Regional Solid Waste Management Plan for Southeastern Virginia

Prepared on behalf of the:

SOUTHEASTERN PUBLIC SERVICE AUTHORITY OF VIRGINIA

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EXECUTIVE SUMMARY

The **Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides an overview and analysis of solid waste management in the Cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk and Virginia Beach, the Counties of Isle of Wight and Southampton, and the Towns of Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield and Windsor. As required by the state regulations, the RSWMP presents background information on population and development patterns in southeastern Virginia, providing the context in which solid waste management occurs in the region. It also provides an inventory and projection of current solid waste management programs and current and future solid waste quantities generated in the region and the characteristics of those wastes. Finally, it discusses and presents available options for meeting the long-term solid waste management needs of the region in the form of a series of goals and objectives and an implementation plan.

The structure of the RSWMP is as follows:

Chapter 1.0 - Introduction. This chapter provides a history of solid waste management planning in Southeastern Virginia and a description of the planning area. Information is included on the regional transportation system, land use patterns, economic development and markets for recycling.

Chapter 2.0 - Existing Solid Waste Management System. This chapter presents regional solid waste generation quantities and disposal statistics, and the various solid waste processing, recycling, and disposal facilities in the planning area. In addition, a synopsis of solid waste handling practices is provided for each of the cities and counties in the planning area.

Chapter 3.0 - Special Wastes. This chapter addresses the management of additional waste streams generated in the Region such as medical waste and construction and demolition debris.

Chapter 4.0 - Waste Management Summary. This chapter provides a summary of the existing waste management system in the region and an overview of the future of solid waste management based on the sale of the RDF plant.

Chapter 5.0 - Future Solid Waste Management Needs. This chapter presents projections and characterization of the future solid waste stream for the planning area. National trends are presented and solid waste generation is provided by locality. Existing landfill and transfer station capacity is analyzed in light of the projections.

Chapter 6.0 - Recycling Rate. This chapter summarizes the mandatory state recycling rate and a historic overview of regional recycling performance.

Chapter 7.0 - Litter Control. This chapter summarizes existing litter control programs in the Region.

Chapter 8.0 - Solid Waste Needs Assessment. This chapter discusses the waste management hierarchy as it relates to regional solid waste management practices. The hierarchy includes

source reduction, reuse, recycling, resource recovery, incineration and land filling. This chapter includes a summary of current conditions and an overview of potential actions for consideration.

Chapter 9.0 - Implementation Plan. This chapter presents an implementation plan for options selected during the planning process. This Chapter also includes a discussion of public/private partnerships and financing.

Chapter 10.0 - Public Participation. This chapter discusses opportunities for public participation at SPSA board meetings, various public education programs and media events.

Chapter 11.0 - RSWMP Amendment Procedures. This chapter provides an overview of the procedures to amend the RSWMP.

1.0 INTRODUCTION

The **Regional Solid Waste Management Plan for Southeastern Virginia (RSWMP)** provides a guide for the short and long-term management of the solid waste system within the planning area. This Plan documents the existing solid waste management programs and facilities, describes the opportunities for improvement to the existing system, evaluates alternatives and recommends programs and facilities which will achieve the region's goals, and describes the strategy for implementing the recommended programs. This Plan's 20-year planning period is through 2030. A Letter of Certification for the Region's Solid Waste Management Plan was submitted to the Virginia Department of Environmental Quality (VDEQ) on July 26, 2010. This letter was submitted prior to the five-year anniversary of the previous plan approval date and summarizes the waste generation estimates, the available 20-year waste management capacity of the Region, and the schedule for implementation of the RSWMP. The certification letter was acknowledged by the VDEQ on July 27, 2010. Both the certification letter from SPSA and the acknowledgment letter from VDEQ are presented in Appendix A.

The format of this Plan is as follows:

- Section 1: Introduction and Background of the Planning Area
- Section 2: Existing Solid Waste Management System
- Section 3: Special Waste
- Section 4: Waste Management Summary
- Section 5: Future Municipal Solid Waste Management Needs
- Section 6: Recycling Rate
- Section 7: Litter Control
- Section 8: Solid Waste Needs Assessment
- Section 9: Implementation Plan
- Section 10: Public Participation
- Section 11: Plan Amendment Procedures

As required by the regulations, this Plan presents background information on population and development patterns in southeastern Virginia, while providing the context in which solid waste management occurs in the region. It also provides an inventory and projection of current solid waste management programs and current and future solid waste quantities generated in the region and the characteristics of those wastes. Finally, it discusses and presents available options for meeting the long-term solid waste management needs of the region in the form of a series of goals and objectives and an implementation plan.

1.1 SOLID WASTE MANAGEMENT PLANNING IN SOUTHEASTERN VIRGINIA

1.1.1 Historical Perspective

Southeastern Virginia has a long history of cooperation and innovation in solid waste management. Beginning in the early 1970s, the Region's eight cities and counties recognized the

need to develop alternative solid waste management approaches. A regional study process was instituted under the auspices of the Southeastern Virginia Planning District Commission (SVPDC) to examine technological and institutional approaches to management of the region's solid waste. This effort culminated in the identification of a regional waste-to-energy project as a viable solution to this issue and the establishment of the Southeastern Public Service Authority (SPSA) of Virginia as the entity to implement the proposed regional system. Startup of the regional system occurred in 1985 with development of the Regional Landfill. The Refuse Derived Fuel and Waste to Energy Facility (RDF WTE Facility) began operation in 1988 as part of SPSA's waste-to-energy system. The search for additional management options preceded the startup date and is continuing.

Concurrent with the creation of a regional solid waste management system, the two regional agencies and the member local governments examined other aspects of the regional solid waste management issue and developed approaches to dealing with its various aspects. Studies have been undertaken and regional programs implemented in the areas of hazardous waste management and recycling. The local governments have instituted innovations in the collection system (e.g. automated collection), have undertaken components of the regional recycling program, and have implemented measures to better control environmental contaminants, such as landfill gas and leachate, at their own disposal facilities.

In 1989, the Virginia General Assembly enacted legislation requiring that localities, or regional agencies on behalf of the localities, prepare solid waste management plans. These plans were to focus on how the locality or region would achieve recycling goals. Regulations to implement this legislation and to outline common procedures for preparation of these plans were developed by the Virginia Department of Waste Management (VDWM). They were promulgated and became effective on May 15, 1990.

The SVPDC and SPSA acted jointly in March 1990, in accordance with these regulations, to recommend that the boundaries of the Southeastern Virginia Planning District should be designated as the solid waste planning region; that the SVPDC should be responsible for developing the solid waste management plan; and that SPSA should be designated as the Regional Solid Waste Management Agency and charged with implementation of the regional solid waste management plan. The VDWM formally concurred with these recommendations on February 20, 1991. Following the creation of the Hampton Roads Planning District Commission (HRPDC) by the merger of the Southeastern Virginia and Peninsula Planning District Commissions, the HRPDC became the agency responsible for preparing the solid waste management plan. In addition, the VDWM no longer exists and the authority for administering the solid waste management regulations now rests with the Virginia Department of Environmental Quality (VDEQ).

In 1991, the HRPDC, in cooperation with SPSA and its member local governments completed the RSWMP for Southeastern Virginia, which was approved by the VDWM. On August 1, 2001, the regulations were amended to require that solid waste management plans be developed or amended to conform to new plan requirements. To comply with the amended regulations, the RSWMP was revised and adopted by the HRPDC and SPSA in 2005. At that time, it is understood that SPSA accepted responsibility for making future updates to the RSWMP as needed. However, in March 2010, the local governments designated the HRPDC as the regional

solid waste planning agency while SPSA remains the regional solid waste management agency. This revised solid waste management plan has been prepared by the HRPDC in cooperation with SPSA and the member local governments to meet the requirements of the Virginia "Solid Waste Planning and Recycling Regulations" (9 VAC § 20-130-10 et seq.). It builds upon the previous solid waste management planning efforts in southeastern Virginia and establishes a framework by which this region can meet the state-mandated planning requirements and recycling goals as well as the long-term waste management needs of this region.

1.1.2 SPSA Goals and Objectives

The SPSA Board of Directors and staff annually adopt a Strategic Management Plan to address the future of solid waste management functions performed by SPSA in the Region for its member communities and to outline specific goals and objectives which should be addressed during the upcoming year. Many are long-term goals which will take several years to complete; however, all are reviewed annually by the Board of Directors to assess progress and to examine any changes needed to priorities or action plans.

In December 2010, the SPSA Board of Directors and staff adopted a new mission statement and vision statement. To achieve the mission and vision of SPSA, the Board also adopted several core goals:

- **Mission Statement**. To Manage and Operate Safe, Cost Effective and Environmentally Responsible Solid Waste Disposal.
- **Vision Statement.** SPSA Will be a Quality-Focused Organization which Seeks Improvement and Cost Effectiveness.
- **Cores Values.** Integrity, Excellence, Accountability, Cooperation, Teamwork.
- **Core Business.** Operate and Manage the Regional Landfill, Operate and Manage all Transfer Stations, Provide for the Transportation of Processible Waste.
- **Goals.** These represent the accomplishments the organization would like to achieve over the next five years:

Goals	Objectives
Goal 1 Establish Financial Policies	• Objective 1. To Provide Effective Financial Management • Objective 1.1: Maintain a Level and/or Declining Municipal Tipping Fee • Objective 1.2: Actions: - Develop Financial Policies for Board Approval - Monitor Financial Costs and Develop Trend Analysis

Goals	Objectives
Goal 2: Consider Outsourcing SPSA Functions	• Objective 2: Sell or Lease the SPSA Portion of the Regional Office Building • Objective 2.1: Determine the Feasibility of Outsourcing Transportation Services • Objective 2.2: Determine Feasibility of Operating Household Hazardous Waste, Used Oil, Tire Shredder, White Goods Disposal and Freon Extraction Services Programs • Actions: A. Develop a 'White Paper' Outlining the Various Options for Selling/Leasing the Regional Office Building B. Perform Analysis of Existing Transportation and Equipment and Vehicle Maintenance System C. Perform an Analysis of the Household Hazardous Waste, Used Oil and Freon Extractions Programs to Determine if Programs Should Be Discontinued
Goal 3: Develop Employee Incentive and Retainage Program	• Objective 3: Establish a Board Policy Providing For an Employee Incentive/Retainage Program • Objective 3.1: Identify Key Employee Positions • Objective 3.2: Determine the Type and Level of Incentive Program • Actions: A. Develop a Board Policy That Governs the Program B. Develop a Listing and Justification for Positions Placed in This Program
Goal 4: Obtain Communities' Responses Regarding SPSA's Role In Waste Disposal After January 24, 2018	• Objective 4: Determine SPSA's Role Post 2018 • Actions: A. Obtain Communities' View on SPSA's Role in Regional Waste Disposal After 2018 B. Work with SCS Engineers As They Update the Post 2018 Study

Goals	Objectives
Goal 5: Define "Milestone Dates"	• Objective 5: Record All "Milestone" Dates • Objective 5.1 Provide a Description of the "Milestone" Date • Objective 5.2: State the Significance of Each Date • Actions: A. List "Milestone" Dates with Description and Potential Impacts
Goal 6: Obtain the Permit for Cell VII	• Objective 6: Submit required information to finalize the Part B Application
Goal 7: Determine the Future of the Regional Landfill by December 31, 2012	• Objective 7: Determine the Feasibility of Selling/Contracting Operations/Closing of the Regional Landfill • Objective 7.1: Develop an emergency operations plan for waste disposal • Objective 7.2: Establish opportunities for Board of Director's discussions of the "Pros and Cons" of operating the regional Landfill • Actions: A. Perform Legal Research to Determine if the Regional Landfill Can Be Sold, Leased or Closed Based Upon the Parameters of the Use and Support Agreements

1.2 SOLID WASTE MANAGEMENT PLAN REQUIREMENTS

The laws of Virginia mandate the development and adoption of a solid waste management plan by all local governments in the Commonwealth. To facilitate regional coordination of solid waste services, rather than develop an individual plan for each locality, the law allows local governments within a designated region to develop one plan for the region. HRPDC and SPSA are coordinating the development of the solid waste management plan for the local governments in southeastern Virginia.

Under state solid waste planning regulations, no permit for a new sanitary landfill, incinerator, or waste-to-energy facility or for an expansion of an existing sanitary landfill, incinerator, or waste-to-energy facility will be issued until the solid waste planning unit within which the facility is located has developed a solid waste management plan that has been approved by the Virginia Department of Environmental Quality (VDEQ). Regulations governing the development and submittal of solid waste management plans are provided in 9 VAC 20-130-10 et seq.

In addition, the solid waste management plan must be considered in the permitting process in three ways. First, VDEQ must review a proposed solid waste management facility for its consistency with the solid waste management plan. Second, permit applicants must certify that sufficient disposal capacity will be available to allow local governments in the region to comply with the solid waste management plan. Finally, VDEQ may impose permit conditions to allow local governments to contract and reserve disposal capacity in the new facility in accordance with the solid waste management plan.

The solid waste management plan must address six policy areas specified in state law. These six policy areas include:

1. Source Reduction
2. Reuse
3. Recycling
4. Resource Recovery (Waste to Energy)
5. Incineration
6. Landfilling

The plan must give preference to lower numbered policy areas over higher numbered policy areas. These policy areas are based upon the widely accepted waste management hierarchy, originally conceived by the U.S. Environmental Protection Agency and embodied in the Virginia Solid Waste Management Regulations. The hierarchy encourages communities to develop policies that rank the most environmentally sound strategies for management of solid waste (see Figure 1):

- First, Reduce and Reuse – Efforts to prevent the creation of waste should precede other waste management options that deal with the waste after it is generated, as in recycling. The underlying thought is that solid waste that is not produced does not require management.

- Second, Recycle and Compost – This level includes recycling and composting. These techniques have the potential to divert large amounts of waste from disposal and turn them into valuable products. Through these techniques, waste materials can potentially go through several cycles of use, conserving raw materials and energy in the process.

- Third, Recover Energy – This level of the hierarchy also uses waste as a resource, but essentially the material can only be used once. The highest use becomes energy production.

- Finally, Dispose – After the first levels of the hierarchy are maximized, there may be residual solid waste left to manage. This material must be disposed of in an environmentally safe manner, through incineration or landfilling at a permitted facility.

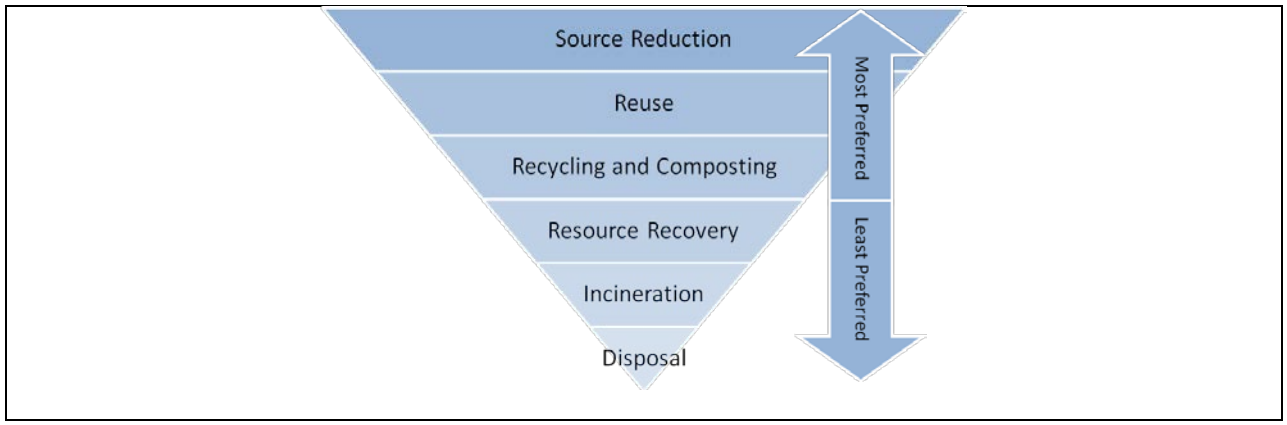


Figure 1. Waste Management Hierarchy

In addition to addressing these policy areas, the plan must provide an integrated waste management strategy with objectives and an implementation plan. The plan must also address achieving the established minimum recycling rate, funding, strategies for public education and public involvement, and public-private partnerships.

The strategies of the solid waste management plan must be supported by descriptions and analysis of urban development, population, transportation system condition, and waste generation estimates in the planning area. Further, the plan must develop future estimates of waste generation and present how the region anticipates meeting future solid waste needs. This plan addresses all of the regulatory requirements and serves as the solid waste management plan for the communities of southeastern Virginia.

1.3 DESCRIPTION OF PLANNING AREA

SPSA is the regional solid waste management organization for eight southeastern Virginia communities with a total land area of nearly 2,000 square miles and a population of 1,137,233 in 2009. The SPSA member localities are the cities of Chesapeake, Franklin, Norfolk, Portsmouth, Suffolk, and Virginia Beach, and the Counties of Isle of Wight and Southampton. Additional localities covered by this plan are the towns within Isle of Wight and Southampton Counties, including the following: Smithfield and Windsor in Isle of Wight County and Branchville, Boykins, Capron, Courtland, Ivor, and Newsoms in Southampton County. With the exception of Franklin and Southampton County, the SPSA communities are a part of the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area. Figure 2 illustrates the SPSA service area.

The SPSA area is bordered to the north by the James River and the Chesapeake Bay, with the Atlantic Ocean to the east. To the south is the North Carolina state line, while the Virginia Counties of Greensville, Sussex, and Surry border the region to the west.

The SPSA service area is located in the coastal plain of Virginia. The region is blessed with numerous waterways and wetlands, including the Elizabeth, Lynnhaven, Nansemond, Pagan, North Landing, Blackwater, Nottoway, and Meherrin Rivers, the Great Dismal Swamp, Back Bay, and the Intracoastal Waterway.

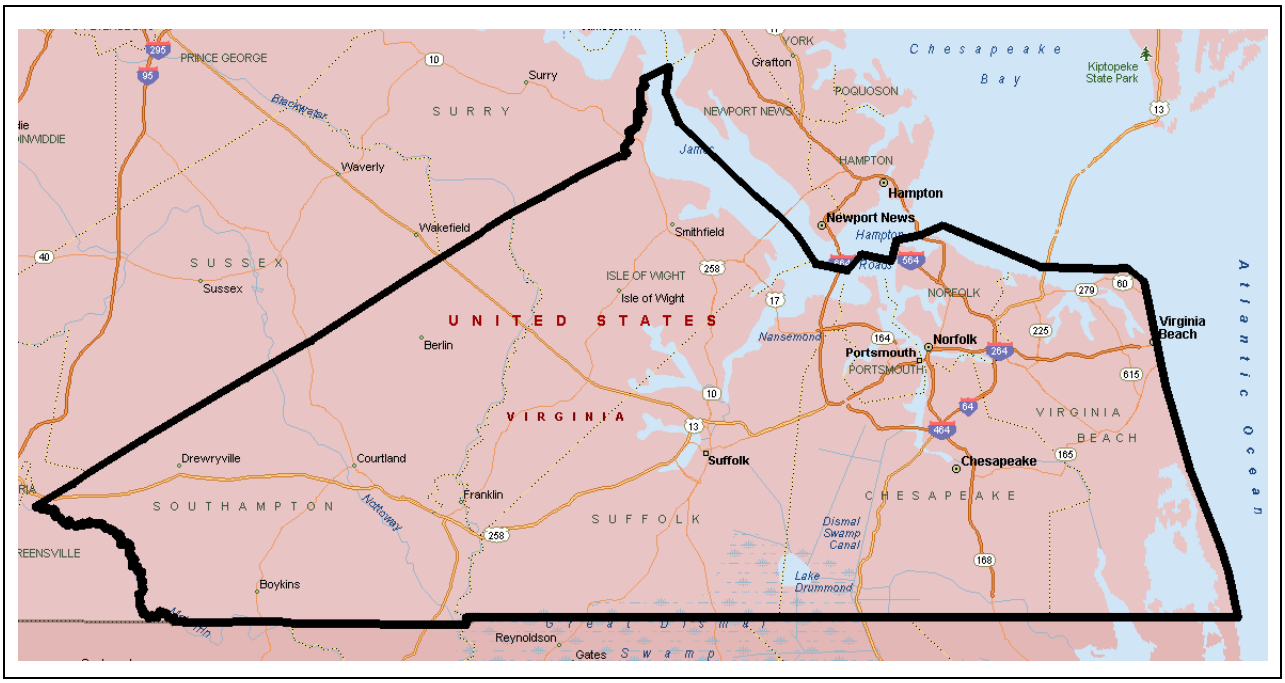


Figure 2. SPSA Service Area

1.3.1 Transportation

The location and topography of the SPSA planning area makes its transportation system unique. Due to the vast number of waterways in the planning area, bridges and tunnels are vital components of the surface transportation system. Four major bridges and tunnels serve major geographic areas of the region: the Hampton Roads Bridge-Tunnel, the Monitor-Merrimac Memorial Bridge Tunnel, the Downtown Tunnel, and the Midtown Tunnel. Other major bridges in the area include the Berkley Bridge, the High Rise Bridge, and the James River Bridge. These bridges and tunnels are significant traffic congestion points. The major interstates in the area consist of I-64 and I-664, which collectively serve as the beltway for the region; I-264 connecting Chesapeake, Portsmouth, Norfolk and Virginia Beach from west to east; and I-464 connecting the cities of Chesapeake and Norfolk. Significant U.S. Routes in the area include U.S. 13, 17, 58, and 460.

Transportation congestion is a major issue in the Region. The collection, transfer, and disposal of solid waste make extensive use of the road transportation network. Transportation to and from the Region is controlled in large part by the various tunnels and bridges that connect to the West and North. The HRPDC has focused much effort over the last several years to facilitate approaches to solving the Region's most vexing transportation problems, and these problems are not easy to solve. According to studies conducted by the HRPDC, travel growth has outpaced roadway capacity improvements in the Region. The Hampton Roads Bridge Tunnel (HRBT), the Monitor-Merrimac Memorial Bridge Tunnel (MMMBT), the Downtown Tunnel, the Midtown Tunnel and the "Highrise" Bridge are major system constraints, and congestion is routinely evident on all the Region's interstates, affecting the movement of people, goods and

services. The constraints imposed by the Region's roadway network affect the planning, siting, implementation, and operation of the Region's solid waste system in the following ways.

- **Collection Efficiency.** Solid waste is collected by public and private operations in the Region. Traffic congestion affects the efficiency of these collection operations. Travel time from collection routes to transfer stations, the Regional Landfill, or the RDF WTE facility are extended during congestion periods, which means that the per day collection rate of each collection vehicle is reduced, more collection vehicles are needed to service collection routes, and overall operational costs are increased.

- **Collection and Transfer Scheduling.** Collection routes and transfer station operations are routinely scheduled to avoid peak congestion periods; however, this is not always practical, and these operations are negatively affected during congestion periods.

- **Location of Facilities.** The Region's current solid waste system is transportation intensive. The Region's transfer station, landfill, and RDF WTE facilities are the primary delivery points for solid waste disposal involving a significant number of collection and transfer vehicles. The capacity of the road networks to and from these facilities and any future facilities is an important consideration.

All solid waste in the Region is collected and transferred by public or private collection vehicles and equipment. Currently, no solid waste is transported to or from the Region by rail or barge, although previous proposals for barging in out-of-state waste have been considered, but ultimately rejected for various political reasons.

1.3.2 Urban Concentration

Within the Region, urban development is primarily concentrated within the beltway formed by the loop of I-64 and I-664 and to the area east of the beltway. Thus, the majority of urban development is concentrated in the cities of Norfolk and Portsmouth and in northern Virginia Beach and Chesapeake. This area contains more than three-quarters of the planning area's population and also the vast majority of the area's employment.

Waste transfer stations in the Region are located to serve existing areas of urban development. Five of the nine existing transfer stations are located in the area within the beltway and northern Virginia Beach and Chesapeake. The location of future transfer stations will need to take into account forecasted growth within the region. Further discussion of future needs can be found in Chapter 5.0, Hierarchy and Implementation.

1.3.3 Economic Growth and Development

Economic forecasts by the HRPDC indicate expected future economic growth and development for the SPSA planning area. In 2010, the member jurisdictions of SPSA had an estimated total population of 1,145,548. In 2010, the largest city in the Region was Virginia Beach with over 38 percent of the population. Norfolk is the second most populated, but the city has the highest population density in the Region.

Population change since 2005 is shown in Table 1. Overall, the Region has experienced growth from 2005 to 2010. However, some jurisdictions experienced a decline in population during this period.

From 2010 to 2034, the Region is expected to grow nearly 24 percent to total more than 1,417,000 people. This equates to an average annual growth rate of slightly less than one percent or approximately 10,000 people per year. Long-term population trends for each jurisdiction are shown in Figure 4. Individually, the projected growth rate for each jurisdiction is provided in Table 2. Suffolk and Isle of Wight are projected to experience the greatest increase in total population (on a percentage basis). The population growth rate is significant for planning purposes since the amount of waste generated increases as population increases.

Projections about population growth, regional employment, and number of households can help define what kinds and amounts of waste the Region will generate. A brief summary of projections for other key planning variables is presented here:

- **Employment:** Is expected to increase at an average annual rate of about 0.62 percent through 2034, resulting in an overall increase of just over 20 percent, which reflects the growth of job opportunities (see Table 3). With the exception of Portsmouth, employment is projected to increase in each community. Suffolk is projected to experience the greatest growth in employment followed by Isle of Wight and Southampton counties. Employment is an important forecasting variable because growth reflects an increase in economic activity, which in turn leads to increased consumption and waste generation.

- **Households:** The number of households in the Region is expected to increase by about 26 percent through 2034 at an average annual rate of 0.78 percent. The largest expansion in population and households is forecasted for the City of Suffolk and Isle of Wight County (Table 4). Generally, each home, regardless of the number of residents, contributes a certain amount of waste such as junk mail and yard waste.

Table 1. SPSA Population 2005 - 2010

	Year						
Jurisdiction	2005	2006	2007	2008	2009	2010	Growth (2005–2010)
Chesapeake	214,145	215,270	215,906	216,622	219,975	222,209	3.77%
Franklin	8,368	8,411	8,357	8,292	8,480	8,582	2.56%
Norfolk	235,071	234,219	235,915	235,092	243,957	242,803	3.29%
Portsmouth	98,514	98,318	97,851	97,599	96,282	95,535	-3.02%
Suffolk	78,511	79,795	81,367	81,907	82,616	84,585	7.74%
Virginia Beach	433,470	431,820	430,349	431,451	437,275	437,994	1.04%
Isle of Wight	32,417	33,089	34,041	34,374	34,845	35,270	8.80%
Southampton	18,045	17,932	18,942	19,262	18,402	18,570	2.91%
Total	1,118,541	1,118,854	1,122,728	1,124,599	1,141,832	1,145,548	2.41%

Source: Weldon Cooper Center for Public Service, Demographics & Workforce Group, February 14, 2011

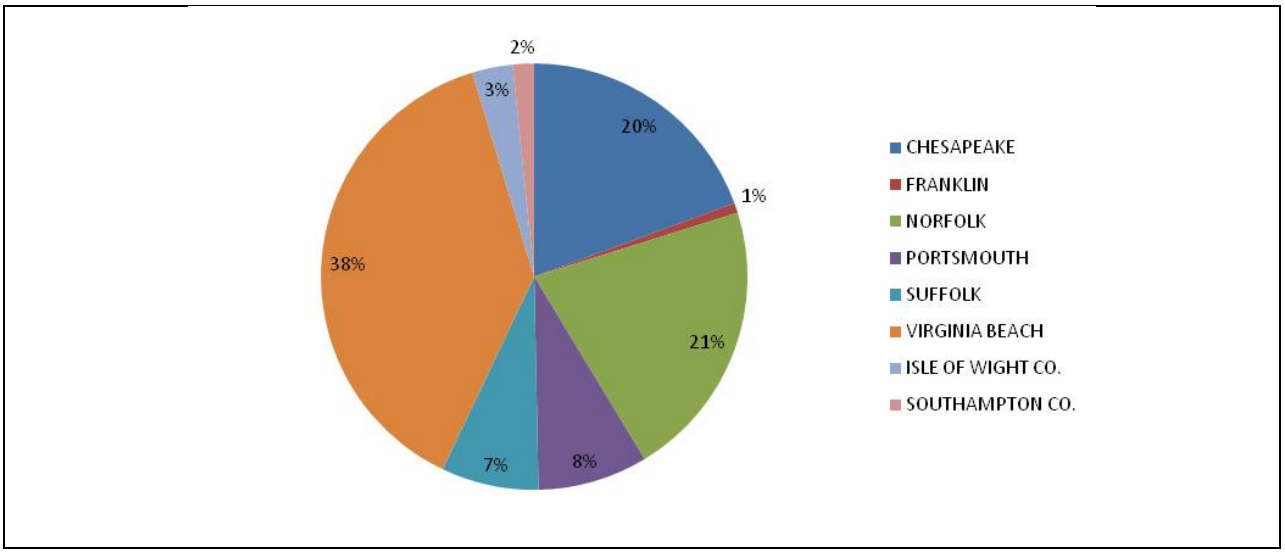


Figure 3. Percentage of Total 2010 Population

Table 2. SPSA Estimated Population Growth by Community

Jurisdiction	2010 Population	2020 Estimated Population	2034 Estimated Population	Average Annual Growth Rate
Chesapeake	222,209	256,508	313,600	1.45%
Franklin	8,582	9,624	11,300	1.15%
Norfolk	242,803	241,799	240,400	-0.04%
Portsmouth	95,535	99,173	104,500	0.37%
Suffolk	84,585	116,026	180,600	3.21%
Virginia Beach	437,994	450,736	469,200	0.29%
Isle of Wight	35,270	46,536	68,600	2.81%
Southampton	18,570	21,671	26,900	1.56%
Total	1,145,548	1,251,735	1,415,100	0.89%

Sources:
2010 Population: Weldon Cooper Center for Public Service, Demographics & Workforce Group, February 14, 2011
2034 Estimate: Hampton Roads 2000 and 2034, Socioeconomic Data by TAZ, HRPDC May 2008

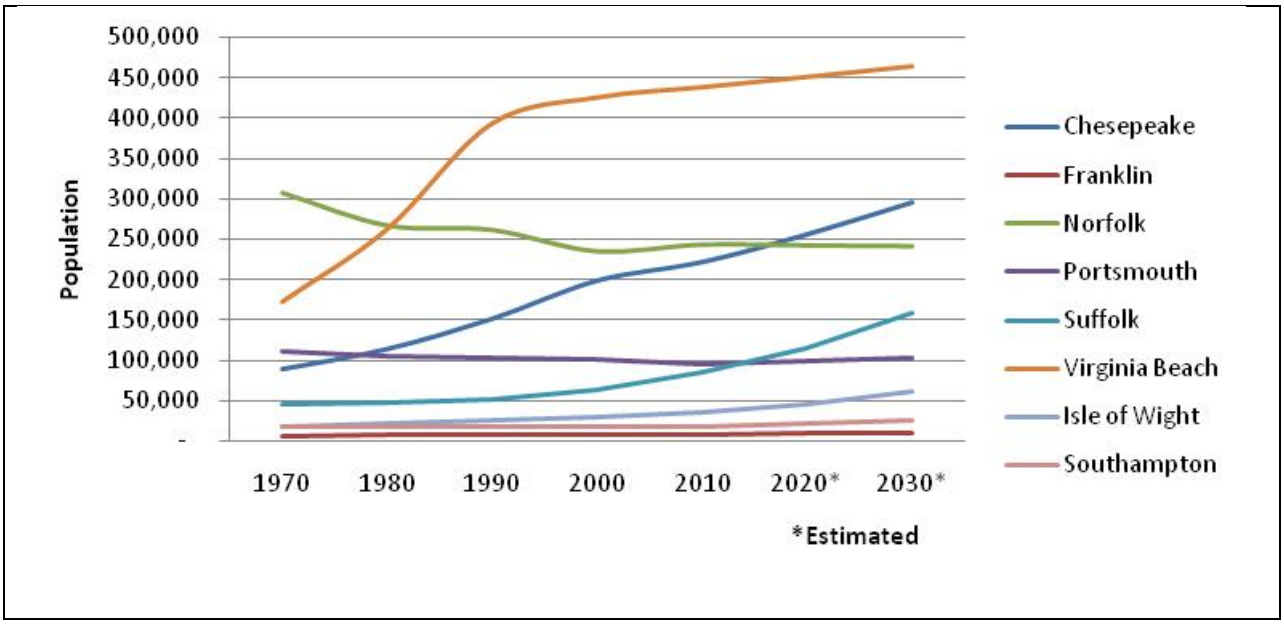


Figure 4. SPSA Projected Population Growth Trends

Table 3. SPSA Employment Projections, 2000 - 2034

Jurisdiction	Year					Percent Growth (2000-2034)	Average Annual Change (2000 – 2034)
	1970	1980	1990	2000	2034		
Chesapeake	22,566	32,288	62,605	102,765	159,600	35.6%	1.05%
Franklin	3,397	4,091	4,685	5,560	6,400	13.1%	0.39%
Norfolk	211,278	230,199	259,481	225,319	229,100	1.7%	0.05%
Portsmouth	48,087	53,996	58,979	52,831	50,300	-5.0%	-0.15%
Suffolk	18,055	19,692	20,660	26,273	81,700	67.8%	2.00%
Virginia Beach	66,246	111,607	187,249	236,446	276,100	14.4%	0.42%
Isle of Wight	9,301	11,880	12,133	16,134	36,100	55.3%	1.63%
Southampton	6,124	5,927	5,461	6,026	9,800	38.5%	1.13%
Total	385,054	469,680	611,253	671,354	849,100	20.9%	0.62%

Source: Hampton Roads 2000 and 2034, Socioeconomic Data by TAZ, HRPDC May 2008

Table 4. SPSA Household Projections, 2000 - 2034

	Year							
Jurisdiction	1970	1980	1990	2000	2010	2034	Percent Growth (2000-2034)	Average Annual Change (2000 – 2034)
Chesapeake	25,178	36,362	52,024	69,900	79,574	114,600	39.0%	1.15%
Franklin	2,113	2,591	3,011	3,384	3,530	4,800	29.5%	0.87%
Norfolk	86,607	74,955	79,518	86,210	86,485	92,100	6.4%	0.19%
Portsmouth	34,470	36,796	38,706	38,170	37,324	40,000	4.6%	0.13%
Suffolk	13,116	15,726	18,518	23,283	30,868	69,400	66.5%	1.95%
Virginia Beach	45,085	85,097	135,365	154,455	165,089	176,800	12.6%	0.37%
Isle of Wight	5,028	7,050	9,031	11,319	13,718	27,200	58.4%	1.72%
Southampton	4,915	5,774	6,004	6,279	6,719	10,300	39.0%	1.15%
Total	216,512	264,351	342,177	393,000	423,307	535,200	26.6%	0.78%

Source: Hampton Roads 2000 and 2034, Socioeconomic Data by TAZ, HRPDC May 2008 and updated (2010 data) in June 2011

2.0 EXISTING SOLID WASTE MANAGEMENT SYSTEM

Solid waste generated in the planning area is managed through a combination of services and service providers. Generally, municipal solid waste is collected by local governments and private haulers and is taken to either a SPSA transfer station or to Wheelabrator's RDF WTE Facility (Portsmouth). The collection of MSW from single-family homes has remained the responsibility of the local governments. Each locality handles its collection systems differently, although almost all are on a weekly/automated system. Some localities also serve multi-family residences and small commercial businesses.

