7.59 and 7.09, respectively. Two out of three of the 'averaged' LOS is above our LOS, which makes it inconsistent with the comp plan.	We have revised the LOS if you want to show a complete LOS with the inclusion of major event generators, then I would take an overall average of SW generation vs population.
Table 9.10 Level of Service Standards	<p>See SW pounds per day excel sheet. Average For past 8 years: Permanent pounds per day per capita average: 16.44. Seasonal pounds per day per capita average: 16.31. Both functional and season pounds per day per capita average: 8.19.</p> <p>I am recommending either we change the LOS to include the seasonal population; doubling the current LOS of 6.97 to 13.94. Or include the attached updated Table 9.10</p>	<p>Made revisions to table 9.10 to reflect the use of functional population and made a small correction to your table to reflect the 2003 waste generated from 216,186 tons/yr to 213,186 tons/yr which I believe was just a typo.</p> <p>Revised table per the recommendation to us functional population.</p>

Location	Comment	K&S Response
9.10 Level of Service Standards	This LOS includes both seasonal and permanent population, AND would include possibility of pre and post hurricane debris. And it wouldn't make our comp plan inconsistent.	Noted, See Previous responses.
9.10 Level of Service Standards	Based on MC recycling efforts and the increases in technology at the landfill, our actual LOS reported will decrease. I am concerned if we make the LOS 6.97, then we get hit by a hurricane and the lbs/cap/day increase, then we become inconsistent with the comp plan and any actions have to be inserted into the CIP.	Noted and revised to accommodate storm events
9.10 Level of Service Standards	Since this new plan doesn't expire till 2030, and recycling efforts are up, seasonal population is up, permanent population is down, we have been very very lucky as to not have any huge weather events, so in an effort not to change the SW LOS for the next 20 years, I'm taking suggestions as to how to proceed. Any suggestions?	<p>From Section 9.10: (4) recycling and consumer awareness will be part of the County's efforts to reduce generation.</p> <p>From Section 9.11: Therefore, it will be necessary for the County to research other means and methods to reduce solid waste generation, improve recycling volume, and increase sustainability to preserve resources in the County and its impacts on other Florida Counties.</p>