SPSA recently made the decision to discontinue curbside and drop-off recycling services; therefore, the cities and counties are now providing these services directly. SPSA continues to operate regional programs for white goods recycling (including Freon extraction), household hazardous waste, tire processing, used oil collection, and battery recycling.

2.1 RECYCLING PROGRAMS

2.1.1 Municipal Recycling Programs

Recycling in the region consists primarily of curbside recycling and drop-off locations:

- Chesapeake contracts for its curbside recycling services. The service is provided on an every-other week schedule using a 96-gallon container. With the implementation of curbside collection, the City eliminated use of drop-off facilities. Recyclable materials include aluminum cans and foil, #1 and #2 plastic bottles and containers, glass jars and bottles, tin and steel cans, mixed paper (newspaper, office, junk mail, telephone books, catalogs/magazines), cardboard and paper bags, boxboard (e.g., cereal boxes, paper towel rolls).

- Curbside recycling in Franklin is provided through a contract with a private firm (All Virginia Environmental Solutions). The service provider uses an automated, single-stream system using 95-gallon carts. Items that are recyclable are, aluminum cans, cardboard, paper (office, newspaper, junk mail, catalogs, glass (clear, green and brown), metal cans, newspaper, office paper and plastics #1 through #7.

- Isle of Wight operates eight, single-stream drop-off recycling facilities at the County convenience centers (Camptown, Carroll Bridge, Carrsville, Crocker's, Jones Creek, Stave Mill, Walters and Wrenn's Mill). Materials accepted at the centers include paper (newspaper, office, magazines and telephone books, junk mail), cardboard, paperboard (cereal boxes, shoe boxes), milk and juice cartons, plastic bottles and containers (#1 through #7), glass, tin and steel cans, aluminum (cans, foil, pie plates). Additional containers are available for plastic bags, electronics, scrap metal, appliances, cooking oil, motor oil, yard waste. Residents of Smithfield receive monthly curbside collection of recyclable materials through a private contractor.

- Norfolk provides curbside collection of recyclable goods on a bi-weekly basis to 58,200 single-family homes. Each residence is provided a 90-gallon recycling container for participation in the curbside program. Citizens also have two drop-off facilities located in the City for recycling; a third site is scheduled to open soon. Office paper and cardboard are collected from Norfolk schools and other City buildings.

- The City of Portsmouth discontinued its curbside recycling program and provides residents the opportunity to recycle at seven local drop-off sites located throughout the City. The bins accept comingled materials.

- Southampton County offers recycling services through drop-off facilities as well as single-stream curbside collection (in some areas of the County) through a contract with a private firm (All Virginia Environmental Solutions). The County is in the process of providing containers for recycling at 11 convenience centers and transfer stations. Recyclables collected include paper, cans (aluminum, steel, tin), glass, plastic bottles and tubs, cardboard, and paperboard.

- Suffolk currently offers recycling services through 13 drop-off locations. Materials accepted include aluminum cans, plastic bottles (#1 and #2), cardboard, mixed papers, steel/tin cans and glass bottles. Suffolk currently has a franchise agreement for a private hauler for curbside collection, but must have 2,500 homeowners sign up for service for it to become effective. The cost for this service is $12 per month.

- Virginia Beach contracts for its own recycling program through Tidewater Fibre Corporation and provides containers to all residents who receive curbside waste collection from the City. Automated recycling pickup, using large 95-gallon containers, is provided on an every-other-week basis. In addition, four drop-off facilities are also located throughout the City. A breakdown of the City's 2009 residential recycling by commodity is shown in Table 5.

Table 5. Virginia Beach
Curbside/Drop-Off Recycling, CY 2009

Commodity	Tons
Fiber (paper, cardboard, chipboard)	23,848
Metal (aluminum, steel)	2,358
Plastic	1,036
Glass	613
Total	**27,855**

Some of the programs offered by SPSA include the following:

- **Ferrous Metal Processing Plant.** Metal collected at the RDF WTE Facility and at the drop-off facilities is brought to this Plant for processing. (Propane tanks are collected as well and handled through a contract with a local distributor.) Ferrous metals, such as steel food and paint cans, scrap metal, and compressed gas tanks are processed into

small nuggets at the Bi-Metals Recycling Facility at the Regional Landfill. These nuggets are then sold to steel mills and processed into new steel.

- **White Goods Recycling Facilities.** Refrigerators, washing machines, air conditioning units, and other large household appliances are collected from residents free of charge at the Regional Landfill. Local contractors prepare the appliances for recycling by removing and collecting the freon for proper disposal. The scrap metal from the appliances is then recycled. In fiscal year 2010, the SPSA white goods program recycled over 1.9 Million pounds of scrap steel and aluminum. In September 2010, Virginia Beach implemented its own white goods recycling program at Virginia Beach Landfill No. 2.

- **Tire Shredder** . Tires are shredded at the Tire Processing Facility located at the Regional Landfill. The shredded tires are used for drainage projects, pipe bedding and alternate daily cover ADC). SPSA reports that approximately 400,000 tires are shredded per year.

- **Used Oil Collection Sites.** Most SPSA facilities have containers to collect motor oil from residents free of charge. Used oil is cleaned of particles and processed into new oil and fuels. The oil collected by SPSA is recycled through a contract with a private vendor.

A summary of recycling opportunities for various materials is provided in Table 6.

2.1.2 Recycling Quantities

SPSA has historically provided recycling services for the Region. SPSA self-performed recycling collections in several member communities and delivered collected materials to a private vendor (Tidewater Fibre Corporation). TFC provided sorting, bailing, marketing and transportation (to markets) services. A summary of materials collected through SPSA's curbside and drop-off programs is provided in Table 7. Through the Virginia Beach curbside and drop-off recycling program, an additional 27,855 tons of recyclable materials were recovered during calendar year 2009. The combination of SPSA and Virginia Beach programs resulted in 62,289 tons of residential material being collected. However, as mentioned earlier, SPSA has discontinued recycling services (curbside and drop-off) and provision of recycling services has transitioned to the cities and counties.

Table 6. City and County Recycling Programs

Jurisdiction	Service		Materials Recycled											
	Curbside	Drop-Off	Plastics							Mixed Paper	Corr. Cardboard/ Paperboard	Glass	Metal Cans	Other
			#1	#2	#3	#4	#5	#6	#7					
Chesapeake	X		X	X						X	X	X	X	Aluminum Foil
Franklin	X		X	X	X	X	X	X	X	X	X	X	X	
Isle of Wight		X	X	X	X	X	X	X	X	X	X	X	X	Plastic Bags, Electronics, Scrap Metal, Appliances, Motor Oil, Cooking Oil, Aluminum Foil/Plates
Norfolk	X	X	X	X						X	X	X	X	Aluminum Foil
Portsmouth		X	X	X	X	X	X	X	X	X	X	X	X	
Southampton		X	X	X	X	X	X	X	X	X	X	X	X	Used Motor Oil
Suffolk	X	X	X	X						X	X	X	X	
Virginia Beach	X	X	X	X						X	X	X	X	Household Batteries, Aluminum Foil

Table 7. Materials Recycled (Curbside and Drop-Off Programs)

Material	Tons Recycled					Change (2005-2009)	Change (2008-2009)
	FY 05	FY 06	FY 07	FY 08	FY 09		
Aluminum	276	312	302	300	284	2.9%	-5.3%
Tin	557	651	647	632	599	7.5%	-5.2%
Cardboard	1,290	1,781	1,784	1,702	1,665	29.1%	-2.2%
Metals*	15,167	17,122	15,474	13,287	12,490	-17.7%	-6.0%
Glass	1,397	1,696	1,678	1,644	1,560	11.7%	-5.1%
HDPE Plastics	1,340	1,693	1,657	1,620	1,537	14.7%	-5.1%
Newsprint	11,937	12,491	13,025	12,960	12,280	2.9%	-5.2%
Office Paper	281	169	4	6	21	-92.5%	250.0%
Yard Waste	32,971	40,495	33,821	8,251	5,037	-84.7%	-39.0%
Total	65,216	76,410	68,392	40,402	35,473	-45.6%	-12.2%

* Includes ferrous and non-ferrous metals
Source: SPSA Solid Waste Quantities Report

2.1.3 Recycling Education

HRPDC and the individual localities continue to bring awareness of its programs to the public that are both local and regional in scope. Educational initiatives to encourage recycling are currently underway both at the local and regional level. These educational initiatives will be continued and expanded, based on need and availability of funding and staff resources, to ensure that the citizens and businesses in the SPSA localities are aware of available recycling programs and the benefits of recycling.

- **HR CLEAN: HR CLEAN** promotes litter prevention, recycling, community beautification and environmental awareness in the 16 cities and counties that make up the Hampton Roads Region. The program is managed by the HRPDC and closely coordinates with other regional environmental education programs. The program's website (www.hrclean.org) contains information on residential recycling, business recycling and buying recycled goods.

- **Chesapeake:** The city has curbside recycling information, including "how to" videos for the new curbside collection program available on its website (http://www.chesapeake.va.us/services/depart/pub-wrks/wastemanagement-recycling.shtml). The City recently implemented "Recycling Perks," a program that rewards residents for participation in the recycling program. The City's website states that "Recycling Perks are designed to help residents save money and provide discounts on entertainment or leisure activities. Rewards are offered by local businesses to reward residents for recycling."

- **Franklin:** Recycling information is included in the city's newsletter *City Clips*, which is available online at: http://www.franklinva.com.

- **Isle of Wight:** The county has a webpage devoted to environmental issues that is entitled *Isle be Green* (http://islebegreen.com). The webpage includes recycling information.

- **Norfolk:** The Norfolk Environmental Commission http://www.norfolkbeautiful.org/). This website contains information for Norfolk residents regarding household hazardous waste, recycling, and adopt a spot. Additional recycling information is available on the city's website (http://www.norfolk.gov/curbside_recycling).

- **Portsmouth:** Information regarding recycling drop off facilities is available on the city's website at http://www.portsmouthva.gov/publicworks/recycle.aspx.

- **Suffolk:** Recycling information is provided on the City's website at http://www.suffolk.va.us/pub_wks/recycling.html. It has been reported by the local newspaper (Virginian Pilot, May 17, 2011) that the City has initiated a Recycling Perks program similar to the city of Chesapeake.

- **Virginia Beach:** Recycling information is available on the city's public works webpage, which is available through http://www.vbgov.com. The Waste

Management division also uses social media (facebook) to disseminate updated recycling information. Virginia Beach recently acquired an official recycling mascot to attend local events. The mascot represents the city's "Catch the Wave--Recycle" logo.

Both the municipalities and the HRPDC provide information to the public on waste disposal issues, including litter control, recycling, and household hazardous waste. In addition, through the HRPDC, information is provided to the public on a variety of other environmental issues. This information is provided in the form of media coverage, advertising, fact sheets, brochures, educational materials, and "give-aways." For example, HRPDC recently (June 2011) hosted "Plastic Bag Forgiveness Day," on which those who brought in five or more plastic bags received free items including a reusable tote bag. These programs will be continued.

2.1.4 Private Recycling Programs

Private businesses provide additional recycling opportunities in the Region for residents and businesses. Many examples are provided below.[1] Although most recycling businesses accept one or two materials, many accept a range of common recyclable materials. In addition to the opportunities listed here, many large businesses, such as Walmart, have branches in the Region likely have their own recycling programs to back-haul their recyclables to central locations.

The quantities of materials recycled through private recyclers is typically not tracked in a comprehensive fashion by the Region. Quantities of recycling by firms are tracked.

2.1.4.1 Commercial Recycling Collection

Both TFC and Bay Disposal offer fee-based recycling opportunities to commercial businesses located in the Region. Collection programs generally are offered for paper, corrugated cardboard, plastic containers, aluminum cans, steel/tin cans, and glass. Butler Paper Recycling and Atlantic Paper Stock provide office and institutional recycling for paper commodities.

2.1.4.2 Private Material-specific Drop-off Locations

Several businesses in the Region specialize in recycling a few material types as described below.

2.1.4.2.1 Electronics

Collection of computers, monitors, laptops, and televisions, telephones, game consoles, and small appliances is provided by Goodwill, Best Buy, and Signs by Tomorrow. Generally, electronics recycling, with the exception of monitors, is free; however, some retailers will provide incentives for users of their electronics recycling programs.

[1] Discussion of specific recycling programs n this section should not be construed as a recommendation or endorsement by the Hampton Roads Planning District Commission. The recycling programs discussed here may not represent all programs available in the region as some businesses may have reduced or expanded the types of materials they accept.

2.1.4.2.2 Household battery, ink cartridge, and cell phone collection

Several locations within the Region collect ink cartridges, cell phones and household batteries. Some retailers, such as Target, collect all three. Only cell phones are collected at most wireless retailers. Retailers that accept NiCad/rechargeable batteries include Radioshack, Home Depot, Best Buy, and Batteries Plus. Ink cartridges are accepted at recycling programs operated by OfficeMax and Best Buy.

2.1.4.2.3 Metal Recycling

Several metal recyclers are located in the Region that will accept both ferrous and nonferrous metals, including aluminum, brass, and copper. These recyclers include Dubin metals, Guterman Iron and Metal, Surplus Recycling, U-Cycle Recycling, Virginia Beach Salvage Exchange, and Wise Recycling. Some will pay a fee for certain metals.

2.1.4.2.4 Car Batteries and Used Motor Oil

Car batteries and used motor oil are accepted at Jiffy Lube, Advanced Auto Parts, Firestone, Treadquarters, Pep Boys, and Interstate.

2.1.4.2.5 Compact Fluorescent Lights

Used compact fluorescent lights (CFL) are accepted by Home Depot and Lowes stores.

2.1.4.2.6 Plastic Bags

Plastic bags (#2 and #4 plastics) are accepted at a variety of grocery stores and retailers including Farm Fresh, Sam's Club, Lowe's, JCPenny, Walmart, and Target.

2.1.4.2.7 Asphalt, Concrete, and Brick

These three materials are accepted by Waterway. Concrete is accepted by Vulcan materials.

2.1.4.2.8 Waste Cooking Oil

Virginia Beach SPCA accepts used vegetable oil to fuel its Neuter Scooter mobile clinic.

2.1.4.2.9 Textiles

Goodwill stores generally recycle textiles that are not of high enough quality to be sold in the stores.

2.1.4.3 Reuse Opportunities

Various organizations offer reuse opportunities for clothing and household items including Goodwill, Salvation Army, and Habitat for Humanity (reusable building materials).

2.1.5 Material Recovery Facilities

The 2014 VDEQ database lists 16 permitted material recovery facilities (MRFs) in the Tidewater area. Table 8 lists the known active and proposed MRFs in the Tidewater area.

Table 8. Material Recovery Facilities in the Tidewater Region

Facility	Location	Operator
Permitted Facilities		
Bay Disposal Inc., MRF	Norfolk	Bay Disposal
Meeks Disposal Corporation Recycling Facility	Chesapeake	Meeks Disposal Corporation
Norfolk Naval Shipyard MRF	Portsmouth	US Navy
Clearfield MMG, Inc.	Chesapeake	Clearfield MMG, Inc.
Clearfield MMG, Inc.	Suffolk	Clearfield MMG, Inc.
SPSA Tire Processing Facility	Suffolk	Southeastern Public Service Authority
Tidewater Green Corporation MRF	Chesapeake	Tidewater Green Corp.
United Disposal Wellman Street	Norfolk	United Disposal
Virginia Materials, Inc	Norfolk	Virginia Materials, Inc
Waste Industries, LLC	Chesapeake	Waste Industries
Waterway Marine Terminal	Chesapeake	
Wheelabrator Portsmouth, Inc.	Portsmouth	Wheelabrator
Recycling & Disposal Solutions MRF	Portsmouth	Recycling & Disposal Solutions
TFC Recycling MRF	Chesapeake	Tidewater Fibre Corp
B & H Sales Corporation MRF	Norfolk	B & H Sales Corporation
Military Highway Recycling Center	Chesapeake	East Coast Gutternman, LLC
Proposed Facilities		
Bay Disposal Inc., MRF	Town of Smithfield	Bay Disposal
Repower South	Chesapeake	Repower South Chesapeake LLC

2.1.6 Markets for Recycling and Reuse

Currently, all of the municipalities rely on the private sector for processing and marketing of collected recyclables. Collected materials are sold to a variety of end markets; the municipalities have no control over marketing decisions or prices paid. The municipalities can affect recycling markets, however, by:

- Using economic development mechanisms to attract business that manufacture recycled products or assist current businesses with methods to use recycled materials. By doing this, the region will help close the loop for recycling and can create markets for their collected materials.

- Creating viable, long-term markets for recovered materials. Generally, markets for recyclables are driven by demand for the end-products manufactured from recovered

materials. The region can encourage procurement of products made with recycled content.

2.1.7 Summary

Currently there is only one significant facility in the Region that is capable of processing materials collected from various recycling programs. At the time the 2005 SWMP was written, SPSA was the primary provider of recycling collection services in the Region, with the exception of Virginia Beach. As an alternative, SPSA considered the construction and operation of a competing MRF. However, SPSA has discontinued recycling services and the member communities have taken over the responsibility for collection of recyclables. Processing of recyclables is currently a private sector function (see Figure 5). Bay Disposal is currently investigating the feasibility of establishing a MRF in Hampton that could have the capacity to handle recycling material collected in the Region.

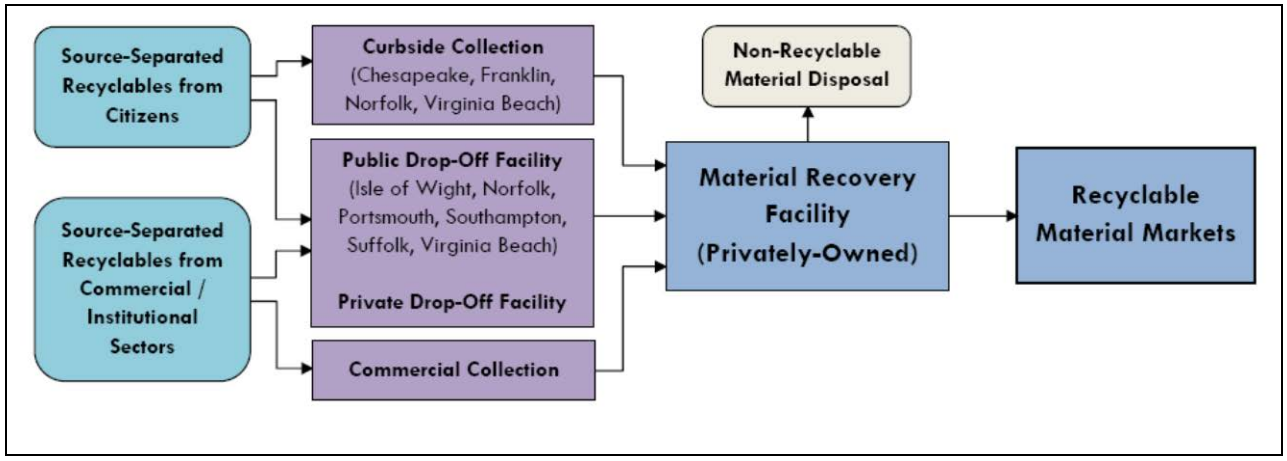


Figure 5. Management of Recyclables

2.2 YARD WASTE MANAGEMENT

Household chores such as raking leaves, mowing grass and trimming trees and shrubs generate the majority of yard waste, which has accounted for approximately 20 percent of solid waste collected in the Region (from SPSA Yard Waste Recycling flyer). The RW Beck Annual Survey and Report (as of February 29, 2008) stated that SPSA received 73,497 tons of yard waste during the FY ending June 30, 2007. This was a small decrease from the previous year. The following is a summary of current yard waste collection/handling activities.

2.2.1 Municipal Collection

The majority of yard waste generated in the Region is currently collected by the SPSA member communities:

- **City of Chesapeake.** Leaves, trimmings and grass clippings are picked up with regular collections when placed at curbside. The City requires yard waste, leaves and

grass clippings to be placed in clear plastic bags. The material currently is delivered to Waterway Materials or the Holland Landfill.

- **City of Franklin.** Each customer is provided a green 90-gallon cart for yard waste collection. Collected yard waste is delivered to a city-owned farm where it is processed.

- **Isle of Wight County.** Approximately 600 tons of yard waste is delivered to the convenience centers, which is transported to a composting facility in Waverly, Virginia.

- **City of Norfolk.** The City collects yard wastes, in amounts up to 20 clear plastic bags (up to 3 cubic yards if scheduled). The City disposes of some yard waste along with bulk items with a private vendor but the majority of yard waste is transported to a composting facility in Waverly, Virginia.

- **City of Portsmouth.** The City provides yard waste collection services; material is taken to the City of Portsmouth's landfill at Craney Island.

- **Southampton County.** The County does not offer curb side yard waste collection. Yard waste is delivered by citizens to the mini-transfer stations operated by the County. Woody debris is grinded by a private vendor.

- **City of Suffolk.** The City collects yard waste from single-family homes. Collected material is sent directly to the Regional Landfill or the Suffolk Transfer Station.

- **City of Virginia Beach.** The City collects yard waste from residences on a weekly schedule. Most yard waste collected is currently transported to a private composting facility in Waverly for beneficial reuse. Some yard waste is mulched at the City's Landfill No. 2 and used to landscape city properties.

2.2.2 Previous SPSA Yard Waste Management Initiatives

SPSA has operated facilities where yard waste collected by member communities was handled, mulched and composed. The end product of this activity had been a source of revenue for the Authority through the sales of mulch and compost (marketed as Nature's Blend). In 2005, operations conducted at the Regional landfill and Landfill No. 2 were consolidated on a section of Landfill No. 2 known as Phases 2B and 3. However, this facility was closed in 2007 to address Landfill No. 2 neighbor complaints of excess odors from the facility. No new Regional initiatives have been implemented since the Virginia Beach Landfill No. 2 facility was closed.

2.2.3 Private Sector Yard Waste Management

Waterways Recycling, LLC is located in Chesapeake and operates out of Waterway Marine Terminal. Though the facility is capable of processing and recycling the full range of construction, demolition and debris (CDD) materials, the facility is slightly more geared to

convert woodbased debris into processed wood. A significant portion of their recycled product customer base pre-orders and utilizes its wood chips.

2.2.4 Yard Waste Management Summary

As stated previously, the Region does not currently have a facility dedicated to the handling and processing of yard waste, although several member communities are in the process of implementing programs to beneficially reuse the yard waste that they collect (see **Error! Reference source not found.**).

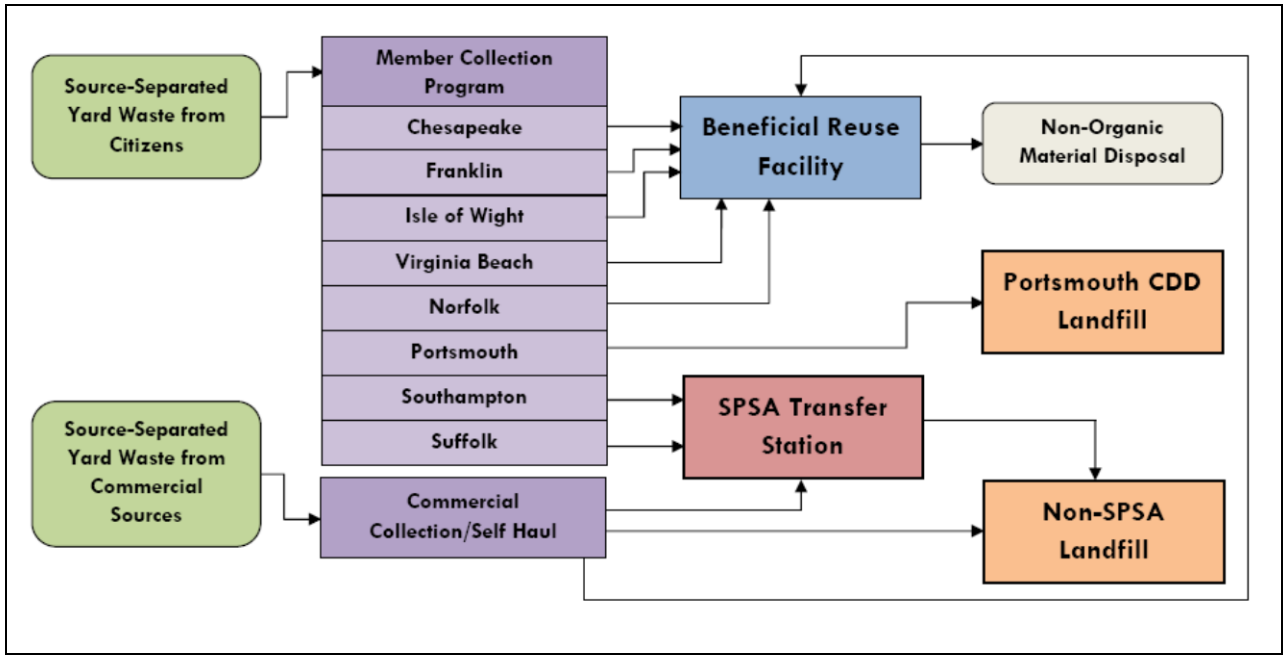


Figure 6. Management of Yard Waste

2.3 SOLID WASTE COLLECTION

2.3.1 Municipal Collection

Below is a summary of each member's MSW collection services to its citizens. Table 9 provides a synopsis of fiscal year 2010 tonnages and the relative contributions of the SPSA member localities to the total collected waste within the region. Historical disposal quantities are illustrated in Figure 7. Municipal quantities have decreased over the past few years and were down approximately 15 percent from fiscal year 2007 to fiscal year 2010. Table 10 provides a summary of collection services provided by each municipality.

2.3.1.1 City of Chesapeake

Chesapeake's Department of Public Works, Division of Waste Management collects residential solid waste once per week from over 65,000 households using automated vehicles. Collected waste is primarily delivered to either the RDF WTE Facility or the SPSA Chesapeake Transfer

Station located just off Greenbrier Parkway. The City supplies the residents with standard 96-gallon solid waste containers. Also available upon request is a smaller, 64-gallon container or 35-gallon container.

Chesapeake residents are able to dispose of waste at the Chesapeake Transfer Station or any other SPSA facility at no charge. Yard waste (clear bags or bundles) and bulk waste are collected weekly from residents as well. No requests are necessary for pick up of yard waste, but the City does require that requests to schedule bulk waste collection be received one week prior to the day of collection. Yard waste is delivered to Waterway Materials or the Holland Landfill, bulk waste is delivered to SPSA or to the Holland Landfill.

Residents are responsible for properly disposing of their own building debris and are directed to SPSA transfer stations and the Regional Landfill in Suffolk.

Chesapeake also collects waste from a limited number of small commercial establishments (fewer than 400) that are able to deposit all waste into two or three cans. The City does not intend to expand this service to additional establishments.

The City of Chesapeake delivered 99,969 tons of MSW to SPSA during fiscal year 2010.

2.3.1.2 City of Franklin

The City of Franklin's Department of Public Works offers collection for 3,000 residential and small commercial generators, with weekly solid waste and yard waste collection. Special collections of bulk waste are offered upon request once a month. Each of the customers is given a black 90-gallon solid waste receptacle and a green 90-gallon cart for yard waste. Bulk yard waste is also collected upon request. Yard waste collected is delivered to a city-owned farm where it is processed. All other wastes are taken to the SPSA Franklin transfer station. The City of Franklin delivered 4,596 tons of MSW to SPSA during fiscal year 2010.

2.3.1.3 Isle of Wight County

The County operates eight convenience centers to handle solid waste, most of which are open seven days a week. A SPSA transfer station within the County is also available for waste disposal.

If requested, curbside collection is provided to Isle of Wight County residents for a fee by a franchised commercial hauler. The Towns of Smithfield and Windsor also each provide curbside pickup for residents through an agreement with a private hauler. Smithfield provides twice-weekly pickup of both residential refuse and yard debris. The hauler provides containers for a monthly fee. No municipal refuse collection is provided for Town businesses.

The County of Isle of Wight delivered 18,676 tons of MSW to SPSA during fiscal year 2010. Approximately 600 tons of yard waste is delivered to the convenience centers, which is transported to a composting facility near Waverly, Virginia.

2.3.1.4 City of Norfolk

The Waste Management Division of the Department of Public Works collects approximately 95,000 tons of refuse, bulk waste, and yard waste annually from 61,000 households and businesses within the City. The City issues 90-gallon containers to residents of single-family homes, and curbside collection is provided once weekly by automated collection vehicles. Collection of bulk wastes is handled on the same designated day, when requested at least 24 hours in advance. In addition, yard wastes, in amounts up to 20 clear plastic bags (up to 3 cubic yards if scheduled), can also be collected at this time for recycling.

Waste collection in Norfolk's central business district takes place each Monday, Wednesday, and Friday evening. In addition, the City collects recyclables such as paper and cardboard each Tuesday and Thursday evening. Businesses outside the central business district receive waste collection weekly.

During fiscal year 2010, the City of Norfolk delivered 77,874 tons of MSW tons of yard waste to SPSA via the Norfolk Transfer Station.

2.3.1.5 City of Portsmouth

The City of Portsmouth's Department of Public Works collects MSW from approximately 33,000 households each week using 95-gallon containers. During fiscal year 2010, the City of Portsmouth delivered 44,057 tons of MSW to the RDF WTE Facility. Bulk waste and yard waste collection services also are provided; material is taken to the City of Portsmouth's landfill at Craney Island.

2.3.1.6 Southampton County

In addition to the Franklin Transfer Station, SPSA operates two other stations within Southampton County at Ivor and Boykins. The County offers to the residents of Southampton County fourteen mini-transfer stations. The waste collected from these mini-transfer stations is then delivered to the larger sites, where it is collected by SPSA. Southampton County residents may dispose of waste at any other SPSA facility free of charge. During fiscal year 2010, the County delivered 9,263 tons of MSW to SPSA.

2.3.1.7 City of Suffolk

The City of Suffolk Department of Public Works provides weekly residential refuse collection for all single-family homes within the City (approximately 32,000) using 90 gallon containers and automated collection vehicles. The City also provides collection services to approximately 200 businesses. Bulk and yard waste are also collected by the City. The City delivers collected waste directly to the Regional Landfill or the Suffolk Transfer Station. During fiscal year 2010, 46,607 tons of MSW were delivered to the SPSA.

2.3.1.8 City of Virginia Beach

Virginia Beach provides 95-gallon solid waste containers and weekly, automated curbside collection for approximately 150,000 households within the City. Curbside bulk pickup is

available to households by special request. Each request must be received 24 hours prior to the regularly scheduled collection day. Yard waste is also collected from residences on the collection day. Bulk waste is delivered to the SPSA transfer stations and the majority of yard waste is transported to a private handling facility near Waverly, Virginia. Some yard waste is transported to the City's Landfill No. 2 where it is mulched for use on city properties. During fiscal year 2010, 80,134 tons were delivered to SPSA.

The Virginia Beach Landfill No. 2 is a 300-acre facility located in the Kempsville area of the City. Waste generated within the City by Virginia Beach residents can be delivered in privately owned vehicles to Landfill No. 2 free of charge. However, most the waste received at the Landfill is ash from the Wheelabrator RDF WTE Facility. The Landfill currently accepts ash at a rate of approximately 200,000 tons per year.

The City operates a landfill gas recovery plant at its Landfill No. 2 in cooperation with a private firm, Ingenco. According to Ingenco, Landfill No. 2 annually produces landfill gas equivalent in energy to approximately 1.5 million gallons of fuel oil. The plant harnesses the landfill-produced methane gas for energy production, and provides the City with royalty payments annually.

Table 9. Breakdown of Municipally Collected Waste by Locality

Locality	Municipal Tonnage (FY2010)	Tonnage per Household	Percentage of Total
Franklin	4,596	1.30	1.0%
Southampton County	9,263	1.38	1.9%
Isle of Wight County	18,676	1.36	3.9%
Suffolk	46,607	1.51	9.7%
Portsmouth	44,057	1.18	9.2%
Chesapeake	99,969	1.26	20.8%
Norfolk	77,874	0.09	16.2%
Virginia Beach	180,134	1.09	37.4%
Total	481,176	1.18	100%

Source: SPSA Solid Waste Quantities Report
Tonnage per Household calculated using data on Table 4

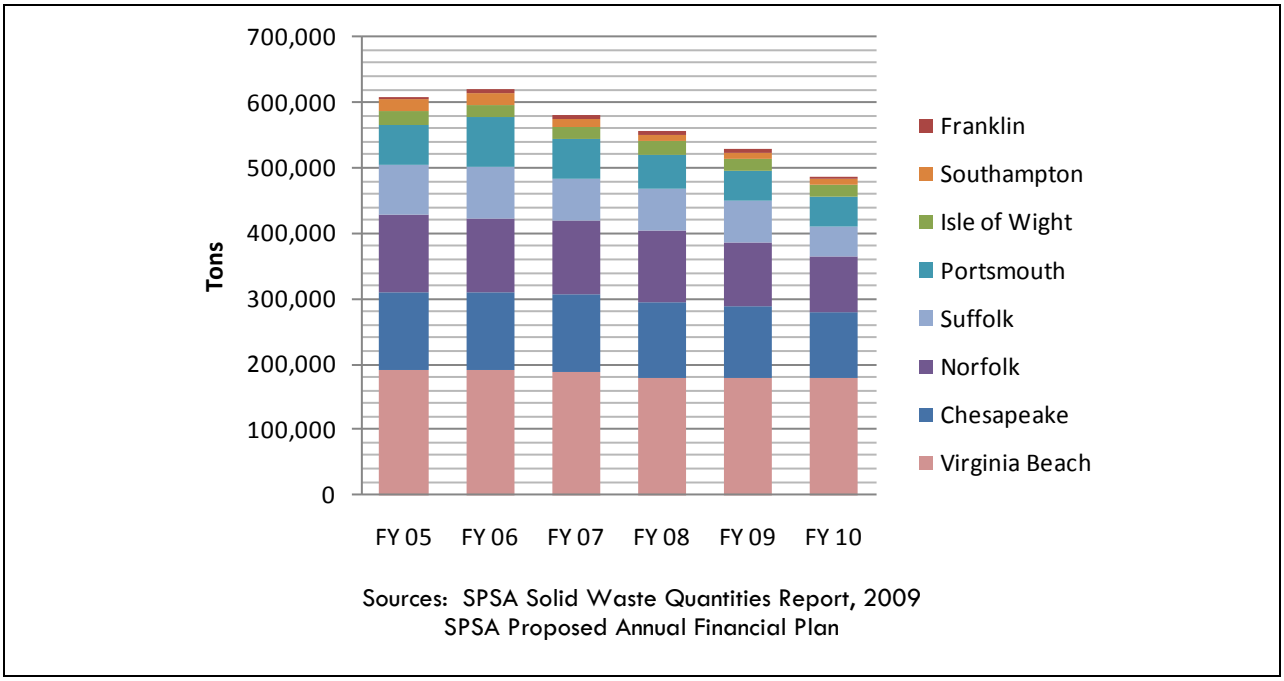


Figure 7. Historic Municipal Waste Quantities

Table 10. Solid Waste Services

Service	Chesapeake	Franklin	Norfolk	Portsmouth
Solid Waste Residential Collection	The city provides weekly, automated collection using 96-gallon containers.	The city provides weekly collection using 90-gallon containers.	The city provides weekly, automated service using 90-gallon containers.	The city provides weekly collection services.
Solid Waste Commercial Collection	Not provided.	The city provides collection services for small commercial generators.	The city provides collection services for businesses located in the Central Business District (CBD) every other day. Businesses located outside the CBD receive one weekly collection.	Not provided.
Yard Waste Collection	City provides separate collection of yard waste using clear plastic bags on a weekly basis.	City provides collection services using a green 90-gallon cart on a weekly basis.	Yard waste is collected weekly by the City. Residents may use either a 30-gallon container or clear plastic bags.	Yard waste is collected by the City in clear plastic bags from the curb (placed next to MSW).
Recyclables Collection	The City provides curbside recycling services for the city every other week using a 96-gallon bin.	Franklin offers automated recycling using a 95-gallon cart.	The city collects recyclables twice a week from businesses located in the CBD. Curbside collection of recyclables is provided by the City every other week using a 95-gallon cart.	The City operates recycling drop off locations for the city.

Table 10 (Continued)

Service	Suffolk	Virginia Beach	Isle of Wight	Southampton
Solid Waste Residential Collection	The city provides weekly automated and manual collection from single-family homes.	The city provides weekly automated collection from single-family homes using 90-gallon containers. Townhouse areas may use 32-gallon containers or plastic bags.	The county provides weekly collection through a franchised hauler (for a fee) for those residents requesting the service. As an alternative, the county operates eight full-service manned convenience centers for self-hauled waste.	The county operates 14 sites for residents to self haul waste.
Solid Waste Commercial Collection	Not provided.	Not provided.	Not provided.	Not provided.
Yard Waste Collection	The City offers curb-side yard waste collection upon request (limited to residential dwellings).	The City provides weekly collection of yard waste either stacked or in clear plastic bags. The City also offers a yard waste container rental program for larger quantities of yard waste.	The County does not provide curb-side collection of yard waste, but does provide containers for residents to dispose of yard waste at each of its eight convenience centers.	The County does not offer curb-side yard waste collection. Yard waste is accepted at the County's 16 refuse collection sites.
Recyclables Collection	The city offers drop-off only recycling for its residents. Drop-off facilities are located throughout the city.	Virginia Beach provides residents with automated curbside collection (non-SPSA) using 95-gallon carts on an every-other-week basis.	Drop-off only recycling sites for the county that are located at the convenience centers and the transfer station. The town of Smithfield offers bi-weekly curbside recycling to all single-family homes, duplexes, and townhouses.	The county provides 18-gallon bin recycling for residents of Courtland, Newsoms, and Boykins. Drop-off facilities are located at six of the county's mini-transfer stations.

2.3.2 Private Collection

Private firms perform a significant function in the Region with regard to waste collection and disposal. While the SPSA member communities are the primary collectors of MSW from single-family residents (with the exception of the more rural areas in Southampton and Isle of Wight Counties), private firms are the primary collectors of MSW from multi-family, commercial, and industrial establishments. Commercially collected MSW is delivered by the private firms to either the Wheelabrator RDF WTE Facility, a SPSA Transfer Station or an out-of Region disposal facility. Of the waste that is delivered to the Transfer Stations, processible waste is delivered to the RDF WTE Facility by SPSA for a fee. Non-processible waste is loaded onto Wheelabrator trailers for eventual disposal at Waste Management's Bethel or Atlantic Waste Landfills (Waste Management is the parent company of Wheelabrator). Wheelabrator maintains contracts with the private haulers. Firms that play a significant role in the collection of MSW in the Region include Waste Management, Waste Industries, Republic Services, and Bay Disposal.

2.3.2.1 Commercial Waste Receipts

During fiscal year 2009, SPSA's commercial customers delivered 560,531 tons of waste into the system. This amount includes 35,930 tons of CDD waste, 35,050 tons of Navy waste, 8,109 tons of out of area waste, and 22,033 tons of proprietary waste.[2] Historically, quantities of commercial waste have been decreasing due to expiration of contracts, an increase in tipping fees for CDD waste, and a Board decision to cease accepting out of area waste in late 2008. A historical summary of commercial wastes received by SPSA is provided in Table 11.

Table 11. SPSA Commercial Waste Receipts

	Tons Received				
Category	FY 06	FY 07	FY 08	FY 09	FY 10
Commercial	583,042	579,325	534,908	459,409	387,488
CDD*	65,879	80,651	157,273	35,930	97,433
Navy	37,101	39,605	37,618	35,050	28,790
Out of Area	54,891	127,817	132,545	8,109	NA
Proprietary	24,648	23,155	23,928	22,033	NA
Total	765,561	850,553	886,272	560,531	513,711

* For FY 10: includes contaminated recyclables, Out of Area, as well as CDD
Source: SPSA Solid Waste Quantities Report
NA: information not available

2.3.2.2 Flow Control

When SPSA was formed, its organization and facilities were sized and began operations under the assumption that all MSW generated in its service area would be delivered to SPSA facilities.

[2] Proprietary Waste includes off-specification and out-of-date consumer products, office records and other waste material which requires assured destruction.

Since SPSA's formation, the Commonwealth of Virginia has allowed several large landfills to be constructed in largely rural areas of eastern Virginia.

With the adoption by the U.S. Supreme Court of the Carbone decision in 1994, neither states nor localities could effectively control the flow of waste across political boundaries. In order to internalize cash flows, the operators of the large private landfills began hauling waste generated from within the SPSA service area to their own landfills, sometimes as much as 100 miles away. Because the SPSA system was developed and sized to accept all of the region's waste, the loss of a significant portion of the waste stream has had a significant negative financial impact on SPSA and its member communities. The Use and Support Contracts which called for member communities to deliver all or substantially all of their solid waste to SPSA were effectively amended by this decision to include only that waste which is collected by the member communities or controlled by them through contracts. The SPSA system was built under the assumption that SPSA members could control the flow of both residential and commercial solid waste generated within their borders and that adequate waste flows would create sufficient revenues to finance construction and maintenance of the system. In 1994, the U.S. Supreme Court ruled (Carbone case) that flow control was unconstitutional. After this decision, SPSA's commercial waste flows significantly decreased. In an attempt to regain lost waste flows, SPSA negotiated contracts with private haulers, both in and outside of the Region, which included a reduced tipping fee.

In 2007, the Court clarified its decision (United Haulers case) to allow localities to direct waste to a publicly-owned facility. As a result, the cities of Norfolk, Chesapeake, Portsmouth, and Franklin, and Isle of Wight and Southampton counties passed ordinances requiring delivery of waste generated within their jurisdictions to SPSA facilities beginning in January 2009; however, the Cities of Virginia Beach and Suffolk did not. The decline in commercial waste deliveries, and the resulting negative revenue impact to SPSA led to a financial crisis culminating in the sale of the RDF WTE Facility to Wheelabrator in April 2010. This has significantly reduced SPSA's debt service, stabilized its financial condition, and reduced tipping fees.

2.4 SOLID WASTE TRANSFER

2.4.1 SPSA Transfer Stations

SPSA currently operates nine transfer stations that received 753,593 tons of waste in fiscal year 2010. Figure 8 shows the location of each facility. In fiscal year 2010, the Landstown Station accepted the greatest percentage of waste (see Figure 9) followed closely by the Norfolk Station. A summary of each transfer station throughput is provided in Table 12. A brief description of each transfer station is provided below:

- **Norfolk Transfer Station.** The Norfolk Transfer with a design capacity of 1,300 tons per day, is one of the two busiest stations in the solid waste system. The capability of loading three trailers at a time is incorporated into the facility design. The facility accepts waste Monday through Friday and a half-day (in the mornings) on Saturday. In addition, the City contracts with SPSA to keep the facility open in the afternoons (12:00 to 4:00) on Saturdays and Sundays to accept waste from Norfolk residents only. In fiscal year 2010, the station accepted approximately 210,000 tons of waste.

- **Landstown Transfer Station.** The Landstown Transfer Station is one of the largest facilities based on design capacity (1,300 tons per day) of the solid waste management system stations. The facility contains three hoppers for loading, similar to the Norfolk Transfer Station and operates 24 hours per day. In fiscal year 2010, the station accepted approximately 214,000 tons of waste.

- **Oceana Transfer Station.** The Oceana Transfer Station has one hopper for transfer trailer loading and is designed to receive 500 tons per day. In fiscal year 2010, the station accepted approximately 86,000 tons of waste.

- **Chesapeake Transfer Station**. The Chesapeake Transfer Station operates with one hopper for transfer trailer loading and has been designed to handle up to 500 tons per average day. In fiscal year 2010, the station accepted approximately 128,000 tons of waste.

- **The Franklin Transfer Station.** The Franklin Transfer Station is located approximately 2 miles west of Franklin and primarily serves the City of Franklin and portions of Southampton and Isle of Wight counties. The facility is designed to handle up to 150 tons per day and is operated by three personnel, including a full time driver to assist with drop and hook. In fiscal year 2010, the station accepted 21,393. tons of waste.

- **Isle of Wight Transfer Station.** The Isle of Wight Transfer Station uses a front-end loader to lift waste into transfer vehicles and is designed to manage 150 tons per day. In fiscal year 2010, the station accepted 27,161 tons of waste.

- **Suffolk Transfer Station.** The Suffolk Transfer Station is located at the Regional Landfill to allow diversion of waste from the Landfill to the RDF WTE Facility. Operation of the facility began in April 2005. In fiscal year 2010, the station accepted 67,457 tons of waste.

- **Ivor Transfer Station.** The Ivor Transfer Station is primarily used for self-hauled disposal and is designed to handle 50 tons per day. Southampton County collection vehicles are also permitted to use the facility. Waste quantities were not tracked separately in fiscal year 2010 but the station generally accepts less than 1,000 tons of waste per year.

- **Boykins Transfer Station.** The Boykins Transfer Station is similar to the Ivor facility. Its design capacity is 50 tons per day. Waste quantities were not tracked separately in fiscal year 2010 but the station generally accepts less than 1,000 tons of waste per year.

2.4.2 Private Transfer Stations

There are no known proposed or permitted privately owned transfer stations in the Region.

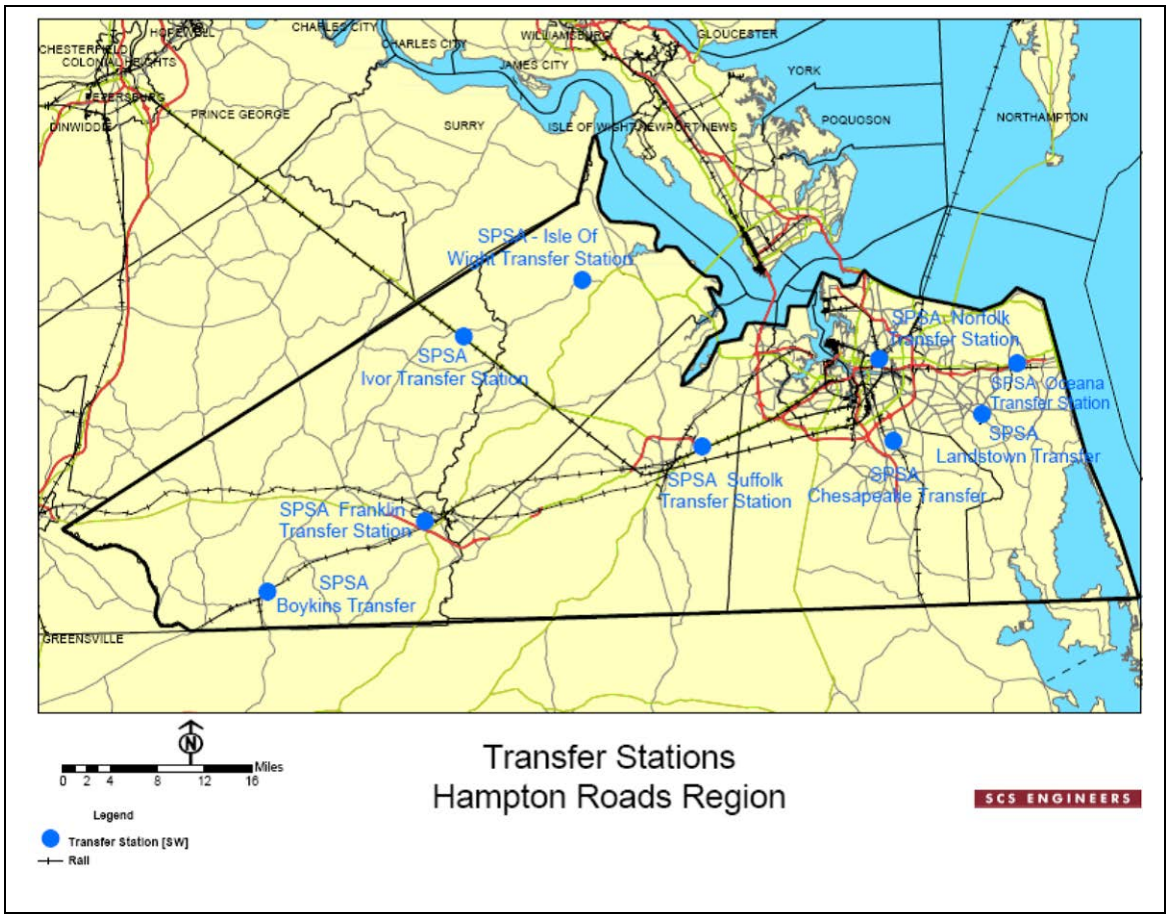


Figure 8. SPSA Transfer Station Location Map

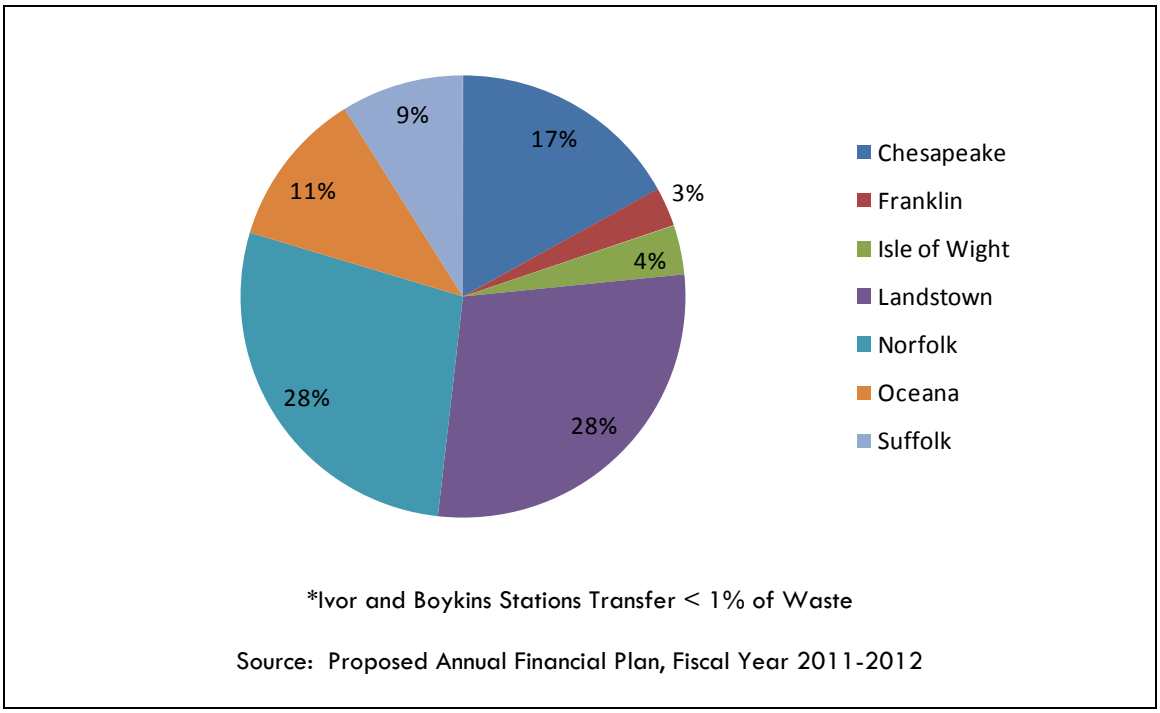


Figure 9. Relative Proportion of Waste Transferred – Fiscal Year 2010

Table 12. Transfer Station Solid Waste Totals

Transfer Station	Design Capacity (tons per day)	Tons Received				
		FY 06	FY 07	FY 08	FY 09	FY 10
Boykins	50	1,267	1,027	727	653	(1)
Chesapeake	500	164,815	159,165	158,209	148,159	127,883
Franklin	150	31,276	28,018	24,643	23,910	21,393
Isle of Wight	150	31,603	36,115	31,831	27,464	27,161
Ivor	50	1,618	1,278	702	698	(1)
Landstown	1,300	249,196	251,372	237,378	223,688	213,976
Norfolk	1,300	289,318	288,694	274,543	232,640	209,769
Oceana	500	127,525	120,213	106,401	96,622	85,954
Suffolk	500	55,715	65,289	68,780	70,385	67,457
Total		952,333	951,181	903,275	824,219	753,593

Source: SPSA Solid Waste Quantities Report – years FY06 to FY10
Proposed Annual Financial Plan, Fiscal Year 2011-2012
(1) Boykins and Ivor waste quantities not reported separately in FY 10

2.5 SOLID WASTE DISPOSAL

Described in the following section are the solid waste disposal assets located in the planning area including the SPSA Regional Landfill, the Virginia Beach Landfill No. 2, the Wheelabrator RDF WTE Facility, and other private disposal facilities.

2.5.1 Regional Facilities

2.5.1.1 RDF WTE Facility

2.5.1.1.1 Operations

The RDF WTE Facility, located in Portsmouth, Virginia opened in June 1987. The facility processes municipal and commercial solid waste into fuel, shredding the wastes and removing metals. The fuel is burned in lieu of coal at the adjacent Power Plant to produce steam and electricity.

Solid waste is delivered to the RDF WTE Facility and dumped onto the enclosed tipping floor, which is roughly four acres in size. Front-end loaders push the waste toward the initial conveyor belts, while pulling out non-processible materials such as mattresses, lumber, tires and other bulky items. Hazardous wastes are also pulled out of the waste to be processed. Those items that are not processed are sent to a landfill for recycling and/or landfilling.

The waste placed on the conveyors is taken through a series of shredders, trommels, and sorting machines. The waste is broken down into smaller pieces that pass through magnetic separators in order to remove ferrous metals. Stations are positioned along the conveyor for teams of pickers who pull out large sticks or other non-processible objects prior to the waste being transported to the Power Plant. The result is small particles of solid waste that are in a more acceptable fuel form. These are sent by conveyor to the adjacent Power Plant that fuels the Norfolk Naval Shipyard.

The RDF WTE Facility was designed to process 2,000 tons of waste per day, and originally projected to divert just over 450,000 tons of material per year from the Regional Landfill. During fiscal year 2010, 562,296 tons of waste was delivered by SPSA to the RDF WTE Facility in order to be processed into fuel for the Navy. Ferrous metals are removed from the combustor ash produced from the RDF WTE Facility. During fiscal year 2009, 124,431 tons of ash were disposed at the Regional Landfill.

2.5.1.1.2 Ownership and Contractual Arrangements

In late 2007, SPSA advertised that it would entertain proposals from qualified interested parties for the sale of the RDF WTE Facility. In April 2010, the facility was sold to Wheelabrator Technologies. Under the terms of the sale, Wheelabrator accepts and processes SPSA member community solid waste at the RDF WTE Facility until January 24, 2018; this term can be extended by SPSA for an additional ten years. As part of the sale agreement, SPSA must deliver 500,000 tons of waste and agrees to dispose of ash from the facility. SPSA pays Wheelabrator to process waste; in turn, Wheelabrator credits SPSA with:

- Ten percent of steam energy revenues.
- A hauling fee for transporting commercial waste from the transfer stations to the RDF WTE Facility.
- A loading fee for loading non-processible waste and diverted waste into trailers.

The non-processible waste, which historically has been disposed of in the SPSA Regional Landfill, is now being taken by Wheelabrator to landfills that are located outside of the SPSA service area (see Figure 10).

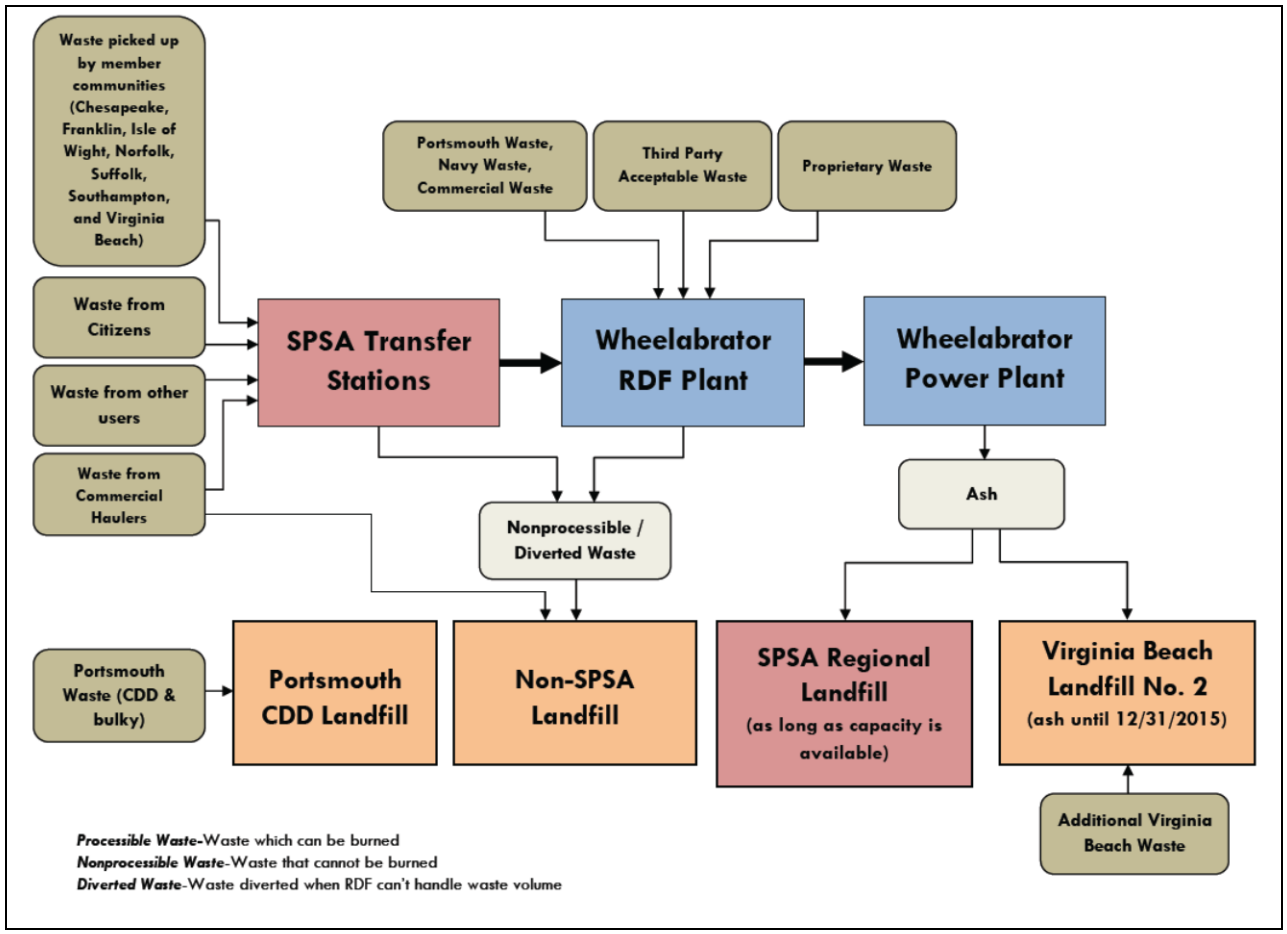


Figure 10. Flow of Municipal Solid Waste after RDF WTE Facilities Sale

2.5.1.2 Regional Landfill

The SPSA Regional Landfill is located on 833 acres within the City of Suffolk near the intersection of US Route 13/58/460 and the US Route 58/460 Bypass. SPSA began disposing of waste in the Landfill in January 1985. Of the 833 acres, 188 acres are currently permitted and constructed landfill area (Cells I through VI), and Cell VII has recently (June 2011) been

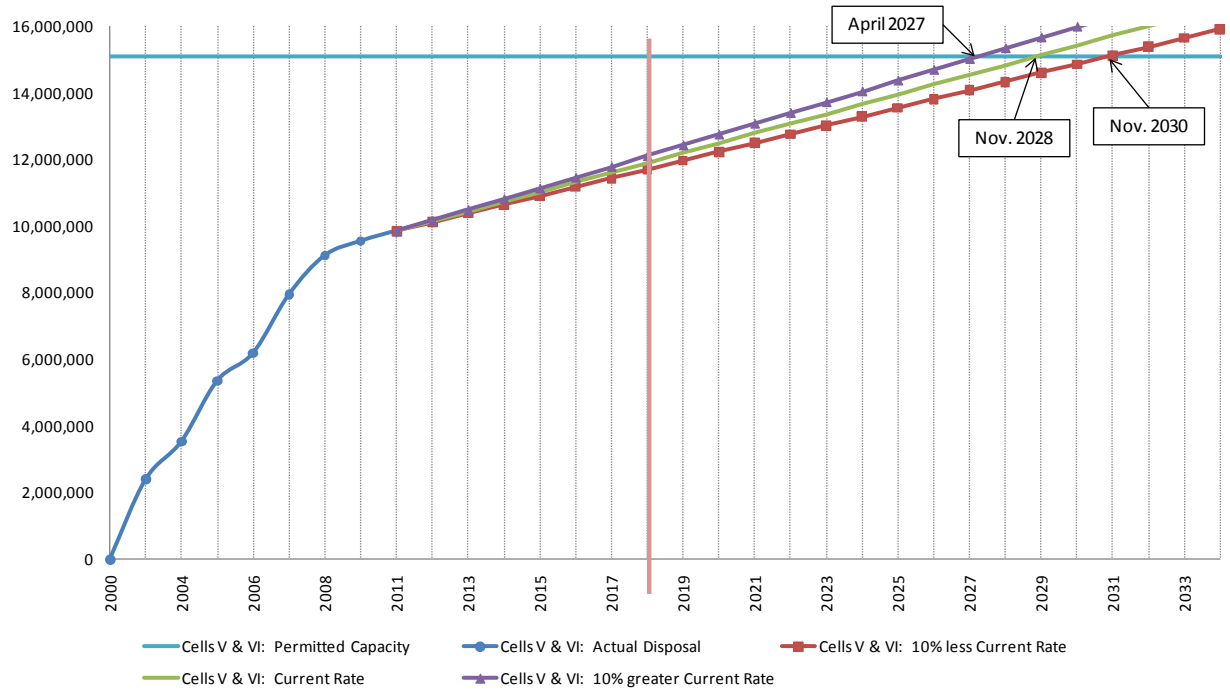
permitted. With the recent agreement between SPSA and Wheelabrator, the facility hours have been reduced to Tuesday through Friday; 7:00 a.m. to 4:00 p.m. The Landfill is closed Saturday through Monday, and on some holidays (on most non-Monday holidays it is open only in the morning). Residents and businesses can bring their non-hazardous and commercial waste, including CDD, bulky and approved industrial process to the Landfill during these hours.

The Landfill now receives waste primarily only from residents and businesses that bring their waste directly to the Landfill. Ash from the RDF WTE Facility ceased being placed in the Landfill in May 2010, although it is possible that ash will be disposed of in the Landfill from time to time. However, the facility may receive waste from SPSA members and/or Wheelabrator if the RDF WTE Facility cannot accept it due to equipment malfunction. The most recent Airspace Management Report (by HDR Engineers, January 2011) indicates that the facility is currently receiving an average of 772 tons per day. During the period from January to December 2010 approximately 241,000 were disposed in the Landfill. Leachate is pumped directly to the Hampton Roads Sanitation District for treatment.

The Landfill was originally designed to contain four disposal cells (Cells I through IV), which have recently undergone the closure process. The capacity of Cells I through IV is 12,200,000 cubic yards (9,400,000 tons). In 1998, Cell V opened and provided the Landfill with an additional 6,100,000 cubic yards (4,700,000 tons) of capacity, extending the life of the Landfill through 2005. With the addition of Cell V, a final height of 205 feet above mean sea level can be achieved. A sixth landfill cell (Cell VI) opened in May 2006. Located to the west of Cell V, Cell VI has a capacity of 8,900,000 cubic yards (6,800,000 tons).

The total permitted capacity (Cells I through VI) of the Regional Landfill is 27,200,000 cubic yards (20,900,000 tons) with approximately 5,400,000 cubic yards of capacity still remaining in Cells V and VI as of January 2011. With the decreased waste volume being disposed of in the Landfill the existing capacity is expected to be expended in November 2028 (Figure 11).

In November 2010, an agreement became effective between SPSA and Suffolk Energy Partners, LLC (SEP), that conveyed exclusive rights for all the landfill gas (LFG) at the Regional Landfill to SEP for capture and beneficial reuse. SEP had held the rights to the LFG under a previous agreement and owns and operates the LFG recovery system that consists of recovery wells and flare. In addition, SEP owns and operates an electrical power plant at the Landfill that generates electrical power for sale to Dominion Virginia Power. SEP is currently in the process of constructing a facility at the BASF Plant on Wilroy Road in Suffolk, approximately 2.3 miles from the Landfill, that will supply LFG to the Plant for direct use (via an existing pipeline constructed in 2001) in its manufacturing process. It is understood that under the new agreement, in return for giving up the rights to the LFG, SPSA receives 30 percent of revenues from sales of recovered gas and 20 percent of revenues received from sales of electricity generated from the recovered gas. SPSA estimates that in FY2012 revenues from this agreement will be approximately $550,000.



Source: HDR, 2010

Figure 11. Life of Site Estimate Through Cell VI – Suffolk Regional Landfill

2.5.1.3 Virginia Beach Landfill

The Virginia Beach Landfill No. 2 (also known as Mount Trashmore 2) is a 300-acre facility in the western portion of the City. The current landfill area footprint is 104 acres. Waste generated within the City by Virginia Beach residents can be delivered in privately owned vehicles to the Landfill free of charge.

Pursuant to the terms of the Ash Disposal Agreement between SPSA and the City, SPSA is required to pay the operating costs of the Landfill in return for the option to dispose of up to 300,000 tons per year of ash from the RDF WTE Facility. SPSA had not been exercising this option but started to dispose of at least a portion of the ash generated at the RDF WTE Facility in the Landfill starting in 2009, and since the sale of the RDF WTE Facility to Wheelabrator has been using the Virginia Beach Landfill No. 2 exclusively for the disposal of ash residue. The landfill is currently accepting ash from the RDF WTE Facility at a rate of approximately 200,000 tons per year.

2.5.1.3.1 Capacity

According to the Updated Topographic Survey and Capacity Evaluation for Landfill No. 2 (Malcolm Pirnie, July 2, 2007), the estimated remaining disposal capacity for currently permitted

areas (Phases 1, 2A and 4) of the Landfill was 4.13 million cubic yards (or approximately 2.7 million tons assuming a waste density of 1,300 pounds per cubic yard).

2.5.1.3.2 Estimated Site Life

The City has concluded that as currently permitted, Landfill No. 2 provides sufficient capacity to dispose of its own solid waste through 2022 (Malcolm Pirnie, 2007), assuming a waste escalation rate of 2 percent. This life of site estimate also assumes that Landfill No. 2 will accept all City of Virginia Beach MSW after its contract with SPSA expires in 2018, which may or may not be the case. The City currently is evaluating options for optimizing the utilization of the City's property for solid waste management and disposal, as well as other options for managing various elements of the City's solid waste stream.

2.5.1.3.3 Expansion Potential

The City has identified several expansion alternatives within its current property and onto adjacent properties not owned by the City which could provide up to 43.8 million cubic yards of disposal capacity (28.5 million tons at an effective density of 1,300 pounds per cubic yard). This additional disposal capacity could serve the City's disposal needs well beyond the 30-year planning horizon of this study.

The July 2, 2007 Malcolm Pirnie capacity evaluation also contained the estimated disposal capacity for currently unpermitted areas (Phases 2B and 3, site of the former SPSA compost facility). According to the report, this area could accommodate as much as 8.1 million cubic yards (equivalent to approximately 5.3 million tons) of waste. The facility's Borrow Area/Pond 2 located adjacent to and within the facility's north property boundary represents approximately 9 million cubic yards of airspace (equivalent to 5.9 million ton of capacity). However, if the areas stated were developed, it is estimated that the life of the landfill could be extended to 2035 (again, assuming a 2 percent waste escalation rate and that Landfill No. 2 will accept all City MSW after its contract with SPSA expires in 2018).

The evaluation states that all of the projected airspace/disposal capacity estimates are contingent on successfully permitting these areas and as such are speculative inasmuch as their utilization is dependent on regulatory approvals. The City estimates that they would need to invest between $50.3 to $74 million, which is equivalent to $8.5 to $13.3 per ton on a lifecycle basis, to purchase additional properties and implement "primary measures" to abate and/or mitigate potential nuisance impacts to achieve this expansion potential (Malcolm Pirnie, 2008). Secondary measures may also be considered to further mitigate nuisance impacts, with additional costs of $2.6 to $4.8 per ton. [Note: Current effective densities measured by the City of Virginia Beach have averaged 900 pounds per cubic yard, compared to the 1,300 pounds per cubic yard assumed herein for discussion purposes. There are reasons specific to the City's current operations that explain the relatively low in-place densities. Also, this in-place density differs from what SPSA's current operational in-place density of 1,540 pounds per cubic yard is).

Recent studies conducted by Malcolm Pirnie (Final Interim Report Preliminary Assessment of Urban Landfill Development, City of Virginia Beach Landfill No. 2, June 2008) state that "existing and projected future urban encroachment represents significant potential constraints

and limitations to facility development and operations." The study concluded that measures could be taken to effectively abate and/or mitigate potential nuisance impacts on surrounding land use.

2.5.1.4 Portsmouth CDD Landfill

The City of Portsmouth owns and operates a permitted (permit No. SWP041) construction, demolition, and debris (CDD) landfill. The Landfill is in the northern portion of the City and is known as the Craney Island Landfill. The facility accepts CDD generated within the City only. It is reported that the City currently disposes of approximately 50,000 tons of waste in the Landfill per year.

2.5.1.4.1 Capacity

The City reports that the Landfill had a remaining capacity of 3,250,000 cubic yards, or 878,000 tons as of 2008.

2.5.1.4.2 Estimated Site Life

As reported by the City, approximately 50 percent of the designed air space of the Landfill is available. The life expectancy of the facility is 40 years assuming the City's current rate of disposal.

2.5.1.4.3 Expansion Potential

The City has no plans at this time to expand the Landfill.

2.5.2 Private Landfill Capacity

There are several privately-owned disposal facilities that have the potential for accepting the Region's solid waste. All of these facilities are outside the Region. A large majority of the Region's waste that does not go to the RDF WTE Facility is currently being disposed in Waste Management's Bethel and Atlantic Waste Disposal Landfills.

2.5.2.1 Location and Status

Figure 12 shows the locations of most of the private disposal facilities with the approximate distance from the approximate center of the South Hampton Roads Region (intersection of I-264 and I-64).

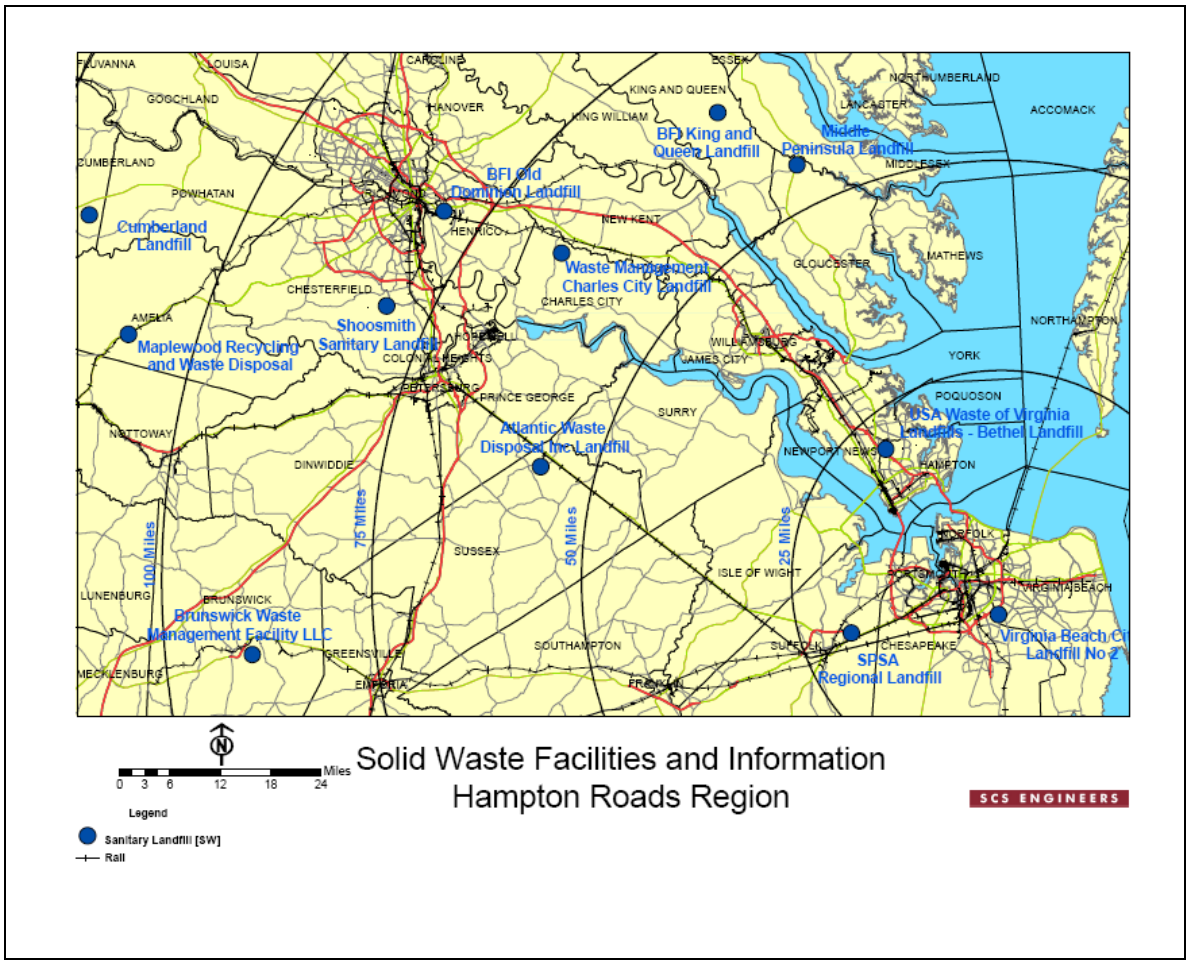


Figure 12. Private Landfill Facilities in Eastern Virginia

2.5.2.2 Capacity

As shown on Table 13, not all the private disposal facilities in eastern Virginia will have sufficient capacity needed to accommodate the Region's waste flow through the planning period. The facilities with the greatest long term (total projected) capacity are Cumberland, Middle Peninsula Landfill, Bethel Landfill, Maplewood and Atlantic Waste Disposal.

The table summarizes the reported estimated total remaining permitted capacity, remaining reported permitted life, total projected remaining capacity and total projected life of each facility as of the end of 2008. As indicated, the total remaining permitted capacity and life of each facility were obtained from VDEQ's published annual report on solid waste management in Virginia (for calendar year 2008). The data in VDEQ's report was provided by the facility owners. The total projected remaining capacity and life of each facility were provided directly to SCS from the facility owners (also 2008 data), and represents their estimate of the currently permitted and potential future capacity of their facilities. These numbers are highly dependent on state and local regulatory conditions at the time future expansion areas are permitted and constructed.

2.5.2.3 Haul Distance

Table 14 shows the hauling distance from each transfer station (and the RDF WTE Facility) in the SPSA network to each private waste disposal facility in eastern Virginia.

2.5.2.4 Rail Access

Several of the out-of-region landfills listed in Table 13 and Table 14 have rail access and transfer capabilities for servicing New York, Maryland, and other out-of-state communities (Atlantic Waste, King George, Brunswick).

2.5.3 Survey of Solid Waste Disposal Sites

The Virginia Regulations for Solid Waste Management require that all known solid waste disposal sites (closed, inactive, and active) in the planning region be documented and recorded. The methodology used to develop this inventory is included in the appendices.

Table 13. Out of Region Landfill Facilities

Landfill	Total Remaining Permitted Capacity* (Tons)	Waste Disposed* (Tons)	Remaining Reported Permitted Life* (Years)	Total Projected Remaining Capacity** (Tons)	Total Projected Life** (Years)
Atlantic Waste Disposal - Sussex Co. (Waste Management)	43,180,136	1,674,843	37	66,440,000	50
BFI King and Queen Landfill (Republic)	10,750,000	961,046	21.9	same	same
BFI Old Dominion Landfill (Republic)	2,900,000	562,344	11.5	7,500,000	same
Brunswick Waste Management Facility	10,675,000	628,652	27	75,000,000	50
King George Sanitary Landfill (Waste Management)	12,080,939	1,015,190	17.4	23,900,000	20
Maplewood Recycling and Disposal (Waste Management)	18,107,639	364,194	75	32,600,000	81
Middle Peninsula (Waste Management)	18,129,052	480,504	90	18,800,000	same
Bethel Landfill (Waste Management)	24,549,224	492,012	106	44,000,000	same
Charles City Landfill (Waste Management)	14,751,460	404,220	30.1	40,700,000	85
Cumberland (Republic)	NA	NA	NA	80,000,000	30
Shoosmith Sanitary Landfill	4,000,000	825,393	9	NA	NA

* From Solid Waste Managed in Virginia During Calendar Year 2009 (VDEQ, June 2010).
**From facility owners when asked in 2008.
NA - Information not available or not applicable.

Table 14. Potential Out-of-Region Long Haul Transportation Distance (From Current SPSA Transfer Stations)

Transfer Station	Distance, Miles (One Way)											
	SPSA Regional Landfill	ATL Waste Disposal, Sussex County	WM Charles City County Landfill	Cumberland Landfill	WM Maplewood Landfill	WM Middle Peninsula Landfill	WM King George Landfill	BFI King & Queen Landfill	BFI Old Dominion Landfill	Brunswick Waste Management Facility	WM Bethel Landfill	Shoesmith Sanitary Landfill
Landstown	27	73	89	155	139	70	144	82	99	107	34	104
Oceanna	29	68	89	143	137	70	144	82	100	109	28	106
Norfolk	17	63	78	145	129	59	133	71	88	98	23	94
Franklin	30	42	72	118	104	96	146	109	77	53	60	67
Isle of Wight	25	34	64	116	101	58	140	71	72	76	23	65
Suffolk	0	46	85	128	117	65	152	78	95	81	29	77
Boykins	44	45	76	120	107	109	153	117	83	52	73	71
Ivor	25	21	52	102	89	72	127	85	60	64	36	53
Chesapeake	20	65	88	148	132	68	142	81	98	100	32	97
RDF Transfer - Portsmouth	13	59	87	141	125	68	142	80	98	94	31	90

3.0 SPECIAL WASTE

This section includes discussions of various waste types generated in the region that are categorized, processed, handled, or otherwise addressed separately or differently than the wastes that are addressed in the other sections of this plan. The following information describes in more detail the most prevalent types of special wastes handled throughout the region.

3.1.1 Household Hazardous Waste

Household cleaners, pesticides and fertilizers, fuels, paints, batteries, and pool chemicals that would otherwise go into the Regional Landfill are diverted from the waste stream through the SPSA Household Hazardous Waste (HHW) collection program. SPSA operates five HHW collection facilities. Virginia Beach has assumed responsibility for the HHW facility operation at the City's Landfill No. 2. The City of Norfolk also operates a household hazardous waste facility; but has temporarily suspended its collection of household hazardous waste, pending site improvements. Table 15 provides a breakdown of the materials collected at the SPSA facilities in fiscal years 2009 and 2010.

Table 15. Household Hazardous Waste Disposal Quantities

Waste Profile	Units	Quantity	
		FY 2009	FY 2010
Paint Related Materials	Gallons	5,856	1,540
High Btu (Waste fuel/solvents)	Gallons	2,790	1,540
Low Btu (Waste oil/oily water)	Gallons	619	1,485
Detergents/Cleaners	Gallons	804	1,045
Pesticide Liquids	Gallons	1,221	6,960
Inorganic Acids	Gallons	872	990
Base Liquids	Gallons	142	1,056
Oxidizers	Gallons	1,385	NR
Antifreeze	Gallons	2,905	1,433
Wet Cell Batteries	Each	2,776	950
Propane Cylinders	Each	3,315	3,574
Pesticide Solids	Pounds	9,700	4,505
Base Solids	Pounds	245	880
Dry Cell Batteries	Pounds	11,920	12,600
Aerosol Cans	Pounds	5,925	855
Mercury	Pounds	NR	825
Reactive (Calcium Carbide)	Pounds	NR	5

NR – Not reported
Sources:
SPSA Solid Waste Quantities Report, 2009
SPSA Proposed Annual Financial Plan

3.1.2 Medical Waste

Virginia's medical waste management regulations have established standards for the storage, transportation and treatment of medical waste. Regulated medical waste may be stored, steam sterilized, incinerated or treated by an acceptable alternative mechanism in a permitted facility. The private sector is the primary supplier of Regulated Medical Waste (RMW) collection, treatment and disposal in the Region. There are three active RMW stream sterilizers in the Region. Permitted facilities (two units) are operated by ODU (Norfolk) and one facility is operated by the Norfolk Public Health – Laboratories Bureau (Norfolk). There are currently no permitted RMW incinerators or transfer stations in the Region. Table 16 lists the active and proposed RMW facilities in the Tidewater Region from the February 2011 VDEQ database.

The purpose of medical waste regulations is to establish standards and procedures in order to protect public health and safety, and to protect the environment and natural resources. Under current permitting requirements, those facilities that handle and process wastes on site, (such as hospitals and college labs) and do not accept wastes from other institutions or businesses, are not required to obtain a permit or report quantities. They are however, required to maintain proper handling procedures and standards for the protection of public safety and health, and the environment.

Table 16. Regulated Medical Waste Facilities in the Tidewater Region

Facility Name	Location	Type	Operator
American Transportation Systems Transfer Station (proposed)	Suffolk	RMW Transfer Facility	American Transportation Systems, LLC
Norfolk Public Health Laboratories Bureau	Norfolk	Steam Sterilizer	Norfolk Health Department
Old Dominion University	Norfolk	Steam Sterilizer (Unit 1)	ODU
Old Dominion University	Norfolk	Steam Sterilizer (Unit 2)	ODU
American Environmental Group	Suffolk	Storage Facility	AEG

3.1.3 Construction and Demolition Debris

CDD consists of waste generated during construction, renovation, and demolition projects. The often bulky, heavy materials that make up CDD include wood, concrete, steel, brick, asphalt, gypsum, and plastic. CDD also includes salvaged building components such as doors, windows, and plumbing fixtures. Every time a building, road, or bridge is constructed, remodeled, or demolished, these materials are generated.

In addition, large volumes of CDD waste materials are generated during major storm events such as tropical storms and hurricanes. Historically, the region has experienced such storm events and

has been forced to manage the resulting debris. The Region must plan and prepare for the management of large influxes of CDD in addition to the volumes of CDD waste that are generated as a result of normal construction and demolition activities within the area.

In 2003, EPA estimated that the per capita generation of building-related CDD materials was 3.2 pounds per person per day. This estimate was based on a series of calculations to estimate residential construction debris nonresidential construction debris, residential demolition debris, nonresidential demolition debris, and renovation/remodeling debris. EPA further estimated that 52 percent of CDD is disposed (i.e., 48 percent is recovered). In 1996, this per capita rate was estimated to be 2.8 pounds per person per day.

While not every person generates CDD materials personally, population growth increases the need for buildings and infrastructure to support that growth. Since little recovery of CDD appears to occur in the region and construction activity has declined, an average CDD disposal rate was used based on disposal studies conducted in California; Wisconsin; and King County, Washington. Forecasts of CDD disposal are provided in Figure 13, using a disposal average of 2.1 tons/person/year (1.16 pounds/person/day).

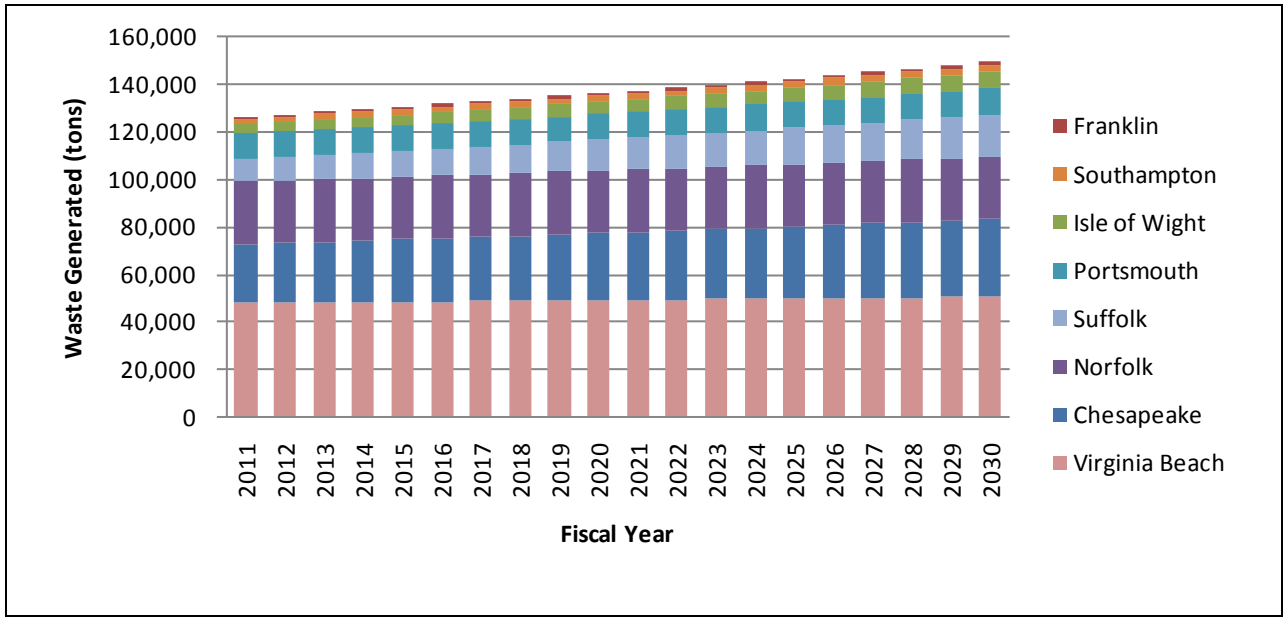


Figure 13. Estimated CDD Generation for the Region

The majority of CDD handled and disposed of in the Region is collected by the private sector. The active permitted private CDD only disposal facilities in the South Hampton Roads Region are shown in Table 17.

There are two active CDD-only disposal facilities in the Region with capacity that extend well into the current study planning period (through 2047). The City of Portsmouth's landfill is intended for disposal of city produced CDD material only. The Centerville Turnpike CDD Landfill has a reported capacity of 5,400,000 tons (as of July 2015) with 13 years of life (VDEQ, June 2015) and is anticipated to be the only active CDD only disposal facility for the foreseeable future in the Region. The Higgerson-Buchanan Landfill has very little permitted capacity

remaining and it is reported that the facility has at least temporarily stopped accepting waste. Although, it is possible that an expansion may be permitted and constructed in the near future.

The Elbow Road CDD landfill on Centerville Turnpike in Chesapeake has a permitted expansion, although there are no plans to construct the expansion area, according to the site owner (personnel communication with facility owner, Warren Thrasher). The expansion has a reported capacity of approximately 1.6 million cubic yards with an estimated life of 13 years (assuming a waste disposal rate of 125,000 cubic yards per year). The expansion area would cover a total area of 20.7 acres (15.3 acres plus 5.3 acres of piggback).

Table 17. Active CDD and Industrial Landfills In Region

Landfill	Facility Type	Total Remaining Permitted Capacity (Tons)	Waste Disposed (Tons)	Remaining Reported Permitted Life (Years)
City of Portsmouth Craney Island Landfill	CDD	800,201*	53,244*	17*
Higgerson Buchanan Landfill	CDD	32,705*	42,125*	1*
Centerville Turnpike CDD Landfill	CDD	5,400,000***	39,290*	13*
John C. Holland Enterprises Landfill (JCHEI)	Industrial	3,964,000**	5,573,000**	31**

*From Solid Waste Managed in Virginia During Calendar Year 2009 (VDEQ June 2010)
**Correspondence from JCHEI to HRPDC dated September 5, 2011
***Correspondence Submitted to HRPDC dated June 12, 2015

Landfills that are permitted for other types of waste (either MSW or Industrial) may also accept CDD, although a CDD only disposal facility would most likely have a lower tipping fee, and therefore disposal of CDD in a MSW or Industrial landfill may not be considered cost effective since CDD waste would be replacing MSW or Industrial waste air space. Non-CDD only permitted landfills that may accept CDD waste include the SPSA Regional Landfill (MSW) as noted above, the City of Virginia Beach Landfill No. 2 (MSW) and the Holland Landfill (Industrial). According to the VDEQ (Solid Waste Managed in Virginia During Calendar Year 2009), the Holland Landfill has over 12 million tons of capacity with an reported remaining life of more than 50 years, which extends through the study planning period.

Active and permitted Material Recovery Facilities (MRFs) that recycle and otherwise handle CDD in the Region are; Waste Industries on Cook Blvd. in Chesapeake, Bay Disposal on East Indian River Road in Norfolk, Waterway Marine Terminal on Precon Drive in Chesapeake, United Disposal on Wellman Street in Norfolk and Meeks Disposal Corporation on Cavalier Boulevard in Chesapeake.

According to VDEQ records, Waterways Recycling processes approximately 50,000 tons of CDD material annually (calendar year 2007 data), at least some of it from out of the Region. According to the facility manager, the facility has the capacity to handle up to 700,000 tons annually, with a recycling rate of 92 percent. The remaining 8 percent of the material is disposed of most likely in the Centerville Turnpike CDD Landfill.

The International Paper – Franklin Mill Industrial Waste Landfill was previously considered a "captive" industrial landfill. As the Franklin Mill has been repurposed, separate corporations will be operating facilities within the Mill. International Paper intends for businesses operation on the Mill site and generating similar wastes to dispose of that waste in the International Paper Industrial Waste Landfill. There is no intent to accept wastes from other locations and activities.

"East Coast Gutterman, LLc proposes to operate a material recovery facility for CDD in Chesapeake. This facility will have an initial design capacity of 200 tons/day." The facility will accept, sort, and process construction and demolition debris (CDD) waste consisting primarily of steel, wood, shingles, sheetrock, concrete, and the like for recycling. The facility will include a concrete crushing operation. Recycled concrete and brick will be temporarily stockpiled on-site. Residual waste from the processing operation will be transferred from the facility to a permitted landfill or transfer station. The design capacity of the facility is 200 tons per day.

Bay Disposal, Inc. proposes to operate a material recovery facility in the Town of Smithfield, VA. The facility will accept, sort, and process municipal solid waste (MSW), construction and demolition debris (CDD), and recyclables. The design capacity of the facility is 400 tons per day.

RePower South Chesapeake LLC proposes to operate a material recovery facility in the City of Chesapeake, VA. The Facility will accept MSW; source separated, and single stream recyclable materials. Incoming MSW and single stream recyclables will be separated into marketable recyclable, nonhazardous secondary material bio-fuel feedstock, and residual waste through the use of a Multi-Material Processing Platform (MMPP). The facility will accept and process not less than 350,000 tons of solid waste per Fiscal Year with the availability to increase the amount processed to 400,000 tons of Solid Waste per fiscal year.

3.1.4 Industrial Sludge

Industrial Sludge is generated by a variety of businesses and industries in south Hampton Roads. The following major producers have, in the past, reported the volumes of sludge produced and the disposal methods.

- Smithfield Foods reported that it produced 62 wet tons of wet solids per day, 4 to 5 days per week. The waste was reportedly sent to the BFI landfill in Lawrenceville.
- City of Norfolk Moore's Bridges Water Treatment Plant generated 1,100 tons per month of sludge from the water treatment process which is disposed of in the SPSA Regional Landfill.
- City of Norfolk 37th Street Water Treatment Plant sludge was piped directly to the solids handling section at HRSD's VIP wastewater treatment plant behind ODU.

SCS has not obtained information on current total industrial sludge volumes or disposal methods. SPSA received 5,890 tons of sludge from Norfolk in FY10 (from SPSA records). Several private companies in southeastern Virginia collect, handle, and dispose of industrial sludge. These companies include Clean Harbors, IMS, PetroChem and Marpol. Little information is available on the volumes of sludge handled. Clean Harbors has estimated in the past that they handled approximately 50 tons of sludge per month that is disposed of locally through incineration at the RDF WTE Facility. An additional unknown volume is disposed of at facilities outside of Hampton Roads.

3.1.5 Agricultural Waste

Agricultural wastes are by-products of farming and ranching that include crop harvesting waste and manure. According to the 2007 Census of Agriculture, the number of farms in the region is decreasing:

- **Chesapeake.** Land in farms is down 16 percent from 2002 (61,087 acres to 51,124 acres). Of the acreage in farms, 85 percent is cropland.
- **Isle of Wight.** Acreage of farms is down 15 percent from 2002 to 2007 (86,521 acres to 73,461 acres). Approximately 70 percent is cropland and 23 percent is woodland.
- **Southampton.** Approximately 168,700 acres of farmland existed in 2002. This decreased to approximately 161,650 acres in 2007 (a 4 percent decrease). Of the remaining farmland, 56 percent is cropland and 36 percent in woodland.
- **Suffolk.** Since 2002, both the number of farms and acreage in farmland increased 26 percent and 1 percent, respectively. The amount of land in farms in 2007 was approximately 71,400 acres. Of this, 75 percent was cropland and 16 percent was woodland.
- **Virginia Beach.** The amount of land in farms has decreased 6 percent (28,380 acres in 2002 to 26,670 acres in 2007). Of this acreage, 81 percent is cropland.

A rural waste characterization study conducted for Washington State Department of Ecology attempted to quantify and characterize the types of waste disposed, recycled, or reused for four agricultural groups (field crops, orchards, vegetables, and livestock). The study found that less than 1% of the waste generated by these agricultural groups was landfilled. The primary means of handling waste generated by agriculture was through beneficial use, such as replenishment of soil nutrients.

4.0 WASTE MANAGEMENT SUMMARY

During fiscal year 2009, SPSA facilities handled over 1.2 million tons of solid waste, including recyclables. This section provides a summary of the waste management system that was in place prior to the sale of the RDF WTE Facility and that has been discussed in previous sections. This section also presents an overview of the future solid waste management system.

4.1 RECYCLABLES

Norfolk is the only locality in the Region that conducts curbside recycling itself. The other communities that SPSA has served with recycling since 1988 - Virginia Beach, Chesapeake, Portsmouth, Suffolk, Franklin, Isle of Wight County and Southampton County - have all contracted with private firms or are negotiating private contracts for curbside and/or drop-off facility services.

Other public and private programs exist within the region for the recycling of non-curbside collected materials: used oil, batteries, appliances, electronics, and tires.

4.2 YARD WASTE

Yard waste in the region is managed through a variety of mechanisms:

- Some residents recycle yard debris in their own yards (grasscycling and/or composting)
- Several municipalities collect grass, clippings, and leaves at the curb. Collected material is either sent for composting at a private facility or disposal within the SPSA system.

However, no Regionally-owned composting option is available.

4.3 MUNICIPAL SOLID WASTE

Due to the transfer of the RDF WTE Facility to Wheelabrator, the flow of waste in the system has changed since the last solid waste management plan was written. Overviews of municipal solid waste flows both prior to and after the sale are provided in Figure 14 and Figure 15.

4.4 CONSTRUCTION AND DEMOLITION DEBRIS (CDD)

Currently, most CDD generated in the Region is sent directly to CDD landfills, both in and outside the Region. The private CDD landfills accept material from a wide area, including out-of-state sources. Privately owned collection firms operating in the Region provide CDD collection services. Construction firms are responsible for procuring CDD collection containers (e.g., dumpsters) and services at their building sites. Most companies collect CDD from the construction sites for transport directly to a CDD disposal facility. CDD generated by the City of Portsmouth is sent to the Portsmouth Landfill (Craney Island) for disposal.

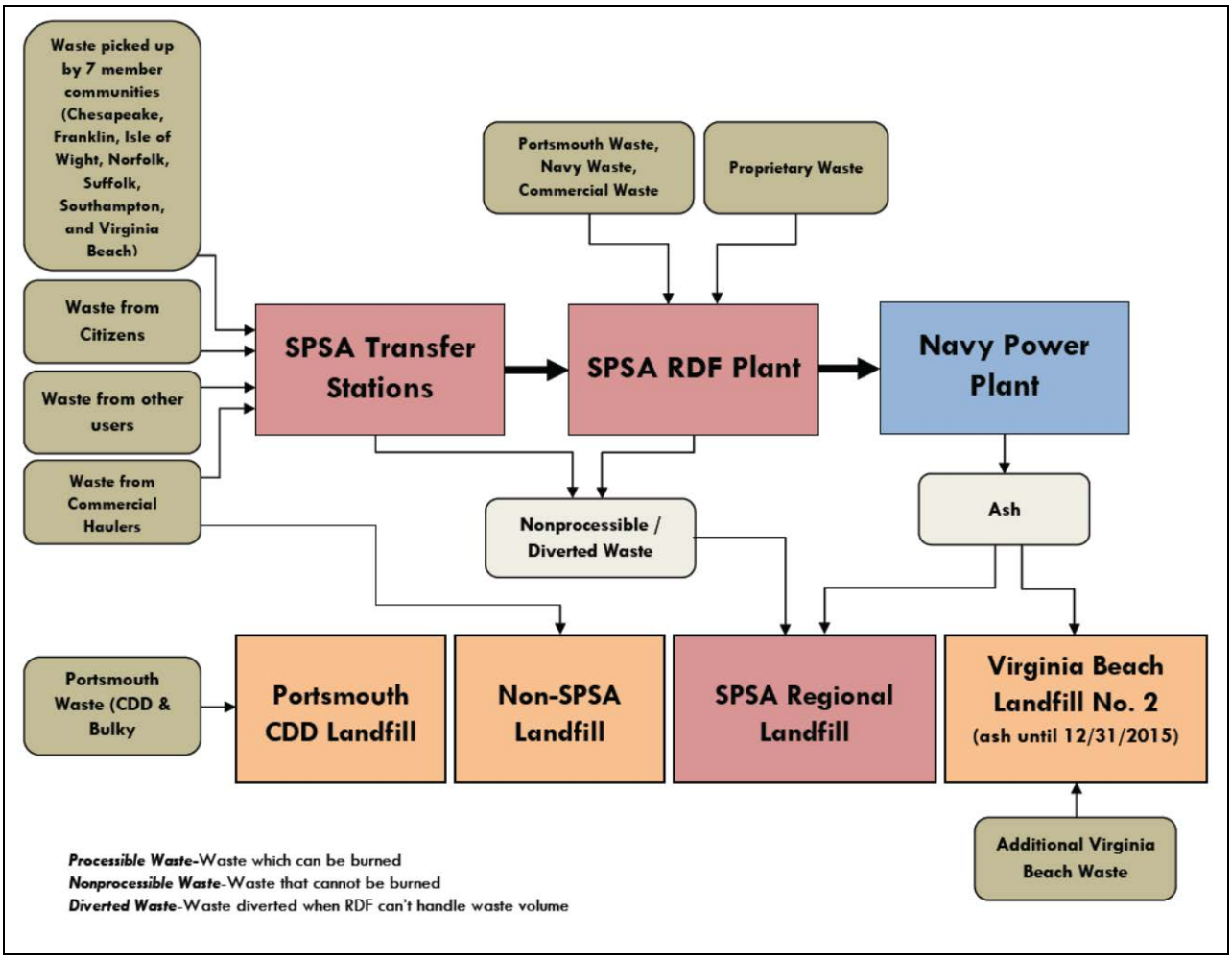


Figure 14. Flow of Municipal Solid Waste in the Region prior to 2010

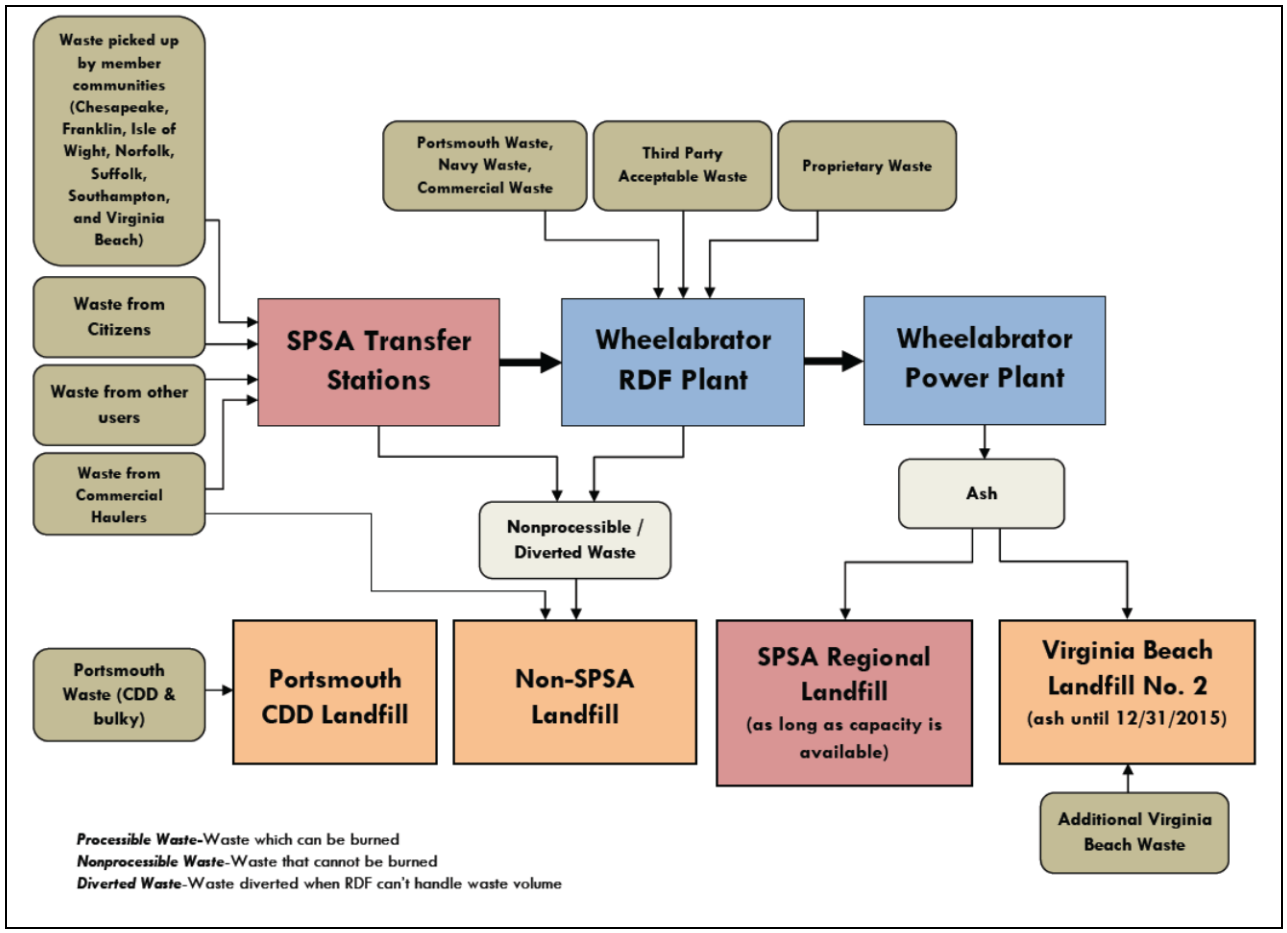


Figure 15. Flow of Municipal Solid Waste in the Region after 2010

5.0 FUTURE MUNICIPAL SOLID WASTE MANAGEMENT NEEDS

5.1 INTRODUCTION

While the Region has programs in place and facilities are available for management of the current waste stream, the quantity of waste generated in the Region will change with time. This means that the Region's programs will be required to change in response. To provide the Region with an understanding of these projected changes, it was necessary to document current waste generation and project future waste generation.

5.2 RESIDENTIAL MUNICIPAL SOLID WASTE

The 2005 Regional Solid Waste Management Plan estimated solid waste generation in the Region ranged from 1.09 tons/person/year (for SPSA disposed waste) to 1.68 tons/person/year for "Total Waste," (i.e., waste disposed at both SPSA and private facilities). It was further assumed that the waste generation rates would remain constant during the planning period. HRPDC has re-evaluated waste generation within the Region and has developed a new waste generation rate based on 2009 data. For the purposes of this analysis, residential waste generation is defined as the sum of tons of solid waste disposed and recycled either through SPSA or municipal programs.

Waste disposal tonnages for the SPSA Regional Landfill, the Virginia Beach Landfill No. 2, and the City of Portsmouth construction, and demolition debris (CDD) Landfill are provided in Figure 16 for the years 2005 through 2009. Similarly, recycling quantities for both SPSA operated programs and City of Virginia Beach programs are provided in Figure 17 for the years 2005 through 2009. The combined disposal and recycling tonnages are provided in Figure 18, which represents waste generation for the SPSA service area. The tonnages represented in the figures do not include waste or recyclables that are generated within the SPSA service area, but disposed or otherwise managed by the private sector outside of the Region.

Waste generation rates were then developed by dividing the total waste generated (Figure 3) with population estimates for the SPSA member communities (see Table 2). The resultant waste generation rates are provided in Table 18. The waste generation rate calculated for 2009 is higher than the rate used to estimate waste generation in the 2005 RSWMP.

The 2009 estimated waste generation rate was combined with population projections for the Region to provide an estimate of waste generation for the 20-year planning period. By the end of the planning period, the SPSA Region will generate nearly 1.6 million tons of municipal solid waste:

- 2011: 1,345,700 tons
- 2020: 1,457,400 tons
- 2030: 1,592,500 tons

Waste generation estimates are presented graphically in Figure 19.

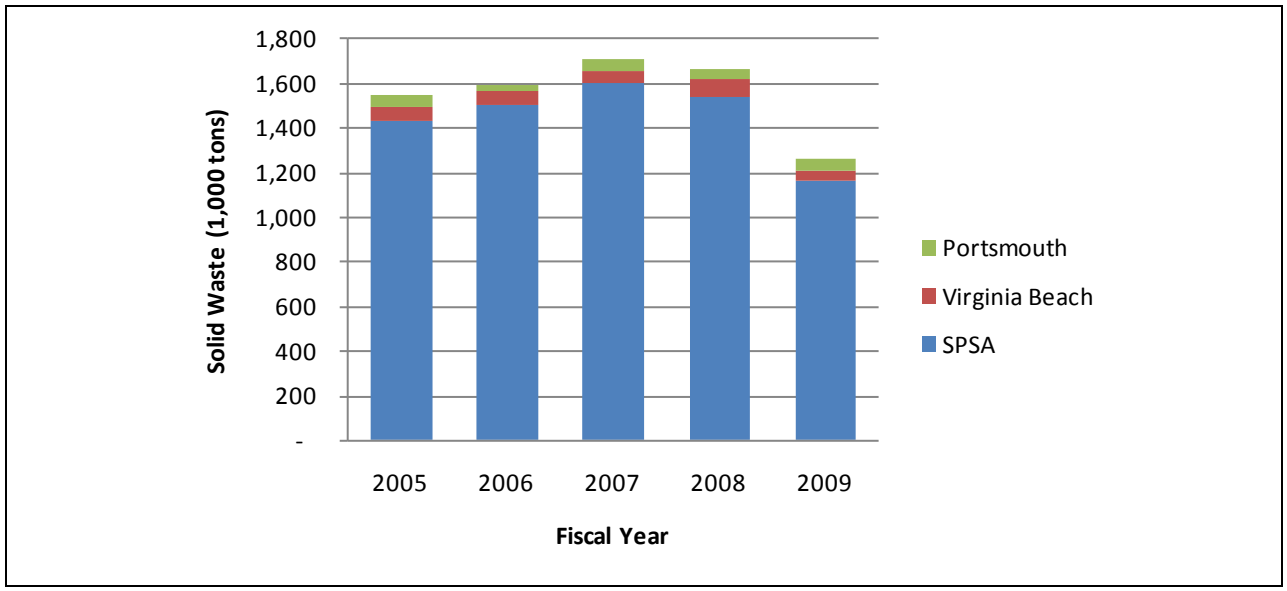


Figure 16. Solid Waste Disposal in the SPSA Region (SPSA and Municipal Facilities)

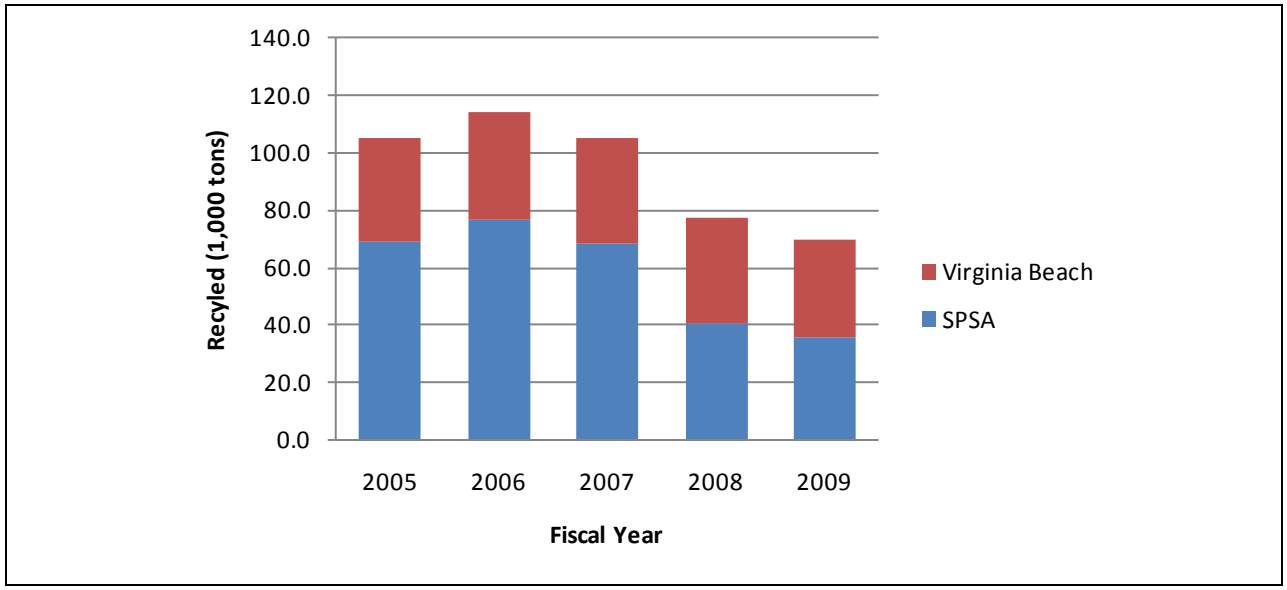


Figure 17. Tons Recycled Through SPSA and Municipal Programs

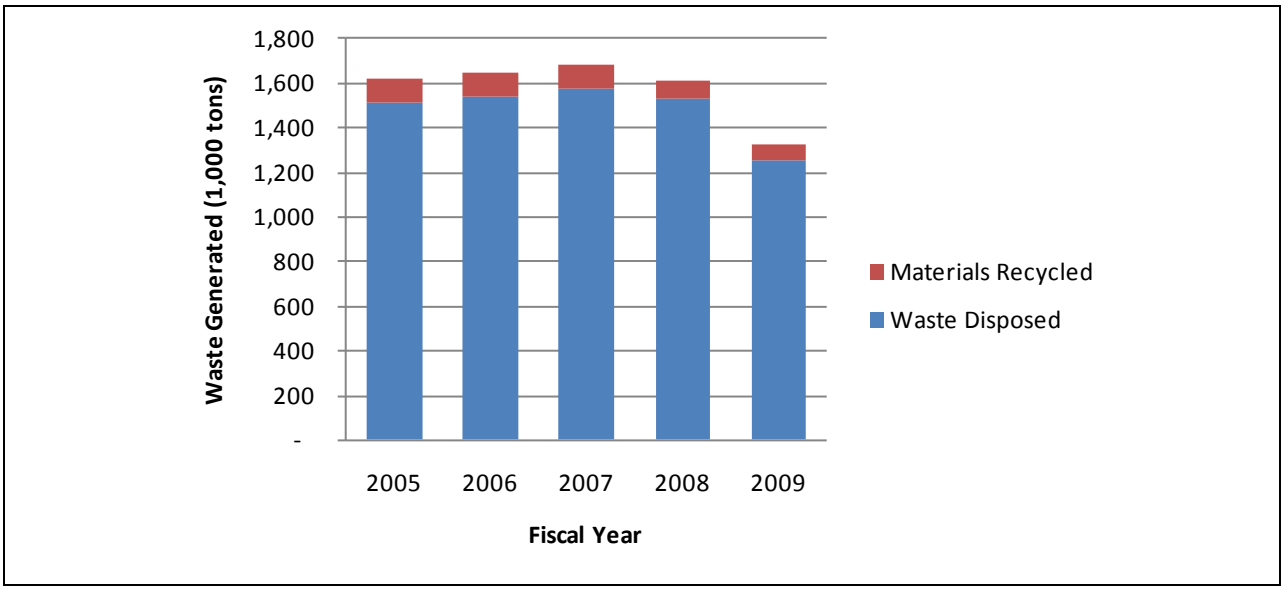


Figure 18. MSW Generated in the SPSA Region

Table 18. Municipal Solid Waste Generation Rates

Fiscal Year	Waste Generated * (1,000 tons)	Estimated Population	Waste Generation Rate (tons/person/year)
2005	1,616	1,118,541	1.44
2006	1,651	1,118,854	1.48
2007	1,682	1,122,728	1.50
2008	1,609	1,124,599	1.43
2009	1,322	1,135,224	1.16

* Includes waste disposed and materials recycled

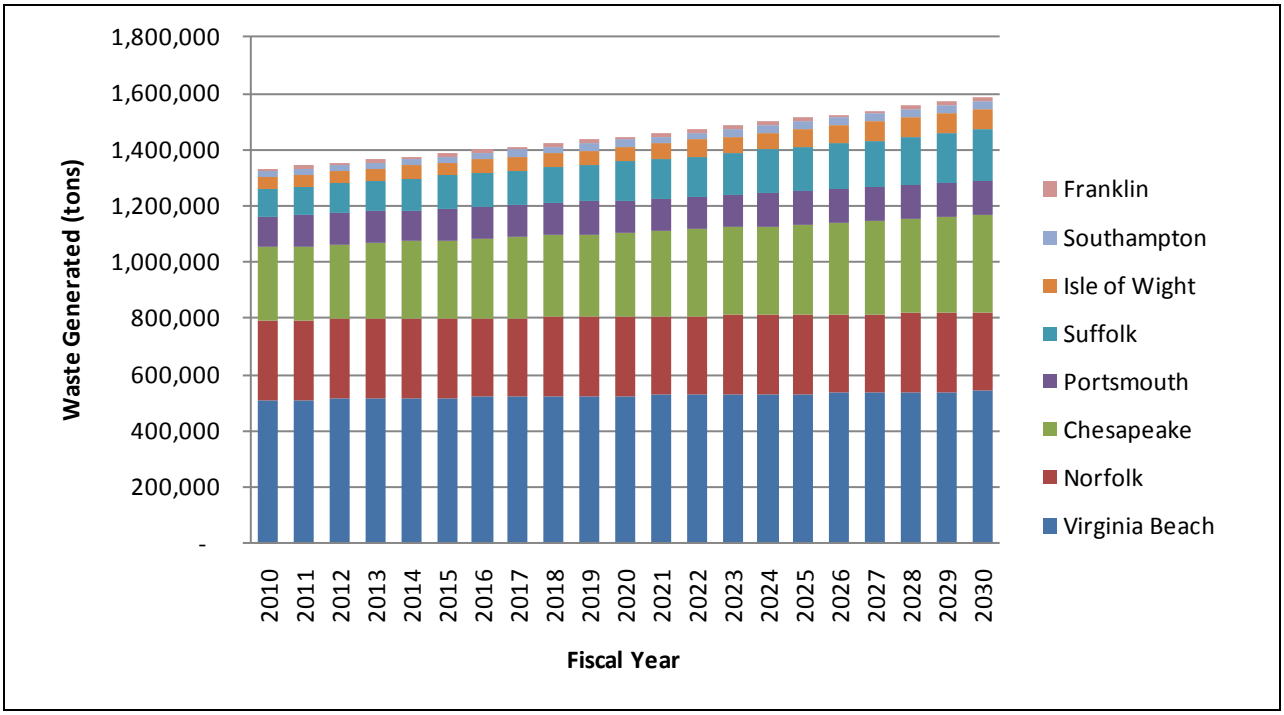


Figure 19. Estimated Residential Waste Generation

5.3 COMMERCIAL SOLID WASTE

Commercial solid waste is managed by private industry waste haulers and recycling organizations. SCS has attempted to obtain actual waste collection data from these organizations and VDEQ but has determined that this information is not available. Therefore, the development of the commercial waste disposal estimates for the Region is based on a number of other factors.

It is important to note that commercial waste is waste derived from businesses, shopping centers, government buildings, schools, colleges, hospitals, retirement homes, other institutions, restaurants, office buildings, and a variety of other sources. Commercial waste also includes multi-family waste because it is generally collected by the commercial rather than the municipal sector.

5.3.1 Business-Generated Waste

As part of a waste characterization study conducted in 1999, the State of California developed waste disposal rates for 39 business categories. The premise behind the study was that each business type has its own disposal rate—restaurants dispose different amounts of waste than offices for example. The study also assumes that the larger the business (i.e., the more employees), the more waste that is disposed. Therefore, each business of a certain type (e.g., restaurants) dispose of similar wastes at similar rates (per employee), regardless of the location of the business.

Table 19 contains the waste disposal rates for several business types based on North American Industry Classification System (NAICS) classification. While the California study developed

waste disposal rates for several different types of manufacturers or NAICS subgroups (e.g., food/kindred, apparel/textile, furniture/fixtures) employment data were not available for each subgroup, so an average waste disposal rate was used for manufacturing and retail establishments. The waste disposal rates were combined with employment data obtained from the Virginia Employment Commission for the associated NAICS groups. Each jurisdiction's employment data and waste disposal data are provided in Table 19.

In total, the Region's businesses dispose of an estimated 583,600 tons of waste annually. When combined with reported recycling for the commercial sector (396,900 tons recycled in 2009 minus 35,500 tons recycled through SPSA/municipal programs), estimated business waste generation is estimated at 945,000 tons annually or 1.96 tons/employee (assuming approximately 483,000 employees) using Virginia Employment Commission 2010 employment estimates.

Using HRPDC employment estimate, along with 1.96 tons per employee, results in an estimated 1.4 million tons of business waste generated annually.

5.3.2 Multi-Family Waste

As discussed earlier, the member jurisdictions collect solid waste from single-family residences; commercial haulers collect from multi-family residences. The quantity of multi-family waste was estimated based on the number of multi-family units. This information was obtained from the U.S. Census Bureau and is provided in Table 20. This table also presents the quantity of waste generated by multi-family units within the Region. The multi-family waste generation rate of 0.71 tons/unit/year was based on generation rates used by other jurisdictions.

In total, multi-family units generated an estimated 55,700 tons annually.

5.3.3 Total Commercial Waste

The Region's businesses and multi-family residences generate an estimated 639,300 tons of waste annually. In 2009, commercial haulers delivered 560,530 tons of waste to the SPSA system. Therefore, an estimated 78,790 tons of commercial waste is disposed outside of the SPSA service area.

Projections of commercial solid waste collected for disposal, recovered through recycling, and generation were estimated through the year 2030 using employment projections provided in Table 3 and household projections provided in Table 4. It was assumed that the per employee waste generation rate, the current ratio of housing types, and multi-family waste generation rates would remain the same. Projections are displayed graphically below in Figure 20 and Figure 21.

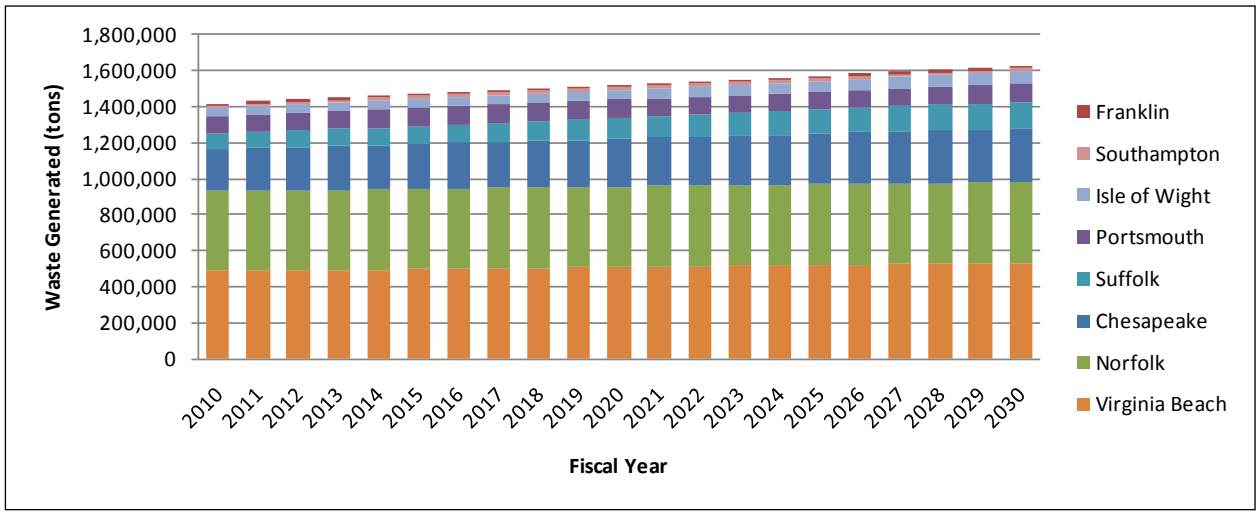


Figure 20. Estimated Employment-Based Business Waste Generation

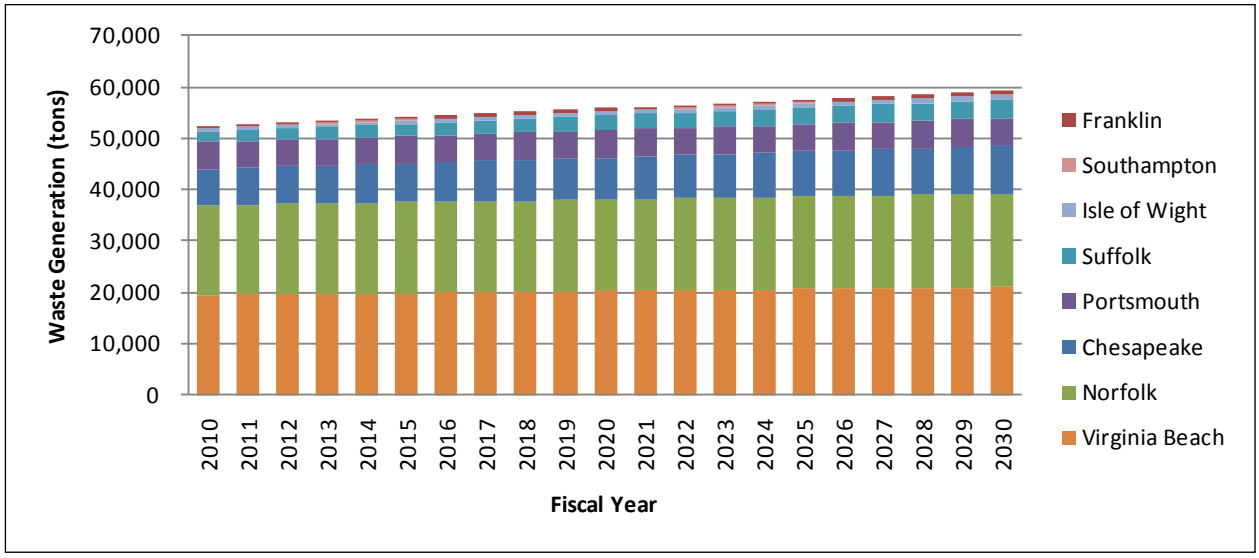


Figure 21. Estimated Multi-Family Waste Generation

5.4 TOTAL MUNICIPAL SOLID WASTE

Estimates for residential, business, and multi-family waste generation were combined to estimate total waste generation for the region through 2030. Results are presented below in Figure 22. By the end of the planning period, the SPSA Region will generate nearly 3.3 million tons of solid waste:

- 2010: 2,804,600 tons
- 2020: 3,024,500 tons
- 2030: 3,269,800 tons.

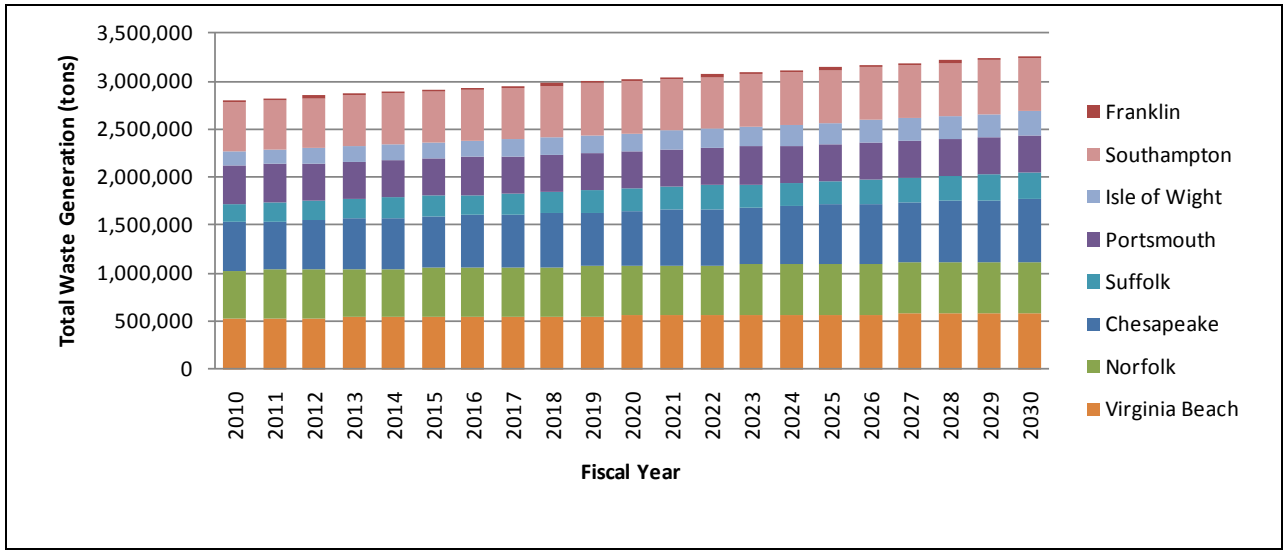


Figure 22. Total Solid Waste Generation (Estimated)

Table 19. Estimated Commercial Waste Disposal

Employment Category	NAICS	Average Disposal Rate (tons/ employee/ year)	Chesapeake		Franklin		Isle of Wight	
			Employees	Waste Disposed (tons)	Employees	Waste Disposed (tons)	Employees	Waste Disposed (tons)
Agriculture, Forestry, Fishing and Hunting	11	0.9	194	175		-	165	149
Mining	21	1.8	41	74		-		-
Utilities	22	0.3	166	50		-	44	13
Construction	23	3	8,279	24,837	24	72	421	1,263
Manufacturing*	31-33	1.26	4,302	5,427	25	32	3,449	4,351
Wholesale Trade	42	0.9	4,076	3,668	44	40	93	84
Retail Trade*	44-45	2.02	14,532	29,306	939	1,894	998	2,013
Transportation & Warehousing	48-49	1.45	3,562	5,165		-	297	431
Information	51	1.5	2,778	4,167	45	68	48	72
Finance & Insurance	52	0.3	2,384	715	179	54	214	64
Real Estate Rental & Leasing	53	0.3	1,527	458	39	12	84	25
Professional, Technical & Scientific	54	1.2	7,595	9,114	110	132	406	487
Management Companies	55	0.3	1,595	479	36	11	149	45
Administrative Support Services	56	0.3	6,564	1,969	99	30	369	111
Educational Services	61	0.8	932	746		-		-
Health Care & Social Assistance	62	1.5	5,730	8,595	955	1,433	671	1,007
Arts, Entertainment & Recreation	71	1.1	692	761		-	88	97
Accommodation & Food Services	72	2.1	9,414	19,769	444	932	775	1,628
Other Services	81	0.9	3,744	3,370	211	190	369	332
Local, State & Federal Government	92	0.4	17,092	6,837	838	335	1,591	636
Total			94,798	125,383	3,988	5,232	10,231	12,644

Table 19. Estimated Commercial Waste Disposal (continued)

Employment Category	NAICS	Average Disposal Rate (tons/ employee/ year)	Norfolk		Portsmouth		Southampton	
			Employees	Waste Disposed (tons)	Employees	Waste Disposed (tons)	Employees	Waste Disposed (tons)
Agriculture, Forestry, Fishing and Hunting	11	0.9	14	13		-	114	103
Mining	21	1.8		-		-		-
Utilities	22	0.3		-		-		-
Construction	23	3	4,654	13,962	2,268	6,804	110	330
Manufacturing*	31-33	1.26	6,370	8,036	1,884	2,377	598	754
Wholesale Trade	42	0.9	4,069	3,662	680	612	132	119
Retail Trade*	44-45	2.02	11,634	23,462	2,908	5,864	253	510
Transportation & Warehousing	48-49	1.45	7,693	11,155	1,587	2,301	82	119
Information	51	1.5	2,498	3,747	381	572	9	14
Finance & Insurance	52	0.3	5,421	1,626	547	164	40	12
Real Estate Rental & Leasing	53	0.3	2,275	683	464	139	47	14
Professional, Technical & Scientific	54	1.2	8,817	10,580	1,344	1,613	134	161
Management Companies	55	0.3	2,052	616	78	23		-
Administrative Support Services	56	0.3	6,459	1,938	2,452	736	37	11
Educational Services	61	0.8	3,787	3,030	215	172		
Health Care & Social Assistance	62	1.5	19,520	29,280	5,778	8,667	231	347
Arts, Entertainment & Recreation	71	1.1	1,306	1,437	278	306		-
Accommodation & Food Services	72	2.1	10,437	21,918	2,222	4,666	91	191
Other Services	81	0.9	3,541	3,187	1,780	1,602	45	41
Local, State & Federal Government	92	0.4	35,810	14,324	17,316	6,926	1,728	691
Total			136,357	152,641	42,182	43,544	3,651	3,313

Table 19. Estimated Commercial Waste Disposal (continued)

Employment Category	NAICS	Average Disposal Rate (tons/ employee/ year)	Suffolk		Virginia Beach		Total Employees	Total Disposed (tons)
			Employees	Waste Disposed (tons)	Employees	Waste Disposed (tons)		
Agriculture, Forestry, Fishing and Hunting	11	0.9	290	261	60	54	837	753
Mining	21	1.8		-		-	41	74
Utilities	22	0.3	145	44		-	355	107
Construction	23	3	907	2,721	9,281	27,843	25,944	77,832
Manufacturing*	31-33	1.26	1,924	2,427	5,506	6,946	24,058	30,350
Wholesale Trade	42	0.9	1,189	1,070	4,570	4,113	14,853	13,368
Retail Trade*	44-45	2.02	3,189	6,431	21,850	44,064	56,303	113,544
Transportation & Warehousing	48-49	1.45	1,368	1,984	1,720	2,494	16,309	23,648
Information	51	1.5	174	261	3,561	5,342	9,494	14,241
Finance & Insurance	52	0.3	365	110	7,649	2,295	16,799	5,040
Real Estate Rental & Leasing	53	0.3	240	72	4,822	1,447	9,498	2,849
Professional, Technical & Scientific	54	1.2	1,290	1,548	12,153	14,584	31,849	38,219
Management Companies	55	0.3	335	101	2,398	719	6,643	1,993
Administrative Support Services	56	0.3	743	223	11,084	3,325	27,807	8,342
Educational Services	61	0.8	317	254	3,496	2,797	8,747	6,998
Health Care & Social Assistance	62	1.5	3,560	5,340	18,650	27,975	55,095	82,643
Arts, Entertainment & Recreation	71	1.1	224	246	2,593	2,852	5,181	5,699
Accommodation & Food Services	72	2.1	2,231	4,685	22,348	46,931	47,962	100,720
Other Services	81	0.9	746	671	5,578	5,020	16,014	14,413
Local, State & Federal Government	92	0.4	5,991	2,396	28,912	11,565	109,278	43,711
Total			25,228	30,540	166,231	210,311	482,666	583,609

Notes: Data not disclosed by Virginia Employment Commission shaded: red

*Average of several industry-specific disposal rates included in original study

Table 20. Waste Generation from Multi-Family Units

Housing Type	Number of Housing Units								
	Chesapeake	Franklin	Isle of Wight	Norfolk	Portsmouth	Southampton	Suffolk	Virginia Beach	Total Units
1, detached	57,719	2,595	10,752	46,852	26,356	6,125	24,987	96,995	272,381
1, attached	8,556	52	647	7,331	3,910	80	1,568	35,076	57,220
2	1,281	224	46	6,799	1,824	55	1,481	2,599	14,309
3 or 4	2,420	318	230	7,403	2,512	85	567	7,322	20,857
5 to 9	3,624	524	314	11,218	4,248	98	1,249	13,184	34,459
10 to 19	2,980	70	210	7,449	1,859	12	570	7,592	20,742
20 to 49	1,445	79	177	2,956	838	6	200	3,192	8,893
50 or more	1,571	83	51	4,770	1,024	0	462	6,409	14,370
Subtotal:	9,620	756	752	26,393	7,969	116	2,481	30,377	78,464
Mobile home	2,060	0	2,007	573	314	1,170	952	1,754	8,830
Boat, RV, van, etc.	35	29	0	47	8	0	13	10	142
Total Units:	81,691	3,974	14,434	95,398	42,893	7,631	32,049	174,133	452,203
	Waste Generated (5 or more units) based on 0.71 tons/unit/year								
Tons:	6,830	537	534	18,739	5,658	82	1,762	21,568	55,709

Source: U.S. Census Bureau, 2005-2009 American Community Survey

Waste Generation per unit: Solid Waste Authority of Palm Beach County, Florida and Montgomery County, Maryland

6.0 RECYCLING RATE

The following provides an overview of the Virginia recycling requirements and the recycling rates achieved by the Region's recycling programs.

6.1 VIRGINIA REQUIREMENTS FOR SOLID WASTE MANAGEMENT PLANNING, RECYCLING, AND ANNUAL REPORTING

In 1989, the Virginia General Assembly adopted legislation that laid the foundation for solid waste management planning, requiring that solid waste management plans be developed at the local or regional level. After July 1, 2007 no permit for a new sanitary landfill, incinerator, or waste-to-energy facility or for an expansion of an existing sanitary landfill, incinerator, or waste-to-energy facility will be issued until the solid waste planning unit within which the facility is located has an approved solid waste management plan. Regulations governing the development and submittal of solid waste management plans are provided in 9VAC20-130-10 et seq.

This legislation also established recycling rates for communities. The established rates were: 10 percent by 1991, 15 percent by 1993, and 25 percent by 1995. Each county, city, town, or regional authority was required by the legislation to establish recycling programs that would meet these goals.

Legislation introduced in 2006 provided for a two-tiered recycling mandate: 15 percent or 25 percent. The recycling rate that must be achieved by a community is dependent upon two factors: population density and unemployment rates. Localities or regions (called Solid Waste Planning Units or SWPUs) with population densities less than 100 persons per square mile or with an unemployment rate 50 percent higher than the statewide average are required to meet the 15 percent mandated recycling level, all others are required to continue to meet the 25 percent recycling mandated level.

The regulations for solid waste management plans require that the plan describe how the mandated recycling rate will be met or exceeded. Additionally, Section 9VAC 20-130-165 D requires that every city, county, town, or SWPU submit the data and calculations to document the recycling rate for the preceding calendar year to the Department of Environmental Quality.

Virginia uses the following formula for calculating the recycling rate:

Recycling Rate = (PRMs + Credits) ÷ (PRMs + Credits + MSW Disposed)

Where:

- **"Principal recyclable materials (PRMs)"** means paper, metal, plastic, glass, commingled yard waste, wood, textiles, tires, used oil, used oil filters, used antifreeze, batteries, electronics, or material as may be approved by the director.

- **"Municipal solid waste (MSW)"** means waste that is normally composed of residential, commercial, and institutional solid waste and residues derived from the combustion of these wastes. MSW generated equals the sum of PRMs recycled and MSW disposed. (MSW disposed equals the amount of MSW delivered to landfills, transfer stations, incineration and waste-to-energy facilities).

  - "Residential waste" means any waste material, including garbage, trash and refuse, derived from households. Households include single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day-use recreation areas. Residential wastes do not include sanitary waste in septic tanks (septage) that is regulated by other state agencies.

  - "Commercial waste" means all solid waste generated by establishments engaged in business operations other than manufacturing or construction. This category includes, but is not limited to, solid waste resulting from the operation of stores, markets, office buildings, restaurants and shopping centers.

  - "Institutional waste" means all solid waste emanating from institutions such as hospitals, nursing homes, orphanages, and public or private schools. It can include regulated medical waste from health care facilities and research facilities that must be managed as a regulated medical waste.

- **Credits** may be added to the recycling formula, provided that the aggregate of the credits does not exceed five percentage points of the annual municipal solid waste recycling rate achieved for each solid waste planning unit:

  - A credit of one ton for each ton of any non-municipal solid waste material that is recycled (e.g., industrial waste, construction and demolition debris).

  - A credit of one ton for each ton of any solid waste material that is reused.

  - A credit of one ton for each ton of recycling residue disposed in a landfill. "Recycling residue" means the (i) nonmetallic substances, including but not limited to plastic, rubber, and insulation, which remain after a shredder has separated for purposes of recycling the ferrous and nonferrous metal from a motor vehicle, appliance, or other discarded metallic item, and (ii) organic waste remaining after removal of metals, glass, plastics and paper which are to be recycled as part of a resource recovery process for municipal solid waste resulting in the production of a refuse derived fuel.

  - A credit of two percentage points of the minimum recycling rate mandated for the solid waste planning unit for a source reduction program that is implemented within the solid waste planning unit. "Source reduction" means any action that reduces or eliminates the generation of waste at the source, usually within a process. Source reduction measures include process modifications, feedstock substitutions, improvements in feedstock purity, improvements in housekeeping

and management practices, increases in the efficiency of machinery, and recycling within a process. Source reduction minimizes the material that must be managed by waste disposal or nondisposal options by creating less waste. "Source reduction" is also called "waste prevention," "waste minimization," or "waste reduction."

- A credit of one ton for each inoperable vehicle for which a locality receives reimbursement from the Virginia Department of Motor Vehicles under §46.2-1407 of the Code of Virginia.

If the SWPU's annual recycling rate falls below the minimum rate, the SWPU is required to submit a recycling action plan (RAP), or its approved solid waste management plan may be revoked. The RAP must identify specific elements of the recycling program that will be changed or improved in order for the SWPU to reach its recycling rate. The RAP requires both a commitment by the SWPU to provide resources necessary to improve its program, as well as a timeline for achieving the program elements. The RAP must be adopted by the administrative governmental board(s) for all localities covered by the Solid Waste Management Plan, and then approved by DEQ. Regular reporting on the progress made on the RAP elements is required.

6.2 HISTORIC RECYCLING RATES

Beginning with calendar year 2001, Virginia required that all SWPUs submit annual recycling rate reports. The state uses these reports to establish a statewide recycling rate. A comparison of the statewide recycling rate and the recycling rate achieved by SPSA since 2001 is provided in Figure 23. SPSA has consistently exceeded the state's requirement of 25 percent; although recycling rates are dropping with time and are below the state's average. In calendar year 2008, SPSA achieved a recycling rate of 28.9 percent; down from 37.5 percent in calendar year 2007. This decline could be due to lower reporting participation and the closure of yard waste and mulching facilities. Recycling rates somewhat rebounded in 2009.

A summary of recycling quantities reported for calendar years 2006 through 2009 is presented in Table 21. This table shows a general decline in recycled quantities for most materials. Most notable is the decline in Ferrous/Tin/Steel. This decline is primarily due to the fact that several private recyclers did not respond to the survey request.

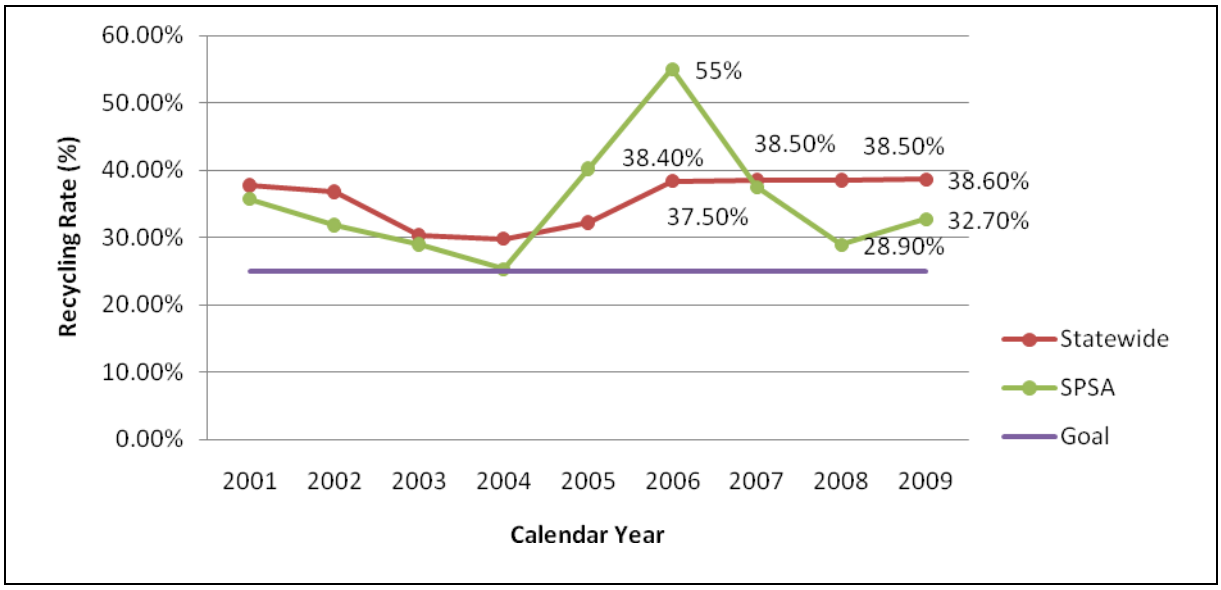


Figure 23. Comparison of Recycling Rates

Table 21. Summary of Regional Recycling Quantities (as reported to SPSA and HRPDC)

Recycled Materials	2006 Tons	2007 Tons	2008 Tons	2009 Tons
Metals				1,325.58
Aluminum	7,409.39	8,263.64	18,427.87	1,738.31
Ferrous/Tin/Steel	222,427.24	126,371.60	151,085.46	18,331.06
Non-Ferrous	4,678.99	6,301.10	5,747.86	1,509.49
Auto Bodies	0.00	617.20	219.51	112.00
Appliances	5,000.00	3,526.00	38.00	1,323.77
Paper				
Newsprint	18,063.00	16,746.19	7,156.00	3,019.50
Cardboard	35,008.74	34,371.79	83,711.40	25,837.57
Office/Computer	8,170.74	6,814.95	4,240.59	295.00
Other	28,338.18	29,244.50	23,167.64	30,414.56
Comingled Paper/Plastic	0.00	0.00	0.00	1,206.24
Plastic				
Bottles	2,869.00	2,790.63	1,127.51	1,216.16
Scrap Plastic	181.66	811.63	1,228.80	1,466.34
Mixed Plastic	0.00	0.00	226.62	35,793.78
Arboreal				
Large Tree Stumps	0.00	15,050.00	12,460.00	1.00
Yard Waste	42,516.58	29,604.32	12,703.14	35,038.81
Tree Debris	32,680.00	0.00	11.84	0.00
Miscellaneous				
Glass Containers	2,376.00	2,323.92	663.13	613.15
Cloth/Textiles	2,074.00	2,379.21	2,665.00	0.00
Used Oil	26,237.95	3,023.61	2,684.79	7,467.10
Used Oil Filters	18.88	150.20	726.87	148.10
Electronics	1.51	1.11	76.47	76.36
Antifreeze	31.22	346.91	1,194.01	334.44
Solvents	0.01	36.81	156.79	25.55
Toner Cartridges	2.52	3.00	0.00	0.00
Cooking Grease	9.55	944.50	0.00	0.00
Photo Cameras	0.06	0.04	17.16	0.00
Photo Film	0.11	1.40	23.48	0.91
Fluorescent Light Blbs.	0.20	1.56	0.12	2.42
Electric Motors/Transf.	178.10	0.00	0.53	0.00
Construction Rubble	7,459.14	60,432.00	27,388.00	10,686.34
Tires	680.82	6,823.00	5,894.16	4,519.05
Concrete	176.52	10,004.00	19,074.00	30,061.00
Asphalt	40,325.81	59,321.00	100,524.00	86,277.81
Batteries	5,508.69	2,689.39	2,157.12	2,129.11
Wood Chips	100.00	18.50	4.00	420.32
Sludge	0.00	0.00	7,144.58	12,389.43
Sand Blast Grit	3,175.72	30,230.00	3,981.00	3,707.84
Other	0.00	68.04	10,116.12	3,251.32
Total	495,700.32	459,311.74	506,043.55	320,739.42

7.0 LITTER CONTROL

The Region's localities all participate in the Clean Community Program of the Commonwealth. They utilize state grants, when available, together with local funding, other grants and private initiatives in operating their local litter control and related educational programs. The Virginia Beach Clean Community Commission is now a City Council appointed commission with administrative support from Public Works, Waste Management Division. Programs and events include; adopt a spot, storm drain marker, Clean the Bay Day and support for Earth Day. The eight cities and counties that are members of SPSA also participate with SPSA, the Virginia Peninsulas Public Service Authority and their local government counterparts on the Peninsula in HR CLEAN, which is the regional litter control and recycling education program. It operates through the HRPDC. Among the initiatives undertaken by HR CLEAN is an effort to develop an educational program for members of the law enforcement community and judicial system about littering, its control, and the need for more stringent enforcement of anti-littering statutes.

The Cities of Chesapeake, Norfolk, Portsmouth, and Suffolk are member affiliates of the Keep America Beautiful (KAB) program. Each affiliate provides opportunities to the public in areas of education, beautification, and litter control programs. To be an affiliate of KAB, minimum standards and reporting are required. One of the programs being offered to volunteers is the Great American Clean-up where citizens participate in litter clean-ups in their neighborhoods and public areas. The Great American Cleanup takes place annually from March through May.

In addition to the KAB programs, the localities in Southeastern Virginia support and participate in clean-up activities supported by private organizations, such as the Chesapeake Bay Foundation, Lynnhaven River Now, Riverkeepers and other private foundations. They also support and participate in the various "Adopt" programs, which operate under the auspices of the Virginia Departments of Conservation and Recreation and Transportation. They also participate in the various Stewardship programs, which are sponsored by the Governor and the Secretary of Natural Resources.

Examples of these cooperative programs include:

- The Chesapeake Bay Foundation (CBF) promotes volunteer opportunities throughout the region. Along with local coordinators, CBF organizes clean up events not only on the Bay, but at nearby rivers, waterways, under bridges, and the oceanfront.

- Each locality has the opportunity to participate in the annual "Clean The Bay Day," which takes place the second Saturday of June in Norfolk, Chesapeake, Gloucester, Newport News, Poquoson, Portsmouth, Suffolk, and Virginia Beach. Most of the waste collected is put into the waste stream while a small percent might be recycled.

- Similar "Adopt" programs operate under a state umbrella, but are administered locally. The Adopt-A-Highway Program, the first of such "adoption" efforts, is an anti-litter and roadside enhancement campaign intended to promote pride and local ownership in our beautiful state. It allows individuals and organized groups of citizens and/or businesses to work in partnership with the Commonwealth by

"adopting" a section of state highway and agreeing to help take care of it. This program offers organizations a way to contribute to their community and state, as well as generate publicity for their efforts. A number of localities and private organizations also participate in the Adopt-A-Waterway Program, which is facilitated by the Department of Conservation and Recreation. Due to the overwhelming success of these efforts, HR CLEAN promotes Adopt Hampton Roads as a way to encourage involvement in Adopt-A-Spot and Adopt-A-Waterway programs. These efforts have flourished region wide.

- In several instances, the Sheriffs in Hampton Roads localities utilize inmate labor to clean up areas of highways throughout the region.

Additionally, in an effort to curb litter and non-point source pollution, each locality requires citizens to secure waste set out for collection.

8.0 SOLID WASTE NEEDS ASSESSMENT

8.1 EVALUATION OF SOLID WASTE MANAGEMENT

SPSA annually employs R.W. Beck to conduct a comprehensive annual survey and report. The report evaluates SPSA's fiscal and operational health. The report summarizes current and recent solid waste collection data for each of SPSA's facilities, including the Regional Landfill, the RDF WTE Facility, and transfer stations. The report also describes the current and projected future condition and capacities of these facilities.

Regarding solid waste received at each transfer station, the individual local governments decide on solid waste collection routes. In deciding these routes, the local governments will bring solid waste from different areas within their jurisdiction to the most appropriate transfer station. In addition, private solid waste collection companies make similar decisions. These decisions in turn will affect the amount of solid waste any transfer station receives. SPSA itself has no direct control over the decisions of these entities but works with these entities to plan and identify needed new improvements and facilities.

The 2010 R.W. Beck Annual Survey and Report, titled Regional Solid Waste Disposal System, begins by providing a description of SPSA's solid waste facilities. It provides historical information on how each facility was created. The Report also describes the existing type of equipment at each facility. In addition, the Report compares the amount of solid waste received at each facility for the current year and the previous year. For the transfer stations, the Report places these figures in the context of each station's design capacity. Finally, the report describes additional actions SPSA has implemented or is considering to improve its solid waste management system.

The R.W. Beck Report includes an evaluation of whether each transfer station is operating within its capacity and identifies successful improvements that have resulted in increased throughput capacity. The Report also recommends specific improvements that can be taken to increase the efficiency of operating each transfer station, allowing it to accept more solid waste. The Report conducts a similar analysis for SPSA's other facilities, such as the Regional Landfill, and RDF WTE Facility. In addition, the Report examines the sufficiency of existing maintenance levels of SPSA's solid waste facilities and recommends improvements, as appropriate, to ensure the most efficient operating levels.

SPSA will continue to rely on conducting this type of annual evaluation and assessment of its solid waste management system to improve its ability to meet the solid waste management needs of the region.

8.2 NEEDS ASSESSMENT

The existing solid waste management system was reviewed within the context of the solid waste management hierarchy to identify needs to be addressed during the development of this plan and its future implementation. This assessment is presented according to the solid waste

management hierarchy. Identified needs that fall outside of the hierarchy, such as solid waste transfer, are presented at the end of the section.

8.2.1 Source Reduction and Reuse

8.2.1.1 Current Conditions

There are four basic methods for waste reduction:

- Reduce consumption by using product alternatives that generate less waste.
- Reuse products for their original or compatible purposes.
- Increase the durability or lifetime of products.
- Decrease the amount of material used to produce each product or reduce product packaging.

Waste reduction is generally not as well documented or understood as recycling and requires extensive education. Additionally, some waste reduction tactics, especially those involving product and packaging waste, are controlled by economic, political, and educational forces beyond the city and county control.

Waste reduction is supported in the region through various programs and offerings. Many promotional materials and outreach programs exist to spread awareness of waste reduction and recycling. Material donation and reuse opportunities currently available include:

- Numerous private and non-profit businesses operate secondhand material outlets throughout the county.
- Websites such as www.craigslist.org provide an internet-based forum to buy, sell, and exchange secondhand products locally.
- The cities and counties sponsor public surplus sales of materials and equipment no longer needed by those agencies but still usable.
- Some of the member jurisdictions have developed internal goals for buildings that meet Leadership in Environmental Engineering Design (LEED) standards. Some of the jurisdictions have LEED certified buildings.

8.2.1.2 Needs

Waste reduction could be further encouraged by addressing the following needs:

- Residents and businesses are not exposed to education and promotion programs focusing on alternatives to toxics and proper disposal of household hazardous waste.

- According to the most recent EPA estimates, yard waste accounts for 13 percent of the waste stream; food scraps accounts for an additional 13 percent. The cost of home composting bins or mulching mowers may be a deterrent to residents.

- Businesses do not have access to technical assistance and outreach addressing waste reduction opportunities.

- Agencies could adopt procurement policies that encourage the purchase of products made from recycled-content materials.

8.2.1.2.1 Waste/Material Exchange

Materials or waste exchanges are not new. The concept began in Europe and spread to North America in the late 1970s. A waste exchange acts as a liaison between waste generators and potential users. Some exchanges are operated by states or local governments, others are wholly private, for-profit businesses. The exchanges vary in terms of area of service and the types of commodities exchanged. In general, waste exchanges tend to handle hazardous materials and industrial process waste while materials exchanges handle nonhazardous items. Information on several waste exchanges are provided in Table 22.

Increasingly, waste exchanges are making use of the internet to create online databases and eliminate printed catalogs. Private exchanges frequently share information with one another.

Waste/material exchanges operate much like “classified ads.” Businesses, offices, schools, and individuals "advertise" their surplus/unwanted materials, or materials they want to get, by completing an electronic listing form. Once the form has been completed and submitted, the listing is posted on the website. Users can look for and find materials by browsing or searching the materials categories. Users interested in trading posted materials then contact each other directly.

In many instances, sites offer school donation programs. These programs provide the opportunity for businesses to list materials specifically available to schools. Since schools are working with limited resources.

Web-based materials exchange opportunities are limited in the Region. HRPDC could consider establishing a regionally-based waste or material exchange for businesses or residents.

Table 22. Waste/Material Exchanges

State Waste Exchanges
Alaska Materials Exchange (AME) http://www.greenstarinc.org/ame/ameindex.php The AME was developed in 1994 as a partnership among the Alaska Department of Environmental Conservation, ARCO-Alaska, BP Exploration, Alyeska Pipeline Services, the Anchorage Chamber of Commerce, and the U.S. EPA. From 1994 until 2003, the AME was a quarterly printed catalog mailed to users across the State. In 2003, the AME was transferred to Green Star and updated to an interactive web-based system.
California Materials Exchange (CalMAX) http://www.ciwmb.ca.gov/calmax CalMAX, maintained by the California Integrated Waste Management Board, is a free service designed to help businesses find markets for materials they have traditionally discarded. CalMAX published quarterly catalogs from 1992-2005; however, in an effort to reduce the use of paper and streamline the administrative process, CalMAX made the decision to publish the last catalog in the summer of 2005 and now operates exclusively as an online exchange service. The CalMAX database categorizes materials into 15 separate classifications and is accessible 24 hours a day through the CalMAX Web site.
Ohio's Materials Exchange (OMEx) http://www.myomex.com/ OMEx publishes no-cost materials wanted and available ads for the purpose of facilitating exchanges for users who then work out the details of payment, transportation and storage. Ads are placed, and updated, by the listing entities. OMEx began in 1998. It is administered by the Association of Ohio Recyclers and funded through the Ohio Department of Development's Ohio Energy Office. Waste Alternatives, Inc., of Mount Vernon, OH, services and maintains the listing program while The Internet Professional administers the website.
Indiana Waste Exchange (IMX) http://www.in.gov/idem/imx/index.html The IMX is maintained by the Indiana Department of Environmental Management, Office of Pollution Prevention and Technical Assistance. The IMX is an electronic bulletin board that aids in the dissemination of information on surplus and waste materials either available from or wanted by industrial and commercial entities. IMX operates through the IMX Listserv. Through this listserv, users receive e-mail information about new listings on a regular basis. Listed materials are organized into 17 individual categories.
Iowa Waste Exchange (IWE) http://www.iowadnr.gov/waste/iwe/index.html The mission of the IWE is to provide Iowa industries with smart waste management. The IWE is a free, confidential program that actively promotes the reuse and recycling of Iowa business and industry by-products and wastes. The program operates out of six regions with a coordinator assigned to each region. The IWE is part of and funded by the Iowa Department of Natural Resources. Since 1990 the IWE has matched over 2.6 million tons of materials.
Minnesota Materials Exchange http://www.mnexchange.org/ The Minnesota Materials Exchange program is coordinated by the Minnesota Technical Assistance Program (MnTAP). The program focuses on items that are commonly used in a business or organizational setting, rather than a household. Most things are available free or at a low cost. Users are sent emails (2 per month) identifying the newest available and wanted items. MnTAP, a nonregulatory program that helps businesses reduce waste, is funded primarily by a pass-through grant from the Minnesota Pollution Control Agency's Prevention and Assistance Division to the University of Minnesota, School of Public Health, Division of Environmental Health Sciences.
Montana Material Exchange http://www.montana.edu/mme/ The Montana Material Exchange (MME) maintains and distributes listings of materials available and materials wanted from individuals and local and international companies. The site is maintained by the Montana State University Extension Service, Pollution Prevention Program, in partnership with the Montana Chamber of Commerce.
Nebraska Materials Exchange Program http://www.knb.org/exchange.html Keep Nebraska Beautiful offers this program. Since its inception in the Fall of 1994, the number of materials listed and exchanged has grown tremendously.
Ohio's Materials Exchange (OMEx) http://www.myomex.com/

Table 22. Waste/Material Exchanges

OMEx publishes no-cost materials wanted and available ads for the purpose of facilitating exchanges for users who then work out the details of payment, transportation and storage. Ads are placed, and updated, by the listing entities. Information provided through OMEx is supplied by the listing party. OMEx began in 1998. It is administered by the Association of Ohio Recyclers and funded through the Ohio Department of Development's Ohio Energy Office. Waste Alternatives, Inc., of Mount Vernon, OH, services and maintains the listing program while The Internet Professional administers the website.

Tennessee Materials Exchange (TME) http://www.cis.tennessee.edu/environmental/recycle/TME.shtml

The Tennessee Materials Exchange (TME) is a free service, operated by the University of Tennessee Center for Industrial Services (CIS), that helps Tennessee industries and businesses find markets for industrial by-products, surplus materials and wastes. TME listings are updated monthly.

Vermont Business Materials Exchange (VBMX) http://www.vbmex.org

VBMX is a free service whose goal is to minimize waste by fostering the exchange of reusable resources. VBMX keeps a database of available and wanted materials, and publicizes the listings through this web site, the VBMX Listserve, other specialized listserves, the quarterly catalog, and Vermont Business Magazine.

West Virginia Materials Exchange http://www.state.wv.us/swmb/exchange/Index.htm

Created in 1998 by the West Virginia Solid Waste Management Board, the exchange works with business, industry, government agencies and others to facilitate the exchange, reuse and recycling of surplus materials, overstocks, and manufacturing by-products.

Business Material Exchange of Wisconsin (BMEx) http://www.bmex.org/

The BMEx is regional material exchange that has been operating since 1996. The BMEx is open to any resident, business, organization, institution, agricultural operation or other entity located in Wisconsin.

Regional Exchanges

2Good2Toss http://www.2good2toss.com/

2good2toss is Washington's online exchange for reusable building materials and household items. Washington's Department of Ecology funded the start-up costs to get the site off the ground, and each participating municipality paid the web site developer a one-time set-up fee for their exchange on the site and then pays an annual subscription fee to have the site maintained. While anyone can view posted items, users must reside in participating Washington state counties or cities to be eligible to post items. 2good2toss.com is in keeping with Ecology's mission, as set forth in chapter 70.95 RCW, to reduce the volume of solid waste placed in the state's landfills and waste to energy facilities through waste reduction, source separation, recycling, and diversion.

Resource Exchange Network for Eliminating Waste (RENEW) http://www.zerowastenetwork.org/renewdev/

RENEW is a materials exchange network originally established by the Texas Legislature in 1987 to promote the reuse or recycling of industrial wastes. In 2007, the Zero Waste Network expanded RENEW to encompass the Environmental Protection Agency's Region 6. RENEW is a marketing channel for industries, businesses, and governmental units that want to sell surplus materials, by-products, and wastes to users who will reclaim or reuse them.

Southern Waste Information eXchange http://www.wastexchange.org/

The Southern Waste Information Exchange is a free service designed to help businesses, industries and other organizations. Registered users can post both wanted and available listings, similar to a classified ad section. Businesses, industries and other organizations can list their available materials by type, quantity, frequency of availability, geographic location, and date listed. They may also include photos of the materials. Users can post detailed wanted listings, specifying the type(s) of material they need and the frequency. The WasteXchange is funded by the Florida Department of Environmental Protection.

Table 22. Waste/Material Exchanges

Industrial Materials Exchange http://www.metrokc.gov/hazwaste/imex/ IMEX, the Industrial Materials Exchange, is a free service designed to match businesses that produce wastes, industrial by-products, or surplus materials with businesses that need them. IMEX is a free listing service. Businesses, offices, schools, and individuals "advertise" their surplus/unwanted materials, or materials that they are seeking, by submitting an electronic IMEX listing form. The listings are then posted on the IMEX web site, where they are viewed by interested waste generators and waste recyclers. IMEX will only accept listings from the Pacific Northwest. Specifically, this means that listings will be accepted only from Alaska, Idaho, Oregon, and Washington (EPA Region 10).
National Waste/Material Exhange
Freecycle Network http://faq.freecycle.org/ The Freecycle Network is a private, nonprofit organization incorporated in the State of Arizona. Users join local groups and post items on local Freecycle group sites. Currently, the Freecycle Network is made up of 4,934 groups with 8,338,153 members around the world.
Locally-Sponsored Waste/Material Exchanges
The Los Angeles County Materials Exchange Program (LACoMAX) http://dpw.lacounty.gov/epd/lacomax/ LACoMAX is a free service provided by the County of Los Angeles Department of Public Works, Environmental Programs Division. Users of this on-line materials exchange service can browse or post listings of a wide variety of available and wanted materials. Listings are categorized by 15 material classifications and 6 regions and include common items such as wood pallets, out-of-fashion textiles, and chemicals as well as more uncommon items. All exchanges are coordinated between the two interested parties.
Marin County (Marin Max) http://marinmax.org/ MarinMax is designed for use by businesses, non-profits and individuals within Marin County.
New York City, Department of Sanitation http://www.wastematch.org/ NYC Wastematch is a free service, created and funded by the NYC Department of Sanitation, which facilitates the exchange of used and surplus goods and equipment from organizations that no longer need them to other entities that do.
Twin Cities Free Market http://www.twincitiesfreemarket.org/index.cfm The Twin Cities Free Market is a reuse program of Eureka Recycling, a nonprofit organization. The Free Market is an interactive, internet-based program that targets residential exchanges. Residents of Carver, Hennepin, Ramsey, and Washington County may use the Free Market. The Free Market is funded in part by the City of Saint Paul, Carver County, Hennepin County, Ramsey County, Washington County, and the State of Minnesota SCORE Fund.

8.2.2 Recycling and Composting

8.2.2.1 Current Recycling Conditions

As discussed earlier, the cities and counties currently provide curbside collection services or drop-off facilities for collection of recyclables.

8.2.2.2 Recycling Needs

8.2.2.2.1 Business Recycling

There is a continued need to provide information to businesses to encourage recycling as their actions contribute to the overall recycling rate in the region.

- Recruit and provide technical assistance to large businesses in the region to increase recycling. The purpose of providing technical assistance is to set up new recycling programs in larger businesses and work with the haulers or recyclers to efficiently implement these new programs. After a business is recruited, it would receive a waste audit and at least one on-site visit. During the on-site visit, the program staff person would develop waste reduction and recycling recommendations.

- Develop a business recognition program for recycling, composting, and waste reduction for exemplary waste reduction, composting, and recycling activities.

8.2.2.2.2 Evaluation and Monitoring

Regional recycling programs currently are in transition as SPSA transfers recycling responsibilities to the local communities. The cities and counties have taken over implementation of curbside and drop-off programs. There will need to be a coordinated effort to evaluate the status of individual recycling programs. The evaluation should address the following:

- Evaluation of what is and isn't marketable and identify opportunities to develop markets for recycled materials.

- Progress toward recycling goals.

- Assessment of public outreach and education programs.

- Assessment of recycling collection and marketing programs.

- Establish an accurate assessment of the region's recycling rate.

- Identify gaps and needs in recycling programs.

8.2.2.2.3 E-Waste

The past decade has seen swift growth in the manufacture and sale of consumer electronic products. Advances in technology have led to better, smaller, cheaper products. Industry analysts give every indication that the trend toward rapid introduction of new electronic products will continue.

As the production and use of electronic products continues to grow, the challenge of recovery and disposal is becoming significant. Computer monitors and older TV picture tubes contain an average of four pounds of lead and require special handling at the end of their lives. In addition to lead, electronics can contain chromium, cadmium, mercury, beryllium, nickel, zinc, and brominated flame retardants (USEPA). Another serious concern associated with end-of-life management is the export of electronic scrap to developing countries that may lack adequate worker safety and environmental standards.

While end-of-life electronics (end-of-life electronic products are either obsolete for their intended purpose or no longer useful by the current user and lacks any significant market value as an operational unit. Definition used by the Institute of Scrap Recycling Industries, Inc.) currently comprise only a small amount of the municipal waste stream, that percentage is expected to grow dramatically in the next few years (estimated to be 1.2% of waste generated in 2006 per USEPA, 2006). The average life span of a personal computer is currently about 2-3 years. Electronics that break often are not repaired due to the relatively low price of replacement equipment. When the equipment breaks or becomes obsolete, it is commonly discarded.

SPSA accepts cell phones for recycling through its Household Hazardous Waste Collection facilities. SPSA does not have an established program for the collection and recycling/disposal of computers and other electronics at this time and relies on other programs and vendors to provide this service. Electronics recycling services should be provided to the Region through its solid waste management system.

8.2.2.2.4 Recycling Data Collection

The recycling rate has decreased over the past few years due to a lack of cooperation in recycling reporting; however, the contribution of private recycling efforts is an important component to the region's recycling rate. Currently, a letter and survey are mailed to a limited number of commercial establishments. The following represent possible improvements to the data collection effort:

- Virginia DEQ also has developed a template for gathering recycling information that HRPDC may find useful.

- HRPDC should create a system that is easy to use for commercial establishments to report recyclables. Montgomery County, Maryland, for example, has a reporting module on their website. This reporting system self-populates their recycling database and makes compilation of the data easier. Businesses can also report recycling quantities through the mail or fax via a form that can be downloaded from their website.

- HRPDC should target businesses that are likely to generate recycling quantities that are NOT collected through a licensed (reporting) waste collector. For example, Montgomery County develops a list of SIC codes to target each year. Each year, a different business sector is targeted to establish contact: book stores for book/paper recycling, HVAC contractors for scrap metal, grocery stores for baled cardboard, restaurants for composted food waste, etc. Each year there are several businesses identified that generate significant quantities of recyclables that are not captured through facility or waste collector reporting. Businesses that typically produce large quantities of recyclables include:

  - Landscaping and Tree Service Companies
  - Auto dealerships
  - Large grocery chains (Food Lion, Farm Fresh, Harris Teeter)
  - Property management companies (generally, they establish recycling programs at large office buildings/complexes with multiple tenants)
  - Large retail establishments (Kohls, Wal-Mart, Target). Please note that Virginia DEQ placed recycling information for Walmart on its website.

- HRPDC should maintain enough staff to process submitted recycling information. Montgomery County, Maryland has multiple people on staff that process recycling information submitted by the commercial sector. In addition to verifying their understanding of submitted information, they track the generator of recyclable material, the collector of each recyclable material type, and the ultimate disposal location of the recyclable material. This helps to ensure they do not double count materials.

- Lastly, HRPDC should be prepared to contact non-responsive establishments. As a last resort, most of the municipalities have enacted recycling reporting ordinances that have penalties for non-compliance.

8.2.2.3 Current Composting Conditions

Most of the yard waste in the Region currently is being landfilled although some communities (including Isle of Wight County and the Cities of Norfolk and Virginia Beach) have at least some portion of the yard waste they collect transported to a composting facility near Waverly, Virginia (McGill Environmental Systems Inc.). Collection systems are in place throughout most of the Region to collect yard waste separately. It can be readily processed and recycled for beneficial use either as compost, wood chips, soil amendment, or other beneficial uses.

8.2.2.4 Composting Needs

The Region has had difficulty with its yard waste management program. A comprehensive regional processing facility was constructed by SPSA in 2005 at Virginia Beach's Landfill No. 2, but was closed in 2007 following opposition from surrounding residents and the City of Virginia

Beach after persistent nuisance complaints and public health concerns. A regional facility may be appropriate for the urban areas within the Region (Chesapeake, Norfolk, Suffolk, Portsmouth, and Virginia Beach), but an alternative approach may be appropriate for the more rural areas (City of Franklin and Isle of Wight and Southampton Counties).

8.2.3 Resource Recovery (Waste-to-Energy)

8.2.3.1 Current Conditions

The RDF WTE Facility processes 2,000 tons of the Region's waste per day. Approximately 600,000 tons of Refuse Derived Fuel (RDF), which is more than 50 percent of the total waste stream, was produced and used in the Facility. This process allowed steam and electricity to be produced in an environmentally sound manner. SPSA sold the RDF Plant to Wheelabrator in April 2010 and has signed a contract to continue to deliver waste until 2018. This contract with SPSA can be extended for an additional 10-year term; however, SPSA (and its member communities), must make a decision regarding extending the agreement with Wheelabrator by December 31, 2014.

8.2.3.2 Needs

The RDF WTE Facility is a key component of the Region's waste management infrastructure. It is anticipated that Wheelabrator will operate its RDF WTE Facility into the foreseeable future. The facility has the capacity to dispose of a significant portion of the Region's municipal, commercial, and industrial solid waste. It is uncertain at this time what the intentions of the Region's member communities are with respect to utilization of the Wheelabrator RDF WTE Facility beyond the current contract term agreed to by SPSA. If the contract with SPSA is not renewed pursuant to the service agreement SPSA currently has with Wheelabrator, the individual municipalities may negotiate their own contracts with Wheelabrator or seek other disposal methods.

8.2.4 Landfilling

8.2.4.1 Current Conditions

Currently permitted and constructed Cells at the Regional Landfill are numbered I through VI. With the addition of Cell VI in 2006, the life of the Regional Landfill was thought to be extended to 2012-2014, with approximately 8.9 million additional cubic yards of disposal capacity. However, current projections indicate that Cell VI will have a site life beyond 2018. A planned seventh cell (Cell VII) has recently (June 2010) been permitted. The long-term plans for the continued utilization of the Regional Landfill are currently being evaluated by SPSA and the member localities in light of the significantly reduced tonnage being disposed at the landfill as a result of the sale of the RDF WTE Facility to Wheelabrator in 2010.

8.2.4.2 Needs

Landfills will be needed to provide for the disposal of MSW, CDD, industrial waste, sludges, and ash residue generated in the Region. The quantities of these waste streams that will require landfilling will depend on how much waste is recycled, incinerated, or otherwise processed.

Given current technology, landfills will remain a necessary and important component of waste management for disposal of non-processible waste and ash. Therefore, the Region may be required to maintain landfill disposal capacity within the Region or secure disposal capacity elsewhere.

Under the conditions of the sale of the RDF WTE Facility, Wheelabrator transports and disposes of all non-processible waste at one of its landfills located in Virginia, and the ash residue is disposed of at SPSA's Regional Landfill or Virginia Beach's Landfill No. 2. This has resulted in a significant reduction of solid waste being disposed at the Regional Landfill, which has extended the remaining useful life of the facility. The Virginia Beach Landfill No. 2 can be used for ash disposal through 2015 through the current ash agreement with SPSA. Between newly permitted Cell VII at the Regional Landfill, the Virginia Beach Landfill N. 2, and landfills owned by the private sector, there is sufficient disposal capacity available during the 20-year planning period.

8.3 OTHER WASTE MANAGEMENT NEEDS

8.3.1 Transfer of Solid Waste

SPSA indicates that all eight of the transfer stations are in operation and are generally operating within their design capacities. Table 23 summarizes the design capacity of each station and most recent annual waste quantities reported. The Chesapeake transfer station is at its design capacity, and has been since 2002.

Table 23. Waste Quantities Received at Transfer Stations (FY 2010)

Transfer Station	Design Capacity (tons/day)	Total Annual (tons)	Daily Average (tons/day)
Norfolk	1,300	209,769	733
Oceana	500	85,954	300
Chesapeake	500	127,883	447
Isle of Wight	150	27,162	95
Franklin	150	21,393	75
Boykins	50	(1)	NA
Ivor	50	(1)	NA
Landstown	1,300	213,976	748
Suffolk	500	67,457	236
Note: the daily average is based on 5.5 days per week or 286 operating days per year.			

Source: SPSA Proposed Annual Financial Plan
(1) Total annual waste received for Boykins and Ivor facilities not tracked separately in FY 2010.
NA – Not Applicable

8.3.1.1 Needs

As the region continues to grow, improvements and upgrades will be required at the transfer stations to continue to meet the needs of the region in the most cost-effective manner. The HRPDC is conducting a study in 2010-2011 to evaluate solid waste management options from 2010 to 2018 and beyond. A part of the study includes an assessment of the condition of the existing transfer stations and what should be done to maintain these facilities so they can serve the Region into the foreseeable future. Other future study efforts may include evaluation of transfer station replacements and location of new transfer stations as the need arises.

8.3.1.1.1 Criteria for Transfer Station Improvements

The transfer stations are aging; however, the service levels must be maintained or improved as the population grows and the facilities reach their physical and functional limits. The following can be indicators that a transfer station is in need of upgrading:

- Time spent by customers on site becomes excessive.
- Facility hours are no longer meeting customer needs.
- The transfer station is experiencing difficulty in accommodating all vehicle and tonnage throughput during peak hours.
- The transfer station is experiencing damage due to changes in collection vehicle design.

- Traffic impacts on local streets are increasing.

- Environmental standards are not being met.

As the facilities age and the needs for solid waste services change, the transfer system may require upgrades to maintain operational efficiency. The Region will also have to decide the final disposition of the transfer stations after the use and support agreements between SPSA and the member communities expire in 2018.

In its Annual Survey and Report (as of April 1, 2010), RW Beck described the condition of the SPSA transfer stations as well as needed repairs. Below is a summary from the Survey and Report of their observations.

- **Norfolk Transfer Station:** The Norfolk Transfer Station with a design capacity of 1,300 tons per day, was the second busiest station in the SPSA network with 209,769 tons of waste received. Current waste volumes handled at the facility are from 800 to 1,000 tons per day. The capability of loading three trailers at a time (similar to the Landstown Station) is incorporated into the facility design. The 6.2 acres that the facility sits on is owned by SPSA. The facility accepts waste from municipal and private haulers Monday through Friday and a half-day on Saturday. Norfolk residents only may dispose of waste from noon on Saturday or Sunday to 4:00 pm free of charge. The station is generally in an acceptable state of repair with recent major capital repairs including two thirds of the tipping floor resurfacing and replacement of the in-bound scales. Several lights have also been added to the interior of the building. Pending repairs include hopper refurbishment (in first half 2011), resurfacing of the remaining one third of the tipping floor (by the end of summer 2011) and storm water drainage improvements. Some repairs will also be made to the tipping floor push walls. The Authority plans to replace the out-bound scale and repair sections of the damaged/rusted building siding and pressure wash and paint the siding. The Authority also plans to replace one loader within the next year. The facility received an excavator from the recycling facility when SPSA stopped this surface over a year ago.

- **Landstown Transfer Station:** The Landstown Transfer Station is one of the two largest facilities based on design capacity (1,300 tons per day) of the stations in the SPSA system. The Landstown station contains three hoppers for waste loading. The Station received 213,975 tons of waste in FY2010, making it the busiest facility in the SPSA network during that period. The 11.5 acres that the facility is built on is owned by the city of Virginia Beach and is leased by SPSA. The facility is maintained in good condition. Recent improvements include sprinkler system upgrades, a new water supply well, new slide-up exit door, up-grades to lighting, pavement patching, new hose reels, new sky lights and vent fans, new AC units and new stacking walls. Other than general maintenance, improvements planned for subsequent years include resurfacing the entire tipping floor as well as some repairs to the hoppers. In addition, an excavator is due to be replaced.

- **Oceana Transfer Station:** The Oceana Transfer Station has one hopper for transfer trailer loading. It received 85,954 tons of waste in FY2010. The 6.9 acres that the facility sits on is leased from the Virginia Department of Transportation (VDOT) by SPSA. Replacement of the entire transfer station building above the concrete slab were completed in April 2011. In addition, the hopper will be refurbished and the tipping floor will be resurfaced, along with new lighting and plumbing which will be installed. The scalehouse roof has recently been replaced. The Authority intends to resurface the asphalt pavement at the facility entrance in the next few years. The facility recently received a new Volvo loader and power sweeper.

- **Chesapeake Transfer Station:** The Chesapeake Transfer Station operates with one hopper for transfer trailer loading. Approximately 127,883 tons were received in FY2010. The 4.75 acres that the facility sits on is leased from the city of Chesapeake by SPSA. According to the facility supervisor, the Authority has made the following capital improvements in recent years; trailer pad installations, tipping floor resurfacing (inside and partially outside), in-bound scale replaced (the out-bound scale was replaced in 2003), roof repairs and coating, lighting improvements including new light poles and hopper refurbishment. The Authority is planning to make repairs to the trailer parking area pavement as well as make storm water drainage improvements within the next fiscal year. The facility recently replaced a loader and sweeper. An excavator is due to be replaced in 2011.

- **Franklin Transfer Station:** The Franklin Transfer Station is operated by three personnel. The facility design does not include a building enclosure. The Station received 21,393 tons of waste in FY2010. The land that the facility sits on is owned by SPSA. The Station is maintained in good condition. The tipping floor was recently resurfaced. Cleaning and repainting of the steel hopper and frame are needed to minimize corrosion. SPSA staff are currently improving site drainage by filling and grading low spots between the entrance and exit roadways. The front-end loader is scheduled to be replaced in 2014. No other major capital improvements are anticipated in the near future.

- **Isle of Wight Transfer Station:** The Isle of Wight Transfer Station uses a front-end loader to lift waste into transfer vehicles. The Station received 27,162 tons of waste in FY2010. The 6.1 acres that the facility sits on is leased by SPSA from the County. The Authority is preparing to bid out repairs to the station's tipping floor and pushwall by the Spring of 2011. A new front-end loader is scheduled to be delivered to the station in February 2011.

- **Suffolk Transfer Station:** The Suffolk Transfer Station is located at the Regional Landfill and was originally intended to allow diversion of waste from the Landfill to the RDF WTE Facility. Operation of the facility began in April 2005 with a 500-ton per day design capacity and two hoppers. The facility currently handles an estimated 100 to 450 tons per day (depending on the day of the week). Approximately 67,457 tons were received at the Station in FY2010. The land that the facility sits on is owned by SPSA. The facility is maintained in good condition with no major capital improvements planned in the near future. However, during SCS' site visit on January

20, 2011, it was noted that the tipping floor was worn near the building entrance. The supervisor stated that the remainder of the floor (which was not visible at the time of the visit) was in better condition.

- **Ivor Transfer Station:** The Ivor Transfer Station is primarily used for self-hauled disposal although Southampton County collection vehicles are also permitted to use the facility. Waste quantities were not tracked separately in fiscal year 2010 but the station generally accepts less than 1,000 tons of waste per year. The 1.5 acres that the facility sits on is leased by SPSA from Charles and Kathleen Clark. The Authority plans to construct a potable water well and leachate holding tank to contain drippings from the waste compactor. The improvements are scheduled to be completed by the end of 2011.

- **Boykins Transfer Station:** The Boykins Transfer Station is similar to the Ivor facility. Waste quantities were not tracked separately in fiscal year 2010 but the station generally accepts less than 1,000 tons of waste per year. The land that the facility sits on is leased by SPSA from John Evert Bryant. The Authority plans to replace the steel hopper over the compactor in 2012.

8.3.1.1.2 Expanded Transfer Station Capacity

A general rule for evaluating the need for collection vehicle transfer is based on hauling distance. Although cost-effectiveness will vary, transfer stations generally become economically viable when the one-way hauling distance to the disposal facility is greater than 15 to 20 miles. However, it should be noted that transportation conditions (i.e., traffic, road quality, size of vehicles used and collection routing) will impact the benefit of direct-haul versus consolidating refuse at a transfer station.

In rural areas, transfer stations also provide increased convenience for residential and non-residential self haulers, who might otherwise have to travel long distances to reach a disposal site. Increased convenience helps reduce the amount of illegal dumping, illegal burning, and other inappropriate forms of disposal.

SPSA currently operates a transfer station network. Two possible reasons for adding an additional transfer station include:

- Economic growth in outlying areas of the region, particularly western Chesapeake, western Portsmouth and northern Suffolk and the southern sections of Chesapeake and Virginia Beach, may cause the waste stream to grow to a point where another transfer station may become feasible or desirable. Drive times would be significantly reduced and convenience for residents would be greatly improved.

- There also may be a need to build an additional transfer station in urban areas particularly if existing stations are being over utilized and any upgrades are not feasible.

- Relocation of an existing transfer station to better conform to existing or planned land uses within a jurisdiction. For example, the City of Virginia Beach is considering options for replacement of the Landstown Transfer Station because its current location is in an area that has an expanding educational land use, and the City would like the existing Landstown transfer station property to be used for different purposes.

The benefits of building a new transfer station must be weighed against the costs of adding new facilities. SPSA maintains the existing transfer stations which may require periodic upgrades.

SPSA could evaluate the long-term need for additional transfer stations based on the following:

- Projected population growth and growth patterns.
- Availability of suitable sites.
- Remaining capacity of existing transfer stations.
- Customer usage of existing transfer stations.
- Convenience and accessibility for the region's residents.
- Effect on transfer system costs.
- Land uses.

Sufficient time should be allowed for construction of new transfer stations as warranted.

9.0 IMPLEMENTATION PLAN

Previous versions of the SWMP provided a timeline for the development of several new facilities for the solid waste system. The following provides an overview of the alternatives that were considered and an update on the Region's progress in implementing these alternatives as well as new initiatives being considered. In addition, the HRPDC sponsored a study in 2008 which evaluated institutional, organizational, technology, and disposal options for managing waste in the region after 2018, when the use and support agreements between the SPSA Region members expire.[3] HRPDC has recently authorized an update of this study that will incorporate recent changes to the region's solid waste management system (most notably the sale of the RDF WTE facility to Wheelabrator). The results of this study are scheduled to be available in spring 2011.

9.1 WASTE MANAGEMENT HIERARCHY

In accordance with the Virginia Solid Waste Management Regulations, the region's solid waste management plan must consider and address all components of the solid waste hierarchy. The solid waste hierarchy ranks methods of managing solid waste from most preferred to least preferred:

The Virginia Department of Environmental Quality has adopted a hierarchical approach to the management of solid waste. The hierarchy establishes the framework for solid waste management and includes the following components:

- Source Reduction
- Reuse
- Recycling
- Resource Recovery (Waste-to-Energy)
- Incineration
- Landfilling

SPSA and its member localities, as well as the HRPDC, continue to examine various alternatives for the management of solid waste in Southeastern Virginia. Historically SPSA has focused its efforts on disposal of the Region's solid waste and on alternative approaches to increasing participation in the disposal programs offered to the region. The eight member local governments continue to focus on improvements to the local solid waste collection and recycling systems as well. This section of the RSWMP summarizes the hierarchical approach to Integrated Waste Management envisioned by state and federal agencies and outlines the alternatives being considered.

[3] SCS Engineers, Final Interim Report, Solid Waste Management for Southside Hampton Roads, Planning Horizon 2018-2047, Prepare for the Hampton Roads Planning District Commission, Revised January 5, 2009.

9.1.1.1 Source Reduction and Reuse

9.1.1.1.1 Source Reduction

The Virginia Solid Waste Planning and Recycling Regulations (9VAC20-130) define source reduction as "any action that reduces or eliminates the generation of waste at the source, usually within a process. Source reduction measures include process modifications, feedstock substitutions, improvements in feedstock purity, improvements in housekeeping and management practices, increases in the efficiency of machinery and recycling within a process."

Source reduction, as an approach to solid waste management, has been applied primarily to industrial and hazardous wastes. It reduces the amount of waste requiring disposal, thus prolonging the life of existing waste disposal alternatives. However, it does not eliminate the need for other disposal options.

The primary responsibility of local and regional agencies in source reduction must be in the area of public education and creation of a spirit of stewardship on the part of the citizens, both individual and corporate, due to the fact that packaging of items is out of the control of SPSA and local retailers. Each governmental entity in the region can practice source reduction, to some degree, through its buying practices. Source reduction is directly under the control of private individuals and businesses.

9.1.1.1.2 Reuse

Reuse generally assumes the reuse of a material in a manner identical to its original use and is not significantly different from recycling or source reduction. Therefore, it is considered in this Plan as synonymous with source reduction. Refilling of returnable drink containers is an example of reuse. As with source reduction, the primary responsibility of local and regional agencies is in the area of public education.

9.1.1.2 Actions

- **Continue Household Hazardous Waste (HHW) collection program:** SPSA continues to operate a regional HHW collection program through five collection facilities. One facility (at the Regional Landfill) is open on a full-time basis; the remaining four are open based on a monthly recurring schedule. The City of Virginia Beach has recently opened its own HHW drop-off facility at its Landfill No. 2, and the City of Norfolk also plans to begin operation of HHW facilities to serve their residents. These programs support other environmental programs such as the Hampton Roads Regional Stormwater Management Program which is built on a series of cooperative initiatives such as illicit discharge detection and elimination.

- **Consider Implementation of a Regional Waste/Material Exchange:** As discussed earlier, one company's disposal problem may be another's valuable resources. HRPDC can assess options for implementing a regional waste/material exchange for use by businesses and/or residents.

9.1.2 Recycling and Composting

Recycling is the third highest priority in strategies to manage materials in the waste stream. Recycling is defined by the Virginia regulations as "the process of separating a given waste material from the waste stream and processing it so that it may be used again as raw material for a product which may or may not be similar to the original product." Processing old newspapers to produce "new" paper and composting or mulching of yard wastes are examples of recycling.

Recycling reduces the amount of solid waste that requires disposal. It also reduces reliance on the use of virgin materials in manufacturing. Concurrently, recycling can further enhance the increased public awareness of solid waste management issues by involving the public directly in waste management.

9.1.2.1 Actions

- **Evaluate Materials Recovery Facility:** Currently there is only one significant Materials Recovery Facility (MRF) in the Region that is capable of processing materials collected from various recycling programs. At the time the 2005 SWMP was written, SPSA was the primary provider of recycling collection services in the Region, with the exception of Virginia Beach. As an alternative, SPSA considered the construction and operation of a competing MRF. However, SPSA has discontinued recycling services and the member communities have taken over the responsibility for collection of recyclables. A SPSA-operated MRF is no longer a consideration for the Region and processing of recyclables will continue to remain a private sector function (see Figure 5).

- **Yard waste facility:** SPSA has operated facilities where yard waste collected by member communities was handled, mulched and composed. Yard waste was transported by SPSA from member collection points to the yard waste management facility at the Virginia Beach Landfill No. 2. However, this facility was closed in 2007 to address neighbor complaints of excess odors from the facility. The Region does not currently have a facility dedicated to the handling and processing yard waste. Although the SPSA's regional yard waste management facility located at Virginia Beach's Landfill No. 2 was abandoned after it encountered operational challenges with odors, the development of a regional facility should be considered in the future if the SPSA member communities decide to cooperate in whole or in part their after use and support agreement with SPSA expire in 2018. However, in the interim, the member jurisdictions continue to evaluate options for utilization of their yard waste for beneficial purposes rather than disposing in a landfill.

- **Consider implementation of a Web-Based Recycling Reporting System:** While this option will not increase recycling, it will facilitate easier, more accurate reporting of collected quantities.

9.1.3 Resource Recovery (Waste-to-Energy)

According to Virginia's Solid Waste Planning Regulations, resource recovery entails a comprehensive "solid waste management system which provides for collection, separation, recycling and recovery of energy or solid wastes, including disposal of non-recoverable waste residues." Combustible items are burned as a fuel to produce steam and/or electricity. Noncombustible items, including the ash from the combustibles, must be disposed of in some other fashion, such as landfill or Alternative Daily Cover (ADC). Recyclable materials, typically glass, ferrous metals and aluminum, are recycled following separation. Recycling and source reduction programs may enhance the effectiveness of the combustion alternatives.

9.1.3.1 Actions

- **Operation of RDF WTE Facility:** As mentioned earlier, the sale of the RDF WTE Facility and subsequent transfer of non-processible waste to a private landfill located outside of the SPSA Region has will be the primary disposal method in the Region at least through 2018, and likely beyond that time. Long-term planning for future disposal will still be pursued by the Region members, either cooperatively or independently after 2018. Use of the RDF WTE Facility will still be an available option after 2018.

9.1.4 Landfilling

Landfill disposal of solid waste is the most prevalent option in the United States. The Virginia Regulations define a landfill to include "a sanitary landfill, an industrial waste landfill, or a construction/demolition/debris (CDD) landfill." Landfills for municipal solid waste presently are operated as sanitary landfills, involving daily cover of the waste, required use of liners, and leachate collection systems. Landfilling is required for management of solid wastes that do not lend themselves to any of the other management options. Of the Southeastern Virginia landfills currently permitted and in operation, three are publicly owned while the others are private CDD landfills.

9.1.4.1 Actions

- **New transfer stations**: In addition to the waste transfer facilities in the existing SPSA network, two additional facilities are proposed as a condition of the Special Use Permit (from the city of Suffolk) associated with the permitting of the proposed expansion of the Regional Landfill (Cell VII). It is understood that the status of these facilities is uncertain pending further evaluation by SPSA and discussions with the City.

- **Plan and permit Cell VII of regional landfill**: SPSA currently is in the process of permitting Cell VII of the SPSA Regional Landfill and has submitted a Part B application to DEQ. However, with the sale of the RDF WTE Facility to Wheelabrator, the need for this cell has been greatly reduced. The permitting of this cell; however, may provide backup disposal capacity to the Region in the event that the RDF WTE Facility is no longer in service (for whatever reason) or it is not the

primary disposal facility selected by the SPSA member communities after 2018. However, SPSA and the member communities are evaluating the future of the Regional Landfill.

- **Begin planning for a new regional landfill:** As mentioned above, the sale of the RDF WTE Facility and subsequent transfer of non-processible waste to a private landfill located outside of the SPSA Region has reduced the immediate need for a new regional landfill; however, long-term planning for future disposal will still be pursued by the Region members, either cooperatively or independently after 2018. Having a landfill located close to the member communities in the Region will be a significant factor in determining the long-term costs for solid waste management. (SCS, 2008)

- **Evaluate new construction and demolition debris (CDD) landfill:** The 2005 SWMP recommended the evaluation of various methods for managing CDD. However, the majority of CDD that is currently handled and disposed of in the Region is collected, recycled, and disposed by the private sector. The primary concern at the writing of the 2005 SWMP was providing an outlet for storm debris. Due to changes in the disposal of non-processible waste, and the recent permitting of a new private CDD landfill in the Region (Centerville Turnpike CDD Landfill), there appears to be sufficient capacity for the management of municipally collected CDD.

- **Continue operation of the Virginia Beach Landfill No. 2:** This landfill is owned by the City of Virginia Beach and continues to remain in operation. The landfill will continue to accept ash from the RDF WTE Facility until 2015. The City will make a decision about whether to continue accepting ash after 2015. The City is considering other long term options for the facility such as potential expansion.

9.2 IMPLEMENTATION OF ACTIONS

The timeline for implementation of most actions stated in the previous section is a subject of the study recently authorized by the HRPDC (update of the study originally performed in 2008). In addition, based on the study results, the SPSA member communities are expected to determine if SPSA will continue to be the designated regional solid waste management agency. As long as SPSA is the regional solid waste management agency, it will be involved in the development of the regional solid waste management plan. In March 2010, the communities designated the HRPDC as the regional solid waste planning agency and the agency responsible for tracking and reporting on recycling activates in the Region. Key milestones are summarized below:

- Complete update to the 2018 and Beyond Study (April/May 2011)

- Make decision regarding the extension of the Wheelabrator service agreement (December 31, 2014). If the SPSA/Wheelabrator service agreement is not extended by the member communities, each community will need to plan for future disposal of its own solid waste, individually or corporately.

- Fate of the Regional Landfill (2011 – 2018): The fate of the Regional Landfill is currently under consideration; however, no definitive schedule has been set for a final decision. Options include keeping the facility operational, but under reduced operational conditions, moth-balling the facility indefinitely, closing the facility, or selling it to a private entity, either directly or through some form of a lease agreement. These options are being considered as a part of the update to the 2018 and Beyond Study schedule to be completed by the HRPDC in early 2011.

- Expiration of the ash disposal agreement with the City of Virginia Beach (December 31, 2015). After this date, the City of Virginia Beach will be required to pay the same tip fee as the other SPSA members (with the exception of Suffolk), and will no longer be obligated to accept ash residue from the RDF WTE Facility. Wheelabrator is responsible for the disposal of ash residue and SPSA may accept it if its Regional Landfill is open.

9.3 FUNDING/FINANCING OF PROGRAMS AND FACILITIES

SPSA currently establishes the tip fee each year to fund its operations. The tip fee is based on the municipally collected waste delivered to SPSA's facilities, and is based on the use and support agreements that each community has with SPSA. The City of Suffolk and Virginia Beach have unique agreements with SPSA since they host landfills in the Region. Suffolk pays no tipping fees through 2018 and the City of Virginia Beach has a set tip fee schedule through December 31, 2015, after which it pays the same tip fee as the other SPSA member communities, with the exception of Suffolk. The tip fee accounts for unique agreements with the City of Suffolk, Virginia Beach, commercial haulers, and Wheelabrator. Each member then calculates what their respective charges will be for their residential customers and distributes those charges through their respective ad valorem tax systems or dedicated waste management fees. The current approach only covers the residential customers that receive municipal collection services. Commercial customers pay the tip fee directly to SPSA through their collection contractors.

This section provides an overview of the budgets and funding mechanisms established by the member communities to pay for management of solid waste. The solid waste management services offered by each community were discussed earlier in this document.

- **City of Chesapeake:** The Waste Management Division of the Public Works Department provides refuse collection services for over 60,000 residences in the city. Over 100,000 tons of refuse is collected annually. The City allocates monies from the General Fund to cover the costs of this service. The FY 2009-2010 budget totals $31,009,559 ($8,904,439 for solid waste collection and $22,105,120 for solid waste disposal and recycling). Beginning July 1, 2009, Chesapeake residents who have City trash collection pay $3 per month per household for collection, disposal and recycling. This is to offset the increased SPSA disposal costs and pay for enhanced recycling, which has been requested by citizens for several years. The City Council approved the fee through January 1, 2011. The cost of personnel and equipment associated with trash pickup will continue to be paid from the General Fund.

- **City of Franklin:** The City uses General Fund revenues to pay for the costs of solid waste collection and disposal. Revenues to the General Fund (FY 2010-2011) include charges for solid waste collection in the amount of $765,746. These charges are paid by homeowners and businesses on the monthly utility bill and are currently $32.00 per month for a single-family home or $30.00 per month for a business using one container. The City's current budget for solid waste management is $1,539,746.

- **City of Norfolk:** The Waste Management Division collects approximately 120,000 tons of refuse annually from 75,000 residences and businesses. The City charges a daily rate of $0.55 for single-family homes (approximately $16.68/month), which is included in the Hampton Roads Utility Billing Service statement. The daily rate for businesses in the Central Business District is $3.01 per container. The City uses the General Fund to pay for services. The FY 2010 approved budget includes $25,702,745 for waste collection and $221,398 for clean community recycling.

- **City of Portsmouth:** The City charges a refuse collection fee of $40.72 per month per dwelling unit on the public utilities bill. The City has established a separate Waste Management Fund to pay for the costs of service. The FY 2010 adopted budget includes revenues and expenditures of $12,622,091 (of which $12,587,500 are charges for service).

- **City of Suffolk:** The City uses General Fund revenues to pay for the costs of solid waste collection and disposal. The City's budget for refuse collection for FY 2010 totals $3,771,566. The City is implementing a fee of $18.50 per month per household starting July 1, 2011.

- **Virginia Beach:** The City collects more than 200,000 tons of waste and 35,000 tons of recyclables (through a contract with Tidewater Fibre Corporation) per year. The City's operations are funded through the General Fund with FY 2010 budgets totaling $11,500,842 for waste collection, $20,384,355 for waste disposal, and $5,325,351 for recycling.

- **Isle of Wight County:** The County uses its General Fund to pay for refuse collection and disposal services. For FY 2010, the County has budgeted $770,646 for refuse collection and $3,450,000 for refuse disposal and recycling.

- **Southampton County:** Southampton County uses the General Fund to cover costs for refuse collection and disposal services. The County's approved 2007-2008 budget included $677,555 for waste removal and $1,152,860 for refuse disposal.

9.4 PUBLIC EDUCATION

Educational programs are ongoing throughout the region, and both SPSA and the localities continue to educate the public on the need for proper waste management and disposal practices. This is done through a variety of means, including a detailed SPSA website, classroom presentations, SPSA facility tours and print pieces such as brochures and informative booklets, and media spots. SPSA and the individual localities provide and participate in a variety of

educational programs throughout the member localities and the Hampton Roads region. Programs include the following:

- **SPSA Programs:** SPSA continues to to offer limited educational materials on its website.

- **Local Programs:** Most localities in Southeastern Virginia have Clean Community offices that provide educational information to the public about their specific locality, as well as an array of volunteer opportunities. Some of these opportunities include Clean the Bay Day, Adopt-a-Spot, Keep America Beautiful projects, and many more. Most Clean Community offices have program information and contact lists available through the host locality's website.

  Since the municipalities have taken the responsibility for collection of recyclables, information on recycling is available on city/county websites.

- **Regional Programs:** HR CLEAN, the recycling and litter prevention education program of the HRPDC, is a regional coalition of local and regional Clean Community, recycling, and environmental education coordinators who promote litter prevention, recycling, community beautification, and general environmental awareness through educational projects designed to reach all sectors of our communities.

9.5 PUBLIC/PRIVATE PARTNERSHIPS

A broad range of issues will influence the configuration of the regional solid waste system in the future. The economic dynamics of solid waste management are difficult to predict. Public/private partnerships may offer cost effective and efficient solutions to specific solid waste management problems in the future. SPSA continues to develop and explore opportunities and ideas for joint ventures. Among the many current partnerships are the metals recovery and recycling with the firm Bi-Metals, and automotive battery recovery and recycling with local business Battery Outlet. Other partnership examples are the previously discussed Landfill Gas-to-Energy Plant at the SPSA Regional Landfill and the methane recovery plant at Virginia Beach Landfill No. 2. Through its relationship with Suffolk Energy Partners, SPSA is able to process landfill gas for use by either Dominion Virginia Power or BASF. The City of Virginia Beach has partnered with Ingenco in its efforts in this arena.

Contracts between the localities and SPSA, as well as between Wheelabrator and private waste haulers, are and will continue to be important to the waste management programs offered throughout the region. The current agreements between SPSA and its eight member localities will expire in the year 2018. Efforts are already underway to promote continued and strengthened commitment of area local governments to SPSA, and to ensure the future viability of the agency.

9.5.1 Existing Role of the Private Sector

The private sector currently plays a significant role in handling and disposing solid waste generated within the SPSA localities. The existing role of both the public and private sector is explained in Section 2.0. The continued mix of public sector and private sector involvement will be needed to insure that the waste management needs of South Hampton Roads are met in an efficient manner. For the several components of the solid waste stream the division of responsibility between SPSA, the localities, and the private sector is as follows:

- **Municipal Waste**

  - **Recyclable Materials:** Tidewater Fibre collects residential recyclables under contract to several member jurisdictions including Virginia Beach, Chesapeake, Suffolk, and Portsmouth. Norfolk collects the recyclables and delivers the collected materials to Tidewater Fibre. Virginia Environmental Systems provides services to Franklin, Isle of Wight County, and Southampton County.

  - **Municipal Solid Waste:** Municipal solid waste currently is collected by the localities and delivered to SPSA. This waste stream is segregated into processible or non-processible waste. Processible waste is transferred by SPSA to the RDF WTE Facility. Non-Processible waste is transported by Wheelabrator to other disposal facilities. This arrangement is governed by the service agreement between Wheelabrator and SPSA, and is effective through January 2018. In the event the RDF WTE Facility is not operational, waste is either diverted to the Regional Landfill or to other disposal facilities pursuant to the agreement between SPSA and Wheelabrator. Both the operation of the RDF WTE Facility and final disposal of non-processible waste is managed by a private firm. After 2018, new contractual and operational arrangements will be in place governing the management of municipal solid waste, and may include maintaining the existing disposal arrangements, or developing new ones.

  - **Other Recyclable Materials:** Other recyclable materials such as yard waste, white goods, and metals from ash residue generated from the RDF WTE Facility are handled, in part, by private firms (e.g., Bi-Metals Corporation at the RDF WTE Facility, McGill Environmental for yard waste for Isle of Wight, Norfolk, and Virginia Beach).

- **Other Wastes**

  - **Construction and Demolition Debris**: The bulk of CDD handled and disposed of within the SPSA localities is processed by the private sector.

  - **Household Hazardous waste** is collected by SPSA. Disposal is handled by a private contractor.

  - **Special Wastes:** Several types of special wastes, including motor vehicle tires, waste oil and batteries are collected and processed by SPSA. These materials are

also collected and processed by the private sector. Other types of special wastes, including stumps and land clearing debris, are for the most part processed as part of the CDD waste stream by the private sector. Septage and sludge are handled by a combination of SPSA, Hampton Roads Sanitation District, and a wide range of private companies.

- **Petroleum-Contaminated Materials:** Opened August 20, 1999, Soilex specializes in the treatment and recycling of petroleum-contaminated materials and receives the majority of the region's waste materials that come from oil spills and other emergency response actions. This facility will allow SPSA to receive larger volumes of materials that, once treated, may be used in other beneficial ways at the landfill. What the partnership means to SPSA is additional material to cover landfilled waste that SPSA does not need to pay for and avoided fuel and transportation costs.

- **Methane Gas:** In November 2010, an agreement between SPSA and Suffolk Energy Partners, LLC (SEP) was made that conveyed exclusive rights for all the landfill gas (LFG) at the Regional Landfill to SEP for capture and beneficial reuse. SEP had held the rights to the LFG under a previous agreement and owns and operates the LFG recovery system that consists of recovery wells and flare. In addition, SEP owns and operates an electrical power plant at the Landfill that generates electrical power for sale to Dominion Virginia Power. SEP is currently in the process of constructing a facility at the BASF Plant on Wilroy Road in Suffolk, approximately 2.3 miles from the Landfill, that will supply LFG to the Plant for direct use (via an existing pipeline constructed in 2001) in its manufacturing process. It is understood that under the new agreement, in return for giving up the rights to the LFG, SPSA receives 30 percent of revenues from sales of recovered gas and 20 percent of revenues received from sales of electricity generated from the recovered gas. SPSA estimates that in FY2012 revenues from this agreement will be approximately $550,000. The City of Virginia Beach has also partnered with Ingenco to use landfill gas as a fuel to generate power to sale to the electrical grid during peak usage times.

9.5.2 Potential Future Role of the Private Sector: Municipal Solid Waste

The nature of the future role of the private sector in handling and processing municipal solid waste generated within the SPSA localities has changed over the past several years and will be determined by a combination of economic factors and political decisions made at the local and regional level. Under the existing contractual structure between the localities and SPSA, the division of responsibility between SPSA and the localities will remain relatively static until 2018. The existing contracts between the localities and SPSA will expire in 2018, as will the contract between SPSA and Wheelabrator. If the contracts are not renegotiated between SPSA and the localities, disposal of solid waste could become a function of the private sector.

9.6 SOLID WASTE MANAGEMENT PLAN IMPLEMENTATION

Section 9VAC20-130-90. B. indicates that "multi-jurisdictional plans developed in fulfillment of the requirements of this chapter must be adopted under authority of the Regional Cooperation Act (Chapter 42, (Section 15.2-4200, et. seq.) of Title 15.2 of the Code of Virginia), the Virginia Water and Waste Authorities Act (Chapter 51, (Section 15.2-5100, et. seq.) of Title 15.2 of the Code of Virginia), the provisions of the Code of Virginia governing joint exercise of powers by political subdivisions (Section 15.2-1300), or other authority as applicable." Action by SPSA originally in 2004 to adopt the Regional Solid Waste Management Plan for Southeastern Virginia, in accordance with its plan approval procedures, satisfied this requirement.

SPSA was designated the regional solid waste planning agency for Southeastern Virginia by action of the Department of Environmental Quality in 2004. This action followed formal requests by the sixteen cities, counties and towns in Southeastern Virginia that SPSA be designated as the regional solid waste planning agency. However, in March 2010, the communities designated the HRPDC as the regional planning agency while SPSA remains the regional solid waste management agency at least until January 2018.

10.0 PUBLIC PARTICIPATION

10.1 CURRENT & FUTURE PROGRAMMING

SPSA offers an outlet for the public, both citizens and businesses, to give suggestions, make requests and comments on its website, www.spsa.com. In addition, SPSA offers the public an opportunity to speak to the Board of Directors at the monthly Board meetings held in the Regional Board Room at 723 Woodlake Drive, Chesapeake, VA 23320. These meetings, which are normally held on the fourth Wednesday of every month, are open to the public. The public may also participate in programs such as HRCLEAN which is sponsored by the HRPDC. The HRPDC also offers the public opportunities to speak at their Quarterly Commission meetings.

10.2 SOLID WASTE MANAGEMENT PLAN PUBLIC NOTICE AND HEARING

SPSA provided for public participation during the development of the original RSWMP. Public participation procedures include publication of a public notice announcing the availability of the revised RSWMP and commencement of a 30-day comment period and the person to be contacted with comments. The HRPDC will conduct a public meeting before the finalization of this Plan.

11.0 REGIONAL SOLID WASTE MANAGEMENT PLAN AMENDMENT PROCEDURES

HRPDC adopted the following procedures for interested parties to request an amendment to the approved RSWMP, and for HRPDC staff to review and process such requests. To initiate an amendment to the RSWMP, a completed application form which can be obtained from the HRPDC) with supporting documentation, must be submitted. The application will be reviewed for completeness and evaluated based on the justification of need for the proposed amendment. The HRPDC must approve all major and most minor amendments to the RSWMP prior to its submittal to the VDEQ. (Minor amendments described in Section 11.1.B.1 and 2 below require such approval.)

11.1 TYPES OF AMENDMENTS TO THE RSWMP

Virginia's Solid Waste Planning Regulations allow for two types of amendments to approved solid waste management plans. They are classified as major or minor amendments.

A. Section 9 VAC 20-130-175.A.1 of defines major amendments as:

1. Any addition, deletion, or cessation of operation of any solid waste disposal facility;
2. Any increase in landfill capacity;
3. Any change that moves toward implementation of a waste management strategy that is lower in the waste management hierarchy;
4. Action plan(s), including an action plan to address a planning unit's recycling rate that has fallen below the statutory minimum;
5. And any change to membership in the approved area.

B. Section 9 VAC 20-130-175.A.2 defines minor amendments as:

1. Any addition, deletion, or cessation or operation of any facility that is not a solid waste disposal facility;
2. Any change that moves toward implementation of a waste management strategy that is higher in the waste management hierarchy or;
3. Any non-substantive administrative change, such as a change in name.

11.2 RSWMP AMENDMENT PROCEDURES

A. To request an amendment to the RSWMP, an applicant shall:

1. Submit a completed application and supporting documentation to the HRPDC for the desired amendment and

2. Pay out of pocket expenses associated with its application such as advertisement of public notice.

3. The application and all supporting documents shall be submitted to the HRPDC.

B. HRPDC response to an application to amend the RSWMP shall include:

1. Within fifteen (15) days of receipt, HRPDC will acknowledge receipt of the application to amend the RSWMP.

2. Within thirty (30) days of receipt, HRPDC will evaluate the application for completeness. A letter acknowledging a complete application will be sent to the applicant.

3. If needed, a request for additional information will be sent to the applicant, who will have thirty (30) days to submit the additional information, or the request to amend the RSWMP will be denied.

4. Within ninety (90) days of receipt of a complete application, HRPDC staff will review and evaluate the justification of need for the proposed facility. This review may include discussions with the applicant, local government officials, members of SPSA staff and permitting staff at VDEQ.

5. The approved RSWMP will be the primary instrument used to evaluate the need for the requested amendment.

6. If the conclusion of the evaluation is that the requested amendment is consistent with the intent of the RSWMP and in the best interest of the planning region, HRPDC staff will amend the text of the approved RSWMP to accommodate the amendment request.

C. Public Participation

1. Public participation is required for all major RSWMP amendments and minor amendments described above.

2. HRPCD Staff will arrange for publication of a required public notice describing the proposed amendment, the commencement of a public comment period (30 days, at minimum), and date, time and location of a required public hearing.

3. Publication of the public notice will occur not less than fifteen (15) days prior to the scheduled hearing.

4. HRPDC staff will arrange for and conduct a public hearing not less than fifteen (15) days prior to the end of the public comment period, nor less that fifteen (15) days following the publication of notice of said hearing. The public hearing will most likely be part of a normally scheduled SPSA Board of Directors meeting.

5. HRPCD staff will ensure the text of the proposed amendment is available for review during the public comment period. The proposed amendment will be placed on HRPDC's website at www.hrpdc.org. Hard copies of the amendment will also be provided upon written request.

D. VDEQ Approval

1. Following the public comment period, HRPDC staff will forward the revised RSWMP to VDEQ. Minor amendments will be submitted to VDEQ for informational purposes. Major amendments will be submitted to VDEQ for its approval.

2. In either case, VDEQ must acknowledge receipt of and/or approve the amendment prior to HRPDC finalizing the amended RSWMP.

3. Amending the RSWMP does not remove the requirement for the applicant to obtain necessary environmental permits to construct and operate the solid waste facility in accordance with local and state regulations.

4. In the event a requested amendment is deemed to not be in keeping with the strategy outlined in the RSWMP or Solid Waste Planning Regulations, HRPDC will so advise the VDEQ, and the applicant.

11.3 GUIDANCE FOR DEMONSTRATING NEED OF A NEW OR EXPANDED SOLID WASTE MANAGEMENT FACILITY

Each application requesting amendment to the RSWMP to include a new facility not detailed in the Plan shall be accompanied by a demonstration of need for the facility in the planning region, which shall be of the form and content as the HRPDC may prescribe. It is the applicant's responsibility to provide reasonable and detailed information sufficient for this determination. Sources of data and information used to demonstrate need shall be cited.

A. The demonstration of need shall be specific as to the types of waste and/or recyclable materials to be managed and shall include, but not be limited to:

1. Documentation of the available capacity at existing facilities in the planning region to be served by the facility;

2. Documentation of the current volume of waste/recyclables generated in the region to be served by the facility and the volume of waste/recyclables reasonably expected to be generated in the area to be served over the next 20 years;

3. A description of additional factors, such as physical limitations on the transportation of materials or the existence of additional capacity outside the region to be served which may satisfied the projected need.

B. The following factors will be considered in evaluating the need for the proposed facility:

1. An approximate service area for the proposed facility which takes into account the economics of collection, processing, transportation, treatment, storage and/or disposal;

2. The quantity of waste/recyclables generated within the planning area suitable for treatment, processing, storage and/or disposal at the proposed facility;

3. The design capacity of existing facilities located within the planning area;

4. The extent to which the proposed facility is needed to replace other facilities, if the need for a proposed facility cannot be established under the above paragraphs.

C. If it is determined that a proposed facility is inconsistent with or contradictory to the above paragraphs or otherwise set forth in the RSWMP, the application to amend the RSWMP will be denied.

Appendix A

July 22, 2015, Letter from SPSA to the Virginia Department of Environmental Quality and Response

July 22, 2015

Mr. Steve Coe
Virginia Department of Environmental Quality
Waste Management Program
629 East Main Street
P.O. Box 1105
Richmond, VA 23218

RE: Letter of Certification

Dear Mr. Coe:

As required by 9VAC20-130-175F, the Hampton Roads Planning District Commission (HRPDC) is submitting this letter, prior to the five-year anniversary of the plan approval date, to certify that the Regional Solid Waste Management Plan for Southeastern Virginia (SWMP) elements have been maintained and updated with respect to:

- Waste generation estimates
- Available 20-year waste management capacity
- Achievement of SWMP schedule increments

The HRPDC was designated as the Regional Solid Waste Planning Agency for the region in August, 2012. Southeastern Virginia Region (the Region) has continued to study the future of solid waste management for 2018 and beyond. The HRPDC contracted with SCS Engineers in 2010 to update the 2018 and Beyond Study. The update was completed in April, 2011 and a Solid Waste 2018 Technical Committee was formed to develop a new Use and Support Agreement. The Southeastern Public Service Authority of Virginia (SPSA) has recently received proposals from interested companies for alternative methods of disposal of solid waste in lieu of the Regional Landfill. SPSA is currently reviewing the proposals to determine the most appropriate and most economical method of disposal. A new Use and Support Agreement has also been drafted for review by the individual localities. The timeline for approval of the Use and Support Agreement and a decision on the disposal method for Post 2018 is October, 2015.

The SWMP has been maintained and has been amended four times since 2010 to accommodate changes in the solid waste system. The following provides a discussion of the above-listed bullet points.

WASTE GENERATION ESTIMATES

The Regional Solid Waste Management Plan (Plan) contains estimates for solid waste generation in the Region that range from .81 tons/person/year (for SPSA disposed waste excluding recycling) to .92 tons/person/year for "Total Waste," (i.e., waste disposed at SPSA and private facilities). It was further assumed that the waste generation rates would remain constant during the planning period. The HRPDC, in cooperation with SPSA, has re-evaluated waste generation within the Region and has developed a new waste generation rate based on 2014 data. For the purposes of this analysis, waste generation is defined as the sum of tons of solid waste disposed and recycled either through SPSA or municipal programs.

Waste disposal tonnages for the SPSA Regional Landfill, the Virginia Beach Landfill No. 2, and the City of Portsmouth construction, and demolition debris (CDD) Landfill are provided in Figure 1 for the years 2010 through 2014. Similarly, recycling quantities for both SPSA and its member communities are provided in Figure 2 for the years 2010 through 2014. The combined disposal and recycling tonnages are provided in Figure 3, which represents waste generation for the SPSA service area. The tonnages represented in the figures do not include waste or recyclables that are generated within the SPSA service area, but are disposed or otherwise managed by the private sector outside of the Region.

Waste generation rates were then developed by dividing the total waste generated (Figure 3) with population estimates for the SPSA member communities. The resultant waste generation rates are provided in Figure 4. The waste generation rate calculated in 2009 is higher than the rate used to estimate waste generation in the 2015 SWMP.

The 2014 estimated waste generation rate was combined with population projections for the Region to provide an estimate of waste generation for the 20-year planning period. By the end of the planning period, the SPSA Region will generate nearly 1.27 million tons of municipal solid waste:

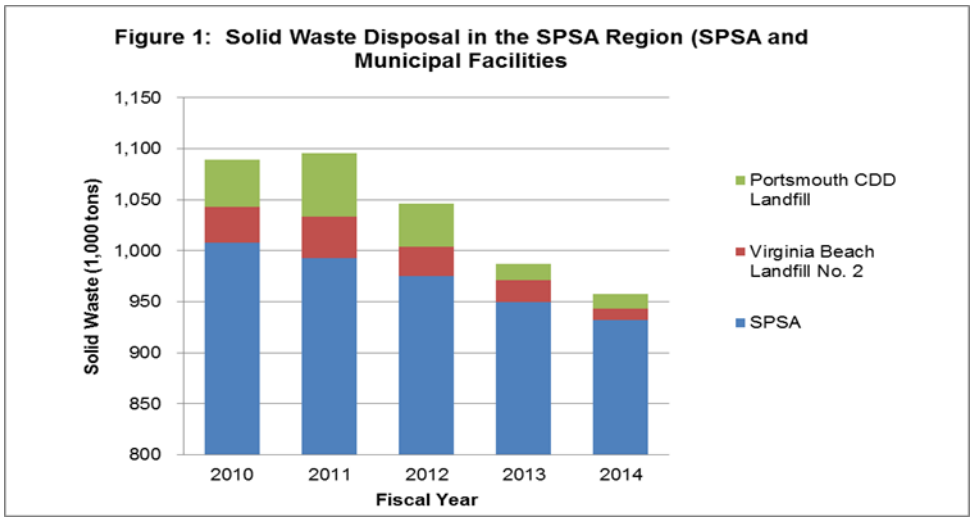
2015: 1,091,900 tons
2025: 1,176,500 tons
2035: 1,267,600 tons

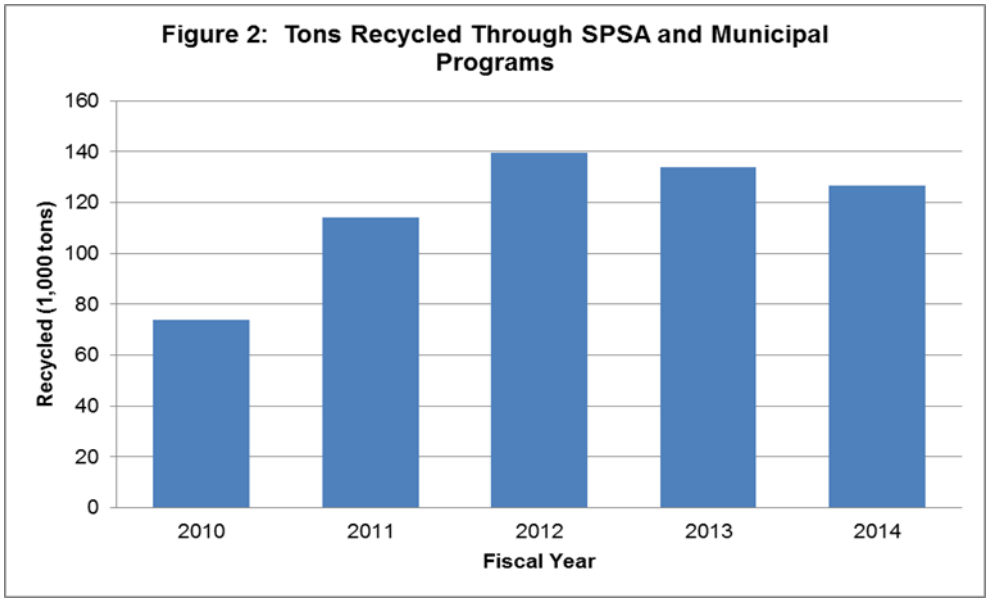
Waste generation estimates are presented graphically in Figure 5.

AVAILABLE WASTE MANAGEMENT CAPACITY

When the 2010 SWMP was written, it was envisioned that SPSA would not be the sole provider of solid waste disposal for the service area. The RDF WTE Facilities were sold to Wheelabrator in April 2010. Under the terms of the sale, Wheelabrator will accept and process SPSA member community municipal solid waste. Ash generated by the facility was disposed of at the Virginia Beach Landfill No. 2 (until 2011). Since August 2011, ash is taken to the Regional Landfill located in Suffolk, Virginia and operated by SPSA. The non-processible waste, which previously had been disposed of in the SPSA Regional Landfill, is

now being taken by Wheelabrator to landfills that are located outside of the SPSA service area (see Figure 6).





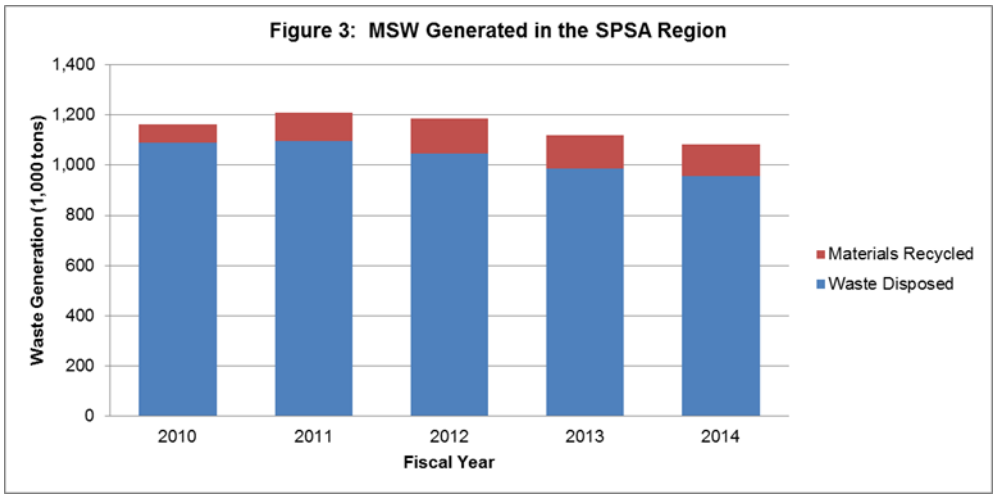
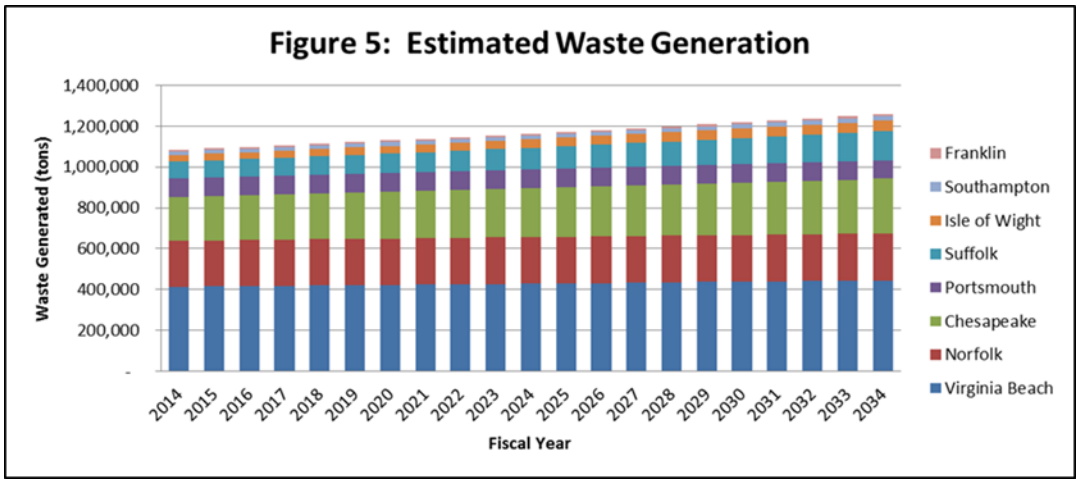


Figure 4: Municipal Solid Waste Generation Rates

Fiscal Year	Waste Generated (1,000 tons)	Estimated Population	Waste Generation Rate (tons/person/year)
2010	1,128	1,145,548	0.98
2011	1,173	1,156,040	1.01
2012	1,185	1,169,112	1.01
2013	1,121	1,177,688	0.95
2014	1,084	1,183,607	0.92

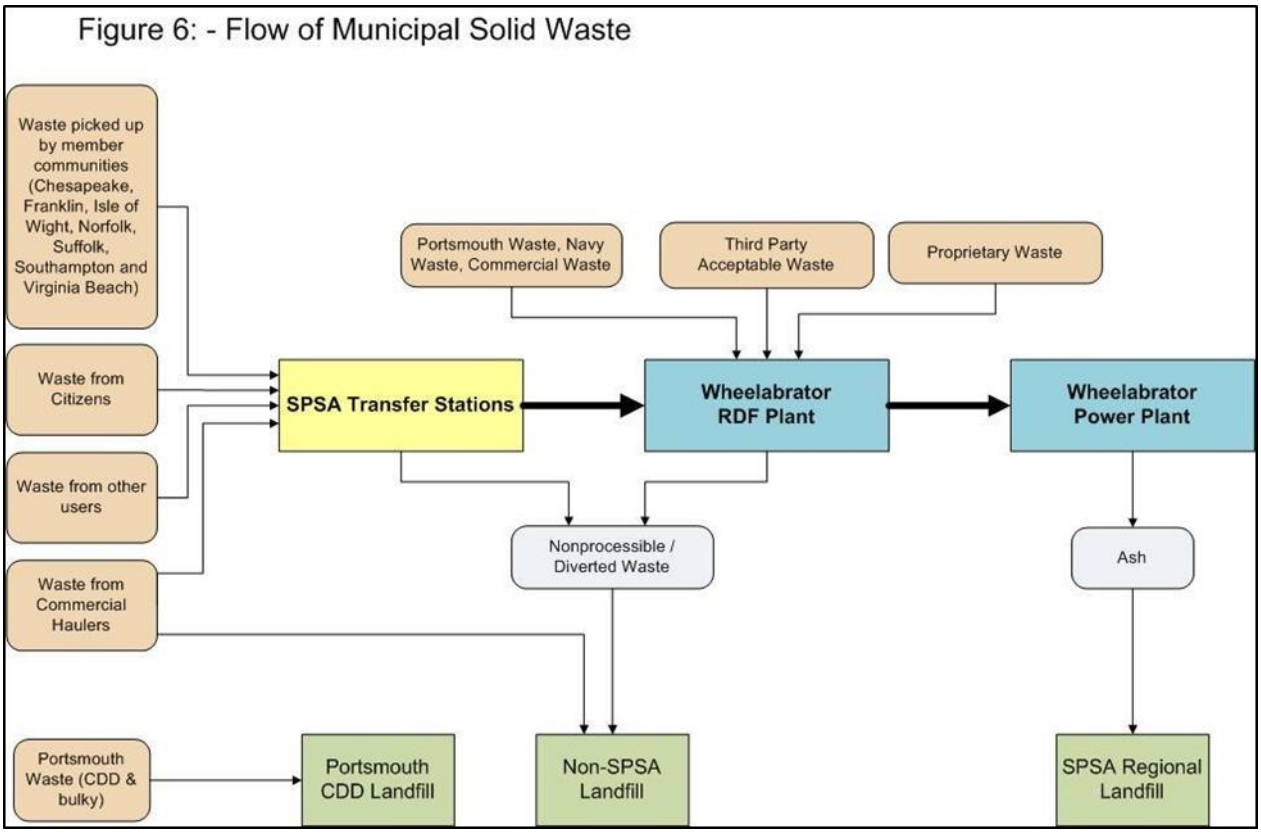


The service agreement requires Wheelabrator to accept SPSA member waste until January 24, 2018.

Assuming Wheelabrator maintains the WTE RDF Facilities so it can be operated at capacity, the RDF plant will continue to provide long-term disposal capacity for the Region well into the future. Several privately owned and operated municipal solid waste landfills are located in Eastern Virginia that could provide disposal capacity for the Region's non-processible waste. For example, at the end of 2013, the Bethel Landfill had more than 24 million tons and 76.3 years of remaining capacity.[1]

With the diversion of non-processible wastes from the SPSA Regional Landfill, SPSA projects that the anticipated remaining disposal capacity of Cell VI of the SPSA Regional Landfill will now extend beyond 2018; providing sufficient capacity for disposal. On June 8, 2011, the Virginia Department of Environmental Quality issued amended Permit#417 for Cell VII expansion of the SPSA Regional Landfill in Suffolk, whereby adding an additional 56 acres of lined disposal area to the Regional Landfill. It is also anticipated that the Virginia Beach Landfill No. 2 and the City of Portsmouth CDD Landfill both will have potential capacity for the 20-year planning period.

[1] This disposal capacity estimate does not account for acceptance of non-processible waste from the SPSA region. Source: Solid Waste Managed in Virginia During Calendar Year 2013, Virginia Department of Environmental Quality, June 2014.



PLAN SCHEDULE INCREMENTS

The 2010 SWMP provides a timeline for the development of several new facilities for the solid waste system. The following provides an overview of the alternatives that were considered and an update on the Region's progress in implementing these alternatives. In addition, the HRPDC sponsored a study in 2011 which updated the evaluation of institutional, organizational, technology, and disposal options for managing waste in the region after 2018, when the Use and Support Agreements between the SPSA Region members expire.[2] The findings from the HRPDC study are still being considered by the Region.

Planning for a new regional landfill: The sale of the RDF plant and subsequent transfer of non-processible waste to a private landfill located outside of the SPSA Region has reduced the immediate need for a new regional landfill; however, long-term planning for future disposal will still be pursued by the Region members, either cooperatively or independently after 2018.

New transfer stations: The 2010 SWMP identified the need for three new transfer stations in the Region. However, except for the Chesapeake facility, all transfer stations are operating at or below their design capacity.

[2] SCS Engineers, Final Report, Solid Waste Management for Southside Hampton Roads, Planning Horizon 2011-2047, Prepared for the Hampton Roads Planning District Commission, October 6, 2011.

Yard waste facility: SPSA has operated facilities where yard waste collected by member communities was handled, mulched and composted. Yard waste was transported by SPSA from member collection points to the yard waste management facility at the Virginia Beach Landfill No. 2. This facility was closed in 2007 to address neighbor complaints of excess odors from the facility. The Region does not currently have a facility dedicated to handling and processing yard waste, although several member communities are in the process of implementing programs to beneficially reuse the yard waste that they collect (see Figure 7).

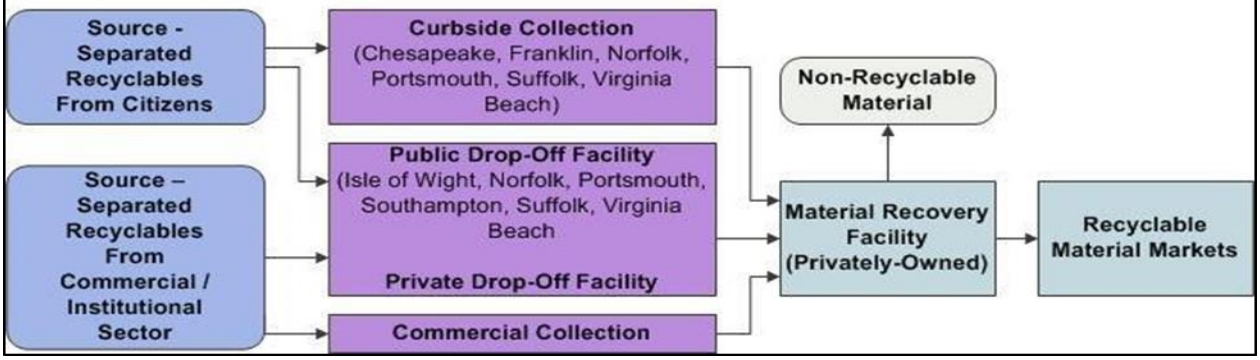
Evaluate Materials Recovery Facility: Currently there are eleven Materials Recovery Facilities (MRF) in the Region that are capable of processing materials collected from various recycling programs. SPSA discontinued recycling services in 2010 and the member communities have taken over the responsibility for collection of recyclables (see Figure 8).

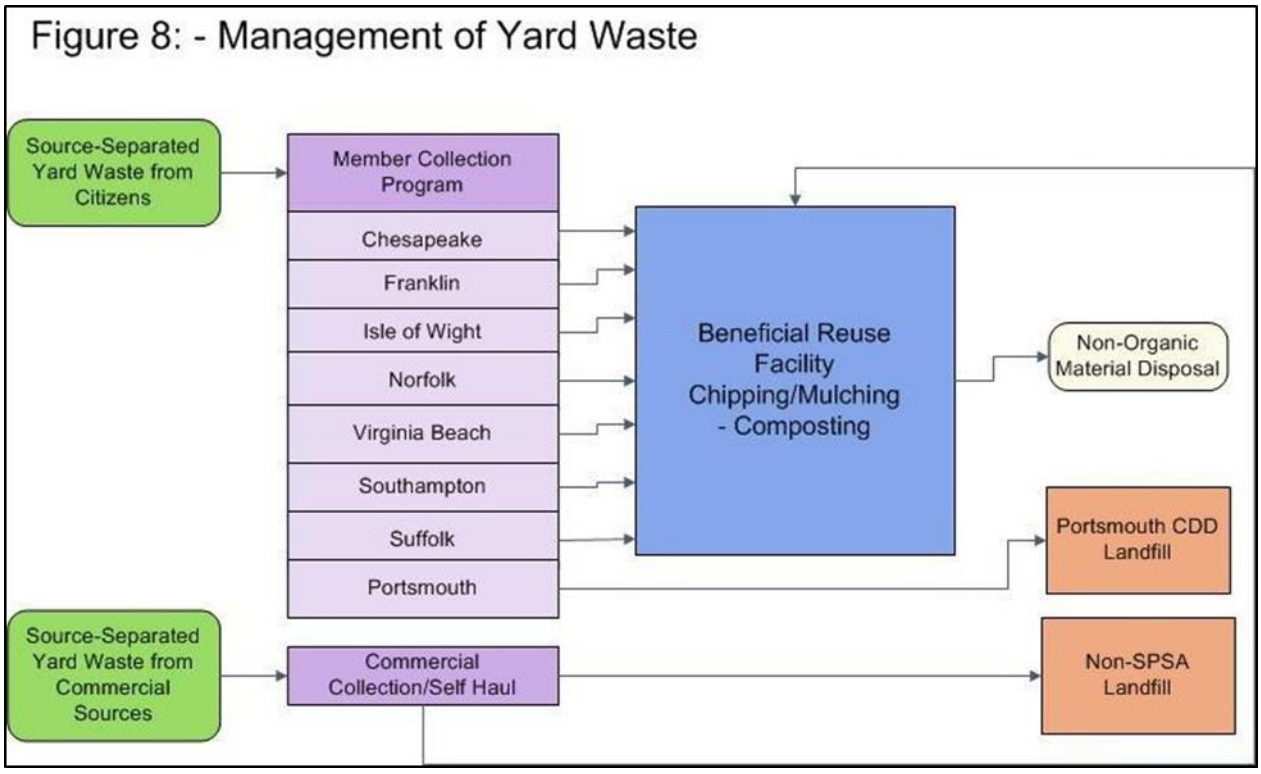
Evaluate new construction and demolition debris (CDD) landfill: The 2010 SWMP recommended the evaluation of various methods for managing CDD. However, the majority of CDD that is handled and disposed of in the Region is collected by the private sector. The primary concern at the writing of the 2010 SWMP was providing an outlet for storm debris. Due to changes in the disposal of non-processible waste, and the existing private CDD landfills in the Region, there should be sufficient capacity for the management of municipally collected CDD.

Continue Household Hazardous Waste (HHW) collection program: SPSA continues to operate a regional HHW collection program through three collection facilities. One facility is open on a full-time basis; the remaining two are open based on a monthly recurring schedule. The cities of Norfolk and Virginia Beach and Isle of Wight County operate their own HHW program to serve their residents.

Continue operation of the Virginia Beach Landfill No. 2: This landfill is owned by the City of Virginia Beach and continues to remain in operation. The landfill discontinued the acceptance of ash from the RDF plant in August 2011.

Figure 7: - Management of Recyclables





CLOSING

Even with changes in the solid waste management system and increased waste generation, there appears to be sufficient municipally-owned or privately-owned capacity to effectively manage the Region's waste stream. Furthermore, SPSA has maintained and implemented several aspects of the 2010 SWMP. Other alternatives are still under evaluation or have been negated due to changes in disposal practices. The HRPDC updated the overall regional solid waste plan document in 2013 to incorporate the previous amendments to the plan and update other demographic, facility, management, and waste flow information.

Should you need additional information, do not hesitate to contact me.

Sincerely,

Robert Crum
Executive Director

JBH/jc